Environmental Impact Assessment Report (EIAR)

Ringaskiddy Port Re-development – Volume II Main Document

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[1] Introduction, Scoping and Consultation

[1.1] Preamble

The Port of Cork Company (POCC, herein referred to as 'the Developer') has appointed Ayesa to compile an updated Environmental Impact Assessment Report (EIAR) in order to obtain planning permission to complete the final stages of a previously approved project at the Ringaskiddy Port, County Cork (herein referred to as 'the Project'). The additional permission is required as the original planning permission is due to expire in October 2025. The Project includes the following main components:

- **Ringaskiddy East (Container Berth 2)**
    - Construction of an additional 200m Container Berth 2 (CCT2)
    - Dredging of the seabed to a level of -13.0 m Chart Datum (CD)
    - Installation of link-span comprising a floating pontoon and access bridge
    - Installation of container handling cranes
    - Lighting and Fencing
    - **Ringaskiddy West (Deepwater Berth Extension):**
        - A new 182m extension to the existing Deepwater Berth (DWB) which will comprise a filled quay structure (of approximately 231m) extending no further seaward than the edge of the existing DWB
        - Dredging works to varying levels to facilitate navigational access to the new facilities
        - Lighting
- **Road Improvements:**
    - Improvements to internal road network at Ringaskiddy East to facilitate future access to the N28
    - Lighting and fencing

A comprehensive description of the Project is included in Chapter 3 of this EIAR.

[1.2] Planning Context

[1.2.1] Planning Approval 2015

A Planning Approval was previously granted for this same Project by An Bord Pleanála under reference PA0035, amended via references PM0010, ABP-304-437-19 and ABP-310847-21. A ten-year permission was granted.

Through direct correspondence with An Bord Pleanála, the previous planning application was determined as Strategic Infrastructure Development. This correspondence is contained within Volume III a - Appendix 1.1 of the original EIS.

The original Environmental Impact Statement (EIS) for this application is available via the Project website (http://ringaskiddyportredevelopment.gdwin.net/index.cfm/page/non_technical_summary).

[1.2.2] Extension of Planning Duration

Ayesa have been requested by the POCC to update the original EIS and re-issue, in coordination with McCutcheon Halley Chartered Planning Consultants (herein referred to as 'the Planner'), in order to extend the planning duration for this same Project. No other alterations to the granted planning permission is intended.

Therefore, this EIAR has been produced as an update to the original EIS, prepared in accordance with renewed planning policy and guidance, and within the context of the current baseline environment. It should be read in conjunction with the updated Appropriate Assessment Screening and Natura Impact Statement (NIS) prepared in the same vein, as an update to the original documents.

[1.3] Legislative Basis and Scope of Environmental Impact Assessment (EIA)

[1.3.1] Statutory Requirement for an EIA

EIA is a procedure required under the terms of EU Directive 2014/52/EU, transposed into Irish Law through the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (SI 296 of 2018). This Directive requires an assessment of the effects of certain public and private projects on the environment. Ireland implements this Directive through the Planning and Development Regulations 2001-2024

The mandatory requirement is generally based on the nature or scale of a proposed development, as set out in EU Directive 85/337/EEC (as amended by Directive 97/11/EC). The Planning and Development Regulations 2001-2024 – Schedule 5 also identify certain types and scales of development, generally based on thresholds of scale, for which an EIA is mandatory.

The Proposed Project falls within the criteria set out for which a mandatory EIA is required. With respect to the Ringaskiddy Port Re-development, it is subject to the requirements of Part X of the Act and Part 10 of the Planning and Development Regulations on the basis of criteria set out in:

Schedule 5, Part 2, Section 2 (d):

Extraction of stone, gravel, sand or clay by marine dredging (other than maintenance dredging), where the area involved would be greater than 5 hectares *or, in the case of fluvial dredging (other than maintenance dredging), where the length of river involved would be greater than 500 meters.*

Schedule 5, Part 2, Section 10 (e):

New or extended harbours and port installations*, including fishing harbours, not included in Part 1 of this Schedule, where the area, or additional area, of water enclosed would be 20 hectares or*

more, or which would involve the reclamation of 5 hectares or more of land, or which would involve ***the construction of additional quays exceeding 500 meters in length.***

Those conditions highlighted in **bold** are relevant to the Project and, given that both conditions are exceeded, the determination of the requirement for an EIA for the Project.

[1.3.2] EIA Guidance

In preparing the EIAR, regard has been had to the following overarching EIA related guidance:

- Department of Housing, Planning and Local Government (2018) Circular PL 05/2018 - Transposition into Planning Law of Directive 2014/52/EU amending Directive 2011/92/EU on the effects of certain public and private projects on the environment (the EIA Directive) and Revised Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.
- Department of Housing, Planning, Community and Local Government (2017) Key Issues Consultation Paper on the Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems.
- Department of Housing, Planning, Community and Local Government (2017) Circular PL 1/2017 - Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive): Advice on the Administrative Provisions in Advance of Transposition.
- Environmental Protection Agency (2022) Guidelines on the Information to be contained in Environmental Impact Assessment Reports (May 2022).
- European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, S.I. No. 269/2018.
- European Commission (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report.
- European Commission (2012) Interpretation suggested by the Commission as regards the application of the EIA Directive to ancillary/associated works.
- European Commission (1999) Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions.
- European Union (2013) Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment.
- Government of Ireland (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018).

Additional topic-specific guidance used to undertake assessments is identified in the impact assessment chapters, as appropriate.

[1.3.3] Impact Assessment & Description of Effects

This EIAR has been prepared to provide information on the likely significant effects of the proposed project on the environment as per the Planning and Development Regulations 2001 (as amended by Schedule 6 of the European Union (Planning and development) (Environmental Impact Assessment) Regulations 2018, (S.I. No. 296 of 2018)

EIA Regulations require reporting on those environmental effects arising from a project that are considered likely to be significant. With no statutory definition of what constitutes a 'significant effect', the professional opinion of competent experts is utilised on the basis of:

- The baseline conditions, and the sensitivity and importance of receptors,
- The expected magnitude of change on each receptor (considering the nature and duration of change, including site specific and wider effects; positive and negative effects; temporary and permanent effects; direct, indirect and secondary effects; and cumulative effects such as the interaction of scheme effects acting in combination upon a receptor), and
- The potential to avoid or reduce any potential effects such that they are unlikely to be significant.

The criteria for the presentation of the characteristics of potential significant effects will be described with reference to the magnitude, spatial extent, nature, complexity, probability, duration, frequency, reversibility, cumulative effect and transboundary nature (if applicable) of the effect. The environmental effects for each relevant topic have been predicted by determining the baseline environmental conditions which is the situation without the Proposed Scheme. This is then compared to the conditions that would prevail if the Proposed Scheme were to go ahead.

The classification and description of effects in the Proposed Scheme's EIAR follows the terms provided in Table 3.4 of the Draft EPA Guidelines (2022), modified in Table 1. According to the Guidelines, the relevant terms listed in the table below can be used to consistently describe specific effects, but all categories of terms do not need to be used for every effect. The guideline has six key processes of describing environmental effect (or impact).

The assessment of each environmental aspect has been undertaken for the 'do nothing' effect (i.e., effects should the project not be carried out), the 'construction phase' and the 'operation phase' of the Proposed Scheme.

For each significant adverse effect that has been identified by this EIAR, potential mitigation and monitoring measures have been recommended by the competent experts, consistent with statutory requirements and good industry practice in their respective field. The likely residual environmental impact(s) for each environmental topic are then outlined, determined through a review of what likely remaining impact is following implementation of the suggested mitigation and monitoring measures. These are outlined in the assessment tables, have been summarised further in Chapter 18 'Summary of Residual Effects and Schedule of Environmental Commitments'. Those relevant to the construction stage will also be included in the Outline Construction Environmental Management Plan (CEMP).

Table 1: Description of Effects Terminology (modified from EPA, 2022)

Significance Level	Criteria
Quality of Effects	
Positive Effects	A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
Neutral Effects	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative/adverse Effects	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Describing the Significance of Effect	
Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics
Describing the Extent and Context of Effects	
Extent	Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration or frequency will confirm or contrast with established (baseline) conditions (if it the biggest, longest effect ever?).
Describing the Probability of Effect	
Likely Effects	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely Effects	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration of Effects	
Momentary Effects	Effects lasting from seconds to minutes
Brief Effects	Effects lasting less than a day
Temporary Effects	Effects lasting less than a year

Short-term Effects	Effects lasting one to seven years.
Medium-term Effects	Effects lasting seven to fifteen years
Long-term Effects	Effects lasting fifteen to sixty years.
Permanent Effects	Effects lasting over sixty years
Reversible Effects	Effects that can be undone, for example through remediation or restoration
Frequency of Effects	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).
Describing the Types of Effects	
Indirect Effects (a.k.a. secondary or off-site effects)	Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
Cumulative Effects	The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.
Do-nothing Effects	The environment as it would be in the future should the subject project not be carried out.
Worst-Case Effects	The effects arising from a project in the case where mitigation measures substantially fail.
Indeterminable Effects	When the full consequences of a change in the environment cannot be described.
Irreversible Effects	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
Residual Effects	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
Synergistic Effects	Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SOx and NOx to produce smog).

[1.3.4] Structure of the EIAR

The EIAR will comprise 4 volumes as follows:

Volume 1 This provides the 'Non-Technical Summary' to summarise the findings of the EIAR in a clear, accessible format that uses non-technical language and supporting graphics.

Volume 2 This encompasses the main EIAR (this volume) including the chapters outlined below.

Volume 3 This provides the figures that support the EIAR and are cross-references within Volume 2.

Volume 4 This provides the technical appendices that support the EIAR and are cross-references within Volume 2.

The EIAR (Volume 2) will be structured as follows:

Chapter 1 Introduction, Scoping & Consultation
Chapter 2 Need for Scheme & Alternatives
Chapter 3 Project Description
Chapter 4 Planning Policy
Chapter 5 Population and Human Health
Chapter 6 Cultural Heritage
Chapter 7 Landscape & Visual
Chapter 8 Traffic & Transportation
Chapter 9 Noise & Vibration
Chapter 10 Air Quality
Chapter 11 Climate
Chapter 12 Soils, Geology & Hydrogeology
Chapter 13 Coastal Processes
Chapter 14 Water Environment
Chapter 15 Marine Ecology
Chapter 16 Terrestrial Ecology & Ornithology
Chapter 17 Material Assets
Chapter 18 Interactions & Cumulative Effects
Chapter 19 Major Accidents & Disasters
Chapter 20 Schedule of Environmental Commitments

[1.4] Scoping & Consultation

The Project arises from a strategic need identified by the Developer (POCC) as described in Chapter 2 of this EIAR. The process of consultation initially enabled POCC to gauge opinions on general development options for the Port and facilitated differing perspectives to be taken into account in the initial stages of the development proposal. The consultation processes have helped to shape the proposal presented to An Bord Pleanála.

Building on the consultation carried out during the process to develop the POCC Strategic Development Plan Review in 2010, POCC carried out further extensive consultation on the project in the course of developing the Project. RPS, in the course of preparing the original EIS, also consulted with various statutory and non-statutory bodies, and this facilitated

changes to be made during the design stage of the Project to take account of comments, and suggestions arising from the consultation process.

[1.4.1] Consultation with An Bord Pleanála

A pre-application statutory consultation process was held with An Bord Pleanála relating to the proposed redevelopment at its inception in 2014. This occurred over a series of five pre-application consultation meetings between 2011 and 2014. Copies of the written records of those consultations are included in the original EIA (Volume III a - Appendix 1.2). Following on from that process, An Bord Pleanála served notice that it was of the opinion that the proposed redevelopment falls within the scope of paragraphs 37A(2)(a) and (b) of the 2000 Act and accordingly any application for permission for the proposed redevelopment must therefore be made directly to An Bord Pleanála under section 37E of the Act.

For the current planning application process a Section 287 SID pre-planning meeting was held with An Bord Pleanála on 01 October 2024.

[1.4.2] Consultation with Statutory and Relevant Bodies

[1.4.2.1] Previous Consultation (2013-2014)

As mentioned above, the previous EIAR undertook a scoping phase consultation exercise with a number of statutory and non-statutory organisations. Letters were sent to the consultees, informing them of the proposed project, and inviting their comments on the proposals.

Further, a programme of public consultation was undertaken between April 2013 and February 2014 to seek the views of the wider public on the proposal. The consultation process involved:

- Briefings with local public representatives on the proposal
- Provision of up to date project information on the POC website: www.portofcork.ie
- The publication of public notices in local newspapers
- Conduct of two Public Consultation Events, held on the following dates:
  - 11th – 13th April 2013 (held at the Fota Island Gold Clubhouse, and the Carrigaline Court Hotel).
  - 6th – 8th February 2014 (held at the Sirius Arts Centre Cobh, and the National Maritime College).

[1.4.2.2] Renewed Consultation (2024)

In 2024, letters were sent to the relevant statutory and non-statutory consultees listed below, informing them of the proposed application to finalise the previously approved development and inviting their comments on the proposal;

- An Taisce
- Arts Council
- Birdwatch Ireland

- Bord Gais Eireann
- Bord Iascaigh Mhara
- Commissioners of Irish Lights
- Cork City Council
- Cork County Council
  - County Manager
  - Planning
  - Environment
  - Water Services
  - Roads
  - Corporate, Community & Emergency Services
- Cork Kerry Tourism
- Department of Agriculture, Food and the Marine
- Department of Arts, Heritage and the Gaeltacht
  - Development Applications Unit
  - NPWS Divisional Ecologist
  - Underwater Archaeology Unit
- Department of Children and Youth Affairs
- Department of Communications, Energy and Natural Resources
- Department of Defence
- Department of Education
- Department of Environment, Heritage and Local Government
- Department of Foreign Affairs
- Department of Health
- Department of Enterprise,Trade and Employment
- Department of Justice
- Department of Transport, Tourism and Sport
- EirGrid
- Electricity Supply Board
- Enterprise Ireland
- Environmental Protection Agency
- Failte Ireland
- Geological Survey of Ireland
- Health and Safety Authority
- Health Service Executive – Southern Area
- Heritage Council
- Inland Fisheries Ireland
- Irish Federation of Sea Anglers
- Irish Whale and Dolphin Group
- Irish Wildlife Trust

- Marine Institute
- National Roads Authority
- Office of Public Works
- RNLI Ireland
- SouthWest Regional Authority
- Sustainable Energy Authority for Ireland
- Teagasc

[1.5] Project Team

The EPA Guidelines require that "the introduction to the EIAR should include a list of the competent experts who have contributed to an EIAR, showing which part of the EIAR they have worked on, their qualifications, experience and any other relevant credentials". The EIAR has been prepared by a multidisciplinary team of environmental specialists as set out below.

Table 2: EIAR Team and Qualifications

Consultants	Experienced/Competent Expert and qualifications	Inputs
Ayesa	**Barry Sheridan** Director, Environment BA Hons. (Environmental Sciences), Higher Diploma (Environmental Engineering), Higher Diploma (Acoustics & Noise Control)	Lead EIAR Consultants. Principal report writers.
	Lynn Morrissey Principal Environmental Scientist BSc Biological Sciences MSc Environmental Resource Management	
	Andrea Brogan Environmental Consultant MA (Environmental Humanities), BSc (Tourism Management)	
	Jeff Hean Senior Ecologist PhD (Zoology), MSc (Ecology), ZSSA, SASAqS	Terrestrial Ecology. Appropriate Assessment (AA) Screening. Natura Impact Statement (NIS).
	Joe Butler Senior Ecologist MSc (Wildlife Conservation & Management) BSc (Zoology), QCIEEM	
	Meadhbh Stack Project Ecologist BSc Ecology and Environmental Biology	
Aquafact	**Ronan Browne** Head of Consultancy PhD, MSc, Dip Aquatic Biology	Marine Ecology Bat Survey.

	Eddie McCormack Associate Director PhD in Zoology, BSc Marine Science	Coastal Processes.
The Big Space Ltd.	**Linda Maher** Landscape Architect PhD (Landscape Architecture), MSc (World Heritage Management, BAgriSc Hons (Landscape Horticulture)	Landscape and Visual Impact Assessment.
Chris Shackleton Consulting Ltd.	**Chris Shackleton** Principal BA BAI (Engineering)	Photomontages.

[2] Need for Scheme & Alternatives

[2.1] Introduction

The current scheme is required to complete the final stages of the Ringaskiddy Port Redevelopment which were previously approved by An Bord Pleanála. The application is required as planning permission for the development is due to expire on 20th October 2025 and key elements of the project are yet to be constructed.

As such the rationale of the need for the current scheme involving the final construction stages is broadly similar to those for the overall Port Redevelopment and are outlined below.

[2.1.1] Policy and Planning Context

The provision of effective, efficient and competitive port facilities is essential to the economic vitality of the country and the South-West Region. Ports are essential infrastructure and government policy is to ensure that infrastructure and port services are provided in time to meet changing market demands. Government policy is also to require port companies to fund all of their infrastructure and operational requirements from their own resources. Guaranteeing cost-efficiencies in terms of land use and operational activities is therefore a national policy obligation for the Port of Cork (NPMF 2040).

Within Europe, the Port of Cork is identified as a Core Port within the Trans-European Transport Network (Ten-T) and improving its capacity and efficiency will contribute to the development of an integrated European transport network.

Trade throughput at the Port of Cork is vital to the stability and future growth of the economy in the South-West Region. The Port of Cork is also a vital contributor to the nation economy and European infrastructure network. It is essential that the Port responds to future growth requirements and changes in shipping trends towards larger vessels.

The current government Policy Statement of the facilitation of Offshore Renewable Energy by Commercial Ports in Ireland (Department of Transport 2021), recognises that Irish Ports will have an important role to play in delivering Offshore Renewable Energy targets to meet the EU's goal of climate neutrality by 2050. The Programme for Government 2020 and the Climate Action and Low Carbon development amendment act commit Ireland to a target of 70% electricity to be generated from renewable sources by 2030 and set a target of 5GW for offshore wind by 2030. The National Marine Planning Framework published in 2021 brings together the government's vision, objectives and marine planning policies for port activity and Offshore Renewable Energy. The significant role that the Port of Cork can play in facilitating the development of the Irish offshore renewable energy section is widely recognised in this policy document. To meet Ireland's target of 5GW by 2030 it has been assessed that a minimum of two facilities will be required from 2025 onwards for deployment activity. A multiple of typically smaller ports will also be needed for Operation and Maintenance operations.

The relocation of Port activities from the Upper Harbour, including City Quays is considered a key component to facilitate redevelopment of the Docklands and Tivoli for residential and employment uses. The city needs these lands to achieve its population growth targets and spatial planning objectives for the Region. Further the Port of Cork must release the equity of lands in the longer term in the Upper Harbour to fund their infrastructural and operational requirements, in line with Government policy. In this case, the Port of Cork must also relocate from the Upper Harbour because the depth of the water channel and width of the river at Tivoli

cannot accommodate larger vessels and it is logistically difficult to accommodate with more than 1 container vessel at a time.

POCC undertook significant redevelopment works at Ringaskiddy under the previously permitted Strategic Infrastructure Development application (ref: PA0035, as modified by PM0010, 304437-19 and 310847-21)[1].

A large portion of the permitted works have been completed and are now operational. There is no provision in legislation that provides for an extension of duration of the original permission, given the requirement for both an EIA and an AA. Accordingly, this application is seeking permission for the elements of the work previously permitted but which are yet to be completed.

The current EIAR, therefore, occurs in the context of a pre-existing major port redevelopment project which is now operational. This redevelopment has expanded the capacity of the deep-water port at Ringaskiddy for the purposes of relocation which will ultimately contribute to enabling the Port of Cork to relocate operations entirely from the Upper Harbour by 2050. Stage 1a of the historic redevelopment (PA0035) is now complete and the construction of the Cork Container Terminal (CCT1) at Ringaskiddy East was concluded in 2022. The current approved infrastructure gives the port sufficient operational capacity up to 2029 however a planning condition limits throughput at the Ringaskiddy Port facility to 322,846 TEU until such time as the M28 and Road schemes are complete. CCT1 currently caters for 75-80% of Port of Cork's container traffic, however this is projected to increase progressively towards 2030.

To cater for the projected increase in container traffic and dry bulks and cargoes, a further berth (CCT2) and deepwater berth extension (Ringaskiddy West) as well as extension of the CCT yard are now required and proposed herein to be added to the redevelopment under the current application.

The provision of effective, efficient and competitive port facilities is essential to the economic vitality of the country and the South-West Region. Ports are essential infrastructure and government policy is to ensure that infrastructure and port services are provided in time to meet changing market demands. Government policy is also to require port companies to fund all of their infrastructure and operational requirements from their own resources. Guaranteeing cost-efficiencies in terms of land use and operational activities is therefore a national policy obligation for the Port of Cork.

Ensuring that the Port of Cork continues to meet the external connectivity needs and supports the development of the wider regional and national economy is of key importance. This is clearly enunciated in Irish government policy, including the National Spatial Strategy, and the Government's most recent National Port's Policy statement (March 2013), discussed in more detail in Chapter 4 (Planning Policy). The National Port's Policy Statement identifies three Tier 1 Ports of National Significance, namely Dublin, Cork and Shannon / Foynes.

The onus is primarily placed on Tier 1 Ports to deliver Ireland's required port capacity and services to contribute to overall national development goals.

Within Europe, the Port of Cork is identified as a Core Port within the Trans-European Transport Network (Ten-T) and improving its capacity and efficiency will contribute to the development of an integrated European transport network.

[1] Hereafter referred to as the PA0035 permission.

[2.1.2] Economic Context

A report on the socio-economic impact of the proposed Ringaskiddy Port Redevelopment has been prepared by Indecon International Economic Consultants and is provided in EIAR Volume IV Appendix 2.1 (The Indecon Report).

The Indecon Report evidences that the Port of Cork plays a key strategic role in the development of both the Cork City region and the wider Irish economy. Furthermore, by facilitating the movement of goods to and from the UK and Continental Europe, the Port also plays an important role in the development of the EU's Internal Market. The Indecon Report emphasises that as a small open economy, Ireland is critically dependent on external trade to support its development.

The report also provides a detailed appraisal of the economic impact of the Port of the Cork trade on the regional and national economy. This is discussed in Chapter 5 (Population and Human Health) of the EIAR. In summary, the Indecon Report estimates the value of trade throughput at the port was €13.9 billion in 2012. It is estimated that this trade supported almost 172,000 full-time equivalent jobs across the regional and national economy.

Despite the disruptions from the pandemic, it is anticipated that in the long run, growth rates will be restored. Global GDP Projections are reviewed in the Port of Cork Masterplan 2050 and is projected to continue to grow by between 2% and 3%.

[2.1.3] Port of Cork Trade

The Port of Cork is one of two major national multi-modal ports and is the second largest port in the Republic in turnover terms. The Port of Cork's current facilities do not have sufficient capacity to accommodate the projected changes in freight throughput (detailed in the Indecon Report). To meet future operational requirements and to be consistent with national policy it is therefore necessary for the Port to plan for future growth requirements and to respond in particular to the trend towards larger vessels (see section 2.4.1).

As noted in the National Competitiveness Council's report 'Our Cities: Drivers of national Competitiveness', April 2009:

"…in view of the long lead times for the delivery of air and sea-port infrastructure and services, it is critically important that we plan now to ensure that our cities are well positioned to meet the longer-term needs of business and citizens across the island."

Consistent with this objective, the Port of Cork produced a review of its Strategic Development Plan in 2010. This review considered the Port's objectives; assessed the capacity of existing Port facilities; key drivers for future development; carried out a detailed appraisal of potential sites; and identified the most appropriate way forward to achieve a sustainable balance between the economic, social and environmental aspects of Port operations, while achieving an acceptable return on investments. It was concluded that it is most appropriate from a logistical, economic and planning context to phase out activity at Tivoli and the City Quays and relocate activities to other port locations. Section 2.6 details the site appraisal process carried out as part of the consideration of alternatives for the proposed Ringaskiddy redevelopment.

The most recent annual report indicates that the POCC's container traffic amounted to a record 282,781 TEUs, a slight increase of 965 TEUs on 2021 figures, primarily as a result of the new direct ConRo services between Europe and Ringaskiddy. The turnover for 2022 amounted to €48.4 million (2021: €39.8m) (Port of Cork Masterplan 2050).

In the past five years, the Board has approved over €100m of capital investments, primarily in the container terminal facilities at CCT in Ringaskiddy and Tivoli, to accommodate port container traffic growth of over 30%. These investments included the construction of the CCT in Ringaskiddy; installation of additional reefers; accommodating the movement of adjacent licence tenants; the purchase of new straddle carriers; and digitisation, with the implementation of a new automatic gate operating system for trucks and a vehicle booking system. These measures resulted in improved container facilities, quicker truck turnaround, and less congestion at both container terminals (Port of Cork Masterplan 2050).

In 2022, the PoCC opened the new CCT in Ringaskiddy. The transition of LoLo services from Tivoli to Ringaskiddy commenced in April 2022, and the new CCT was officially opened in September 2022. The CCT is constrained by conditions attached to the current planning permission and so cannot exceed 320,000 TEUs. The PoCC Masterplan shows that the CCT will reach capacity in 2024/2025, and therefore container operations will need to continue at Tivoli to manage volume until the M28 is complete (Port of Cork Masterplan 2050).

[2.1.4] Key Drivers of Need for Project

[2.1.4.1] Physical Constraints

The Port's current facilities at Tivoli and the City Quays are located in the Upper Harbour. The capacity of Tivoli to meet future trends in sea freight traffic is limited due to its location; the relatively narrow width and shallow depth of the harbour at these locations; the limited quay length; and the depth constraint of the Jack Lynch tunnel, which is down harbour of both facilities.

The trend in sea freight traffic is for larger vessels in both the bulk and container fleets, particularly container vessels. To remain competitive, it is vital that the Port of Cork can accommodate these larger vessels. There is steady growth in the proportion of overall vessel arrivals represented by ships with a capacity of 20,000 tonnes and above and a corresponding decline in smaller sized vessels. The presence of scale economies in container vessel usage is leading to a reduction in the volume of such vessels produced internationally, thereby removing smaller vessels from the market.

To remain competitive and effective, the Port of Cork must be able to accommodate larger vessels which are becoming the norm in the shipping trade. Accommodating larger vessels at Tivoli cannot be achieved because:

- Quay lengths are not sufficiently large enough to accommodate more than one large vessel at a time. The overall maximum combined length of container vessels that can be handled effectively at one time is 240 metres. While the mix of vessels currently serving the terminal fall within this dimension there have already been a number of occasions when this has been exceeded and delays have been experienced. As shipping trends continue to change the Tivoli container quay will become more unsuitable, with increased delays and consequential loss of competitiveness inevitable.

- The maintained depth in the approach channel to Tivoli is 6.5 metres, which means that only vessels with a draft of less than 6 m can navigate without restriction. Generally, vessels with a draft greater than 7 m will be subject to delays and are dependent on tidal flows to safely navigate the Upper Harbour. Depth can never be increased due to the presence of the Jack Lynch tunnel.

- Depth alongside at Tivoli is 6.9m Chart Datum (CD) in the eastern berth and 8.8m CD in the western berth. Depending on the height of tide at low water, drafts at the eastern berth can be limited to approximately 6.3 m. The trend is towards vessels with a draft in excess of 7 m and a vessel at this draft could not lie afloat at all stages of the tide in the eastern berth.

- The turning circle at Tivoli is 160 m in diameter, which allows vessels of up to 154 m to turn. The turning circle cannot be increased as it is bounded on the north side by the quayside and on the south side by the Marina. A further limitation is that vessels greater than 135 m in length cannot turn while there are other vessels on the berth. Figure 2.2 shows a container vessel 151 m in length turning at Tivoli. A vessel of this size always requires a tug to berth at Tivoli, because it has to swing in the channel. Use of tugs for berthing is not part of normal container ship operations, but is the only way vessels of this size can be handled at Tivoli. If the Port of Cork cannot respond to changes in ship length and draft the Port will become uncompetitive and ultimately lose business to other Ports.

Figure 2.2: Container Ship turning at Tivoli

The physical constraints for the City Quays are less acute. For the City Quays the principal driver for relocation is to facilitate Docklands redevelopment and to improve logistical efficiencies in Port operations by consolidating activities.

[2.1.4.2] Logistical Operations

Increased freight throughput has an associated increase in demand for back-up lands, both in terms of immediate storage and in terms of developing the ability to locate distribution activities close to the port site, thus maximising port-centric benefits. The trend in port logistical operations is to provide land banks adjacent to port facilities to promote these benefits, which cannot be adequately achieved in the Upper Harbour locations.

[2.1.4.3] Offshore Renewable Energy

While developing the current Port Masterplan, the POCC has engaged with several private sector and semi- state companies that are spearheading the delivery of renewable energy in Ireland, and particularly Offshore Renewable Energy (ORE), to understand how best to facilitate their ambitions.

The POCC at Ringaskiddy can be a key enabler of the green energy sector in Ireland by taking advantage of its deepwater channels and berths and quay loadings designed for ORE Infrastructure; building out new infrastructure that has approved planning permission in place; reclaiming land to accommodate large project cargoes for offshore wind Marshalling and Assembly (M&A) activities; upgrading infrastructure; facilitating use of port lands and/or near shore storage; and providing access to berths and quays for Operation &Maintenance (O&M) activities.

The deepwater berth (DWB) at Ringaskiddy West currently facilitates the import of wind turbine components and other project cargoes associated with the land-based wind energy sector. Some of the longest blades in Ireland have been imported at the deepwater berth. The ADM jetty is currently used for the import of green liquid bulks, such as HVO. There is potential for dry bulks, in the form of solid biomass fuel, to be enabled through Ringaskiddy West DWB with simple modification of the existing dry bulk business. The DWB is currently able to facilitate many of the vessels associated with the ORE industry.

Ringaskiddy East has been identified as a potential location for the development of Offshore Wind activities (ORE), supporting Marshalling and Assembly (M&A) in the short term and Operational & Maintenance (O&M) in the longer term. To achieve this, the POCC can build out port infrastructure with the approved planning permission already in place for 430m of quay walls (Ringaskiddy East CCT: 200m, Ringaskiddy West DWB: 230m). It can also utilise existing landside facilities to support the fixed bottom ORE sector.

[2.1.4.4] Economic Benefits of Redevelopment

Based on growth projections detailed in Table 3.8 in the Indecon Report (April 2014: EIAR Vol IV Appendix 2.1), it is estimated that once the Ringaskiddy Redevelopment is completed, the overall value of trade handled by the Port of Cork would expand to €28.7 billion by 2033. This would translate into an increase in job numbers supported across the economy to over 354,000 FTEs by 2033.

The Indecon Report carried out a Cost-Benefit Appraisal of the proposed Ringaskiddy Redevelopment. This quantified the benefits and costs of proceeding with the project relative to a 'no- development' scenario. The analysis was informed by the trade throughput projections assuming (a) full implementation of the proposed capacity-enhancing measures for the Ringaskiddy site, and (b) no development of Ringaskiddy and 'business as usual' on the basis of intensification of the port's existing facilities and capacities. The Cost-Benefit Appraisal suggests that proceeding with the proposed Ringaskiddy Port Redevelopment would be likely to deliver a net economic return to the Irish economy, compared to a scenario where failure to develop the Port would result in over-capacity trade having to be diverted to other, more distant ports, with associated transport and environmental costs. Indecon's appraisal showed a Benefit-Cost Ratio of 2.31 to 1 in favour of proceeding with the proposed Ringaskiddy Port Redevelopment (see Table 5.10 of the Indecon Report).

[2.1.4.5] Financing Future Development

Government policy requires port companies to fund all their infrastructural and operational requirements from their own funds. To comply with this requirement the Port Company must ensure that future logistical operations are cost-efficient and that capital land assets are properly managed and developed. It is not feasible to redevelop the Upper Harbour port sites to accommodate projected growth in Port trade, or the changing trends in the size of ships. The release of the lands in the Upper Harbour to provide for higher density inner city waterfront development would release capital to fund future port facilities in the longer term in the Lower

Harbour, which are more suited to the developing trends in sea freight transport and port side logistics.

[2.1.5] Summary of Need

Trade throughput at the Port of Cork is vital to the stability and future growth of the economy in the South-West Region. The Port of Cork is also a vital contributor to the national economy and European infrastructure network. It is essential that the Port responds to future growth requirements and changes in shipping trends towards larger vessels. The Port must remain competitive and respond to future economic demands to help sustain the regional and national economy. A Cost-Benefit appraisal carried out as part of the Indecon Report suggests that proceeding with the proposed Ringaskiddy Port Redevelopment would be likely to deliver a net economic return to the Irish economy, with a Benefit-Cost Ratio of 2.31 to 1 in favour of proceeding with the project.

The Port of Cork must relocate from the Upper Harbour because the depth of the water channel and width of the river at Tivoli cannot deal with larger vessels and it is logistically difficult to deal with more than 1 container vessel at a time.

The relocation of Port activities from the Upper Harbour, including City Quays, is also necessary to facilitate redevelopment of the Docklands and Tivoli for residential and employment uses. The City needs these lands to achieve its population growth targets and spatial planning objectives for the Region. Further the Port of Cork must release the equity of lands in the longer term in the Upper Harbour to fund their infrastructural and operational requirements, in line with Government policy.

Port of Cork Ringaskiddy now handles 85% of the Port of Cork's container traffic at CCT1, with the balance of container trade continuing to operate from Tivoli. The projected growth of container trade necessitates the completion of the previously permitted Ringaskiddy facilities.

[2.2] Outline of Alternatives

[2.2.1] The 'Do Nothing Scenario'

The current physical constraints in handling some of the larger vessels simultaneously at the existing Tivoli Container Terminal and the critical operational difficulties associated with the projected further increase in container vessel size and cargo throughput confirms the Port of Cork's view that there is a need to complete the development of the new container terminal in deeper water.

Completion of the new facility will satisfy current and future customers' needs together with supporting local and regional business dependent on trade that passes through the port.

A failure to complete the new deep water container berthing facilities to address the ongoing trend towards larger container vessels would place the Port of Cork at an operational and competitive disadvantage relative to other large ports. In such a situation the Port would start to lose trade and larger unitised freight customers, and over capacity trade would have to be handled at other more distant ports. In this scenario additional socio-economic costs would arise across the Irish economy associated with the internal haulage costs of moving trade, the majority of which would otherwise have an origin- destination catchment that is focussed on the Cork and Munster areas. These internal freight transport/connectivity costs would include additional journey times and vehicle costs, costs associated with increased traffic congestion along national primary routes and associated environmental/ emissions costs.

A failure to provide an extension to the existing Deepwater Berth (DWB) will impact the Port of Cork's ability to service the needs of the bulks sector and will inevitably lead to further operational difficulties due to berth congestion. In addition, there would be negative impacts in that Dockland type development - in Tivoli and the City (a core regional objective) would be severely constrained.

Of significance to the cost-benefit analysis of relocating the port is that the operation of trade from different locations in the Harbour reduces the cost effectiveness of the operation and management of the Port infrastructure. There would be significant economies of scale achieved in the scenario that all container trade was operated from the one site.

[2.2.2] Alternative Locations

The original proposed development was subject to a detailed assessment of alternative locations. These are set out in the sections which follow.

Various alternatives were considered in the course of preparing plans for the Ringaskiddy Redevelopment. Alternatives were considered in the context of the operational requirements of the port in establishing facilities to meet projected needs and the physical characteristics of alternative locations. This process was informed by various previous studies including work undertaken during the preparation of the Port of Cork's Strategic Development Plan Review 2010 (SDP) and an assessment of the case for rail freight connectivity to the Port, Volume IV a - Appendix 2.2

This assessment builds on the assessment of alternatives in the original EIS for the port redevelopment.

[2.2.2.1] Site Requirements

The drivers and factors which influenced the choice of location for the development permitted under PA0035 included;

- Anticipated volumes of future trade
- Anticipated need to service the offshore renewable energy industry
- Anticipated increase in vessel size
- Vessel characteristics and berth requirements
- Flexibility and future proofing

Key criteria which would need to be met for a site to be considered potentially suitable for port related development included;

- The site must provide access to deep water and have the potential to be deepened to at least -11m Chart Datum (CD)
- The site must be adequately sheltered from sea and weather conditions
- The site must be within reasonable distance of existing port locations to ensure effective communications and efficient operations

- The site must be geographically situated to ensure it is suitable to continue to service effectively the main areas associated with the Port of Cork's current operations and existing customer base
- The site must be able to be linked to main transportation networks
- The site must not represent a fundamental conflict with planning policy or environmentally sensitive designated areas

[2.2.2.2] Greenfield Sites Outside Cork Harbour

A review of the coastline adjacent to Cork Harbour has indicated that this particular option is highly unlikely to be worthy of more detailed consideration for a number of reasons including;

- The generally unsuitable nature and topography of the coastline in the immediate vicinity of Cork
- Any areas not comprising unsuitable coastline are generally associated with residential or leisure use or have environmental/amenity value
- Sites outside Cork Harbour would be exposed to frequent and aggressive storm action during winter months and would require substantial engineering works in order to protect a commercial harbour from expected sea and weather conditions
- Such sites would be distant from other Port of Cork facilities, potentially necessitating inefficient duplication.
- Such areas would be increasingly distant from the areas and customers currently serviced by Port of Cork trade
- General lack of adequate road access to coastal locations

[2.2.2.3] Port Facilities Elsewhere

Given the level of trade expected through the Port both in terms of containers, which may be relocated from Tivoli, and bulks and other trades which may be displaced from the City Quays any alternative location would need to be capable of accommodating a significant additional throughput. Any alternative existing port facilities will also need to meet fundamental requirements for water depth (-11m CD) and length of quay and have flexibility for future development in order to continue to meet the ports needs in the future. The following existing port/harbour facilities are located within a 125km radius of Cork;

- Youghal
- Dungarvan
- Dunmore East
- Waterford Port
- Rosslare Port
- Wexford

- Kinsale
- Bantry Harbour
- Castletownbere
- Shannon Foynes Port

A review of these locations has concluded that there are no existing ports within the south/south- western geographical sector of Ireland that could realistically meet all of the requirements for the Port of Cork's relocation of existing and future trade in terms of;

- Physical capacity and access
- Customers needs and access to markets
- Commercial considerations
- Transport and Sustainability

[2.2.2.4] Port Locations and Greenfield Sites within Cork Harbour

Based on an initial consideration of the fundamental criteria for a new port site a long list of potential locations within Cork Harbour worthy of further consideration was developed;

- Marino Point A (including Foaty Channel)
- Marino Point B (including Jetty and former IFI site)
- Cork Dockyard
- Ringaskiddy West, including lands to the west of the existing DWB and the location of existing ADM Jetty
- Ringaskiddy East comprising the east side of Ringaskiddy Basin and lands adjacent to Ringaskiddy Ferry Terminal
- Adjacent Haulbowline Island
- Cuskinny Bay
- Whitegate / East Channel
- Curlane Bank
- Dogsnose Bank
- Aghada / East Channel

Figure 2.3 Potential Locations in Cork Harbour

The sites in Figure 2.3 were assessed and scored with reference to a range of criteria which could influence any future development of port facilities. The main assessment categories used included;

- Physical Suitability
- Navigational Suitability
- Port Operations
- Road Transport
- Rail Transport
- Environmental Impacts including Ecology
- Planning Issues
- Cost

From this a shortlist of the four most suitable sites for each mode of trade was identified.

Rank	Containers	Bulk Solids/General Cargo
1	Ringaskiddy East	Ringaskiddy West
2	Adjacent Ringaskiddy Ferry Terminal	Adjacent Ringaskiddy Ferry Terminal
3	Marino Point B	Marino Point B

Subsequently a more detailed assessment of the short-listed sites was undertaken and included the following main actions:

- Identification of the key features of the various trades which will need to be accommodated
- Preparation of conceptual development plans for how the anticipated future trade might be accommodated at the various sites either individually or together.
- Consideration of the sites under various assessment criteria

Key features of each of the shortlisted locations for unitised and bulk cargos is presented below:

Marino Point B

The Marino Point site occupies the existing lands associated with the former IFI plant. The area was extensively levelled for previous developments. The site includes an existing jetty which could potentially be re-used for other port activities. Access to the site from the jetty is currently restricted to a narrow single access viaduct and any future access may be restricted by the presence of a rock escarpment along the western (shore side) edge of the site. There is potential for reclamation of land between the existing jetty and shoreline.

Previous activity on the site would indicate that some degree of local contamination might be expected.

The site is sheltered but is subject to tidal currents of approximately 2 knots. The depth of the main navigation channel at Marino Point is generally greater than 10m but some dredging will be necessary at the quay line and also towards the western side of the channel to provide adequate depth for a turning basin.

Constraints to developing additional Port Facilities at Marino Point

Constraints to developing container and/or general cargo/bulk facilities at Marino Point included:

- The site is not owned by Port of Cork
- There is currently no Port of Cork activity at the site and so development at this location would not contribute to a consolidation of port operations
- The width of the existing jetty is 20m and with only one narrow existing access viaduct there could be a constraint on the ease of access for Heavy Goods Vehicles (HGV) due to limitations in respect of turning vehicles
- The existing rock escarpment could prove a constraint for access to and from the jetty and the distance from the jetty to the main site could limit operational effectiveness particularly in the case of containers
- The site is accessed by the R624 which has poor capacity and alignment issues and Belvelly Bridge, a heritage structure, is a major constraint. This road is not a designated National Route and it would need to be upgraded to accommodate port

traffic. This site is situated directly south of the Great Island Channel cSAC, pNHA and a section of the Cork Harbour SPA. Disturbance to birds in the adjacent section of Cork Harbour SPA is likely to be the key (non-marine) ecological impact at Marino Point. Containers produce the highest overall levels of noise and the highest levels of 'impulsive' noise compared to bulk or bulk liquids and as a result disturbance to birds is more likely from container operations than for other trades

- Disturbance to birds is less likely with bulk operations
- Dredging which would be required at this site will straddle the main migratory channel for fisheries which will make timing of dredging activities critical for habitat disturbance and degradation due to dredging is the largest of any of the sites.
- There are potentially a large number of properties that may be negatively impacted by noise and emissions from the site. There is limited scope to screen from potential noise emissions to the west and south due to the open nature of the area crossing the river
- There is a potential at this location for negative noise impacts if container handling operations are required to be undertaken during night-time, particularly due to potentially impulsive noise associated with container handling operations
- The presence of cranes on the quayside could have a high visual impact. There would also be a high potential for significant visual impacts if reclamation is undertaken in front of the escarpment
- Marino House and the perimeter escarpment of Marino Point would have to be protected. Land reclamation on the foreshore adjoining the curtilage of Marino House would have impacts on this protected structure

Advantages to developing additional Port Facilities at Marino Point

Key advantages with regard to developing container and/or general cargo/bulk facilities at this location include:

- This site is generally reasonably good in terms of port operations. Vessel activity in the vicinity of the site is limited and there is unlikely to be significant conflict with other harbour users.
- Significant available existing lands that would meet the needs of all modes under consideration
- The site is adjacent to a rail line and the potential therefore exists for rail connectivity in the future. There was previously a railway siding onto the Marino Point site
- The main site is reasonably well screened by the escarpment and there is limited potential for visual impact on scenic routes
- Development at this site is consistent with broad planning policy objectives

Ringaskiddy East (Adjacent CCT1)

This site largely comprises existing port lands adjacent to the facilities at the CCT 1 and close to the port facilities at Ringaskiddy DWB. Some limited reclamation would be required to

provide quays at a location with adequate water depth but with this reclamation the site will be contiguous with existing port lands.

Any development will likely include both existing port lands (previously reclaimed) and new reclamation areas on the existing foreshore. The existing lands have been reclaimed for some considerable period of time and will be suitable for development of the types envisaged.

The site is well sheltered and there is direct access to the main channel and Ringaskiddy Basin. The site includes the existing Ringaskiddy pier and slipway.

Constraints to developing additional Port Facilities Adjacent CCT1

Constraints to developing container and/or general cargo/bulk facilities Adjacent Ringaskiddy Ferry Terminal include:

- Reclamation and construction of quays would likely have some impact on leisure craft sailing grounds
- There are no existing or disused railway lines in the vicinity of this site and as such the site is not suitable for rail connection.
- The nearest section of Cork Harbour SPA is Monkstown Creek (also a pNHA) situated approximately 600m to the west of the site. Potential for disturbance of birds within Cork Harbour SPA is considered low to moderate
- The marine habitat in areas of potential reclamation and dredging is moderate to high quality fish nursery and fish feeding ground and is a good potting and netting area for commercial fishing
- There is limited scope to reduce potential noise emissions to sensitive receptors to the north in Blackpoint and Whitepoint
- There may be a potential for negative noise impacts at this location if container handling operations are required to be undertaken during night-time
- Land must be reclaimed from the sea to facilitate the ultimate development at this location. This will alter the coastline, and impact on the existing visual resource especially at locations across the harbour to the north and west
- For container development at this site the proposed density of containers will potentially have a consolidated and cumulative impact when viewed sporadically from Ringaskiddy to the south, and from coastal locations to the north and west especially. Quayside container cranes will constitute new, prominent vertical elements in the landscape. There is high potential for visual impacts on dwellings occupying higher slopes

Advantages to developing additional Port Facilities at CCT1

Advantages with regard to developing container and/or general cargo/bulk facilities at this location included;

- There was an existing container terminal which can be readily upgraded.
- Site is in close proximity to the shore and with reclamation will be contiguous with existing Port lands. There are no significant infrastructural constraints to development

- There are no significant constraints to navigation at this location and there will be no significant impact on other commercial vessels
- Potential for future extension if required. This site has good potential for the phasing of developments
- This site would access directly onto the future M28 National Road Network
- Potential for disturbance of birds within Cork Harbour SPA is considered low to moderate
- The site is less proximate to sensitive receptors than Marino Point with associated benefits in terms of noise impacts
- Air quality is unlikely to be a significant issue at this site given the relatively large distance to receptors
- Development at this site is broadly consistent with regional planning policy. Development would also be consistent with Cork County Development Plan (CDP) and local planning policy objectives
- This site would offer good degree of flexibility in terms of layout and phasing which would allow development proposals to respond to the potential fluctuations in economic growth of the Region

Dogsnose Bank

This option comprises open water in the vicinity of Dogsnose bank in the outer harbour. The entire site would be created by land reclamation in the shallow water adjacent to the main navigation channel. The development would require a causeway/bridge connection to the existing shoreline. This location provides for easy access to the main navigation channel although dredging would be required to ensure adequate water depth.

Constraints to developing additional Port Facilities at Dogsnose Bank

Constraints to developing container and/or general cargo/bulk facilities at Dognose Bank include:

- Site is more exposed to wave action from the mouth of the harbour than other sites under consideration and could be subject to some negative effects on harbour operations and ships at berth during storm events
- The site is in a location used by leisure craft and any development would result in a loss of sailing grounds
- Site is very remote from all other existing port locations and would not contribute to consolidation of port activities
- All traffic associated with a port development at this location would use the Regional Route R630. The R630 is a busy road and sections of the road already exceed capacity without any additional port related traffic. Any such additional port related traffic would have to route via a number of villages and residential areas such as Aghada, Rostellan, Saleen, and Ballinacurra. All traffic from a port development at this

location would have to access the N25 at the Lakeview Roundabout which is congested at peak periods

- The use of this location would give rise to an additional mileage of approx. 80km per round trip
- There are no existing or disused railway lines in the vicinity of this site and as such the site is not suitable for rail connection
- The Whitegate Bay section of Cork Harbour SPA and Whitegate Bay pNHA lie approximately 500m to the east of the site. The equivalent section of Cork Harbour RAMSAR site is approximately 500m from the site
- Any development involving reclamation is likely to result in a loss of significant areas of the seabed habitat. Reclamation and the construction of an access causeway could possibly constitute a barrier to local fish movement and migration
- Any development involving the reclamation of lands from the sea will constitute a highly visible development from surrounding coastal landscapes regardless of proposed mitigation measures. Large cranes associated with loading and unloading containers will constitute new, prominent vertical elements in the landscape
- •Possible impact on the triangle formed by the historic harbour forts, Spike, Camden and Carlisle which are of significant conservation value

Advantages to developing additional Port Facilities at Dogsnose Bank

Advantages with regard to developing container and/or general cargo/bulk facilities at Dogsnose Bank include;

- Extensive area is available for reclamation and as such sufficient area could be made available for all needs
- Navigation to and from this site would be relatively straightforward with no significant constraints
- The site is relatively isolated and well removed from noise sensitive receptors. There is a much lower density of residential properties located in proximity to the site, compared with the other sites
- This site is proposed within the open harbour and is not within a designated scenic landscape. The immediate coastal landscape to the southeast is however classified as scenic
- Air quality is unlikely to be a significant issue at this site given the relatively large distance to receptors

Ringaskiddy West

This site is located adjacent to the existing DWB and ADM Jetty. The extent of the site is constrained by the presence of the adjacent Monkstown Creek section of Cork Harbour SPA and Monkstown Creek pNHA to the north and the Ringaskiddy Basin to the south.

The site is mainly located on the existing foreshore and is occupied by the existing ADM Jetty structure.

The site is adjacent to the existing Ringaskiddy Basin and would provide for ready access to the main navigation channel via the entrance to the deep-water basin although some dredging will be required to provide navigable water depth to new berths

Constraints to developing additional Port Facilities at Ringaskiddy West

Constraints to developing container and/or general cargo/bulk facilities include:

- Any extension of berthing quays beyond the training wall could have the potential to impact on tidal flows and this would need to be considered in detail
- There is a significant constraint on the back-up land available at the site and there would be insufficient space to accommodate all bulk and general cargo activities envisaged.
- Vehicle access to this site would need to be through the existing DWB hinterland area
- There are no existing or disused railway lines in the vicinity of this site and as such the site is not suitable for rail connection
- The Monkstown Creek section of Cork Harbour SPA and Monkstown Creek pNHA are situated immediately adjacent to the west of the site. Potential for disturbance of birds within Cork Harbour SPA is considered high.
- There is limited scope to reduce potential noise emissions to areas to the north of the site but there would be greater potential to screen noise emission from the site towards Ringaskiddy
- There may be potential for negative noise impacts if cargo handling operations are required to be undertaken extensively during night-time

Advantages to developing additional Port Facilities at Ringaskiddy West

Advantages to developing container and/or general cargo/bulk facilities at this location include;

- The site is adjacent to the existing Ringaskiddy Basin and would provide for ready access to the main navigation channel via the entrance to the deep-water basin. The site is very sheltered.
- Reclamation within the limits of the existing training wall would have little or no impact on the existing hydraulic regime
- Access to the Ringaskiddy Basin will be improved by removal of the existing ADM Jetty structure
- This site is adjacent to the existing DWB with established bulk solids and general cargo handling operations and development at this location would contribute significantly to consolidation of the port's bulks trade
- This site would access directly onto the N28

- Most of the reclamation associated with this site is on intertidal areas which are less productive for fisheries than reclamation areas associated with other sites
- The existing port activities in the area at the DWB establish a port related noise character for the area
- The presence of existing adjacent industrial buildings and infrastructure at this site will provide a backdrop to any proposed developments when viewed from the north, northeast and northwest. This surrounding infrastructure provides a precedent in the landscape for development of an industrial nature
- Development at this site is broadly consistent with regional planning policy. Development would also be consistent with CDP and local planning policy objectives
- A port facility at this location may have less impact on tourism and recreation than a similar development at the eastern side of Ringaskiddy Basin as it would not be as visible from Cobh and would not interfere with existing racing marks

[2.2.2.5] Consideration of Alternatives for Current Development

For the current proposed phase of development alternatives for the development as proposed considered were as follows. This is:

A. Status Quo, keep operating from City Quays and having container trade split between two locations. This has been ruled out due to lack of cost effectiveness and the issues of lack of consistency with sustainable development of the city.

B) Relocate additional bulks and container trade to another lower harbour location. This can be ruled out based on cost effectiveness and established constraints identified in the first EIS in the aforementioned sections.

C) The final choice of location

[2.2.2.6] Choice of Location

Based on a review and comparison of the shortlisted sites which were brought through from the original development within Cork Harbour it was concluded that the optimal location for the current development should be Ringaskiddy East CCT and Ringaskiddy West DWB.

These locations were already associated with considerable port activity and port related development would be consistent with the CDP and Local and Regional Planning and Transportation policy objectives and Port of Cork Masterplan. Consolidation will have considerable benefits in terms of port operations and the relocation of both containers and bulks to this location will minimise the need to rely on more than one major road upgrade scheme.

For completion of the development, the optimal location for Berth 2 and DWB extension is at the location proposed as it would not be considered to be economically feasible to locate the extension facilities distant from the Ringaskiddy Redevelopment site.

A dedicated container terminal is located at Ringaskiddy East on port lands adjacent to the Ringaskiddy Ferry Terminal with bulks and general cargo operations primarily being located at Ringaskiddy West adjacent the existing DWB and ADM Jetty and there are significant economies of scale with location of an additional container berth there.

Thus, the works proposed for CCT2 and DWB extension under this EIAR comprise the relocation of further container operations from Tivoli and some initial accommodation of bulks at Ringaskiddy West by the implementation of the following elements: (and as described more comprehensively in Chapter 3 – Project Description).

[2.2.3] Layout for Container Facilities at Ringaskiddy East

Having identified the site adjacent to Ringaskiddy Ferry Terminal as the most suitable location for container and possible Roll on Roll off (RoRo) activities, consideration has been given to what alternatives might be considered in the context of the facility layout and boundaries.

[2.2.3.1] Berth Positions

The underlying principle behind the development of the container / multi-purpose berths and associated storage areas is to make the most efficient use possible of existing port lands.

The position of the berths is influenced by;

- The extent of existing land bank
- Proximity to deep water
- Avoidance of impacts on shipping access to existing facilities.

Taking the above constraints into consideration there is limited opportunity to consider alternative berth positions. Proposed positions provide access to deep water whilst maintaining a practical balance between dredging, reclamation and the most efficient use of existing lands.

[2.2.3.2] Development Area for Internal Arrangement

The development area must cater for both container and RoRo trade to meet fundamental operations requirements;

- Container stacking
- Gate Operations
- Quay working areas
- RoRo vehicle parking including accompanied and unaccompanied traffic

With retention of existing activities including the Freight Compound, Ferry Passenger Terminal and trade car compounds and Maintenance Buildings there is very limited scope for consideration of alternative site boundary arrangements.

[2.2.4] Layout Options for Development of Additional Bulk Cargo Facilities at Ringaskiddy West

The development of additional bulk cargo facilities can only practically be provided at Ringaskiddy West as a linear extension of the existing DWB which will ensure maximum efficiency in berth occupancy and the use of port equipment such as mobile cranes and hoppers.

As such there are no viable alternatives to the location of this additional berth without the introduction of significant duplication of ancillary services and associated inefficiencies.

Given the proximity of existing commercial sites it is anticipated that a closed form of structure will be most appropriate at this location, however final design solutions could comprise a combination of closed and open piled forms of structure

[2.2.5] Port Operations

[2.2.5.1] Ringaskiddy East

Container and RoRo facilities already developed by Port of Cork are required to maintain a degree of flexibility for a number of reasons;

a. Elements of infrastructure may be implemented in a phased manner responding to specific market drivers

b. Variability in customer demands reacting to global shipping and trade trends Various options are utilised for the method of container handling. These include;

1. Widespan Cranes (rail mounted) – This is the most efficient method of storage in terms of land area requirements but is the least flexible method of yard operation, providing for less opportunity to introduce equipment and infrastructure on a phased basis as needs dictate. Stacking would be up to 5 high and cranes would be served by terminal transporters.

2. Straddle carriers – Straddle carriers are more limited in the height to which containers can be stacked and as such are relatively inefficient in terms of land area required. The area required for the anticipated throughput is unlikely to be able to be provided on the land area currently available. Straddle carriers are typically diesel powered with associated noise levels.

3. Narrow span cranes (Rubber Tyre Gantry (RTG)) – The use of RTG's is popular for container handling, allowing stacking of containers to a reasonable height thus providing for reasonable efficiency in terms of land area required. The cranes can be electrically operated with associated noise benefits. Stacking would be up to 5 high and cranes would be served by terminal transporters. This type of operation is considered most appropriate for the proposed development, allowing accommodation of the anticipated throughput on the limited area available. This is also consistent with existing container operations on the DWB providing for optimisation in maintenance, servicing and spares.

[2.2.5.2] Ringaskiddy West

As the proposed berth at Ringaskiddy West is a direct extension of the existing bulk handling facilities there is limited opportunity for the consideration of alternative methods of port operations as any operations on this new section would need to be consistent with similar operations on the existing bulks berths.

Various options for the handling of bulk materials on the entire DWB including the proposed extension have been reviewed. The use of closed conveyor systems on the DWB have been considered however there are a number of constraints to the implementation of this type of handling system;

- There are several individual operators on the DWB who would all have specific and not necessarily complementary requirements for an automated system. Any system would need to be able to service 3 receivers simultaneously.

- At times there are split unloading operations with one ship discharging to two receiving companies at the same time. This would present problems if ship unloaders and common used conveyors were provided.

- Whilst some of the current operators have considered future use of conveyors, one of the current storage buildings on the DWB is not designed to accommodate a conveyor system. Hence at least all operations would likely continue to use the current hopper and truck system of unloading.

- The provision of fixed conveyor systems on the DWB could constrain the ability of the harbour to operate a multi-purpose facility, to mobilise large items of equipment and handle large cargoes due to potential headroom restrictions.

- The high capital cost of providing sufficient quayside equipment and associated conveyors is prohibitive.

Given these constraints it is the intention of the Port of Cork that the current method of handling cargoes be continued and extended to service the proposed berth extension. The Port will continue to adopt best practice and will actively review with the receiving companies what other measures might be implemented to control release of dust during unloading operations.

[3] Project Description

[3.1] Introduction

POCC undertook significant redevelopment works at Ringaskiddy under the previously permitted Strategic Infrastructure Development application (ref: PA0035, as modified by PM0010, 304437-19 and 310847-21)[1].

A large portion of the permitted works have been completed and are now operational. There is no provision in legislation that provides for an extension of duration of the original permission, given the requirement for both an EIA and an AA. Accordingly, this application is seeking permission for the elements of the work previously permitted but which are yet to be completed.

The works which were completed under the PA0035 permission were:

- Ringaskiddy East
    - A new 314m Container Berth 1/ Multipurpose Berth that will be capable of accommodating vessels carrying a range of different cargoes including containers, freight and general cargoes (CCT 1)
    - Surfacing of existing port lands to provide operational areas
    - Demolition of existing link-span
    - Terminal Transport Equipment
    - Maintenance building, administrative buildings and entrance kiosks
- Road Improvements
    - Improvements to the external road entrance into the Ringaskiddy Deepwater Terminal and to Ringaskiddy West
    - Improvements to the internal link road between Ringaskiddy East and Ringaskiddy West
- Paddy's Point
    - Construction of a new public pier, slipway and boarding platform
    - New planting and landscaping to provide public amenity area
    - Boat Storage, lighting and fencing

This Chapter of the EIAR describes the main components of the proposed redevelopment works at Ringaskiddy, Co Cork yet to be constructed. Where relevant the context of the works constructed under PA0035 is also provided. Consideration is also given to construction activities associated with the works and operation and maintenance of the completed facilities. The proposed

[1] Hereafter referred to as the PA0035 permission.

redevelopment is located on or immediately adjacent to existing port lands in the vicinity of the existing port facilities at Ringaskiddy.

[3.2] Proposed Development Works

The remaining redevelopment works applied for under this application comprise the following main construction elements;

***Ringaskiddy East**:*

- Construction of the remaining phases of a 200m Container/Multipurpose Berth which are not completed by 20th October 2025. The berth is under construction and being developed in 4 phases (1. Combi wall quay wall, 2. Concrete deck piling, 3. Structural slab and 4. Upper slab and yard surfacing),
- Dredging of the seabed to a level of -13 m Chart Datum (CD)
- Installation of link-span comprising a floating pontoon and access bridge
- Installation of container handling cranes
- Ancillary works, including services, lighting and fencing

***Ringaskiddy West**:*

- Extension to the existing Deepwater Berth (DWB), which will comprise a filled quay structure extending no further than the edge of the existing DWB
- Dredging works to varying levels to facilitate navigational access to the new facilities, and
- Ancillary works, including services and lighting

Road Improvements:

- Improvements to internal road network at Ringaskiddy East
- Ancillary works, including lighting and fencing

For brevity of reference the '*200m container/multipurpose berth'* at Ringaskiddy East is referred to variably in the EIAR as '*container berth'* and/or '*CCT 2'*.

[3.2.1] Ringaskiddy East - Container Berths and Multi-purpose Berth

[3.2.1.1] Proposed Port Operations following Completion of Port Upgrade

The proposed general arrangement for CCT2 at Ringaskiddy East is shown in Figure 3.2 which is contained within EIAR Volume III. This drawing provides the context for the overall development within the Ringaskiddy terminal as permitted under PA0035 and highlights the works already constructed and those which are the subject of this application. The drawing excludes the area of Paddy's Point, which is outside the Ringaskiddy terminal and was the permitted community amenity area, now fully competed.

Following the upgrade, port operations will be similar to those currently carried out on CCT1 and will comprise three potential modes;

Lift on Lift off (LoLo)

LoLo operations will involve the loading/unloading of containers from vessels and temporary storage on the site before onward transport by road.

In a typical import cycle the Ship to Shore Gantry Crane (SSG) cranes are used to lift the containers from vessels berthing alongside the new quays. The cranes then place the containers onto trailers/tractor units which transport the containers to the onsite container stacks. Straddle carriers cranes are used for the handling of containers in the main stacks. These straddle carriers lift the containers into the stack and at a later time facilitate onward transport of the containers by transferring to road going Heavy Goods Vehciles (HGVs). In an export cycle the above mentioned process is reversed. Rubber Tyre Gantry (RTG) cranes will be used for handling of containers in the southern container stack area.

Each container stack is orientated perpendicular to the CB/MPB and is 7 containers in width with a vehicle lane being provided beneath the RTG's. In the early stages of use harbour mobile cranes may also be used for ship unloading. Containers will be stacked at an approximate height of 5 containers high, equivalent to 12.8m.

Hazardous container storage facilities are accommodated within the main stacks.

General Cargo Operations

The general cargo area will initially be used to accommodate general break bulk and project cargoes. Materials will generally be stored in the open and no storage buildings are proposed. Generally the maximum height of stored materials will be approximately 5.5m.

Cargo will generally be lifted from vessels using a mobile harbour crane or SSG and will then either be placed directly into the storage area or will be placed on the quayside for onward movement and stacking by internal port equipment such as reach stackers.

Roll on Roll off (RoRo) Operations

The RoRo ramp, once installed will be used to allow direct access by freight HGV traffic to vessels with suitable vehicle loading ramps. Freight traffic may comprise two different types;

Unaccompanied - in this mode the freight trailers/containers are transported on and off the vessel by dedicated port transport tractor units. The trailers are then stored in the port area where they are subsequently collected by road going lorries.

Accompanied – in this mode each trailer on the vessel is accompanied by a road going freight tractor unit. On disembarkation these vehicle will drive directly onto the public road network without being temporarily stored in the port area. During embarkation such vehicles will marshal at the port shortly before the vessel is due to depart.

[3.2.1.2] Proposed Quay Structures

Works on the structure of Container Berth 2 commenced in October 2024 and it is anticipated that these will be complete before the current permission expires in October 2025. To accommodate any unforeseen delays in the construction of Container Berth 2, it is intended to apply for permission to complete the construction of any phases of Container Berth 2, not completed by 20th October 2025. Container Berth 2 is to be constructed in the following four phase (See drawing number CCT2-MWP-ZZ-ZZ-DR-S-1204 enclosed):

i. Combi quay wall

ii. Concrete deck piling

iii. Structural Slab

iv. Upper slab and yard surfacing

Container Berth 1 was constructed along the western edge of the existing area of reclaimed land, under the SID permission reference PA0035. The quay is positioned to provide adequate width of berth slot without impinging on the existing deepwater basin navigable space. Provision is also given to the construction of a landing area and linkspan in order to accommodate RoRo freight operations.

The additional berth (Berth 2), as previously permitted, is proposed as an extension to the Container Berth 1 and is aligned to coincide with the shape of the existing reclaimed land. This second quay will be primarily used for port container traffic. It will have capacity to accommodate unloading of ORE components.

Container Berth 1 wall comprised a concrete deck surface supported on steel/concrete piles. The Berth 2 wall will likely comprise a combi-wall form of construction which involves the installation of intermittent tubular steel piles with traditional steel piles infilling between the main piles although other forms of construction such as open piled, or a combination of open piled and closed structures could be used.

The berthing face to the quay structure will be formed by the installation of a reinforced concrete capping beam which will also be used to support the seaward leg of the main quayside container handling SSG cranes.

Plate 3.1 illustrates a Combi-wall form of quay construction.

Plate 3.1 Example of Combi-wall Under Construction

The quay will be provided with collection facilities for surface water which will be discharged to sea after passing through an oil and silt interceptor. The quay will also be provided with necessary services including power outlets, lighting and water.

Quay construction may be undertaken either by traditional construction contract or on a design and build basis where the contractor undertakes the final detailed design within certain parameters/requirements specified by Port of Cork.

[3.2.1.3] Proposed Reclamation Works

The main container terminal area is largely located on existing reclaimed lands and new reclamation as part of these works will be limited to infill immediately behind the quay walls.

It is anticipated that, if required, suitable fill material will be imported from local land sources.

[3.2.1.4] Demolition

Demolition works have been completed.

[3.2.1.5] Dredging

Dredging works will be carried out to -13.0m CD adjacent to the new quay structures to provide sufficient water depths for vessels at all stages of the tide.

Bed conditions comprise uncompacted silts overlying gravel, clay and limestone depending on location. Dredging will be required in all materials including bedrock.

The soft overlying silt material is unsuitable for use in the works and therefore this will be removed, either by backhoe or trailing suction hopper dredger, and disposed of at a sea disposal site. The quantity involved is in the order of 50,000m³. The disposal of the dredged material will require application for a Dumping at Sea Permit from the Environmental Protection Agency, which is subject to a separate consenting process.

Bedrock and other hard strata will most likely be removed by a combination of drilling and blasting, and / or the use of use of mechanical plant working from a floating or jack-up barge. Typical floating

plant is illustrated in Plate 3.2. Dredged rock and other suitable material will be re-used in the reclamation works where feasible. The total volume of rock to be removed is anticipated to be in the order of 10,000m³. Further detailed site investigations will be carried out prior to dredging to confirm the precise volume of rock to be removed.

[3.2.1.6] Surfacing

The container terminal area will be surfaced using concrete slabs. A series of piled concrete runway beams will be installed along the edges of each southern container stack in order to provide lanes along which the RTG cranes can operate.

The general cargo / RoRo storage area will generally be surfaced using bituminous surfacing.

[3.2.1.7] Linkspan

The CCT2 facility will be provided with a floating linkspan to facilitate RoRo traffic. The linkspan will comprise a floating pontoon of steel construction which will rise and fall with variations in tidal level, maintaining a constant freeboard above water level. Vehicular access to the linkspan pontoon will be via a ramp structure the upper end of which will be fixed to the quay structure with the lower end resting on the pontoon. A linkspan pontoon arrangement is illustrated in Plate 3.3.

Plate 3.2 Mechanical Excavator on Floating Plant

Plate 3.3 Typical Linkspan

[3.2.1.8] Services and Security

The Container Terminal will be provided with the following services and security features.

Storm Water Drainage

Storm drainage systems will be installed within the development site.

Storm water runoff from the site will be collected in a dedicated storm water drainage system. The storm water drainage system will collect rainwater incident upon the site for discharge to the harbour waters via a series of silt traps and oil interceptors.

Mechanical and Electrical Services

The proposed lighting for the general working areas will comprise high mast lighting, details of which will be subject to detailed design. Roadway lighting will comprise standard road lighting columns and lights. Lighting will be designed to provide an average lighting level of 20 Lux for roadways, 50-100 Lux for quayside areas and 30-50 Lux for storage and circulation areas.

The lighting will be designed to prevent direct glare into surrounding properties and illumination of the night sky.

Power supply will be by connection to the local electricity grid system. Water supply will be by connection to the local mains system.

Fencing and Security

Palisade fencing is already provided around the entire landward perimeter of the Container Terminal to comply with the requirements of the International Ship and Port facility Security Code (ISPS). Security gates will be positioned at the entrance and exit of the main CB/MPB terminal.

CCTV cameras are installed within the CB/MPB.

Safety Equipment

All quayside areas will be provided with mooring bollards, ladders and safety chains in accordance with the requirements of BS6349 Code of Practice for Maritime Structures.

Fire hydrants will be provided at regular intervals in all working and storage areas.

Navigation

Navigation simulations have been carried out by Port of Cork pilots and personnel from the Harbour Masters department to confirm the proposed quay can be accessed in a safe and efficient manner.

[3.2.2] Ringaskiddy West – Deepwater Berth Extension

The proposed general arrangement at the new DWB extension at Ringaskiddy West is illustrated in Figure 3.3 which is contained within EIAR Volume III.

[3.2.2.1] Proposed Port Operations

The new berth extension will be primarily used for the importation of bulk materials such as animal feeds and fertilisers, and general cargoes.

Port operations on this new berth extension will be similar to those currently carried out on the existing DWB. Harbour mobile cranes will be used for cargo handling with loose bulk materials being lifted using a grab bucket and deposited via hoppers into awaiting lorries. The materials will then be transferred into bulk stores situated in the existing hinterland areas.

The imported goods are stored until such time when collection is arranged and lorries distribute the cargoes using the local and national road networks. Depending on demand for a particular cargo, there will also be times when the imported materials will be deposited directly onto lorries waiting nearby the quayside for distribution.

Handling of general cargo and specialist project cargoes will be carried out by harbour Mobile Cranes, on the quayside from where they will be transferred to the port hinterland using reach stackers and / or terminal transport vehicles.

[3.2.2.2] Quay Structures

The new 182m extension to the existing Deepwater Berth (DWB) which will comprise a filled quay structure (of approximately 231m) Reclamation Works

Approximately 0.8ha of new land will be created as part of the works. The vast majority of the material arising from the proposed dredging works will be unsuitable for use in the reclamation works and as such it is anticipated that suitable fill material will need to be imported from local quarried sources.

[3.2.2.3] Dredging

Dredging works will be carried out to -13.4m CD at the new berth slot in order to maintain a consistent water depth with the existing DWB. The approach to the berths will be dredged to -11.75m CD.

Bed conditions are similar to that in Ringaskiddy East however rock levels are deeper which will mean that no rock dredging is anticipated as part of the proposed dredging works. Dredging to the required depths will therefore either be by backhoe or trailing suction hopper dredger and disposed of at a sea disposal site. Again, the disposal of the dredged material will require application for a Dumping at Sea Permit from the Environmental Protection Agency. Excavation of approximately 390,000m^3 of material is estimated.

[3.2.2.4] Services and Security

The new DWB will be provided with services and drainage similar to that used on the existing berth. All drainage will be connected to the existing drainage system on the DWB.

[3.2.3] Road Improvements

New road improvement works are proposed in order to provide better access to Ringaskiddy East.

In the longer term it is anticipated that a new eastern connection to the N28 will be provided at the eastern side of Ringaskiddy village. Internal road improvements to facilitate connection to such a new junction are included in the scope of works.

The arrangement of the proposed road improvements are illustrated in Figure 3.4 which is contained within EIAR Volume III.

[3.3] Proposed Terminal Operations Equipment

The details and approximate dimensions of the types of equipment anticipated to be used in port operations associated with the proposed works are described in the following sections. Precise dimensions will vary from manufacturer to manufacturer and final dimensions will only be determined when the supplier of the equipment has been identified. Dimensions considered in preparation of this EIAR are based on typical dimensions of equipment currently available in the marketplace.

Equipment may be installed in a number of phases up to those numbers indicated on the planning application drawings.

[3.3.1] Ringaskiddy East

The Container Terminal is to be provided with various items of equipment for the handling and movement of containers and other cargo. Some equipment utilised for CCT2 will be that already in use at CCT1.

A list of terminal equipment is listed below.

Ship to Shore Gantry Cranes (existing) - 2 nr

Gantry Cranes 6 nr

Harbour Mobile Cranes 1 nr

Terminal Transporters - 12 nr

Reach Stackers 2 nr

[3.3.1.1] Ship to Shore Gantry Cranes

SSG cranes as illustrated in Plate 3.4 are used to transfer containers to and from ships and are located on the quayside. The final size of cranes will be determined by the terminal operator however the maximum size anticipated would have the capacity to service vessels up to 13 containers in width.

Typical maximum overall heights/dimensions for a crane of this capacity are summarised in Table 3.2, although the final dimensions may be smaller.

Table 3.2 Typical Ship to Shore Crane Dimensions

Height to underside Jib (m)	Height to Apex (m)	Overall height with Jib raised (m)
Approx 37m	Approx 65.5m	Approx 89m

Plate 3.4 Typical Rail Mounted Ship to Shore Crane

[3.3.1.2] Rubber Tyred Gantry Cranes

Electrically powered RTG cranes are generally of short span and in this case are anticipated to accommodate 7 containers and a vehicle lane between the legs. A typical height for this type of crane would be in the order of 23m.

Typical photographs of RTG yard cranes are illustrated in Plates 3.5 and 3.6.

Plate 3.5 Typical RTG Yard Crane

Plate 3.6 Typical RTG Yard Crane

[3.3.1.3] Yard Transport

Terminal Tractors

Containers are generally transported to and from the RTG stack using terminal tractors. These are basically similar to a normal HGV tractor unit. A typical unit is illustrated in Plate 3.7.

Plate 3.7 Typical Terminal Tractor

Straddle Carriers

Containers are generally transported to and from the main stack using straddle carriers. A typical unit is illustrated in Plate 3.8.

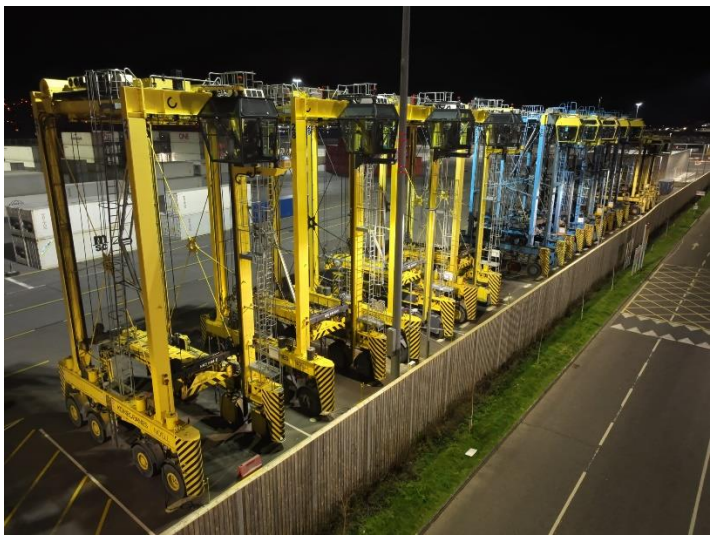


Plate 3.8 Typical Straddle Carrier

Reach Stacker

Reach stackers are front lifting items of equipment which use telescopic arms to place containers at height in stacks. This type of equipment is used in the CB/MPB area to handle containers. They will also be used in the main container terminal to move and handle empty containers. A typical unit is illustrated in Plate 3.8.

Plate 3.9 Typical Reach Stacker

[3.3.2] Ringaskiddy West

Operations at the DWB extension will be similar to those currently undertaken on the existing DWB.

Ship to shore operations will be undertaken by existing harbour Mobile Cranes with cargo being transferred to mobile hoppers discharging into HGV's for transport to onsite storage facilities or directly offsite.

A typical harbour mobile crane is illustrated in Plate 3.10.

Plate 3.10 Typical Harbour Mobile Crane

[3.4] Phased Implementation

The various elements of infrastructure proposed may be implemented in a single construction or alternatively they may be implemented in a number of phases as a result of trade demands, port operational requirements and funding.

It is anticipated that a phased implementation is likely to comprise three main elements as listed below and illustrated in Figure 3.5 which is contained within EIS Volume III.

Phase 1 – Ringaskiddy East comprising;

(a) Construction of Container Berth 2, dredging and surfacing.

(b) RTG Stacks

(c) Additional Internal Roads to facilitate connection to new N28, when constructed, at eastern end of port complex / Ringaskiddy Village

Phase 2 – Ringaskiddy West comprising the extension to the existing DWB

Phase 3 – RoRo Ramp

[3.5] Construction Activities

[3.5.1] Temporary Site Compound

An area will be required for the establishment of the Contractor's site compound. The site compound will be used for the Contractor's site office accommodation and facilities and will include an area for temporary storage of construction materials.

At Ringaskiddy East the extent of the site is such that the contractor will be able to establish facilities within the immediate site area. Should further areas be required then the existing freight compound could be made available.

At Ringaskiddy West an area for a site compound will be made available in the area immediately behind the proposed works / existing DWB as indicated in Figure 3.6 which is contained within EIAR Volume III.

[3.5.2] Site Access

Existing port operations will continue as normal during the construction period.

Suitable traffic management and other systems will be put in place as required to minimise disruption to existing activities during the construction period. These will include:

- Segregation of entrances
- Suitable restrictions on timing of deliveries to avoid peak traffic periods
- Preparation of a detailed traffic management plan for the construction phase

[3.5.3] Pollution Control

Pollution control measures will be put in place during the construction period as described in Chapter 14 of this EIAR.

[3.5.4] Site Safety

The works will be subject to the Safety, Health and Welfare at Work Act 2005 and the Safety, Health and Welfare at Work (Construction) Regulations, 2013. All aspects of design construction will be reviewed with regard to health and safety and a risk assessment will be carried out. A project supervisor (design phase) will be appointed to produce a pre-tender Health and Safety Plan for the project. The principal contractor will be responsible for the control and co-ordination of health and safety during the works and will be appointed as the project supervisor (construction stage).

[3.5.5] Waste Disposal

Contractors working on site during the works will be responsible for the collection, control and disposal of all wastes generated by the works. An indication of the types of waste likely to be generated by the works and the most appropriate method of disposal are presented in Table 3.3.

Table 3.3 Typical Wastes Generated by the Construction Works

Activity	Waste Generated	Disposal/Treatment Recommendations
General Construction Waste	Waste oils	Collected by waste recycling contractor.
	Other waste	Collected in skips for disposal by licensed waste contractor.
General Office/Messing	Paper, packaging, canteen etc.	Collected in covered skips/large bins for disposal by a licensed waste contractor.
Temporary Site Toilets	Sewage	Emptied under contract for disposal at an appropriate facility.

[3.6] Operational Activities

[3.6.1] Maintenance

When construction work has been completed, the quays and revetments will require little by way of maintenance.

Although some siltation may occur in the new dredged areas the water depth is such that this is unlikely to cause any significant problem in the short term. Any maintenance dredging which may be required in the longer term will be carried out as part of the Port of Cork's regular maintenance dredging programme. The material generated would likely be disposed of at sea at a licensed disposal site agreed in accordance with Port of Cork's maintenance dredging licence.

[3.6.2] Pollution Control

Surface water from the main quay and working areas will be collected by a system of drainage channels and gullies. The surface water will be discharged to sea via oil and sludge interceptors to ensure that no pollution is released into the harbour or surrounding waters.

[3.6.3] Waste Disposal from Vessels

Port of Cork operates an Environmental Management System (EMS) which includes procedures for the disposal of waste from berthed vessels.

All waste to be disposed of from berthed vessels will be handled and disposed by a licensed waste disposal contractor. Waste awaiting disposal will not be permitted to be stored on the quayside.

Discharges from vessels to the harbour waters will not be permitted.

[3.7] Construction and Operational Phase Mitigation

Various environmental mitigation measures will be implemented in both the construction and operational phases as detailed in Chapter 20 of this EIAR.

[4] Environmental and Planning Policy

[4.1] European Policy

[4.1.1] European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (S.I. No. 296/2018)

These Regulations extensively amend the Planning and Development Act 2000 and the Planning and Development Regulations 2001 in order to transpose into Irish law the provisions of Directive 2014/52/EU amending Directive 2011/92/EU of the European Parliament and of the Council on the assessment of the effects of certain public and private projects on the environment.

The publication of the Guidelines for Planning Authorities and An Bord Pleanála on Carrying out Environmental Impact Assessment (2018) coincided with the making of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 in order to transpose the Directive into Irish planning law.

[4.1.2] EU Water Framework Directive

The EU has developed the Water Framework Directive (WFD) which establishes a legislative framework for the protection of all waters including rivers, lakes, estuaries, coastal waters and groundwater, and their dependent wildlife and habitats. Specifically, the WFD aims to:

- “protect/enhance all waters (surface, ground and coastal waters),
- achieve ‘good status’ for all waters by December 2015,
- manage water bodies based on river basins (or catchments),
- involve the public, and
- streamline legislation”.

The objectives and targets required by the WFD are set out in the statutory River Basin Management Plan (RBMP) for Ireland 2022-2027(gov.ie, 2022). The RBMP requires that all member states adopt a comprehensive integrated basin-based approach to water management.

Rivers, lakes, estuaries and coastal waters (surface waters) can be awarded one of five statuses i.e., ‘High’, ‘Good’, ‘Moderate’, ‘Poor’ and ‘Bad whereas groundwater can be awarded only ‘Good’ or ‘Poor’ status. Ecological status for surface water bodies is primarily driven by the Biological Quality Elements (BQEs) which includes fish, aquatic flora, macroinvertebrates and phytoplankton. Standards for general physio-chemical parameters, specific pollutants and hydro morphology are set at levels in order that they are sufficient to support the status of the BQEs (Catchments.ie, 2021).

The proposed scheme is obligated to ensure that it does not result in the reduction of WFD quality statuses or prevent the restoration of those assets awarded a status below ‘good’.

[4.1.3] EU Habitats Directive and Birds Directive

EU Directive 92/43/EEC on the Conservation of Habitats and Wild Flora and Fauna (known as the 'Habitats Directive') protects habitats and species of European nature conservation importance. Together with Directive 2009/147/EC on the Conservation of Wild Birds (the 'Birds Directive'), the Habitats Directive establishes a network of nationally important sites designated for their ecological status. These include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs). Internationally important wetlands designated under the 1971 Ramsar Convention are also afforded the same protection as SPAs and SACs.

The Project is subject to Appropriate Assessment (AA) in accordance with the EU Directive 92/43/EEC on the Conservation of Habitats and Wild Flora and Fauna (known as the 'Habitats Directive'), given the proximity to European Sites and the nature of the work resulting in potentially significant effects on these.

As such, a Natura Impact Statement (NIS) has been prepared for the Proposed Scheme and will accompany the Planning Application AA and NIS M1099-AY-ENV-R00.

[4.1.4] Trans-European Trasport Network (TEN-T)

The EU's trans-European transport network policy, the TEN-T policy, is a key instrument for the development high-quality transport infrastructure across the EU. It comprises railways, inland waterways, short sea shipping routes and roads linking urban nodes, maritime and inland ports, airports and terminals.

The TEN-T policy is based on Regulation (EU) No 2024/1679.

The trans-European transport network is designed according to an objective methodology. As set out in the current regulation, it consists of two layers, the core and the comprehensive network. The core network includes the most important connections linking major cities and nodes and must be completed by 2030. The extended core network connects all regions of the EU to the core network and needs to be completed by 2040. With the revision of the TEN-T Regulation, a third layer – the extended core network – should be added as an intermediate milestone, to be completed by 2040.

The trans-European transport network should be a Europe-wide network ensuring the accessibility and connectivity of all regions in the Union, including the outermost regions and other remote rural, insular, peripheral and mountainous regions as well as sparsely populated areas. The requirements for the infrastructure of the trans-European transport network should be set in order to promote the development of a high-quality network throughout the Union.

Significant grant funding has been awarded to progress the Port's strategic development proposals.

[4.2] National Policy

[4.2.1] Planning and Development Acts 2000 (as amended) & Planning and Development Regulations 2001 (as amended)

The Planning and Development Act 2000 (as amended) forms the basis of the planning system, setting out the detail for planning guidelines, obtaining planning permission and the process for EIA.

The requirements of the EIA Directive are transposed into Irish Law and included in the Planning and Development Act 2000, as amended, and Planning and Development Regulations 2001 as amended. The Planning and Development Regulations 2001 (Schedules 5 and 7) also identify certain types and scales of development, generally based on thresholds of scale, for which an EIA is mandatory. The requirements in respect of EIA are contained within the Planning Act and these are described in detail in Chapter 1 'Introduction, Scoping, Consultation'.

[4.2.1.1] Ireland 2040 Plan: National Planning Framework

In 2019, the Department of Housing, Planning, and Local Government is published the Ireland 2040 Plan: National Planning Framework (NPF), replacing the National Spatial Strategy. It is intended that the NPF will focus on integrating Ireland's economic development, spatial planning, infrastructure planning and social considerations. It promotes environmentally focused planning at local level to tackle climate change and the implementation of appropriate measures to mitigate existing issues, guiding regional and local development plans (Department of Housing, Planning and Local Government, 2018).

The NPF aims to align with the UN Sustainable Development Goals, by ensuring that the decision process will safeguard the needs of future generations. The NPF supports the provision of infrastructure, services and amenities and advocates for the delivery of 'must have' physical infrastructure that defines quality of life and personal wellbeing.

These objectives are integrated as part of the National Strategic Outcomes (NSOs) in areas such as climate action, sustainable cities and innovation and infrastructure. The NSO 6: *High-Quality International Connectivity* has direct reference to the Ringaskiddy Port Redevelopment Project:

'This is crucial for overall international competitiveness and addressing opportunities and challenges from Brexit through investment in our ports and airports in line with sectoral priorities already defined through National Ports Policy and National Aviation Policy and signature projects such as the second runway for Dublin Airport and the Port of Cork - Ringaskiddy Redevelopment.'

Ringaskiddy Port, and improved access to the development (via the M8/N25/N40 Dunkettle Junction upgrade), is further outlined as a key 'future growth enabler' for the Cork City and Metropolitan Area

The National Planning Framework (NPF) 2018 underscores the strategic importance of ports in facilitating international trade and enabling economic growth. It emphasises the evolution of ports from facilitators of goods transportation to critical enablers of new industries, such as ORE). The NPF recognises that Ireland's economic growth is highly dependent on the quality and efficiency of its ports, more so than many of its trading partners. To sustain this growth, Ireland must deliver additional port capacity in a timely and predictable manner.

The NPF highlights that Tier 1 and Tier 2 ports, including Cork, Dublin, and Shannon, must lead the response to meet Ireland's future port capacity requirements. The expansion of Ringaskiddy Port is essential for aligning Cork's city growth strategies with national and regional objectives, ensuring the effective growth and sustainable development of the city region.

The expansion of the Port of Cork at Ringaskiddy is a key enabler of large-scale regeneration projects in Cork, particularly the redevelopment of former port sites in the City Docks and Tivoli Docks. This is outlined in **Chapter 3 "Effective Regional development" of the NPF**. National

policy advocates for the transformation of these sites into sustainable, mixed-use developments, which is contingent on the successful relocation of existing port facilities to the Lower Harbour. The proposed extension at Ringaskiddy will facilitate this transition, minimising disruption to business and enabling the city's regeneration.

The **NPF's Chapter 7, "Realising Our Island and Marine Potential"**, places strong emphasis on the maritime industry, particularly the role of ports in regional competitiveness. It identifies the maritime sector as a critical enabler of regional development and highlights the need for ports to support emerging industries, such as ORE. The expansion of the Ringaskiddy Cork Container Terminal and multi-purpose berth, aligns with these strategic priorities, ensuring that Cork remains a vital gateway for Ireland's international trade and emerging industries. The expansion will not only meet the immediate needs of port operations but also support the long-term strategic goals of the region, ensuring that Cork remains a key player in Ireland's economic and maritime landscape.

National Strategic Outcome 6: 'High-Quality International Connectivity' underscores the increasingly pivotal role that ports will play in Ireland's transport and international trade strategies. The NPF emphasises that Ireland's National Ports Policy, along with the hierarchical tiering of ports, recognises the global trend toward the consolidation of resources in the maritime sector. This trend is driven by the need to achieve optimum efficiencies of scale, which has significant implications for port infrastructure, including the size of vessels, the required depths of water, and the scale of hinterland transport connections.

The proposed extension of the port facilities at Ringaskiddy is a strategic necessity that aligns with both European and national policies. It is crucial for accommodating the growing size of vessels, supporting Ireland's economic growth, and enabling the successful redevelopment of Cork City's Docklands. The development is in line with the National Planning Framework's objectives and is essential for maintaining the Port of Cork's competitiveness and efficiency in global trade. The expansion will not only meet the immediate needs of port operations but also support the long-term strategic goals of the region, ensuring that Cork remains a key player in Ireland's economic and maritime landscape.

A draft review of the NPF was published in July 2024. One of the key shifts in the national policy context for ports is increasing emphasis on support for infrastructure requirements needed to facilitate Off-shore Renewable Energy. See the planning policy statement which accompanies the application for further discussion.

[4.2.1.2] National Development Plan, 2021-2030

The National Development Plan 2021-2030 (NDP) was published in October 2021. It is the national plan setting out investment priorities to guide national, regional and local planning and investment decisions. The revised NDP sets out the ten-year capital ceilings to 2030 which will support economic, social, environmental and cultural development across all parts of the country under Project Ireland 2040, in parallel with the NPF (see Section [4.2.1.1] above) which sets the overarching spatial strategy for the next twenty years.

Under NSO 6: *High-Quality International Connectivity*, investment is not only focused on supporting international connectivity and competitiveness, but also the 'greening' of airports and ports, whereby pathways towards achieving net zero carbon emissions by 2050 are already being identified.

The importance of ports and airports in the context of regional connectivity continues to be of strategic importance. Significant investment in Ireland's airports and ports will play a major role in safeguarding and enhancing Ireland's international connectivity which is fundamental to

Ireland's international competitiveness, trading performance in both goods and services and enhancing its attractiveness to foreign direct investment. The importance of this objective cannot be understated in the context of the UK's exit from the EU.

Three major capital infrastructure programmes in Tier 1 Ports are highlighted as ongoing including Dublin, Cork and Shannon Foynes. The aim is to enhance national and international connectivity, provide for future increases in trade and national port capacity requirements by facilitating more vessels, larger sized vessels and increased tonnage and throughput.

Strengthening access routes to Ireland's ports through investment to upgrade and enhance the road and rail transport network to improve journey times is and remains a government priority. The planned N28 Cork to Ringaskiddy Road is highlighted as a key example of this, to provide improved access to the Port of Cork.

The Ringaskiddy Redevelopment is given special mention (Box 11.1, Page 109):

'The Port of Cork is investing to redevelop the port's existing facilities at Ringaskiddy. Planning permission was granted in 2015 towards this development. Delays due to Covid 19 have pushed the completion date out to Q3 2021 with the new facility operational in Q4 2021. The development will enable the Port to accommodate larger vessels and further develop it as an international gateway for trade. The project will alleviate the physical constraints (for example, water depths) of current operations at City Quays and Tivoli, allowing the Port to increase capacity and throughput, diversify customers, cater to the trend of increasing vessel sizes and free the City Quays and Tivoli properties for development and/or divestment.'

[4.2.2] National Ports Policy 2013

The core objective of the National Ports Policy (NPP) is to facilitate a competitive market for maritime transport services. The policy identifies that the long-term international trend in ports and shipping is toward increased consolidation of resources in order to achieve optimum efficiencies of scale.

On 19th October 2023, public consultation for the review of the National Ports Policy was launched.

The NPP introduces a clear categorisation of ports, namely: Ports of National Significance (Tier 1), Ports of National Significance (Tier 2) and Ports of Regional Significance. The Port of Cork is one of three ports identified as at Tier 1 'Port of National Significance (along with Dublin Port Company and

Shannon Foynes Port Company). It is noted that it is critically important that Ports of National

Significance (Tier 1 & 2) provide an efficient and cost-effective service to the economy. Tier 1 ports are identified as Ports that:

- "…are responsible for 15% to 20% of overall tonnage through Irish ports, and
- have clear potential to lead the development of future port capacity in the medium and long term when and as required." (NPP, .p13)

The NPP is not prescriptive as regards the location of future port infrastructure, but it notes that specific locations of future port capacity should be incorporated within the existing planning and development policy hierarch. It also encourages active engagement between port companies and the relevant planning authorities to ensure that port masterplans and relevant

planning and development strategies are complementary and consistent. In other words, while the NPP's core objective supports the expansion of port capacity, it is consider that locational issues are most appropriately addressed within existing spatial planning policy documents.

With specific reference to the Port of Cork the NPP notes that it is one of only two ports capable of handling traffic across all five principal traffic modes (LoLo, RoRo, Break Bulk, Dry Bulk and Liquid Bulk) and is second only to Dublin in its importance in the LoLo sector. The NPP states that:

'The Government endorses the core principles underpinning the company's Strategic Development Plan Review, and the continued commercial development of the Port of Cork Company is a key strategic objective of national Ports Policy.' (NPP, p.26)

In relation to the European unified transport network (TEN-T) the NPP notes that three ports are proposed for inclusion within the network – Dublin, Cork and Shannon Foynes. It also notes that efficient hinterland connections are critically important to a port's ability to facilitate large volumes of traffic. It states that TEN-T core ports must have a connection to both core road and rail networks, although it is acknowledged:

'The vast majority of Ireland's freight movements to and from ports are via road. As acknowledged in the European Commission's White Paper, Roadmap to a Single European Transport Area – Towards a Competitive and Resource-Efficient Transport System, it is likely that "freight movements over short and medium distances (below some 300km) will to a considerable extend remain on trucks" (Commission of the European Communities 2011c).' (NPP, p.45)

In recognition of the likely continued focus on road freight in Ireland, the NPP states that the interconnections between the national primary road network and the commercial port network will continue to be of primary importance.

The NPP also identifies the relationship between ports and major cities, noting that as port facilities have shifted downstream over time it has allowed for the redevelopment of previously port-related lands for other commercial, residential or recreational uses. While it is acknowledged that this can be of mutual benefit to ports and local authorities, the NPP states that the cost of relocating and redeveloping port facility must be considered in any redevelopment plans. This point is made in the context of the government's policy to require ports to fund any infrastructure developments from its own resources. It is stated within the NPP that:

'…redevelopment proposals must take account of the need for sufficient replacement port capacity within the region. Any development proposals requires careful consideration by all relevant stakeholders, in particular the planning authorities, local communities, port authorities and port users.'

The NPP sets a clear policy context for the future expansion of Port of Cork activities, emphasising the crucial role to be played in facilitating national economic growth.

[4.2.3] Harnessing Our Ocean Wealth 2012

The Organisation for Economic Development expect the global ocean economy to grow rapidly in the coming years. By 2030 they estimate that the ocean economy will provide 40 million jobs and double its contribution to global GDP (Ireland's Ocean Economy 2019).

As set out in HOOW, "managing our ocean wealth requires an overarching national marine 'spatial' plan underpinned by an efficient and robust planning and licensing framework". Since the launch of HOOW the EU Maritime Spatial Planning Directive was adopted in 2014. It established an EU-wide framework for maritime spatial planning (MSP). The Department of Housing, Planning and Local Government is currently leading the preparation of a National Marine Spatial Plan for Ireland to cover a 20-year period. The data generated in this report will inform the national level plan. As the maritime spatial planning process matures more regional specific plans will be developed. This will require a more nuanced understanding of the economic contribution of the ocean economy at a more refined spatial scale. This remains a gap in our knowledge for a number of the industries where currently only national level data is available. Integrating the ocean economic data with information/ models of changes in the marine environment is also an area requiring further research in order to deliver an effective maritime spatial plan and to ensure that the sustainable element of blue growth is front and central in marine policy development (Ireland's Ocean Economy 2019).

'Harnessing Our Ocean Wealth: An Integrated Marine Plan for Ireland' (IMP) was published in July 2012 by the Department of Agriculture, Food and the Marine. It sets out a roadmap for the government's vision, high level goals and integrated actions across policy, governance and business for the marine sector. The vision of the IMP is stated as:

"Our ocean wealth will be a key element of our economic recovery and sustainable growth, generating benefits for all our citizens, supported by coherent policy, planning and regulation, and managed in an integrated manner."

The IMP notes that:

"Infrastructure includes fixed assets (e.g. ports, fisheries harbours, piers, slipways, buildings etc), mobile assets…., research, educational and innovation platforms… and datasets…

Maintaining, upgrading and providing these infrastructures is critical to our national economy (e.g. 99% of Ireland's exports and imports are transported through Ireland's ports); energy needs and export potential (e.g. grid infrastructure); …" (IMP July 2012, p. 43)

The key actions for infrastructure include:

"No. 32: Put in place clear integrated policies and strategies for the development of new key strategic infrastructure to support job creation and economic growth (e.g the gird and port infrastructure to support renewable energy and export potential).

No. 34: Carry out national regional and local initiatives aimed at tapping into the potential of new and existing coastal infrastructure to develop sustainable products, services and jobs. This would encourage investment along the coast. Initiatives include:

Supporting major national seaports in the implementation of their master plans to provide additional capacity and greater draft using their own resources. "(IMP July 2012, p. 43-44)

The provision of enhanced port infrastructure is identified as a critical action and clear policy support is provided for the implementation of port master plans (such as the SDP).

[4.2.4] Project Ireland 2040 – National Marine Planning Framework

The National Marine Planning Framework (NMPF) brings together all marine-based human activities, outlining the government's vision, objectives and marine planning policies for each marine activity.

The NMPF details how these marine activities will interact with each other in an ocean space that is under increasing spatial pressure, ensuring the sustainable use of our marine resources to 2040.

The NMPF is intended as the marine equivalent to the National Planning Framework. This approach will enable the Government to:

- set a clear direction for managing our seas
- clarify objectives and priorities
- direct decision makers, users and stakeholders towards strategic, plan-led, and efficient use of our marine resources
- describes enabling works for a thriving maritime economy

The NMPF has been prepared with an ecosystem-based approach and informed by best available knowledge. As part of the preparation of the NMPF, a Strategic Environmental Assessment (SEA) and Appropriate Assessment (AA) have been carried out.

Overarching Marine Planning Policies for Co-existence and for Infrastructure relate to economic objectives. Although there are just two economic policies it should be noted that these are supplemented by the sectoral Marine Planning Policies most of which are aimed at achieving economic objectives.

Coexistence Policy 1:

Proposals should demonstrate that they have considered how to optimise the use of the space, including through consideration of opportunities for co-existence and co-operation with other activities, enhancing other activities where appropriate.

If proposals cannot avoid significant adverse impacts (including displacement) on other activities, they must in order of preference:

a) *minimise significant impacts*

b) *mitigate significant adverse impacts, or*

c) *if it is not possible to mitigate significant adverse impacts proposals should set out the reasons for proceeding.*

Infrastructure Policy 1;

Appropriate land-based infrastructure which facilitates marine activity (and vice versa) should be supported. Proposals for appropriate infrastructure that facilitates the diversification or regeneration of marine industries should be supported.

The National Marine Planning Framework (NMPF) recognises that ports of national significance are key international gateways and facilitators of economic development. It highlights the ongoing phased infrastructure investments at Tier 1 ports, including the Port of Cork stating that,

> *'All three Tier 1 ports are currently engaged in significant phased infrastructure investment in relation to key elements of their masterplans… Supporting the existing and future development*

of ports in line with their approved master / strategic plans is essential to ensure the continued economic prosperity of the country'.

The policy document highlights that with the expected increase in freight volumes and vessel size, accessibility, capacity and navigational safety will bring significant challenges for Ireland's maritime sector. The expansion of port facilities at Ringaskiddy is a strategic response to these challenges.

The NMPF outlines its support for land-based infrastructure proposals that enhance the economic and social benefits of marine activities. The document refers to port infrastructure as essential for achieving this objective, including facilities for the landing, storage, and processing of catch or freight, as well as related transport infrastructure. The framework also acknowledges that certain primarily land-based developments and activities rely on associated marine infrastructure, which is essential for their effective operation. It states:

"This policy supports proposals for the development of land-based infrastructure that facilitates marine activity and the diversification or regeneration of marine industries. It also supports proposals for the development of marine infrastructure that facilitates land-based activity."

This is supported by **Infrastructure Policy 1** which states that,

'Appropriate land-based infrastructure which facilitates marine activity (and vice versa) should be supported. Proposals for appropriate infrastructure that facilitates the diversification or regeneration of marine industries should be supported'.

The policy framework encourages the adaptation of existing marine infrastructure to support emerging industries, such as ORE and the diversification of marine industries.

ORE Policy 7 states:

"Where potential for ports to contribute to ORE is identified, plans and policies related to this port must encourage development in such a way as to facilitate ORE and related supply chain activity".

The policy framework requires that marine activities be managed in a way that protects the environment by ensuring adequate space is allocated for the growth of new or emerging industries. It stipulates that if a proposal results in significant adverse impacts, such as displacement, that cannot be minimised or mitigated, the proposal must include a rationale demonstrating how space optimisation can be achieved.

It is also an objective of the NMPF that marine based activity addresses environmental considerations. The continued dredging in the River Lee, necessary to accommodate larger vessels, has been identified as having negative environmental impacts. This proposed development effectively responds to these environmental concerns by reducing the need for large commercial vessels to enter the upper part of Cork Harbour. By increasing capacity at Ringaskiddy, the number of vessels needing to dock at Tivoli or travel up the River Lee will decrease, minimising environmental impacts.

The NMPF sets out its policy framework for addressing environmental considerations in marine spatial planning. While shipping can lead to the introduction of non-native species, safe and efficient shipping offers significant environmental benefits. Conversely, unnecessary diversions of sea traffic can increase environmental impacts and the risk of maritime incidents. The Marine Planning Policy Framework supports the sustainable development of ports as a means to provide adequate capacity to meet present and future demand, while also adapting to the consequences of climate change. The policy advocates for the protection of the shortest shipping routes to minimise environmental impacts and enhance navigational safety. By

providing a more efficient and direct route to port facilities, the proposed Ringaskiddy development will contribute to reducing the overall carbon footprint of shipping activities.

[4.2.5] Climate Action Plan 2024

The Climate Action Plan 2024 (CAP 2024) is the third update to Ireland's Climate Action Plan, prepared in compliance with the Climate Acts. It was approved by Government on 20 December 2023.

The CAP 2024 builds upon the previous CAP's (2019, 2021, and 2023) by refining and updating the measures and actions required to deliver the carbon budgets and sectoral emissions ceilings. The CAP 2024 provides a roadmap for taking decisive action to halve Irelands emissions by 2030 and reach net zero by no later than 2050, as committed in the Climate Acts. It considers that by or before 2030, Ireland will achieve 80% of electricity demand from renewable sources and a projected decrease in GHG emissions of 75% in 2030 relative to 2018 levels. The CAP's objective is to assist in the delivery of the required GHG emissions abatement to meet climate targets.

[4.3] Regional Policy

[4.3.1] Regional Spatial and Economic Strategy for the Southern Region 2019-2031

The Regional Spatial and Economic Strategy (RSES) for the Southern Region is a strategic plan which identifies regional assets, opportunities and pressures and provides appropriate policy responses in the form of Regional Policy Objectives (RPOs). At this strategic level it provides a framework for investment to better manage spatial planning and economic development to sustainably grow the Southern Region to 2026 and 2031, with a long-term vision to 2040 (Southern Regional Assembly, 2020).

The principal statutory purpose of the RSES is to support the implementation of the NPF and NDP 2021-2030 and the economic policies of the Government by providing a long-term strategic planning and economic framework for the development of the Southern Region.

The RSES sets out the following Regional Policy Objectives regarding ports and connective infrastructure:

- RPO-76 Ensure alignment and consistency between land use and ocean-based planning and to ensure co-ordination which supports the protection of the marine environment and the growth of the marine economy.

- RPO 77 – Support the integration of different uses in the marine environment and ensure consistency and alignment between high level plans such as the National Marine Planning Framework, regional based approaches to maritime spatial planning and localised coastal management plans and local integrated coastal zone management plans. It is important to be cognisant of the need to promote cross boundary management of coastal areas within the Region. Any development of plans in coastal zones should be informed by a Strategic Flood Risk Assessment.

- RPO 78 – Support the sustainable development of the potential of the marine environment to foster opportunities for innovation in the marine economy and drive forward the Region as a first mover under maritime spatial planning while preserving the environmental and ecological conservation status of our marine natural resource. Initiatives arising from this objective shall be subject to robust feasibility and site

selection which includes flood risk assessments and explicit consideration of likely significant effects on European sites and potential for adverse effects on their integrity in advance of any development.

- RPO 142 – strengthen investment to deliver actions under National Ports Policy and investment in sustainable infrastructure projects that:

  a) Strengthen and develop the strategic international, national and regional economic roles of our Tier 1 Ports (Port of Cork and Shannon Foynes Port) and Tier 2 Ports (Port of Waterford and Rosslare Europort) and support the strategic role of our Region's port and harbour assets under the National Marine Planning Framework.

  b) Support the achievement of Ports or National Significance Tier 1 status for the Ports of Waterford and Rosslare Europort.

  c) Strengthen and develop the strategic regional economic role of other regional fishery harbours, ports and harbours.

  d) Support the export, fisheries, marine tourism and marine economy potential of port and harbour assets in the Southern Region as listed in Table 6.2 and support investment in the transition to smart technologies of port and harbour assets.

  e) Support the sustainable development of the 9 no. strategic development locations adjoining sheltered deep-water in line with the recommendations of the SIFP for the Shannon Estuary and subject to the implementation of mitigation measures outlined in the SEA and AA undertaken on the SIFP.

  f) Development proposals will be subject to environmental assessment, implementation of mitigation measures outlined in applicable SEA's and AAs and feasibility studies to establish that any expansions can be achieved without adverse effects on any European Sites and within the carrying capacity of the receiving ports.

- RPO 143 – The critical role of the Region's port and airport assets will be protected by ensuring that local land-use policies subject to required planning and environmental processes facilitate and do not undermine their functions and their landside access capacity, subject to consideration of environmental concerns including water quality, flood risks, human health, natural and built environment.

- RPO 144 - It is an objective to complement investment in port infrastructure by seeking the sustainable development of improved access infrastructure to ports from their regional catchments, including the promotion of rail access where practicable.

- RPO 145 – It is an objective to support the development of a Ports and Harbour Strategy for the Southern Region to be prepared by the relevant stakeholders through consultation with the Department of Transport, Tourism and Sports, Local Authorities, port authorities, TII, NTA and other relevant stakeholders. The implementation mechanisms and monitoring structures to be established following the adoption of the RSES will identify the scope and role of the Ports and Harbour Strategy for the Southern Region and the appropriate timescale for its preparation. The requirements for a Strategic Environmental Assessment and Appropriate Assessment shall be considered, as appropriate, in relation to a Ports and Harbour Strategy for the Southern Region.

- RPO 146 – It is an objective to achieve NSO: High Quality International Connectivity. The following port development actions are identified, subject to required appraisal, planning and environmental assessment processes and implementation of mitigation measures outlined in applicable SEAs and AAs while ensuring the protection of sensitive natural environments and the protection of natura sites, the protection of other harbour interests including recreation, tourism and residential amenity:
    - Continued development and improvement of ports by the relevant responsible commercial State-Owned Enterprises consistent with the sectoral priorities defined through National Ports Policy
    - Continued support for capital infrastructure projects in the Port of Cork's Strategic Development Plan including redevelopment of existing Port Facilities in Ringaskiddy and preparing City Docks and Tivoli for future regeneration.
    - Continued support for the capital infrastructure projects in the Shannon-Foynes Port Company Infrastructure Development Programme including capacity extension works and infrastructure investment towards deep water berthage on Foynes Island and offshore resources.
    - Continued support for Rosslare Europort and Port of Waterford (including the port's strategic plan and Port of Waterford Corporate Plans subject to the implementation of mitigation measures outlined in applicable SEAs and AAs to maintain and strengthen linkages with EU markets.
    - Strategic Review of Rosslare Europort.
    - Strengthening and maintaining access to ports through enhanced transport networks and improved journey times including support for M11 and N80 improved connectivity to Rosslare, N28 Cork to Ringaskiddy Road and N21/N69 (Foynes to Limerick Road Scheme including Adare Bypass).
    - Investment in maritime services programmes to support aids to navigation, Coast Guards and pollution prevention activities.
- RPO 147 –It is an objective for all ports in the Region to:
    - Protect the marine related functions of ports in the Region including landside accessibility to ensure the figure role of ports as strategic marine related assets is protected from inappropriate uses. Harness sustainable economic opportunities from the ocean economy and the role of Ports in the region in realising the full potential of the ocean economy. Particular regard should be had to the Government's integrated plan for the marine industry – Harnessing our Ocean Wealth 2012, the National Marine Research and Innovation Strategy 2017-2021 (Marine Institute Ireland 2017 and Ireland's Ocean Economy (NUIG 2017) as well as the Marine Strategy Framework Directive and Ireland's Programme of Measures and Ireland's forthcoming National Marine Planning Framework subject to the implementation of mitigation measures outlined in the SEA and AA undertaken where necessary.

- Support the role of ports where appropriate in facilitating the sustainable development and operation of off-shore renewable energy development.

- Support sustainable and appropriate enabling infrastructure development to harness our ocean wealth at regional and local levels including grid, pier and port facilities to support renewable energy and export potential.

- Undertake feasibility studies to determine the carrying capacity of ports in relation to potential for likely significant effects on associated European sites including SPA and SAC.

- Port development in the Region must adhere to the European Commission guidelines on the Implementation of the Birds and Habitats Directive in Estuaries and Coastal Zones in order to protect the European Sites around them.

- Any economic activity which utilises the marine resource shall also have regard to Ireland obligations under the Marine Strategy Framework Directive (MSFD) which requires achieving and maintaining Good Environmental Status (GES) of coastal and marine waters (Comprising both the water column and the seabed beneath it).

[4.4] Local Policy

[4.4.1] Cork Metropolitan Area Strategic Plan (MASP)

Cork Metropolitan Area Strategic Plan (MASP) is detailed within the Regional Spatial and Economic Strategy for the Southern Region which provides a vision and strategy for the development of the Cork City Region up to 2020. MASP identified the Port of Cork to be of strategic location of natural amenities, port activities, tourism, heritage and harbour settlements:

"*As Europe's largest natural harbour, Cork Harbour is a special character area and strategic asset. It is a location sharing port activities, strategic employment uses, marine research, energy generation, tourism, heritage and residential communities in an environment with sensitive ecosystems and natural amenities (Cork Harbour SPA).*" (Cork MASP, p.11)

Cork MASP considers the key economic role of Tier 1 Port of Cork.

'Tier 1 International Port of Cork is recognised as a strategic national and regional driver for economic growth. In 2017 the port of Cork handled over 10.3 million tonnes of trade traffic and 68 cruise liners visited bring over 142,000 passengers to the region.'

Indeed, the MASP states that its spatial strategy takes account of a number of policy objectives, including:

Cork MASP Policy Objective 13: - Port of Cork

- *Support the sustainable development and investment in the Port of Cork balanced with the protection of the natural environment and Cork Harbour SPA and promote its role as a Tier 1 International Port and driver for the metropolitan, regional and State*

economy. To support this role the Cork MASP seeks the following subject to the outcome of the required feasibility assessment and environmental processes:

- *The sustainable development of port infrastructure and facilities under the port's strategic development plans balanced with the protection of Cork Harbour's natural environment. Improved quality of inter-regional transport connectivity and networks improving access to the Port of Cork particularly for the freight movement and the quality of the TEN-T Corridor. The delivery of strategic transport network improvements under Cork MASP Objectives 6-9 including improved strategic road access to the Port of Cork Ringaskiddy, Cobh, Marino Point and Whitegate is supported as a critical component for unlocking the full potential of the Port of Cork and to enable regeneration of the Cork Docklands:*
- *Investment in strategic transport corridors as reference in the CMATS and Cork MASP.*
- *The relocation of existing port activities from Cork City and investment in infrastructure to remediate sites and enable regeneration of the Cork City Docks and Tivoli.*
- *The appropriate location of SEVESO activities and the relocation of these activities from the city docklands subject to required planning and environmental processes.*
- *The sustainable development and strengthening of cruise tourism.*
- *Support the feasibility, in co-ordination with relevant stakeholders, to create and more integrated and streamlined approach between planning, environmental and foreshore consenting.*
- *Co-ordinate with the relevant Government departments and stakeholders to align the RSES and MASP with opportunities for the Region under Marine Spatial Planning.*

Cork MASP's policy is supportive of the Port's proposals to relocate its inner harbour activities and of its preference to develop Ringaskiddy.

[4.4.2] Cork County Development Plan 2022-2028

[4.4.2.1] Port of Cork

The Cork County Development Plan Chapter 12 acknowledges Cork Harbour Area as a critical regional and national spatial asset and Cork Port as the second most significant port in the state, critical to the economic success of the South-West Region.

The plan also acknowledges the identification of Port of Cork as a Tier 1 Port of National Significance and as a Core Port within the TEN-T (European Union Trans European Network-Transport).

The Plan:

'*Supports the Port of Cork's Expansion of facilities in Ringaskiddy so that port centered operations and logistics can become more efficient through the accommodation of larger ships so that port traffic can directly access the National Road Network without passing through the City Centre. The expansion of port facilities at Ringaskiddy is ongoing and will release dockland area close to the City for planned redevelopment in line with proposals set out in the City Council's development and local plan areas. The Cork Container Terminal for the Port of Cork Company is expected to begin operations in 2021.*'

The Plan identifies in parallel that:

'the environmental, heritage and ecological values of the Harbour are very important. Developing the harbour in a sustainable manner to include the safeguarding of its key environmental and heritage resources will be critical if the full potential of the Harbour is to be realised. Development proposals will be subject to environmental assessment, implementation of mitigation measures outlined in applicable SEAs and AAs and feasibility studies to establish that any expansions can be achieved without adverse effects on any European Sites and within carrying capacity of receiving environments of the port'

Finally, the Plan commits that:

'Investment in port infrastructure must be complemented by the sustainable development of improved access infrastructure. Transport connectivity priorities for the port supported by this plan are as follows:

- *M8 Dunkettle Interchange*
- *N28 Cork to Ringaskiddy*
- *Upgrading of the R624 Regional Road Linking N25 Marino Point and Cobh to National Road Status*
- *Rail Connection to Marino Point ……'*

a) *Future expansion or intensification of Port activities will have regard to environmental, nature conservation and broader heritage considerations at design, construction and implementation stages*.

[4.4.2.2] Transportation and Mobility

The County Development Plan Objective TM 12-15 Port of Cork and Other Ports commits to:

a) Ensure that the strategic port facilities at Ringaskiddy, Whitegate and Marino Point have appropriate road and transport capacity to facilitate their sustainable development in future years

b) Ensure delivery of the upgrading and realignment of the N28 Cork to Ringaskiddy Road and the upgrading of the R624 Regional Road linking N25 to Marino Point and Cobh and designation to National Road Status to provide appropriate road transport capacity to facilitate sustainable development of port facilities at Ringaskiddy, Whitegate and Marino Point.

c) *Support the wider landside capacity of Port of Cork subject to consideration of environmental concerns including water quality, flood risks, human health, natural and built heritage.*

d) *Support the relocation of port activities and other industry away from the upper harbour on the eastern approaches to the city.*

e) *Support Ringaskiddy as the preferred location for the relocation for the majority of the port related activities having regard to the need for significant improvement to the road network. Also recognising the key role that Marino Point can play in providing an alternative relocation option for some of the port related uses that could best be served by rail transport, taking account of residential amenity, tourism, recreation and renewable energy. The Council is committed to engage with the Port of Cork and other relevant stakeholders in achieving this outcome.*

[4.4.2.3] Biodiversity and Environment

The CDP acknowledges the threat to biodiversity globally and includes within the definition of biodiversity, native plants, animals and the places (habitats and ecosystems) they occupy.

The overarching policy in relation to biodiversity in the CDP is to:

a) *Support and comply with the objectives of the National Biodiversity Plan 2017 – 2021 (and any future National Biodiversity Plan which may be adopted during the period of this plan as appropriate,*

b) *Implement the current County Biodiversity Action Plan and any future updated Plan:*

c) *Support and comply with the biodiversity policy set out in other national and regional policy documents as appropriate.*

The CDP gives explicit mention of the obligation to protect sites, habitats and species with regard to:

- European Legislation,
- National Legislation and International Agreements.
- Special Areas of Conservation.
- Special Protection Areas.
- Marine Protected Areas.
- Natural Heritage Areas.
- Proposed Natural Heritage Areas
- Statutory Nature Reserves
- Refuges for Fauna and
- Ramsar Sites.

[4.4.2.4] Summary

In summary, the 2022-2028 CDP policies relevant to the Port of Cork:

- Recognise the importance of the port and the need for its relocation and development to promote strategic employment growth in Cork City and County.
- Support the relocation of the Port of Cork to facilitate this strategic employment growth and to facilitate redevelopment of land within the city.
- Identify Ringaskiddy as the "preferred location" for the relocation of the port's inner harbour activities.
- Aim to protect land suitable for the expansion of port facilities from inappropriate development.
- Recognise the need to protect existing environmental, residential and recreational amenity in any redevelopment proposals.
- Recognise the benefit, in terms of promoting more sustainable transport, of removing freight transport from city centre routes and other major residential areas.
- Recognise the need to develop an integrated approach to the planning and development of the harbour, through the provision of a specific study to feed into the local area plan process.
- Require that any proposed development is screened for impact on any designated conservation areas and scenic amenity routes.

[4.4.3] Cork City Development Plan 2022-2028

The Port of Cork is also identified by the Cork City Development Plan 2022-2028 (CCDP) as a major contributor to the city in terms of its economic, industrial, tourist and historical significance, it states that:

The CCDP supports the proposals for the relocation of the port activities to facilitate the redevelopment potential of existing port lands close to the heart of the city:

The relocation of port activities, particularly from City Quays and Tivoli, is seen as a key issue because the CCDP aims to benefit from released lands and use their potential for future development of the city:

"Tivoli has been identified in the MASP as an area with future potential for residential and employment uses. The City Council is committed to supporting the regeneration of the Tivoli area by the preparation of a Local Area Plan. Key issues to be resolved prior to regeneration of Tivoli include the timing of the relocation of port activities."

[4.5] Summary

The proposal for finalising the final stages of Ringaskiddy redevelopment is consistent with European and national policy objectives, which identify high quality transport infrastructure, including port facilities, as essential for economic growth; maximising Ireland's ocean wealth; and ensuring competitiveness of Ireland and Europe.

At a European level, the TEN-T recognises the Port of Cork as a core network port; and significant grant funding has been awarded to progress the Port's strategic development proposals.

The 2013 National Ports' Policy (NPP 2013) establishes the policy framework for the development of port facilities in Ireland. It identifies the Port of Cork as one of 3 'Tier 1 – Ports of National Significance' and endorses the principles contained within the SDP. The NPP 2013 notes that identification of appropriate locations for port expansion should be addressed within spatial planning policy documents.

The 2019-2031 Regional Spatial Planning Guidelines (RPGs 2019-2031) highlight the importance of the relocation of the Port to the region's strategic spatial strategy; acknowledge the limitations of potential rail transport and state that future port facilities need to be well served by the road network.

Spatial Planning Policy (Cork MASP, and County Development Plan (2022 -2028)) identify Ringaskiddy as the preferred location for the primary expansion of port activities and the application lands at Ringaskiddy are zoned to provide for the location of the Port of Cork's container and bulk goods facilities. This objective is reinforced within the Cork County Development Plan 2022-2028. The Cork City Development Plan 2022-2028 and the City Development Plan 2022-2028 both identify the critical need to relocate Port activities to facilitate the redevelopment of the Docklands and Tivoli and to maximise the potential of the Upper Harbour for other commercial and recreational uses.

[5] Population and Human Health

[5.1] Introduction

This chapter describes the likely impacts of the construction and operation of the Project upon the economic activity, social considerations including housing, land use, health & safety, recreation, amenities and tourism. Consideration is given to sensitive neighbouring occupied premises such as homes; schools; and commercial premises and to the transient population, such as drivers, boaters and tourists.

[5.1.1] Scope of the Assessment

The following aspects have been considered relevant to the population and human health assessment:

- Design
    - The proximity, location and design elements of the Project and how these may impact upon population subsets, amenity areas, housing, recreational areas and tourism features.
- Construction
    - The impact of construction upon population subsets with regards to human safety.
    - The impact of the construction upon population subsets with regards to human health.
    - The impact of the construction upon the amenity access to ‘Paddy’s Point’ and associated facilities.
    - The impact of the construction phase upon the normal operation of businesses and commercial properties.
- Operation and Maintenance
    - The operational impact of the scheme on population and human health based on the potential effects of the Project.

The primary effect of the Project on Population and Human Health is of a positive nature as the redevelopment of Ringaskiddy port will deliver direct and indirect benefits to the local economy. Moreover, the development of Paddy’s Point Amenity Area has enhanced recreation and amenity facilities in the area. However, negative impacts are also noted, mainly associated with construction activities impacting upon human health:

- The impact of construction works on human health, from the perspective of noise and vibration nuisance, and emissions to air and water from plant and equipment. These are discussed in Chapter 9 ‘Noise and Vibration’, Chapter 10 ‘Air Quality’ and Chapter 14 ‘Water Environment’.

- The impact of construction works on population subsets, residential properties, community facilities and economic activity with regards to cyclist and traffic movement. This is discussed in Chapter 8 'Traffic and Transportation'.

- The impact of construction works on population subsets, residential properties, community facilities and commercial facilities with regards to landscape and visual amenity, and cultural heritage considerations (architecture, archaeology, and intangible cultural heritage). This is discussed in Chapter 6 'Cultural Heritage' and 7 'Landscape and Visual'.

[5.2] Assessment Methodology

[5.2.1] Study Area

The study area for this chapter was determined by a detailed assessment of the human environment baseline and identification of potential receptors; appraisal of the proposed redevelopment to identify potential impacts; consultation with relevant agencies / stakeholders and a public consultation process. The methodology for developing the baseline involved desk top analysis of available mapping and aerial images; census analysis; review of relevant documents; review of comments from statutory bodies and the public consultation process; and consultation with Port of Cork.

The village of Ringaskiddy is characterised by existing large pharmaceutical, industry and port activities. There is a small residential population of c.580 in 2016 (Cork County Council, 2022). There are a relatively high proportion of temporary residents due to student accommodation linked to the National Maritime College of Ireland and temporary workers accommodation linked to Ringport Business Park. Residential amenities include a primary school, church, convenience shop, bar, restaurant and crèche.

Shanbally is a small residential community with a population of c.389 people in 2016) (Cork County Council, 2022). Residential amenities include a primary school, church, shop and bar.

There are a number of recreation and amenity facilities serving Ringaskiddy and Shanbally, including GAA pitches and a soccer club. Adjacent to the lands proposed for redevelopment, are existing recreation and amenity facilities which are open to the public which include Paddy's Point pier and slipway (opened May 2019);

[5.2.2] Legislation & Guidance

The population assessment has been undertaken with due regard to the overarching EIA guidance, including the EIA Directive 2014/52/EU, the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022) and the Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DHPLG, 2018). Regard has also been given to the Fáilte Ireland Guidelines on the Treatment of Tourism in an Environmental Impact Statement (Fáilte Ireland, 2011).

The human health assessment has been undertaken with due regard to the overarching EIA guidance described above. No specific guidance on the definition for Human Health has been defined in the context of EIA to date however relevant guidance that has been considered is included below:

- Institute of Public Health Ireland (2009) Health Impact Assessment Guidance.

- IEMA (2017) Health in Environmental Impact Assessment - A Primer for a Proportionate Approach.
- IEMA 2020 Health Impact Assessment in Planning: Thought pieces from UK practice. Impact Assessment Outlook Journal, Volume 8: October 2020.
- US EPA (2016) Health Impact Assessment Resource and Tool Compilation.

In addressing other factors of community health with regards to noise nuisance, air quality and water quality, specific legislation and guidelines have been used and are outlined in the respective EIAR chapters.

Likely significant effects are categorised in accordance with the EPA 2022 Guidelines (see Table 5-1). Significant effects are compared between the 'Do-Nothing' and the 'Do-Something' scenarios (split into the construction and operation phases) and arise from direct, indirect, secondary, and cumulative effects on environmental conditions. Significant effects can be positive, neutral, or negative. It usually follows that the significance of an impact depends, among other considerations, on:

- The location and character of the local environment,
- The sensitivity of the local population and its capacity to absorb change,
- The nature of the environmental effect,
- The timing and duration of an effect,
- The scale or extent of the effect in terms of area or population affected,
- The magnitude (duration and frequency) of an effect, and
- The probability of an effect's occurrence.

Table 5-1: Significance Criteria for Likely Significant Effects on Population and Human Health

Significance Level	Criteria
Quality of Effects	
Positive Effects	A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
Neutral Effects	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative/adverse Effects	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Describing the Significance of Effect	
Imperceptible	An effect capable of measurement but without significant consequences.

Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics.

[5.2.3] Data Sources

The appraisal of likely significant effects on population and human health was conducted through an initial desk-top review of the current socio-economic environment in the areas adjacent to the Port Development. Baseline information was sourced from a number of secondary data resources including:

- Cork County Development Plan 2022 (Cork County Council, 2022)
- Cork City Development Plan 2022 (Cork City Council, 2022)
- Ballincollig Carrigaline Municipal District: Local Area Plan (Cork County Council, 2017)
- Port of Cork Masterplan 2050 (Port of Cork, 2023)
- Port of Cork Annual Report 2023 (Port of Cork, 2024)
- Central Statistics Office Census 2022 data (CSO, 2022)
- Spatial data, including aerial photography, Google Maps and Google Street view, and Open Street Map

[5.3] Baseline Environment

The proposed redevelopment is within Ringaskiddy village and close to Shanbally village. Ringaskiddy has a population of circa 570 people. The village consists of a main street running east/west along the N28 with some smaller streets running off the main street to the south. The Port of Cork occupies lands to the north of the N28 (see **Figure 5-1**).

The settlement is dominated by port and industrial uses, with relatively limited residential or amenity uses. The Cork County Development Plan 2022 (CCDP) notes that Ringaskiddy is designated as a Strategic Employment Location, within the County and has developed into one of the most significant employment areas in the Country.

Figure 5-1 Aerial view of Port of Cork Lands at Ringaskiddy

Ringaskiddy is connected by road to Haulbowline Island at the eastern end of the village. Haulbowline Island is home to the Irish Defence Forces Naval Base. People's Park is a 22-acre park located in Haulbowline which is complete with 4kms of fully accessible pathways, a 1km jogging circuit, playing pitches and seating areas overlooking Cork Harbour. A crematorium is located on a small island – Rocky Island - between Haulbowline and Ringaskiddy.

Spike Island is situated in the lower Cork Harbour, to the east of Ringaskiddy. Access to the island is currently only possible by boat, with regular tours leaving from Cobh. Spike Island currently offers visitor tours to the military fortification. Strategic plans are being prepared to develop the Island as a more significant tourism and recreational attraction for the Cork area.

Monkstown village is located across the harbour, north-west of Ringaskiddy and the port lands are visible from much of the village. Monkstown is linked in spatial planning policy to Passage West and the area is identified as an important residential settlement. Monkstown is also identified as a significant centre for water-based activities.

Rushbrooke Dockyard is located north of the port lands. Whitepoint, Cobh is located to the east of Rushbrooke and is a relatively low-density residential area. The port lands form part of the harbour vista from a number of residential properties at Whitepoint.

Cobh town is located on the opposite side of the harbour to the north, with the main commercial area of the town facing onto the harbour. The town has a steep topography, with many residential areas having a vista of the harbour and the port lands form part of this vista. There are limited views of the port lands from the commercial part of Cobh town. The shipping lane (known colloquially as Cobh Road) passes up the middle of the harbour and crosses in front of the town.

Carrigaline is located approximately 5km to the south-west of Ringaskiddy. It is a key residential settlement of approximately 18,239 people. Carrigaline experiences strong commuting to Cork City and Ringaskiddy.

Crosshaven is located to the south east of Ringaskiddy. It is a small settlement with a population of c.3,263. The strategic planning aim for Crosshaven is to consolidate the settlement and recognise its important economic, leisure, tourism and marine roles within Cork Harbour Area. The main access route from Crosshaven to Cork City is on the N28, via Carrigaline but there is no strong commuting link identified.

The proposed redevelopment will result in the relocation of some of the Port's current activities from Tivoli and City Quays. The relocation of activities from these sites will provide redevelopment opportunities in the city. In addition to redevelopment of land the relocation of the Tivoli and City Quays will enhance use of the River Lee for leisure and amenity use (Cork City Council, 2022)

[5.4] Sensitive Receptors

The principal receptors that may be impacted by the proposed redevelopment are identified as:

- Residential Receptors
- Direct Economic Receptors
- Indirect Economic Receptors
- Social and Community Facilities
- Transient Population
- Others

[5.4.1] Residential Receptors

[5.4.1.1] Residential Properties Adjacent to the Project site

There are no residential properties directly adjoining the Port lands. The residential properties closest to the site are those located to the south of the N28 on the main street of the village.

There is a row of houses immediately south east of the entrance of the deepwater terminal on Ringaskiddy Main Street, Plate 5.1. Between this row of houses and the entrance to the ferry port there are approximately 30 houses that face onto the N28 and directly overlook the Port lands, 8 of these houses are set back slightly and separated from the road by a small semi-circular greenspace.

[5.4.1.2] Residential Properties Within 0.5km of the Project site

There are less than 200 residential units within 500m of the site. and housing units at Ferryview Park (providing student accommodation).

[5.4.1.3] Residential Properties Adjacent to Primary Transport Routes

The N28 is the primary transport route connecting Ringaskiddy port to the surrounding towns. There are more than 200 residential properties adjacent to the primary transport route from the existing entrance of the Ringaskiddy port to Dunkettle Roundabout. It is at this point that Ringaskiddy port is connected with the nearest motorway.

[5.4.1.4] Residential Properties in wider context

The main settlements within the wider context of Ringaskiddy are; Carrigaline (population c. 18,239); Passage West / Monkstown (population c. 6,051); Cobh (population c. 14,148) and Crosshaven (population c. 2,577).

[5.4.1.5] Land Zoned for Residential Development

There is no land zoned in either Ringaskiddy or Shanbally specifically for future residential development. There are two areas identified on the Ringaskiddy zoning map as 'Town Centre / Neighbourhood Centre', one (RY-T-01) in Shanbally and another (RY-T-02) in Ringaskiddy (see Zoning Map in published CCDP). Further development on these lands is required to reflect the scale and character of the surrounding existing built up residential area. Small scale residential development may be considered acceptable within these zones.

[5.4.2] Direct Economic Receptors

[5.4.2.1] Commercial and Industrial Premises proximal to the Project site

Ringaskiddy is dominated by industrial development, particularly in the pharmaceutical industry. It is a strategic location for large scale, stand-alone industry. As of 2021, more than 3,800 people were reportedly employed in the Ringaskiddy area (Cork County Council, 2017).

The closest existing industry to the Port lands is the Pfizer site, which is located to the west of the Port's landholding. The lands immediately adjoining the Port site to the west are the location of the former ADM factory and tank farm (currently largely unused). There are a number of other major pharmaceutical and biochemical companies located to the south of the N28 and east of Ringaskiddy. There are also a number of other companies located in Ringaskiddy these include car importers, storage and manufacturing businesses.

There is a limited number of commercial service companies located within Ringaskiddy. There is one former public house (Sam's Bar) and one public house / restaurant (Ferryboat Inn) within the village. All of these services are located on the main street. In Shanbally there is one public house located adjacent to the N28 (The Shamrock Bar), and a village shop. Perry Street Market Café which operated on the main street for several years closed in November 2024.

[5.4.2.2] Commercial Activities within Cork Harbour

The primary commercial activities located within Cork Harbour are related directly to Port related activities and fishing. It is noted in the CSO that approximately 1,372 commercial ships entered Cork Port harbour in 2023 (CSO, 2024).

Cork Harbour is one of the largest natural harbours in the world. It offers sheltered fishing in all but the strongest winds. The main type of fishing is at anchor, sometimes drifting and occasionally trawling. Chapter 15, Marine Ecology of this EIAR provides a more detailed description of fishing activities within the harbour.

[5.4.2.3] Tourism Activities within and proximal to Cork Harbour

Cork Harbour provides for a number of marine based leisure activities (including fishing, sailing, kayaking rowing, angling, bird watching and swimming), which support the tourism industry in the area. Marine based leisure activities are also widely used by residents of the County.

The primary tourism related activities in and around Cork Harbour are Spike Island and Cruise Liner traffic, both of which are linked to Cobh town. The CCDP notes that Cobh has significant potential as the tourism base, enhanced by its cruise terminal and potential for an iconic tourism product at Spike Island.

- Cruise Liner Traffic –

  The village of Ringaskiddy is an arrival / departure point for tourists on cruise liners, as well as those using the passenger car ferry. The only current ferry route from the port is the Cork / Roscoff twice a week service; which arrives from Roscoff on Saturdays and Wednesdays and leaves the same day. There are no tourist routes; walking trails; amenities; or heritage / cultural sites of major significance within Ringaskiddy village. Most users of the cruise liners and passenger ferries will pass through Ringaskiddy.

Tourist facilities in terms of restaurants / accommodation are limited. Cobh is the main tourist hub as the alternative landing for Cruise Liner Traffic.

- Spike Island –

  Cork County Council has set a vision for the development of Spike Island as tourism, cultural and recreational destination for Cork.

[5.4.2.4] Land Zoned for Commercial Development

The majority of development lands within Ringaskiddy are zoned for industrial related development (see CCDP Land Use Zoning Map). The lands surrounding the site are in port ownership and are zoned for port facilities and port related activities. To the east of the site there is an area of land zoned as a third level educational campus for MaREI - the SFI Research Centre for Energy, Climate and Marine research and innovation co-ordinated by the Environmental Research Institute (ERI) at University College Cork (UCC).

There are large tracts of lands zoned for industrial development to the south of the N28 and also to the west of the site towards the Shanbally area.

Small scale non-industrial commercial development (such as retail/service use) are considered to be acceptable in principle within the lands zoned 'Town Centre / Neighbourhood Centre' at Shanbally and Ringaskiddy village centres.

[5.4.2.5] Operational and Construction related Employment

There are 196 full-time employees at the Port of Cork Company (Port of Cork, 2024)There are currently 90 people employed by the Port of Cork at the Ringaskiddy site within the following categories: Operations Personnel (71); Engineering Services, Ringaskiddy based (19). At the Port of Cork's Tivoli Terminal, there are 17 people employed directly within the following categories: Operations Personnel (13); Stevedores / Checkers (2); Engineering Services (2) (pers. comms., 2025).

Construction employees will be direct economic receptors of the proposed redevelopment.

[5.4.3] Indirect Economic Receptors

The indirect economic receptors have been identified as:

- Suppliers of construction materials required to complete the proposed redevelopment. At the planning stage it is not possible to identify who these suppliers might be.

- Commercial and Industrial activities served by the N28.

[5.4.4] Social and Community Facilities

[5.4.4.1] Schools

There is one primary school within the village - Ringaskiddy Lower Harbour National School which is located approximately 920m south of the boundary of the Ringaskiddy East and has approximately 58 pupils. There are no secondary schools within the village.

Shanbally National School is situated approximately 1.45km east of Ringaskiddy West adjacent to the N28 and has a roll of approximately 206 pupils. There are no other schools within the village or adjacent to the N28.

[5.4.4.2] Third Level Education & Research Facilities

The National Maritime College of Ireland (NMCI) is situated approximately 815m from the eastern boundary of the site. The college provides training and education for the merchant marine. MaREI, the marine based research centre from UCC, is located within Port of Cork lands – the Beaufort Building.

[5.4.4.3] Childcare Facilities

One crèche has been identified within the village of Ringaskiddy - Ferryview Crèche, which is located at the entrance to the Ferryview housing estate, approximately 430m south of the development boundary.

[5.4.4.4] Community Facilities

Ringaskiddy Community Centre is adjacent to the N28, approximately 340m south of the site. The hall is set back from the road to accommodate one row of parking, as seen in

Plate 5-1 . It is actively used for a range of community activities and events and benefited from significant upgrading works in 2022.The community centre now accommodates five adaptable workstations to support remote working.

Plate 5-1 Ringaskiddy Community Centre

[5.4.4.5] Recreation and Amenity Facilities

- Sports Clubs

  Pfizer Sports Club is situated immediately west of the Pfizer Ringaskiddy Plant, circa 940m from the proposed redevelopment boundary. Shamrocks Hurling and GAA Club is based in Shanbally. The pitch is 1.7km south west of the site and behind a number of residential properties south of the N28. The Hibernian Soccer Club is also based in Shanbally, further south-west

- Leisure Fishing

  The main leisure fishing areas in the vicinity are at the Sea Wall at Monkstown and the deepwater quay, Cobh. Historically the deepwater quay at Ringaskiddy was used for informal leisure fishing. As a secured port area unauthorised access to this area has been restricted for a considerable number of years.

- Amenity/Beaches

  As part of the earlier stages of the Project, Paddy's Point was constructed to provide an open green space for local residents and safe marine access for launching private marine craft. It contains a pier, slipway and pontoon.

Monkstown seafront is a popular amenity walk. At the eastern end of Ringaskiddy is a sandy / rocky shore, known as Gobby Beach. The beach is used for walking and is served by a small car park. There is a footpath from the main Ringaskiddy to Loughbeg Road to the Martello Tower on the eastern shore.

- Bird Watching

  Haulbowline Island is identified as an East Cork Bird Trail Hotspot. A bird reservation is also located at Loughbeg.

- Sailings/Moorings

  Monkstown Bay Sailing Club operates from de Vesci Place (clubhouse) and Sand Quay (dinghy park) circa 1.15km and 940m north west from the site.

  There are boat launching facilities in Monkstown with limited parking for trailers. Glenbrook has one public slipway. The sailing club also make use of the slipway owned and maintained by the Port of Cork, which is to be relocated as part of the proposed redevelopment.

  Cove Sailing Club, Whitepoint, Cobh is a very active club which also hosts several large events – Cobh Peoples Regatta, Cove @ Home, The Marlogue Trophy and the annual Cobh/Blackrock race. There is also an annual race around Spike Island.

  Meitheal Mara is a maritime cultural organisation based in Cork. It was founded in 1994 as a community employment Currach building project and frequently uses the harbour for boating activities. Meitheal Mara organises the annual Ocean to City Race, which is supported by the Port of Cork.

  The Port of Cork Masterplan 2050 notes Crosshaven, Cobh, and Monkstown have long associations with sailing (Port of Cork, 2023).

- Rowing/Kayaking/Swimming

  Rowing Clubs which utilize Cork Harbour include Rushbrooke, Passage West, Commodore, Crosshaven, and the Naval Service. The Ocean to City Race (held in the summer); is a rowing / boating race from Crosshaven to the City. The race is an important part of the annual Cork Maritime Festival and attracts participants and visitors from the rest of Ireland and abroad.

  The harbour is a popular location for sea kayaking trips for local kayaking clubs and commercial entities. Kayakers participate in the ‘Ocean to City Race’ and there is also the ‘Great Island Race’, a winter kayaking race circumnavigating the Great Island.

  Open sea swimming has become more popular within the harbour and there are a number of events throughout the year, including Cork City to Cobh swim and ‘Escape from Spike Island’. Open swimming increasingly attracts participants and visitors from the rest of Ireland and abroad.

[5.4.4.6] Churches and Cemetries

Ringaskiddy Catholic Oratory Church is a small building directly opposite the existing entrance to the Port of Cork, circa 390m south east of the proposed redevelopment boundary – Plate

5.6. The Church of the Immaculate Heart of Mary, Shanbally is circa 1.45km south west of the development boundary and adjacent to the N28.

Barnahely Cemetery is east of the R613/Jansen Pharmaceuticals, circa 570m south-west of the site. The Island Crematorium located on Rocky Island, approximately 1km north-east of Ringaskiddy East.

[5.4.4.7] Land Zoned for Recreation or Amenity Use

There are small pockets of land zoned for green infrastructure south of the village of Ringaskiddy in CCDP. This is designated as providing a buffer zone between existing residential development and adjoining land designated for industrial use. No active recreation or amenity use is proposed on the lands.

Similarly in Shanbally, existing recreational & amenity uses (golf courses and playing pitches) are zoned as open space and additional land is zoned to act as a buffer zone or to protect the feeding grounds of bird species.

[5.4.5] Transient Population

[5.4.5.1] Commuters using the N28

The N28 is a strong commuting route from Carrigaline and surrounding areas into Cork City and also from the City and surrounding areas to Ringaskiddy.

[5.4.5.2] Passengers of the Ferry port

Brittany Ferries runs a Cork to Roscoff service with sailings twice a week from March to the beginning of November. The ship arrives into port at 11:00 Saturday and 9:30 on Wednesday, and departs at 16:00 the same day. The current service caters for a maximum of 2,400 passengers and 650 cars on the weekend sailing and 1,500 passengers and 470 cars on the midweek sailing.

[5.4.5.3] Irish Naval Base

Haulbowline Island is located over 1km north east of the proposed redevelopment boundary and is accessed via a bridge from Ringaskiddy. The State-owned island is circa 33 hectares and serves as the headquarters for the Irish Navy.

The east part of the island is owned by Cork County Council and the land has been to remediated to support Haulbowline Island Recreational Amenity, a landscaped public park.

[5.4.6] Demographics

Demographic data is taken from the 2022 Census Small Area Population Statistics. The subject site lies in Carrigaline Electoral Division and Small Area statistics are also available for the settlements of Shanbally and Ringaskiddy. However, the divisions of these small area statistics were amended for the most recent Census (2022). This means that the trends in data cannot be determined.

Moreover, the trends also cannot be read at a county level as the Cork City Boundary changed before the 2022 Census. The closest large settlement to Ringaskiddy is Carrigaline and,

according to the CCDP, the link between Carrigaline and the employment hub in Ringaskiddy is greatly important. Therefore, the below sections will examine the trends in the Carrigaline Electoral Division as a whole, as well as reviewing recent statistics for the Small Areas of Ringaskiddy and Shanbally.

[5.4.6.1] Population and Households

Table 5.1 indicates that the 2022 population of the Carrigaline Electoral Division stands at 13,249, with the Towns of Ringaskiddy and Shanbally accounting for 575 and 350 respectively. Carrigaline is a significant residential settlement, projected for strong growth in the CCDP.

Table 5.2 details the household size in 2022. The State average household size was 2.6 and Carrigaline average household was 2.9. Household size in Ringaskiddy was somewhat smaller at 2.6 persons, which may be influenced by a relatively high proportion of single households in student accommodation linked to the NMCI and the temporary accommodation linked to Ringport Business Park. The 2022 household size in Shanbally was 3 persons, somewhat higher than the County and State averages and indicative of a more family orientated settlement than Ringaskiddy.

Analysis of Ringaskiddy family cycle data (Table 5.3) shows that the population of Ringaskiddy is predominately young and economically active. It is likely that a high proportion of the population works within the settlement, or attend the NMCI. This assumption is supported by the travel to work / school / college data, indicated in Table 5.6. This data indicates that 35.5% of people in Ringaskiddy spend less than ¼ hr travelling to work / school or college, this is broadly in line with the county or state averages of 35% and 34% respectively.

Table 5-2: Population Change 2016 – 2022

Area	2016	2022	Change 2016-2022
Carrigaline ED	12,118	13,249	+9%
Ringaskiddy*	580	575	-0.8%
Shanbally*	349	350	+0.3%
State	4,761,865	5,149,139	+8%

**2016 data is taken from areas classified as Settlements in 2016 Census, 2022 data is taken from areas classified as Towns in 2022 Census.*

Table 5-3 : Household Size 2022

Area	Households 2022	Household Size 2022
Carrigaline ED	4,497	2.9
Ringaskiddy	219	2.6

Shanbally	118	3
State	1,841,152	2.74

Table 5-4 2022 Household –Family Cycle

Family Cycle	Ringaskiddy	Shanbally	Carrigaline	State
Younger couple	7.5%	3%	8%	9%
Older couple	2%	8.5%	8%	9%
Retired	10%	6%	9%	12%
Pre-school	9%	9%	9%	8%
Early school	11%	8.5%	12%	10%
Pre-adolescent	15%	12%	13%	12%
Adolescent	16%	16%	14%	12%
Adult	28%	36%	28%	27%

[5.4.6.2] Economic Status and Work Travel Patterns

Table 5.5 provides details of the economic status of persons aged over 15 in 2022. The proportion of people at work in Ringaskiddy (62%) and Shanbally (56%) is similar to the proportion for Carrigaline (61%); although it is slightly higher than the state average of 56%. Unemployment rates in both settlements (3% & 2%) are broadly consist with the Carrigaline and state averages.

The economic status data indicates that the economic activity of residential population of Ringaskiddy and Shanbally is broadly in line with state averages.

Table 5.6 provides details of travel to school / work / college times for residents. While Ringaskiddy is broadly consistent with the pattern for the county and state in relation to travel times, Shanbally and Carrigaline as a whole have a somewhat lower proportion of residents who commute to work or education in under ¼ hour. This is indicative of a relatively high proportion of Ringaskiddy residents working, or studying within the settlement.

Table 5-5: 2022 Census Persons Aged 15+ by Principle Economic Status

Area	At Work	Un-employed	Student	Look after home	Unable to work	Retired	Other
Ringaskiddy	62%	3%	10%	6.5%	5%	13.5%	0%

Shanbally	56%	2%	17%	6.5%	6.5%	10.5%	1.5%
Carrigaline	61%	2.5%	13%	7%	4%	12%	0.5%
State	56%	2%	11%	6.5%	4.5%	16%	4%

Table 5-6 Travel Time to Work and Education

Area	Under 15 mins	Under ½ hour	Under ¾ hour	Under 1 hour	Over 1 hour	Not Stated
Ringaskiddy	35.5%	30%	22%	3%	4%	5.5%
Shanbally	29%	38%	17%	6%	6%	4%
Carrigaline	30%	36%	20%	4%	4%	5%

[5.4.6.3] Housing Stock

Ringaskiddy and Shanbally are small residential settlements with a limited housing stock (Table 5.7). The 2022 Census data states that Ringaskiddy has a total of 251 houses, of which 20 were vacant at the time of the Census (8%); Shanbally has 122 houses, of which 3 were vacant (2.5%). The closest large settlement is Carrigaline, which has a housing stock of 4,764 houses, of which 166 were vacant (3%). On Census night the vacancy rate in Cork County was 12.8%.

The vacancy rate in Ringaskiddy, Shanbally and Carrigaline as a whole is significantly lower than the county averages.

[5.4.6.4] Demographic Summary

In summary, there is a relatively small residential population within Ringaskiddy. While the 2011 Census data indicates a population of 580, with a larger than average population at work. The population of Shanbally is higher than average for students and it is likely that a relatively high proportion of this population are resident for a temporary period, linked to further education. The residential property market in Ringaskiddy is relatively weak, with a high vacancy rate and some dereliction evident within the housing stock. Shanbally would appear to have a relatively strong housing market, with a vacancy rate significantly lower than county or state averages.

[5.5] Potential Impacts

The potential impacts of the proposed redevelopment on population and human health are assessed under the following headings:

- Economic Activity
- Social Considerations

- Land Use
- Health and Safety

A report on the socio-economic impact of Ringaskiddy Port Redevelopment was prepared as part of the previous EIS and is included in Appendix 2.1. Given that some of the works are complete, some of these impacts have already been realised. Key findings of this report are referenced within this section as 'The Indecon Report'.

Social considerations relate to whether the development will change patterns and types of activity and land use. In this context it is necessary to consider potential impacts on recreation and amenity; and on non-commercial activities that may be affected by the proposed redevelopment. Potential social and community receptors have been identified as being: residential population; schools; third level education & research facilities; childcare facilities; community facilities; churches and cemeteries; land zoned for recreation or amenity uses.

The relevant character of impacts on social considerations are considered to be; landscape changes and population change.

The proposed redevelopment is on lands currently zoned as 'Industry' within CCDP; and includes limited reclamation of the harbour (see Zoning Map in CCDP Volume 4). The uses on the lands consist of current port and port related activities and access roads. There are no existing way-leaves or rights of way on the landholding.

Health and Safety issues of the proposed redevelopment relate to construction safety; operation of plant and machinery; storage of bulk goods and containers; rodent control; and road and shipping safety.

[5.5.1] The 'do nothing' scenario

[5.5.1.1] Economic Activity

The consequence of a 'Do Nothing' scenario would be that the Port of Cork would continue to operate from its existing locations, handling freight, cargo and passenger traffic on a commercial basis. In the short-term Port activities at existing locations would intensify to respond to economic demands, within the parameters of existing relevant Harbour Works Orders and planning permissions. This intensification of activity would result in a growth in throughput of all trades and a consequential increase in traffic flows, albeit at a lower trajectory than could be facilitated by the proposed Ringaskiddy redevelopment.

While in the short term some intensification and economic growth would be achievable in the 'Do Nothing' scenario, there would be significant long term and wide-reaching negative impacts related to competitiveness; regional economic growth; sustainable transport patterns (discussed in Chapter 8); and strategic spatial development objectives (discussed in sections on Land Use).

[5.5.1.2] Competitiveness

International shipping patterns are changing, particularly in the container trade – with vessels becoming much larger in terms of length and draft to respond to higher trade volumes and provide greater efficiencies in shipping. The development of Container Berth 2 and DWB, as well as improvements to the road are key for maintaining competitiveness. The Draft Revised

National Planning Framework highlights the Port of Cork – Ringaskiddy development as crucial for overall international competitiveness (Government of Ireland, 2024).

The physical constraints of the Jack Lynch tunnel, depth of channel and width of the river at the Tivoli and City Quays sites mean that larger ships cannot be accommodated. As a consequence trade will either have to continue to utilize smaller ships, with a higher unit cost; or trade will be lost to other ports which can accommodate larger vessels (such as Dublin). The competitiveness of Port of Cork activities would be compromised. This would have a consequential impact on the competitiveness of commercial activities in the South-West Region which are reliant on port trade.

The Indecon Report estimates that if the Port of Cork fails to respond to the wider port sector developments, in particular the trend towards larger container vessels, then it would start to lose trade and larger unitized freight customers from around 2022 onwards, with losses increasing over time. However, this report did not account for the global situation that would arise, including a global pandemic. Container storage revenue in 2022 was significantly higher than normal as a result of uncertainty in the market-place with congestion at large European hub ports, covid, the situation in the Ukraine and rising energy prices (Port of Cork, 2024). Table 5.8 estimates the overall present value of future loss in the value of trade handled by Port of Cork, once capacity is reached and additional over-capacity trade must be handled at other ports.

Table 5-7 Estimated Scenario Projections of Present Value Loss of Trade at Port of Cork

	Present Value of Future Loss of Trade Relative to 'No Development' Scenario over period to 2033 - € Millions*
No Development versus Baseline Development Scenario	-22,768
No Development versus Lower Growth Development Scenario	-21,143
No Development versus Higher Growth Development Scenario	-25,707

It is estimated that the overall value of this loss in trade from the Port of Cork could total between €21.1 billion and €25.7 billion in present value terms over the period to 2033.

Having trades located at a number of locations in the Cork Harbour also means reduced economies of scale and increased logistical costs for port operations, again compromising the competitiveness of the Port of Cork.

The 'Do Nothing' scenario therefore means that the competitiveness of the Port of Cork would decline in the medium to longer term, with either higher unit costs, or loss of trade to other ports in the country; and consequential increase in costs for companies reliant on port trade in the South West Region.

[5.5.1.3] Regional Economic Growth

Efficient and competitive international shipping is a critical factor in supporting the economic growth of any region, and in particular regions located within an island economy. Any

compromise to the competitiveness of the Port of Cork will undermine the vitality and economic growth targets for Cork Gateway and the South-West Region. The Port of Cork serves a catchment area which represents a large and strategically important part of the State's population and economic base. Almost two-thirds of the Port's customers are located in Cork, while over 70% are in the South-West region and 92% in Munster. The capacity of the Port of Cork to efficiently and competitively serve the needs of these customers has a direct impact on the viability and profitability of individual companies and consequently the economic vitality of Cork and the wider region.

The Indecon Report undertook research on the views of multinational and indigenous companies on potential implications arising from the failure to address future capacity requirements of the Port of Cork. The majority of businesses surveyed believed the greatest repercussions would arise from having to divert their sea-based trade to alternative ports, which would result in a loss of economic competitiveness in the Cork region; increase the overall costs of transporting goods to / from the Cork regional; undermine the attractiveness of the Cork region for future investment and job creation; lead to increased environmental costs associated with transportation of goods; and undermine the potential for re-development of the Cork Docklands; as well as increase the overall costs of transporting goods to / from Ireland as a whole.

The 'Do-Nothing' scenario would therefore have negative impacts on the potential of the region to deliver its population and associated employment growth targets; it would have a negative impact on the economic vitality of existing businesses located within the region and undermine the attractiveness of the Cork region for future investment.

[5.5.1.4] Ten-T Connectivity

The Port of Cork's Masterplan 2050 has been accepted as being aligned with the Trans-European Transport Network (TEN-T) principles. The Port of Cork is designated as one of Ireland's three "Core Ports" in the TEN-T and as a Port of National Significance (Tier 1) under the Government's National Ports Policy 2013 (Port of Cork, 2023). The do-nothing scenario would lose the potential TEN-T connectively advantages and efficiencies, with the loss of future funding opportunities to develop the Port's infrastructure.

The Do-Nothing scenario would therefore have negative impacts on the potential of the Port of Cork to be connected to the Ten-T, with consequential negative impacts on the integration of the South West Region to the rest of Europe.

[5.5.1.5] Social Considerations

In a 'Do Nothing' scenario there will be some intensification of existing permitted activities within the boundary of the site. However, it is considered that any intensification of existing activities would have no impacts on social considerations.

[5.5.1.6] Land Use

The National Planning Framework target future population and growth to the Cork Metropolitan area, with a strong reliance on the redevelopment of Cork Docklands to achieve the targets. This is carried forward into 2022 Cork City Development Plan. Chapter 2, paragraph 55 of the City Development Plan notes:

"Regeneration of Cork Docklands is project of international importance with potential to be exemplars for sustainable urban living."

One of the primary objectives of focusing development on the Cork Docklands is to promote sustainable patterns of development, reducing the need for commuting and ensuring economies of scale in terms of the delivery of retail, social and community facilities. The development of Cork Docklands cannot be fully realised unless the Port of Cork activities are relocated from both the City Quays and Tivoli.

The 'Do Nothing' scenario would, therefore, result in stifling the strategic spatial development objectives for the South-West Region and limiting the potential of development land within Cork City. The 'Do Nothing' scenario would therefore result in a significant, negative, long-term impact on land use.

[5.5.1.7] Health and Safety

In a 'Do Nothing' scenario there may be some intensification of existing permitted activities within the boundary of the site. Any intensification of activities will be controlled by the port's existing health and safety procedures and no negative impacts are predicted in relation to land based activities.

[5.5.2] Construction Phase

[5.5.2.1] Economic Activity

Potential temporary construction impacts arise from a range of issues discussed elsewhere in this EIAR: Traffic and Transportation (Chapter 8); Noise and Vibration (Chapter 9); Air Quality (Chapter 10) and Climate (Chapter 11). Potential impacts on economic activity not discussed elsewhere relate to the direct employment of construction workers and indirect economic activity generated by the construction process.

5.5.2.1.1 Direct Employment & Indirect Economic Activity

Construction activities relate to Ringaskiddy East and Ringaskiddy West, with proposed phasing as detailed in Chapter 3 of the EIAR.

Table 5-8 details the estimated capital expenditure; labour expenditure and full-time equivalent jobs (FTEs) related to the proposed redevelopment.

Table 5-8 Estimated Construction Employment

Development	Estimated Capital Expenditure - € million	Estimated Labour Component of Capital Expenditure	Estimated FTE Jobs per €1m of Construction Labour Spend	Implied Direct Construction Phase FTEs	Economy-wide FTEs (Direct & Indirect/ Multiplier Impacts	Implied Economy-wide Incomes Supported - €million
Ringaskiddy East	177.4	29.6	25 FTEs	739	1,282	51.2

Ringaskiddy West (Deep Water Berth)	13.2	4.4	25 FTEs	110	191	7.6
Full Development Proposals (Ringaskiddy East & West)	**190.6**	**34.0**	**25 FTEs**	**849**	**1,473**	**58.8**

The total construction capital expenditure of the proposed redevelopment remaining is €200M, with an estimated 849 direct FTE construction jobs. Combined direct and indirect FTE jobs are estimated to be 1,473 with an implied economy wide income support of €58.8 m as a result of the construction process.

The proposed redevelopment will therefore have a moderate, positive, short-term impact on direct and indirect construction employment; construction suppliers and associated economic activity.

[5.5.2.2] Social Considerations

Potential construction impacts relating to traffic; noise & vibration; and dust are assessed in chapters 8, 9 and 10 respectively. In terms of additional social considerations the development has resulted in changes to existing recreation and amenity provisions within Port lands and in the harbour. With the completion of Paddy's Point, no further social considerations have been identified; therefore no other mitigation measures are required.

[5.5.2.3] Land Use

5.5.2.3.1 Construction Access

Construction access to the site will be via the existing port access road. There will be no change to existing land use to accommodate construction access; therefore there is no impact on land use.

5.5.2.3.2 Construction Site Establishment

The construction site establishment will include site office; secure compound for storage of materials and plant; temporary vehicle parking area; and storage for excavated materials, prior to off-site disposal. It will be located on land currently undeveloped and used as temporary open storage, with no existing way-leave; right of way or amenity use. The construction site establishment will therefore have a moderate, neutral short-term impact on land use.

[5.5.2.4] Health and Safety

During the construction phase, health & safety risks will arise from construction activities, including blasting and operation of heavy plant and machinery. A construction related accident could result in injury or death to construction workers; port employees or visitors to the port site. Construction safety will therefore be closely controlled by the development and implementation of construction safety arrangements. A Project Supervisor, Design Process (PSDP), will be appointed at tender stage to coordinate the design effort and to address and

minimise construction risks during the detailed design period. Notification of this appointment will be sent to the HSA by means of their Approved Form 1 (AF1).

As design advances and before construction commences, a Preliminary Health and Safety Plan will be drawn up by the PSDP and reviewed by the project team. This ultimately will be passed on to the appointed Project Supervisor Construction Stage (PSCS) to be developed into a Construction Health and Safety Plan, prior to construction commencing. Notification of this appointment and the commencement date of construction will be sent to the HSA by means of their Approved Form 2 (AF2).

With Health & Safety procedures in place, construction activities will have a negligible, neutral, short-term impact on health and safety.

[5.5.3] Operation Phase

[5.5.3.1] Economic Activity

Potential operational impacts arise from a range of issues discussed elsewhere in this EIAR Landscape & Visual (Chapter 7); Traffic & Transportation (Chapter 8); Noise & Vibration (Chapter 9); Air Quality (Chapter 10) and Climate (Chapter 11).

Potential impacts on economic activity not discussed elsewhere relate to the relocation of upper harbour activities; direct employment and indirect economic activity.

5.5.3.1.1 Relocation of Upper Harbour Activities

The proposed redevelopment will facilitate the relocation of some bulk goods cargo from the City Quays and container activities from Tivoli. The relocation of these activities is a major step forward in facilitating the development of Cork Docklands and Tivoli for mixed use development, consistent with national, regional and local spatial planning policies. Objective 10.36 of the 2022 Cork City Development Plan notes that:

"*Cork City Council will work with the Port of Cork to agree a decommissioning strategy for the City Quays to enable the development of the quays and waterfront sites to proceed on a phased basis*".

The relocation of container activities from Tivoli will free up approximately 150 hectares of land for potential development. Some non-port related activities and businesses would remain on the site at Tivoli, pending their independent commercial decision on whether to relocate.

The relocation of port trades and will act as a significant catalyst for the redevelopment of the City Quays and Tivoli sites and will have a significant, positive, permanent impact on the development of Cork City and consequently the county.

5.5.3.1.2 Direct Employment & Indirect Economic Activity

The proposed redevelopment will facilitate the relocation of existing operations from the upper harbour; consolidation of bulk goods cargo handling and greater efficiencies in port operations. It is projected that there will be no increase in employment during the operational phase in the short term. 68 workers were redeployed from Tivoli to Ringaskiddy; and 7 were redeployed from the City Quays, as detailed in Table 5-9 during the initial phases of redevelopment.

Table 5-9 Redeployment of Workers to Ringaskiddy

Tivoli	
Tivoli Operations Personnel at Present	23
Maintenance General Tivoli	5
Stevedores/Checkers – Tivoli	5
Engineering Services Tivoli	10
Non POC (e.g. shipping agents/lines Tivoli	25
Total Tivoli moving to Ringaskiddy	68

City Quays	
City Quays moving to Ringaskiddy	7

Ringaskiddy	
Operations Personnel at present	12
Engineering Services Ringaskiddy	5
Engineering Services – Various Locations	5
Total moving to Ringaskiddy (Tivoli and City Quays)	75

Overall Port operations support about 600 FTEs - between the Port of Cork and wider service providers linked with the port's activities (stevedoring, haulage and other service providers, but excluding ferry and cruise activities). As port trades grow there may be a need to increase direct employment by the port, and there will be a related growth in employment linked to the port's activities.

The operational phase of the proposed redevelopment is therefore considered to have a slight, positive, medium-term impact on direct port related employment; growing to a moderate positive long term impact as trade activity grows.

In terms of indirect economic activity, the proposed redevelopment is essential to support the regeneration and growth of the economy in the South-West Region. Economic development policy emphasises that the provision of excellent port infrastructure is essential to develop and maintain economic growth and national competitiveness. The Port of Cork services a wide area in South-West Ireland and ensures that business and industry in the region have good access to international import and export services. The proposed redevelopment will ensure that these services are maintained and can grow in line with economic growth demands from the region. The Indecon Report has estimated the economic impact of the proposed Ringaskiddy Port Redevelopment on the value of trade and employment supported by this trade. It is estimated the value of trade will grow from €13,937m in 2012 to €28,741m by 2033. The associated employment supported from this trade is estimated to grow from 171,787 in 2012 to 354,256 in 2033.

Consequently, the operational phase will have a significant, positive, permanent impact on the economic activity of the region.

[5.5.3.2] Social Considerations

Social considerations are examined under the following sections.

5.5.3.2.1 Landscape Changes

Landscaping of the proposed redevelopment is detailed in Chapter 7 - Landscape & Visual.

5.5.3.2.2 Paddy's Point

Paddy's Point Amenity Area, adjacent to the NMCI and MaREI, has been opened as part of the earlier planning permission. This public amenity is easily accessible, with improved parking facilities and boat storage. Paddy's Point Amenity Area is well landscaped, with enhanced facilities for casual amenity. Paddy's Point Amenity Area had a moderate neutral permanent impact on recreation and amenity.

5.5.3.2.3 Population Change

Ringaskiddy village is designated as a strategic employment area, with no population growth targeted within the Council planning policy framework. Analysis of the existing demographics has indicated that there is a relatively small existing residential population in Ringaskiddy (< 600) and that the housing market is relatively weak, with a high vacancy rate and some dereliction evident within the existing stock.

It is anticipated, therefore, that the proposed redevelopment will have no impact on population change of Ringaskiddy village or surrounding settlements.

[5.5.3.3] Land Use

The operational phase of the proposed redevelopment will incorporate intensification of existing port area; reclamation of some of the harbour area; and the storage of containers on lands to the east of the proposed new quay wall at Ringaskiddy Basin East.

The reclamation of areas of the harbour will result in a change to the physical structure of the area from 'port operation waters' to 'port operation lands'. While there is a physical change from water to land, the use of the area will remain 'port operations' and it is considered that there is a significant neutral permanent impact in relation to 'land' use.

The storage of containers on lands to the east of the new quay wall will result in the long-term change of land use to active industrial use. In relation to the zoning provision of the land, this provides for a more intensive and appropriate land use and is therefore a moderate positive long-term impact.

[5.5.3.4] Health and Safety

During the operational phase of the proposed redevelopment health and safety impacts will be related to port operations; pest control; and road and sea traffic. Potential receptors are port employees; workers of other companies based at the port; visiting contractors and workers; ferry passengers; harbour users; casual visitors to port lands; and traffic, pedestrians passing the port entrance.

5.5.3.4.1 Port Operations

The main health and safety risks during the operational phase of the proposed redevelopment arise from the operation of plant and machinery; the storage of bulk goods and movement and storage of containers on the port lands.

Health and Safety activities for port operations are guided by national Health & Safety legislation. The Port of Cork is also OHSAS 18001 Safety System and ISO 14001 Environmental System compliant. These are internationally recognised Health, Safety & Environmental voluntary quality standards. The Port's Safety Officer, Joann Salmon, is responsible for ensuring compliance with these safety procedures.

The project design has taken cognisance of necessary health and safety requirement for port operations and has minimised any increased health and safety risk associated with the development. In addition the Port's existing Health & Safety procedures will be reviewed to take account of the increased operations at Ringaskiddy. Consequently, increased port operations will have negligible, neutral permanent impact on health and safety.

5.5.3.4.2 Pest Control

The storage of certain bulk goods on shore and the importing of international cargo have an associated risk of rodent and other pest nuisance. The Port of Cork operates an 'Integrated Pest Management' approach to pest control. This process anticipates and prevents pest activity and infestation by education; inspection of imported cargo; proper waste management; maintenance of bulk storage areas and pesticide application when necessary.

The proposed redevelopment will increase trade activity at Ringaskiddy and increase the amount of bulk goods storage on shore. Accordingly, there is an associated increased risk of pest nuisance, which if not mitigated could have a negative impact in relation to health and safety. Continued implementation of the Port's 'Integrated Pest Management' procedures will, however, ensure that no additional risks of pest nuisance arise as a result of increased trade. The HSE is responsible for monitoring of pest management at the port and is reviewing procedures in the context of the proposed redevelopment. Any recommendations of the HSE will be fully complied with, consequently, in relation to pest control; the proposed redevelopment will have a negligible, neutral permanent impact on health and safety.

5.5.3.4.3 Sea and Road Traffic

There is a potential enhanced risk of accidents related to the increase in road and sea freight traffic. The design of the proposed redevelopment and implementation of existing road and sea traffic management operational procedures will ensure that increased traffic has no negative impact on health and safety.

Consequently, in relation to sea and road traffic, the operational phase of the proposed redevelopment will have a negligible, neutral permanent impact on health and safety.

[5.6] Mitigation Measures

[5.6.1] Construction Phase

[5.6.1.1] Economic Activity

No negative impacts on economic activity have been identified for the construction phase; therefore no mitigation measures are required.

[5.6.1.2] Social Considerations

Considering the implementation of Paddy's Point Amenity Area, no significant negative impacts on social considerations have been identified for the construction phase; therefore no other mitigation measures are required.

[5.6.1.3] Land Use

No negative impacts have been identified in relation to land use for the construction phase; therefore no mitigation measures are required.

[5.6.1.4] Health and Safety

PHH1 - In accordance with current legislation and in order to prevent and minimise construction activity accidents, a Project Supervisor Design Process (PSDP) will be appointed at detailed design stage. As the design advances but before construction commences a preliminary Health and Safety Plan will be drawn up by the PSDP and reviewed by the project team.

During construction all areas will be delineated and will be under the control of the Project Supervisor Construction Stage (PSCS) who will coordinate and supervise all safety aspects of the project. A Safety File will be complied and maintained on site for the duration of the project and the implementation of the Plan will be subject to regular audits.

Strict security procedures are already in place on site to deal with all access on a 24-Phour basis. These procedures require all vehicles and personnel visiting the site to be logged.

[5.6.2] Operation Phase

[5.6.2.1] Economic Activity

No negative impacts on economic activity have been identified for the operation phase; therefore no mitigation measures are required.

[5.6.2.2] Social Considerations

Considering the implementation of Paddy's Point Amenity Area, no significant negative impacts on social considerations have been identified for the operation phase; therefore, no other mitigation measures are required.

[5.6.2.3] Land Use

No negative impacts have been identified in relation to land use for the operation phase; therefore no mitigation measures are required.

[5.6.2.4] Health and Safety

No negative impacts on Health & Safety have been identified by the operational phase of the proposed redevelopment; therefore no further mitigation measures are required.

[5.7] Monitoring

[5.7.1] Construction Phase

No monitoring is recommended for the construction phase for this aspect.

[5.7.2] Operation Phase

No monitoring is recommended for the operation phase for this aspect.

[5.8] Residual Effects

[5.8.1] Construction Phase

[5.8.2] Economic Activity

No negative residual impacts in relation to economic activity have been identified.

[5.8.3] Social Considerations

As no mitigation measures are required there are no residual impacts to be considered.

[5.8.4] Land Use

As no mitigation measures are required, there are no residual impacts to consider.

[5.8.5] Health and Safety

No negative residual impacts in relation to health and safety have been identified.

[5.8.6] Operation Phase

[5.9] Potential Interactions & Cumulative Impacts

A planning history review was undertaken to identify any recently approved or pending developments which may have a cumulative impact on Population and Human Health.

The significant developments in terms of impacts on Population and Human Health relate to a number of applications for expansion of existing commercial and industrial activities in

Ringaskiddy. The permitted applications for extension to existing commercial and industrial facilities in the area will consolidate Ringaskiddy's role as a strategic employment location. Cumulatively the continuing development of commercial, industrial and port activities will have a significant positive impact on the economic vitality of Cork and its Region.

[5.10] Summary

[5.10.1] Economic Activity

A 'Do-Nothing' scenario would undermine the competitiveness of the Port of Cork; resulting in negative impact on the economic vitality of existing businesses with the South West Region, undermining its attractiveness for future investment. A 'Do-Nothing' scenario would also have negative impact on the potential of the Port of Cork to be connected to the Trans-European Network, with consequential negative impact on the integration of the South West Region to the rest of Europe.

The proposed Ringaskiddy redevelopment will have a positive impact on economic activity during both construction and operational phases. It is estimated that the construction phase will require a total of 849 Full Time Equivalent (FTE) jobs, as well as having significant indirect economic impacts, which will result in a moderate, positive, short-term impact on economic activity.

During the operational phase the relocation of port trades from the upper harbour will act as a significant catalyst for redevelopment of City Quays and Tivoli sites. The Ringaskiddy redevelopment will allow the Port of Cork to remain competitive within national and international markets, supporting the economic growth of the region. While there will be no immediate increase in direct employment, as trade grows there may be a need to increase direct employment and there will be a related growth in indirect employment. The operation phase of the redevelopment will have a significant, positive, permanent impact on economic activity of the region.

No negative impacts on economic activity have been identified therefore no mitigation measures are required.

[5.10.2] Land Use

A 'Do-Nothing' scenario would stifle the strategic spatial development objectives for the South-West Region, as development of lands at City Quays and Tivoli would be stifled, resulting in a significant, negative, long-term impact on land use.

No negative impacts have been identified in relation to land use therefore no mitigation measures are required.

[5.10.3] Health & Safety

The main health and safety risks related to proposed redevelopment arise from construction activities; the operation of plant and machinery; the storage of bulk goods and movement and storage of containers on the port lands. Health and Safety procedures will be followed during construction and operational phases of the redevelopment, therefore no negative impacts were identified and no further mitigation measures required

[6] Cultural Heritage

[6.1] Introduction

The Port of Cork proposes to undertake works in Ringaskiddy East and Ringaskiddy West that include new quay walls, capital dredging and improvements to the road system and related surface facilities. An aerial view of the Port of Cork Lands at Ringaskiddy is shown in Figure 6.1. All figures accompanying this Chapter are contained in EIAR Volume II. All appendices accompanying this Chapter are contained in EIAR Volume III a. The redevelopment proposals are described in Chapter 3 of this EIAR.

The Archaeological Diving Company Ltd. (ADCO) were appointed to carry out the cultural heritage assessment. Cultural Heritage assessment seeks to identify and record the location, nature, and dimensions of any archaeological and architectural features, fabric or artefacts that may be impacted by a development's proposed works. Assessment includes an examination of existing sources and the acquisition of new data arising from site inspections and surveys. The assessment gauges the level of development impact and includes detailed recommendations for the mitigation of any archaeology present within the development area.

In January 2024 Mizen Archaeology were additionally appointed to undertake an Underwater Archaeological Impact Assessment (UAIA) of the two proposed capital dredge pockets in the Ringaskiddy basin and berths at Ringaskiddy.

For both studies, a comprehensive review of existing sources was completed, and extensive new data sets have been acquired based on non-intrusive survey and recording above and below the waterline.

[6.2] Baseline Environment

Ringaskiddy is located in Cork Harbour, approximately half-way along the circuitous route that leads from the sea northward to Lough Mahon and Cork city (Figure 6.2). It is one of the series of natural havens that populate the edges of the wide harbour, and it is located to the west of where navigation can fork in two directions around Great Island. The maritime location defines the cultural heritage context of Ringaskiddy.

Material remains from the early stages of human occupation in Ireland have been discovered in Cork Harbour, and are manifested in a series of stone tools from the Mesolithic period which indicate the presence of Hunter-Gatherer-Fisher folk in the fourth millennium BC. At Ringaskiddy however the earliest indicators are somewhat later. Two coastal midden sites exist on the east shore overlooking the West Channel (Register of Monuments and Places [RMP], CO087-54 and -161; see Appendix 6.1 for descriptions of all sites mentioned in this overview). The middens are ancient low mounds or heaps of domestic waste, and may indicate the presence of ancient fishing places.

More tangible prehistoric evidence was discovered during works associated with the N28 road scheme in Barnahely townland, when terrestrial geophysical survey revealed a complex of interlocking enclosure features indicative of unenclosed settlement sites that might be Bronze Age or Iron Age in date (RMP CO087-155.

Figure 6.3 shows the location of the known archaeological monuments in the vicinity of the port complex). This relatively small area of landscape also retains sites that are more recent in date. The next significant evidence lies in Ballintaggart townland and is represented by a former ecclesiastical site (RMP CO87-061) belonging to the early medieval period (c. 500-1100

AD). The site does not survive above ground today, but it is thought to have been one of the principal church sites in the southwest. The medieval period is represented in Barnahely townland, where the ruined remains of a sixteenth-century tower house castle and its bawn survive (RMP CO087-052). Also known today as Castle Warren, the tower house was built by the De Cogans. The site lies close to and south of Barnahely Church (RMP CO087-051), whose visible remains date to the early 1700s, but which was undoubtedly associated with the castle.

A Martello tower (RMP CO087-053) was built on the highest point of Ringaskiddy promontory to the west, and represents the most prominent statement of the location's maritime heritage. The harbour had for long been strategically of great importance, and successive phases of defensive construction had been witnessed. As early as 1590, Sir George Carew, Master of the Ordnance in Ireland, observed that while 'Cork can hardly ever be fortified, yet upon the river, towards the sea, many convenient places may be found for annoying the shipping on the passage towards the town' The great batteries and star-shaped forts at Dognose, Ramhead, and Spike Island convey the conscious attempts to protect the Harbour against invasion. A bastioned fort was also built on Haulbowline Island in 1602 under the direction of the military designer Paul Ive, who was also responsible for the fortification work at Castle Ny Park, to protect Kinsale. The continued if episodic threat of invasion into the nineteenth century saw a rebuilding of the Harbour's coastal defences with the construction of its Martello Towers.

Such towers are named after a successful engagement by the Royal Navy at Martello in Italy, where the attackers were impressed by the defensive towers, whose substantial form presented solid rebuttals to ship-borne artillery, and whose upper platforms provided superior gun platforms that could exploit a 360-degree rotation if needs be. The Navy studied the towers and absorbed their plan into their own coastal defence systems. They have become an iconic symbol of the Napoleonic era, and were built into the defences of Ireland's major harbours at the time. Under construction in 1812-15, the Ringaskiddy tower is the largest of the Martello towers constructed around Cork Harbour as a defensive network to protect against the possibility of a French invasion. Located on dry land to the south of Ringaskiddy East, the Ringaskiddy tower is positioned at the centre of a circular enclosure, and was associated with an avenue that was built from the tower to the shoreline, which would have served to convey ordnance. The proximities of the magazine (RMP CO087-105) stored on Rocky Island to the north of Ringaskiddy, and the slightly more distant fortifications on Haulbowline Island (CO087-059001-3), highlight the complex fortified landscape that Ringaskiddy was a part of at this time.

Haulbowline Island was known for its ship-building and was upgraded to a Naval Dockyard in 1869. The island was artificially enlarged to provide an open-water harbour protected by a breakwater that effectively doubled its area. Ringaskiddy seems to have played less of a role in subsequent naval defence. The nineteenth century also saw the growth of parklands and big houses discretely away from the more strategic coastal locations. Ballybricken House was the mansion of the Connors, and Prospect House the villa of Lieutenant-Colonel Burke. Both lay to the west of the village that developed along the former shoreline of Barnahely and Loughbeg townlands, immediately adjacent to the Ringaskiddy East area. Though known today as Ringaskiddy, having absorbed the townland's name to the east, the nineteenth-century village was also known simply as 'Ring'. Fishing was important to the village's economy, particularly during the winter months, while Ringaskiddy also became a known summer resort.

[6.2.1] Cartographic sources

The narrative of development revealed in the standing archaeological sites and features is indicated in the sequence of maps and charts that survive. The Down Survey of 1670 facilitated

an assessment of landholding across Ireland for Cromwellian interests by mapping the available lands in some detail. It accompanied a written record of such, known as the Civil Survey. A general map of the province included Cork Harbour, and the shoreline at Ringaskiddy is clearly indicated along with Haulbowline and Spike Islands, as the cartographer traces the passage of shipping to and from Cork (Figure 6.4). The barony map of Kerrycurrihy shows the coastline in greater detail but as its focus of attention was to plot the parishes within the barony it was less concerned with the accuracy of topographical detail (Figure 6.4). One begins to see the detail at parish level (Figure 6.4). Barnahely Parish, complete with its church and castle was valued at £235, and it included the townlands of Ballebricane (Ballybricken) on the shoreline to the west, and Reniskydy (Ringaskiddy) to the east. There was a small holding of the Earle of Corke on the shoreline between both townlands, while what became known in the nineteenth century as Ring Island was named Creagh on the Down Survey. The shoreline and sea area is clearly recorded but there is nothing to distinguish water depths or shoreline features, as these were not subjects that concerned the Down Surveyors.

Given the importance of the wider Harbour it is little surprise that other useful maps are known from an early period. A map of the Harbour dated c. 1770 shows Ringaskiddy in some greater detail from a maritime perspective, lying to the south of Great Island and in association with Haulbowline and Spike islands, while indicating the natural channels of navigation (Figure 6.5). The highlights on the landscape reveal the headlands and the forts. The map is clearly focusing on maritime access to the town, and the strategic role of Haulbowline and Spike Island is conveyed, as sentinel posts either side of the narrow passage around the point at Ringaskiddy. It is clear too that certain settlement exists on Ring Island, while what becomes Ballybricken House to the west has three buildings recorded, when it was known as Ballybrillon. A map of 1781 presents a still more strategic record (Figure 6.5). It accompanies a report of Lieutenant-Colonel Charles Vallancy on the defences of the Harbour, and was commissioned at the time of the American War of Independence, when Cork remained a key naval base to support England's efforts. The 'Survey of the harbour of Cork from the entrance to Haulbowline Yards showing the range of the batteries…' highlights the integral place that Ring Point had. Recorded as 'Innishiddy Pt.' the map shows the low headland connected to the shoreline by a narrow sandy/stony bar. There is no fort on the headland but there is a small dark feature that perhaps represented a structure of some sort. A further map of 1800/1802 was completed following the French-supported United Irishmen rebellion of 1798 and indicates the strategic approaches to Cork (Figure 6.5). The channel for passage around the southwest side of Great Island is indicated running between Spike Island and Haulbowline Island. Ringaskiddy is clearly shown and labelled but there is little to indicate its fortified nature, and more to suggest its residential emphasis.

In the mid-1800s, the Ordnance Survey provides the first large-scale metrically accurate mapping, and this reveals the low-lying nature of the shoreline that is dominated by sandy shallows. Apart from the Martello tower and its associated features, the remains at Ringaskiddy are entirely residential and parklands, with a simple fishing village recorded at Ring, just south of the present-day East Basin (Ringaskiddy East) (Figure 6.6). A landing place is indicated at the foot of Ballybricken House, with a linear feature extending across the sandflats. Boathouses are shown on the shoreline close to where the demesne of Ballybricken House met the edge of Prospect Villa. There is little other structural evidence along the shoreline, while Ring Island and Ring Point show only a series of small field walls. An Ordnance Survey datum station is indicated at the tip of Ring Point. The structures that may have existed on Ring Island earlier are not shown.

Later editions of the Ordnance Survey maps show the progressive development of the shoreline. By the time of the Third Edition (c. 1912), the landing place at Ballybricken had been extended below the Low Water Mark and is recorded as 'Ballybricken Hard' (Figure 6.3). It reached almost across to what is today the reclaimed land of Ringaskiddy East. The

boathouses belonging to Ballybricken House continued to exist, while a new linear breakwater, 'Foot's Hard', was built across the intertidal shallows on the east side of Ring Island. Buildings are once again recorded on the island, and include a windmill. There was also a well. The locations of these features are all now beneath the reclaimed land that forms Ringaskiddy East.

Much of the landscape along the shore of Ring/Ringaskiddy has been transformed since the mid- twentieth century. The building of industrial complexes took place across the parkland of Ballytaggart in the 1960s with the development of the Pfizer pharmaceutical plant. The development of the deepwater port at Ringaskiddy has seen the progressive reclamation of the foreshore along Barnahely and Loughbeg, and the former narrow extents of Ring Island and Ring Point are absorbed under the much more extensive Ringaskiddy East area, as indicated on Figure 6.3.

The footprint of the modern port shows the need to undertake extensive reclamation to reach the deep waters of the main channel. This is evident in Ringaskiddy West where the former shoreline of Ballybricken has been buried. The reclamation work has been far greater in Ringaskiddy East, where the large area of low lying land that included Ring Island and Ring Point, and the sandy shallows that connected these locations with the shoreline, are beneath the current port surface. There is none of the original natural shoreline exposed within the current port area.

[6.2.2] Architectural evidence

The Martello tower and Barracks (NIAH 20908747) are recorded as features of architectural heritage interest and are also recorded as a complex of archaeological features (CO087-059001-3) (Appendix 6.1 in EIS Volume III a). The site area lies 1.1km away from the current development and will be not impacted by it.

A section of estate boundary wall runs along the western side of the R613 roadway, where it is intended to tie-in the improved road network of the Port to that outside. The wall defines the eastern boundary of Prospect Villa (NIAH CO-87-W-774641). A modern factory has been built on the site of the villa.

There is no entry made for Ringaskiddy in the OPW Ports and Harbours record files, 1708-1922, indicating that no state-financed harbour work took place there between those dates.

[6.2.3] Historic Shipwreck Inventory

Neither the Ordnance Survey maps nor the Admiralty Charts indicate the presence of shipwrecks at Ring/Ringaskiddy. The Historic Shipwreck Inventory maintained by the National Monuments Section of DAHG, contains information on 150 shipwrecking events within Cork Harbour. The Inventory is a robust source for wrecking since the mid-1700s when records were made consistently. There are no references to wreckage at Ringaskiddy. When the Inventory is examined in detail with reference to recorded places of loss, there are only four possible instances of wreckage that occur close to Ringaskiddy (Appendix 6.1 in EIS Volume III a). The nearest locations are to the north at Cobh, or to the northeast at Haulbowline Island where, for instance, an unnamed wooden rowing boat collided with the steamship Cambridge on 20th October 1898 'off Haulbowline' and was lost with five of the 16 workmen aboard being drowned. The Maria was lost in 1900 at Rocky Island, which lies to the east of the main development. The existing record does not reveal further insight to what type of vessel the Maria was, or where she wrecked on the island. The absence of reported wrecking events at or immediately adjacent to Ringaskiddy may suggest the low potential for new discovery, but

it is necessary to observe that the Inventory of Shipwrecks does not claim to be representative of wrecking events that occurred before c. 1750.

[6.2.4] Licensed Archaeological Work

Archaeological work has been carried out, in general, however, despite the number of different opportunities to monitor and investigate the soils on land and at sea in the area around the port, little significant new insight has emerged.

This may be due in part to the limited and discrete nature of most of the investigations. The discovery of the possible Bronze Age or Iron Age settlement enclosures made during work associated with the N28 road scheme in Barnahely townland is the notable exception, and the fact that this work necessitated the investigation of a relatively large area may be a factor in the discovery. It may therefore be anticipated that new works that are carried out over large areas, increase the archaeological risk of new discovery in what is a landscape and seascape of known and significant cultural heritage activity.

While archaeological work has occurred within the Ringaskiddy area, it has so far been non-intrusive survey and assessment. That work has resolved that there is no obvious material of archaeological significance exposed to view within the areas assessed and recommends procedures of active archaeological monitoring during construction activities that may excavate and/or dredge into the underlying deposits. The marine geophysical survey and subsequent diver inspection that occurred in 2005-6 within the port area is reported in Section 6.3, and the work conducted in 2012 and 2014 is presented in Section 6.4 and the Underwater Archaeological Assessment (UAIA) is presented in Section 6.5.

[6.3] 2006-2014 Cultural Heritage Assessment

[6.3.1] Assessment Methodology

A sequence of work has been completed to ensure that the Cultural Heritage assessment has been comprehensive and robust. The work has included a desktop study of known archaeological and architectural sources, while marine geophysical survey and archaeological dive inspection conducted in 2005-06 provide a robust foundation for a phase of additional inspection conducted in 2012 and 2014 and in 2024 by Mizen Archaeology…….

[6.3.1.1] Consultations

The consultations carried out for the cultural heritage chapter of 2014 EIS are as follows:

- The Irish Antiquities Division of the National Museum of Ireland (NMI) retains an extensive archive of small finds and objects discovered across Ireland and reported to the Museum and its predecessors since the nineteenth century. It represents a critical resource for archaeological research, where registered objects are recorded by townland in the Topographical Files. For the present project, the following townlands were assessed: Barnahely; Ballybricken; Ringaskiddy.

- Department of Arts, Heritage and the Gaeltacht (DAHG) Sites and Monuments Record files. The information, which is also filed according to townland, provides details relating to specific monuments and sites of archaeological importance that survive or whose site area is recorded. The record generally includes only sites that pre-date c. 1750 AD.

- DAHG's Historic Shipwreck Inventory files and Places and Ports archive. This information relates to the archives maintained by the National Monuments Section's Underwater Archaeology Unit for shipwreck and other maritime sites of archaeological interest. The information is located with reference to the nearest topographic locator, such as a town or headland, as well as site-specific grid coordinates where known. For the present project, the following landmarks were considered to be relevant: Monkstown Creek; Ballybricken Point; Ring; Ring Island; Ring Point; Ringaskiddy; Ringaskiddy Island; Paddy's Point; Rocky Island; Oyster Bank; Golden Rock.

- National Inventory of Architectural Heritage (NIAH). The DAHG provides an online register of historic buildings and features/street furniture that retain architectural heritage interest and is maintained by the DAHG's architectural section. The Inventory is organized by place and townland. The Inventory complements the archaeological inventories by including buildings and features that date from the eighteenth century and more recently.

In addition, the following sources were consulted:

- Cartographic sources, including Admiralty Charts (Chart 1777) and Ordnance Survey First and Second Edition maps (6-inch Sheet Cork 87). Historic and current topographical maps represent very important sources that can reveal the progress of natural erosion and human development across a landscape/seascape over time. Such mapping in Ireland is metrically accurate from the mid-late nineteenth century.

- Office of Public Works (OPW) Piers and Harbour Structures files, 1708-1922 (OPW/8). This body of state records refers to port improvement works across the country and forms part of the National Archives collection.

- Excavations Bulletin is an annual published list of licensed archaeological intervention work conducted across Ireland. It is arranged by county and then by townland, and is currently completed to 2010.

- Relevant published sources.

[6.3.1.2] Data Acquisition

The desktop review included a review of historic mapping that can reveal the development of the landscape over time, an examination of existing archival information at the NMI and the DAHG in relation to the known archaeological objects and features and sites of archaeological and architectural interest, and a review of archaeological work conducted in the immediate vicinity of the project area from published and unpublished sources. The information combines to establish a baseline data source.

A programme of marine geophysical survey conducted in 2005 and archaeological diver inspection carried out in 2006, conducted under licence from what is today the DAHG, provide a robust set of data commissioned by the Port of Cork for cultural heritage assessment at Ringaskiddy. Additional new primary project-specific data was acquired in 2012 and 2014 to complement the earlier data sets.

The baseline data and the factual observations made in the on-site surveys are presented in detail in Appendices 6.1 and 6.2 (EIAR Volume IV a).

[6.3.1.3] Legislation and Guidance

The following legislation, standards and guidelines with particular reference to Archaeology were consulted for the purposes of this evaluation:

- National Monuments Acts, 1930-2004;
- The Planning and Development (Strategic Infrastructure) Act, 2006;
- The Heritage Act, 1995;
- Guidelines on the information to be contained in Environmental Impact Statements, 2002, EPA;
- Advice Notes on Current Practice (in preparation of Environmental Impact Statements), 2003, EPA;
- Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes, no date, NRA;
- Frameworks and Principles for the Protection of the Archaeological Heritage, 1999, Department of Arts, Heritage, Gaeltacht and Islands (now DAHG);
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 2000 and the Local Government (Planning and Development) Act 2000;
- Code of Practice between Bord Gáis Éireann and the Minister for Arts, Heritage, Gaeltacht and the Islands (now the Department of Arts, Heritage and the Gaeltacht), 2002.

[6.3.1.4] Classification of Impacts

Impacts are generally categorised as either being a direct impact, an indirect impact or as having no predicted impact:

Direct impact occurs when an item of archaeological or architectural heritage is located within the footprint of the proposed development and entails the removal of part, or all, of the monument or feature.

Indirect impact may be caused where a feature or site of archaeological or architectural interest is located in close proximity of the proposed development.

No predicted impact occurs when the proposed development does not adversely or positively affect an archaeological or architectural heritage site.

These impact categories are further assessed in terms of their quality i.e. positive, negative, neutral (or direct and indirect).

Negative Impact is a change that will detract from or permanently remove an archaeological or architectural monument from the landscape.

Neutral Impact is a change that does not affect the archaeological or architectural heritage.

Positive Impact is a change that improves or enhances the setting of an archaeological or architectural monument.

A significance rating for these impacts is then given i.e. slight, moderate, significant or profound.

Profound an effect which obliterates sensitive characteristics.

Significant is an impact that, by its magnitude, duration or intensity alters an important aspect of the environment. An impact like this would be where the site/feature or part thereof would be permanently impacted upon leading to a loss of character, integrity and data about the archaeological or architectural site/feature.

Moderate An effect which alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.

Not Significant is an effect that causes noticeable change in the character of the environment that are not significant or profound and do not directly impact or affect an archaeological or architectural feature or monument.

Imperceptible is an impact capable of measurement but without noticeable consequences.

In addition, the duration of impacts is assessed and has been sub-divided into the following categories.

Temporary Impact, where an impact lasts for less than a year.

Short-term Impacts, where an impact lasts one to seven years.

Medium-term Impact, where an impact lasts seven to fifteen years.

Long-term Impact, where an impact lasts fifteen to sixty years.

Permanent Impact, where an impact lasts over sixty years.

[6.4] Site Visits/Surveys 2005-2006

The results for the full archaeological survey undertaken for the first planning application for Ringaskiddy re-development project are presented in this chapter for completeness, while the updated survey focuses only on those areas affected by the project. The original survey work covered all of Oyster Bank and Paddy's Point area.

[6.4.1] Marine Geophysical Survey 2005-2006

The marine geophysical survey was conducted by Hydrographic Surveys Ltd, a leading marine survey company in Ireland with a detailed knowledge of the project area. In addition to ongoing bathymetric survey to monitor seabed levels, a new survey was carried out by Hydrographic Surveys Ltd in 2006. Seismic survey would principally inform geotechnical aspects, while cultural heritage issues were more directly addressed by undertaking side-scan sonar survey and magnetometer survey. The work was focused on two areas; an area at Oyster Bank and the Ramp that includes the current redevelopment proposals within Ringaskiddy East, and a large area that extended either side of the ADM Jetty and included the area of the current development footprint in Ringaskiddy West (Figure 6.7). The work identified a series of anomalies on the seabed, and these were subsequently inspected by diving to assess further

their archaeological potential (the work conducted under licence 06D026). None of the anomalies proved to be archaeological in nature and referred to former mooring features or debris.

The survey grid at Oyster Bank was conducted at 50m intervals, which ensured 100% coverage of the seabed area, and it extended beyond the area of the seabed where works are proposed for the current submission. The survey lines ran parallel with each other and were aligned East-West. The survey at the ADM Jetty was conducted at 50m intervals on the east or basin side, which ensured 100% coverage of the seabed area where it is proposed to conduct capital dredging as part of the present submission. The survey lines ran parallel to each other on a Northwest-Southeast alignment, and a single long line ran at right angles through the centre of this grid. The seabed on the north side of the jetty is much shallower and presents constraints to such survey but nevertheless followed a similar pattern in the deeper water.

A C-Boom sub-bottom profiler was used to ascertain the nature of the seabed layers. The survey concluded that the seabed at Oyster Bank and the ADM Jetty is characterised by sand, silt, shells, gravel, and clay, with peat also being noted at Oyster Bank, and that the thickness of subsurface material can range from 0m to 11.9m. The sub-bottom profiles at the Ramp reveal a coarse seabed littered with boulders lying on and extending through the sediment.

A CMax 800 dual frequency side-scan sonar device was used with range settings of 50m and 100m per channel. No indication of significant debris was observed but a series of small-scale anomalies were identified, and these locations were subsequently inspected by archaeological divers to clarify their nature and extent, as described in section 6.3.2.

An AX2000 Proton magnetometer was used. No indication of significant debris was observed but a series of small-scale anomalies were identified, and these locations were subsequently inspected by archaeological divers to clarify their nature and extent, as described in section 6.3.2

[6.4.1.1] Archaeological Inspection of Marine Geophysical Survey Anomalies

The marine geophysical survey identified 22 anomalies at Oyster Bank and 11 anomalies at the ADM Jetty site. The anomalies inspected underwater by archaeological divers sought to clarify their nature and extent. The diver would locate on site underwater and conduct a search pattern around the anomaly location, extending up to 30m from it, to ensure that the target area was fully identified and inspected. Record was made of the topographical context of the anomaly as well as of the feature itself, and an underwater metal-detector was employed to further assist in the survey work.

The seabed at Oyster Bank is dominated by a fine silt-sand mix that is up to 1m in thickness and lies over a silt-clay substrate. Occasional concentrations of rock and gravel were evident. The seabed at the ADM site is dominated by a similar fine silt-sand mix, which lies 40cm thick over a harder silt-clay mix. Linear undulations running parallel with the shore may result from vessel prop-wash, while certain dredge scars were visible resulting from maintenance dredging of the basin.

Of the 33 anomalies identified in the marine geophysical survey data 31 were positively identified underwater, and the remaining two targets were thought to have represented mobile objects that had been moved by the tides. The observations are described in Appendix 6.2 (see EIAR Volume IV). No material of archaeological significance was observed.

[6.4.2] Intertidal Survey 2005-2006

The Oyster Bank area was inspected and metal-detected at Low Water as an intertidal exercise. The work confirmed the presence of a rock-armoured shoreline associated with the present quay area, and soft featureless sediment along its base. While large numbers of metallic debris were identified littering the shoreline, they were noted to be modern in date, and no features of archaeological interest were observed.

[6.5] Site Visits/Surveys 2012, 2014

On-site work in 2012 by ADCO combined intertidal inspection and sub-tidal dive inspection to focus on three areas that had not been considered in detail previously, relative to the development proposals of the present submission (Figure 6.8). The work was completed under licence from the DAHG (12D016, 12R073). The intertidal survey was conducted during Low Water, and throughout the surveys the weather was clear, the sea state calm, and underwater visibility was good at 2m. The underwater work was completed using Surface Supplied Diving Apparatus. Further underwater assessment was carried out in 2014 of the proposed new Public pier and slipway at Paddy's Point, upstream of the bridge to Haulbowline Island.

[6.5.1] Land Assessment

Field-walking was undertaken in the Ringaskiddy East area in the locations on land within the development footprint. The reclaimed nature of the land area is clear (Figure 6.10). There is no indication of the former island that underlies this large area of fill, or of related features recorded on the First Edition Ordnance Survey and earlier maps. No material of archaeological significance was observed.

[6.5.2] Intertidal Assessment

Intertidal work was completed in the Ringaskiddy West area, extending west along the shoreline at Ballintaggart, and east in the space for reclamation beside the ADM Jetty (Figure 6.8). This landscape bears witness to the significant level of modern development; the shoreline is covered in rock armour except to the west along Ballintaggart, outside the Port of Cork property. In this location, which extends into Monkstown Creek, a wooded landscape extends to the High Water Mark, and a gently sloping shingle shore over sand extends seawards (Figure 6.11).

Within the Port of Cork area, soft sand and silt extends from the toe of the rock armour. A few patches of hard shingle are deposited close inshore on the north side of the ADM Jetty, but elsewhere the surface is featureless sand. The breakwater to the north is surfaced with rock armour.

Metal-detection noted a series of small anomalies that were revealed as modern debris. No material of archaeological significance was observed.

[6.5.3] Underwater Assessment

Underwater inspection was completed in 2014 at four locations (Figures 6.8, 6.14). A c. 500m long area extending up to 50m wide was inspected along the shore of Ringaskiddy East; this includes the Ramp area that was subject to seismic survey in 2005. The seabed area within the No. 2 dolphin ramps was also dived, on the south side of the port, where it is proposed to improve the road network within the port. The third area that was dived is where the Deepwater

Berth in Ringaskiddy West is to be extended towards the ADM Jetty. In all three areas, the dives commenced in shallow water (-0.4m CD depth) (Figure 6.9). At both Ringaskiddy East and Ringaskiddy West the dive progressed downslope to the current dredge depths of -11m/-12m CD; at the No.2 dolphin ramps, dive depth reached -7m CD. The fourth area dived was at Paddy's Point, where it is proposed to construct a new Public Slipway and amenity area. The assessment undertaken at this location encompassed both the intertidal and sub-tidal environments (Figure 6.14).

The archaeological diver was towed in a systematic manner to-and-fro across each area to ensure that the same area of seabed was inspected from different angles. He was equipped with an underwater camera and a metal detector to assist in the recording of observations.

The dive area along Ringaskiddy East extended within the perch buoys that define the edge of the dredged channel. The shore is defined by rock armour (Figure 6.12). The seabed is composed of clean sand that slopes gently from a depth of c. 2m at the toe of the rock armour to some 10-11m at the edge of the dredged channel, where the seabed then slopes significantly into the dredged area. Apart from numerous observations of crabs, there were only two objects of debris noted; a modern coffee cup, and a tyre. No material of archaeological significance was observed.

The dive area within the No. 2 ramp dolphins represents a quiet area of the modern port close inshore. Rock armour lines the shoreline, while the dolphin ramps are made from large concrete piles. The seabed is rocky inshore (Figure 6.13). Such rock is not associated with the rock armour but extends outwards from the shoreline and is considered to represent the natural shore. Kelp and seaweed fronds represent a light vegetation cover. The rocky sub-tidal shore quickly gives way to sand, which occupies the remaining area out to the dolphin ramps. The sand lies quite high in the seabed but slopes significantly at the piles, where large hollows are a feature around the piles, representing scour pockets. No material of archaeological significance was observed.

The third dive area occurred in a narrow stretch from the north end of the DWB to the ADM Jetty (Figure 6.13). At Low-Water-Springs much of this area appears to dry out, but on the day of inspection it was sub-tidal. Rock armour lines the shoreline with a series of very large boulders forming the rock armour toe. Sand extends from the toe seaward, where it slopes gently until a point that is in line with the outer extent of the deepwater quay to the south. At this point, the seabed shelves steeply. No material of archaeological significance was observed.

The fourth dive area, located at Paddy's Point, extended across the intertidal foreshore for a distance of 40m (at Low Water) and 50m of sub-tidal seabed (Figure 6.14). To the east of the survey area, the upper foreshore comprises of sections of exposed, shelving, bedrock. To the west, the upper foreshore comprises of rock amour, placed as part of modern reclamation works. The intertidal foreshore comprises silty-clay with frequent mussels (live) and crushed-shell inclusions. A linear feature, comprising a series of car tyres that run northeast-southwest along the foreshore and immediately to the west of the proposed public slipway, form a crab-trap that appears to be operated by the local angling club (a trap that has been maintained since the 1906s, according to local information). The sub-tidal zone is composed of a flat-featureless deposit of silty-clay with a penetration depth of over 1m. No material of archaeological significance was observed. The proposed alignment of the new slipway has since been shifted slightly and includes a small area of seabed that was not inspected. Subject to the granting of permission for the scheme, this area of seabed will be inspected prior to construction.

The intertidal and dive work did not observe any of the features relating to the former seashore recorded on the nineteenth century Ordnance Survey First Edition maps. The work observed a seabed characterised by sand and silt which would provide a good holding content for buried material if it exists. No features or objects of archaeological significance were observed lying on the seabed surface or protruding from it. It remains possible that archaeological material lies buried in the covering sediments.

[6.6] Underwater Archaeological Assessment (UAIA) 2024

[6.6.1.1] Study area

The study area for the 2024 Underwater Archaeological Impact Assessment by Mizen Archaeology includes the two dredge pockets of berth and basin previously permitted for Ringaskiddy Basin, bordering the northwest and southeast of the entrance, as well as the proposed licenced disposal site located 4.5km South of Power Head at the mouth of Cork Harbour.

[6.6.1.2] Data Sources

The following sources were consulted as part of the desktop study:

- The Record of Monuments and Places (RMP) compiled by the Archaeological Survey of Ireland, which comprises lists, classifications of monuments and maps of all recorded monuments with known locations and zones of archaeological significance. The monument records are accessible online from the National Monuments Scect6ion (NMS) of the Department of Housing, Local Government and Heritage at www.archaeology.ie. These were used to establish the wider archaeological context of the site.

- Ordnance Survey Ireland (OSI) and contemporary maps were examined to measure the changing landscape

- The Excavations Bulletin online database (www.excavations.ie) which contains summaries of all archaeological excavations in Ireland was consulted to review archaeological investigations done previously in the area.

- Cartography several historic maps and charts were examined

- Aerial photography: A variety of low and high-altitude aerial photography was examined

- Documentary sources: Several sources were examined

[6.6.1.3] Desktop review

6.6.1.3.1 Prehistoric Period

The earliest evidence of archaeological activity in Ireland dates to the Mesolithic period. Shell middens are often associated with this period, however several of the middens occurring within Cork Harbour have not returned such early dates. Over 300 Late Mesolithic lithics were recovered close to Roches Point at the mouth of the harbour. Other scatters were found at Gyleen, Fota Island, Inch and Power Head (Rynne 1993, 2; Monk 2005, 45; O'Brien 2012, 36).

The Neolithic Period is represented in Cork Harbour by Rostellan dolmen, a port tomb on the east side of the harbour. Today, the megalith is submerged underwater at high tide, suggesting that other Neolithic activity may be submerged. Artefactually, the Neolithic is represented in the broader study area by the discovery of at least six polished stone axes, including two from Ravenswood near Carrigaline, three from Mahon Peninsula and one from Ballinaspig More.

Evidence of Bronze Age activity in the harbour is best represented by numerous fulacht fiadh, thought to be used to heat water for cooking or other purposes. Artefactually, this period is visible in the wider area in the discovery of an early flat copper axe, along with amber beads, and an amber ball at Carrigaline West to name one example.

The Iron Age in Cork Harbour is exemplified by a set of three bronze horns, known as 'the Cork Horns' that were found in mud dredged from the River Lee in 1909 (O'Brien 2012, 233) and are characteristic of La Téne- style art. Other artefacts from this period include a horse-bit from Tracton Abbey near Carrigaline.

6.6.1.3.2 Early Medieval and High Medieval Period

The archaeology of the Early Medieval period in Cork Harbour is represented by over 80 ringforts, of which seven are recorded in the Ringaskiddy area, including three on the grounds of the Novartis manufacturing facility.

In the Medieval period, the cantred of Kerrycurrihy was first attested as the 'Cantred' of the Ostmen' or Viking in 1177 (MacCotter 2008, 155). It contained all the lands extending south of the north channel of the River Lee on the west side of Cork Harbour and extended as far south as Minane/Ringabella Bay and included Kilpatrick and Tracton. Castle Warren (CO087-052) constructed by the De Cogan family- reputedly by Richard de Cogan, Lord of the manor in 1536- is situated c. 600m to the south of Ringaskiddy. De Cogans occupied the site until 1642 when the garrison surrendered to Lord Inchiquin after a 'piece of ordnance' was discharged at the castle (Coleman 1915, 4-7; O Murchadha 1985, 81).

6.6.1.3.3 Late-Medieval and Post-Medieval Periods (1700 AD- 1800s AD)

The remains of Barnahely Castle, to the southwest of the port, provide evidence from the 16th century for castle-building in the area. However, its foundations may have dated back to the High Medieval period when the Anglo-Norman Lord Milo de Cogan may have built the original fortification on the site. The name of the peninsula the castle stands on- located between Ringaskiddy and Lough Beg- possibly refers to such an earlier fort, being called 'Longa-Gowgan' or 'Ships of Cogan'. De Cogan came to the area in the 1100s and is reputedly buried in the nearby Barnahely graveyard (Healy 1988, 103-4). A member of the De Cogan family was still in residence in the 16th century at the castle, but during the fall of the Gaelic Order later that century, De Cogan is said to have fled to Spain. It is thereafter recorded that a merchant family called Terry were in residence. Later, in 1796, ownership passed to the Warren family, who incorporated their own substantial, sub-rectangular mansion into the remains of the castle (ibid.). It has since taken on the name Warren Castle, with the remains of the mansion now the most prominent. Lewis (1837) noted that the grounds of the castle were well-planted.

The Post-Medieval period saw the French Revolutionary wars (1793-1802) and the Napoleonic Wars (1803- 1815), which provided the impetus for an extensive number of defensive works to protect Cork Harbour and the newly created naval dockyard on Haulbowline Island. In the same period, a small fort was constructed on Spike Island, the inner core of Fort Carlisle was built, Rams Head (later Camden) Fort was remodelled, and five Martello towers were built (Stevenson 1998). The largest of these towers was constructed between 1813 and 1815 on

the highest point of Ringaskiddy promontory, overlooking Cork Harbour. It is a circular tower, enclosed by a dry fosse within a circular enclosure marked by ordnance stones.

The name 'Martello' derives from Mortella Point in Corsica where, during the war with France in 1794, the British naval ships HMS Juno and HMS Fortitude were driven back by bombardment from a round tower at the entrance to the harbour there. The effectiveness of the design was noted and the British subsequently began building similar towers around the coast of Ireland from about 1803 (Pochin Mould 1991, 223).

6.6.1.3.4 Maritime and Underwater Cultural Heritage

The earliest archaeological evidence of human habitation in Ireland dates to around c. 7000 BC. As there is little evidence of a land bridge at the time, it is most likely that the early Mesolithic colonists of the island reached it by travelling over water. However, aside from their very presence on the island, there is no evidence for continued use of long-range seaworthy vessels at the time. The Neolithic (c. 4000-2500 BC), similarly has archaeological evidence which implies the use of seaworthy vessels to introduce cattle and ship to Ireland. Distributions of stone axes across Ireland and Britain also indicate trade links across the Irish Sea. Archaeological evidence for maritime activity during this period is limited to logboats, which have generally been found in sheltered waters. The discovery of a logboat 1km offshore from Gormanstown, Co. Meath during pipeline construction indicates that these vessels were not limited to inland waterways (Breen and Forsythe 2004, 33). The Bronze Age (c. 2400-600 BC) saw an increase in trade links, with tin imported from Cornwall or Iberia and bronze items exported in return. The Iron Age (c. 600- AD 400) saw the continuation and expansion of trade. Documentary evidence indicates the use of skin-covered boats in Ireland and England at the time. Tacitus, writing in the early 2nd century AD, noted that, "the interior parts [of Ireland] are little known, but through commercial intercourse and merchants there is better knowledge of the harbour and approaches" (ibid., 39). Even as early as the late 4th century, the dangers of the Irish coast were known to foreigners. In Argonautica, Orpheus states, "the ship Argo fears passing Ierne…but sails pass safely" (ibid.). This is supported by the archaeological record, as a fragment of a Roman olla- a storage jar- was brought up by a trawler 150 miles off the west coast, in 274m of water, in 1934 (ibid.). The fragment is believed to date no later than the 2nd century AD.

In the early Medieval Period (c. 400-1169 AD), the Lives of Saints texts make several references to maritime activities. It is clear that deep sea fishing took place at the time, with bones of deep- water species, such as cod and wrasse, found during excavations at Church Island and Illuanloughan, Co. Kerry (ibid., 46). The Vikings began raiding Ireland as early as AD 795 and were establishing permanent bases in Ireland by the mid-9th century AD. Some of these bases- such as Dublin, Waterford, Wexford, Cork and Limerick- developed into trading towns by the early 10th century, with the Vikings integrating with the local population.

The High Medieval period (c. AD 1169-1400) began in Ireland with the arrival of the Anglo-Normans. Confined mostly to the east, their urban centres became successful ports with important links across to England. Merchants from France, Iberia, and Italy traded wine, salt and luxury goods for hides, wool, fish, flax, and furs in Irish ports (ibid., 71). Trade networks expanded in the 12th century, leading to the formation of trading confederations in the 13th century, which in turn further increased merchant shipping in northern Europe. During this period, English shipping around Ireland was continually under attack. The King responded to this threat in 1222 by commanding the ports of Ireland to build galleys for the defence of the King's realm in Ireland (ibid., 77). Archaeological remains of the period include a possible medieval ship's timber trawled from Dublin Bay in the late 1980s and a large timber retrieved from the Suir estuary, near Waterford (ibid., 81).

The Late Medieval period (c. AD 1400-1600) was a time of varied fortune for Irish ports. The arrival of huge herring shoals off the south-west and west coast was a hugely important economic event for coastal communities. In 1588, as many as 26 vessels from the ill-fated Spanish Armada were lost along the north and west Irish coasts.

In the Post Medieval period (c. 1600-1750), Ireland's economic development was largely dictated by England, with cattle, butter, and wool becoming the most prominent exports. The 17th century saw an increase in maritime activity in Irish waters, including intensification of the fishing industry, ships stopping over along transatlantic voyages, and growth in local and international trade (Brady et al. 2012, 21). Large trading companies, such as the Dutch East India Trading Company (VOC), developed in order to facilitate international trade. A number of ships belonging to such companies were wrecked on the Irish coast. Around this time, a number of slave ships, belonging to companies such as the Royal African Company or the South Sea Company, utilised the Channel and Irish ports. Evidence of their presence along the coast is recorded where the slave trader Amity was lost in 1700 in Dunworley, Co. Cork (ibid., 22). However, less than 2% of the wrecks listed on the Shipwreck Inventory of Ireland date to this period, reflecting more on the paucity of records than the actual number of wrecking events (ibid., 21).

Irish waters were frequented by French, Spanish, Dutch, American and English privateers in the late 18th century. These were state-sanctioned vessels, allowed to keep the greater part of their spoils, while giving the state one-tenth of them (Breen and Forsythe 2004, 118). American privateer activity increased after that nation declared independence in 1776, although the intensity lasted for a relatively short time. The British responded to these attacks with naval actions and employment of their own privateers.

After attacks in the 1790s and the Napoleonic Wars in the early 19th century, Ireland's strategic position in the North Atlantic was recognised. Control of its ports, harbour and naval bases became of greater importance to the English authorities (Brady et al. 2012, 21). The end of the Napoleonic Wars also saw a spike in smuggling activity along the Irish coast, which the English sought to suppress (Breen and Forsythe 2004, 125).

Systematic recording of ship losses began in the mid-18th century, providing comprehensive records from around the Irish coast from this point onwards (Brady et al. 2012, 21).

The 19th century saw developments in steam navigation, which was closely linked with the large-scale emigration sparked by the Great Famine (1845-1852). This emigration led to the development of a system of routes across the Irish Sea and, when considered along with trade and naval patrols, made the Irish Sea one of the busiest waterways in the world (Pearsall 1990, 845; Brady et al. 2012, 23). As a direct result of the increase in maritime activity, the 19th century holds the highest number of wrecks recorded for any period in Irish history, with an estimation of up to 60% of all wrecks in Irish waters dating the 19th century (Brady et al. 2012, 23). In the mid-19th century, an average of one wreck was reported every three days (ibid.), a figure which remained relatively constant up to the outbreak of World War I.

During World War I, the Imperial German Navy focused submarine activity in the waters to the north and south of Ireland, in an attempt to hinder Britain's international trade (ibid., 44). An estimated 1,800 shipwrecks around Ireland belong to this period.

Generally, the Cork coastline is a rural and rugged landscape that has served that has, over millennia, facilitated trade, shipping and settlement, as well as giving stage to shipwreck and tragedy. The intensity of maritime activity and traffic between Cork and Europe is reflected in the shipwreck record. Over 3000 wrecks are recorded in Cork coastal waters, of which only c. 600 have identified locations. The true number of vessels wrecked off of the Cork coast, and

lives lost on them, can only be estimated (WIID). These ships claim origins internationally, though the majority were coming or going from Europe. These vessels were utilising the North Atlantic for a variety of purposes and, as they stopped off in Cork, it became one of the primary North Atlantic havens, particularly in modern historic times (Kelleher 2018, 45).

Cork's connection with the sea and wider Atlantic has influenced its social, political and economic development through time (ibid.). The fortification of the harbour is protected it from threats, but also facilitated control of shipping, both militarily and commercially. The depth of the harbour has made it a focus of strategic importance, particular during the World Wars. For example, the fortification on Spike Island served as a bastioned military installation for the British Navy prior to 1938. It also functioned as a convict prison in the 1850s and again reverted to serving as a jail in the 1980s.

Located on the southwest side of Cork Harbour, Ringaskiddy forms part of the maritime landscape of the second deepest harbour in the world behind Sydney Harbour in Australia. As one of the numerous haves and inlets skirting the harbour, Ringaskiddy, under the auspices of Cork Port Authority, has expanded as a port facility in recent times. Ringaskiddy is also home to the National Maritime college, which provides both Naval and merchant training. The Irish Navy's main base of operations and naval dockyards are situated a short distance away, on the adjacent Haulbowline Island. Ringaskiddy, therefore, has been the focus of maritime activity spanning several centuries. Cork Harbour and Port have played host to all manner of maritime activity over time; both influenced and impacted by national and international events.

6.6.1.3.5 Cartographic Information

A survey carried out by Murdoch Mackenzie in 1775 charted the coast of Ireland, including the proposed disposal site and dredge sites (Figure 3). This survey shows a large house at 'Ballybrickan' and a small settlement at 'Grinaskedy'. It does not show any improvements along the foreshore. This map does not record any features within the proposed disposal site.

The OS 6-inch map (1841-2) (Figure 4) shows a landing place extending out from the foreshore adjacent to Ballybricken House. This landing place extends almost to the southwestern limit of the proposed southeast dredge pocket. The footprint of the proposed northwest dredge pocket does not contain any features. Much of the reclaimed land that now makes up Ringaskiddy Port was not yet in existence, and 'Ring Island' is clearly shown to the southeast, with causeways connecting it to the mainland.

The OS 25-inch map (1928-9) (Figure 5) also shows the landing place, though it appears to extend out further, reaching all the way to the proposed southeast dredge pocket, and it is annotated 'Ballybricken Hard'. An arm is shown jutting out from Ballybricken Point, close to the proposed northwest dredge pocket, though this arcs to the northwest, outside of the proposed works area. The only feature shown within the proposed northwest dredge pocket is a buoy, near the southeast corner. 'Ringaskiddy Island' is also shown, with a windmill visible on the western portion of it.

The disposal site is not depicted on the historic Ordnance Survey maps.

Figure 3 Extract from a 'The South Coast of Ireland from Cable Island to Gally Head' (Mackenzie, 1775).

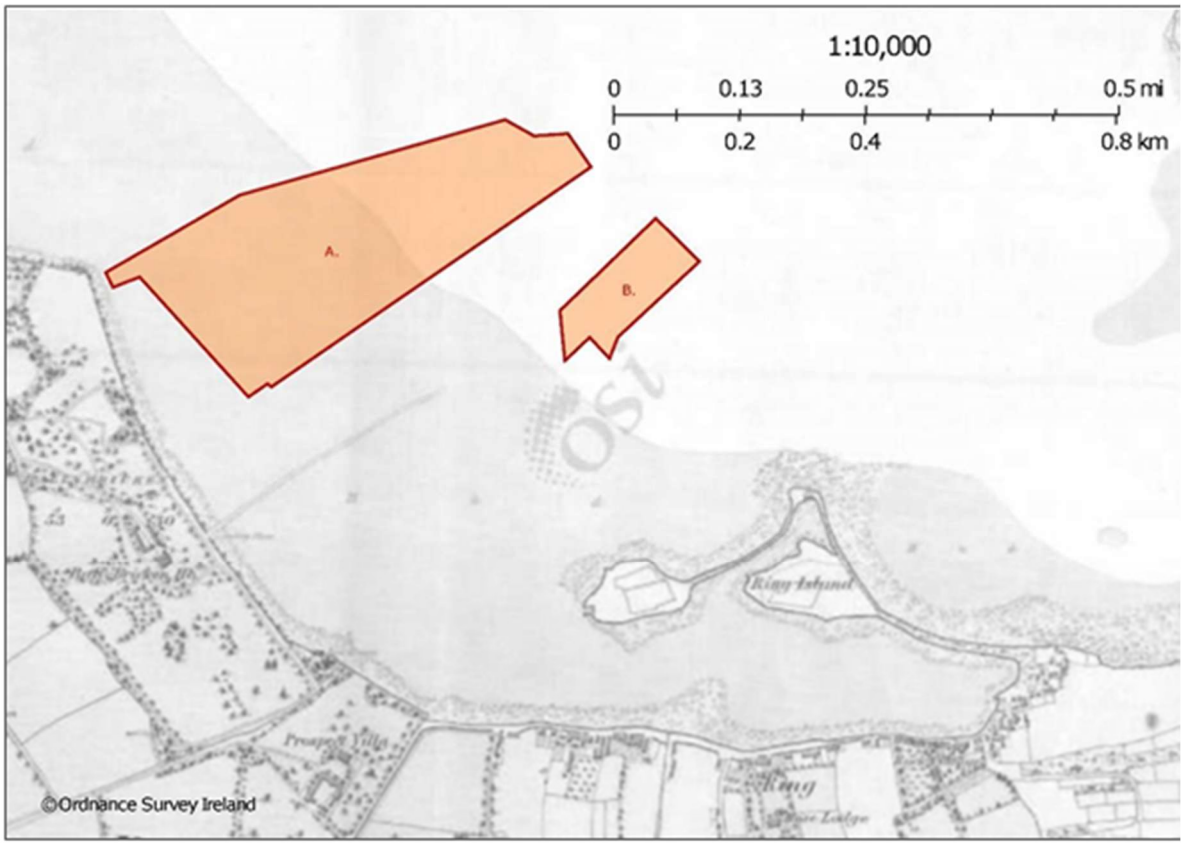


Figure 4 Extract from OS 6-inch map (1841-2), showing the proposed dredge locations.

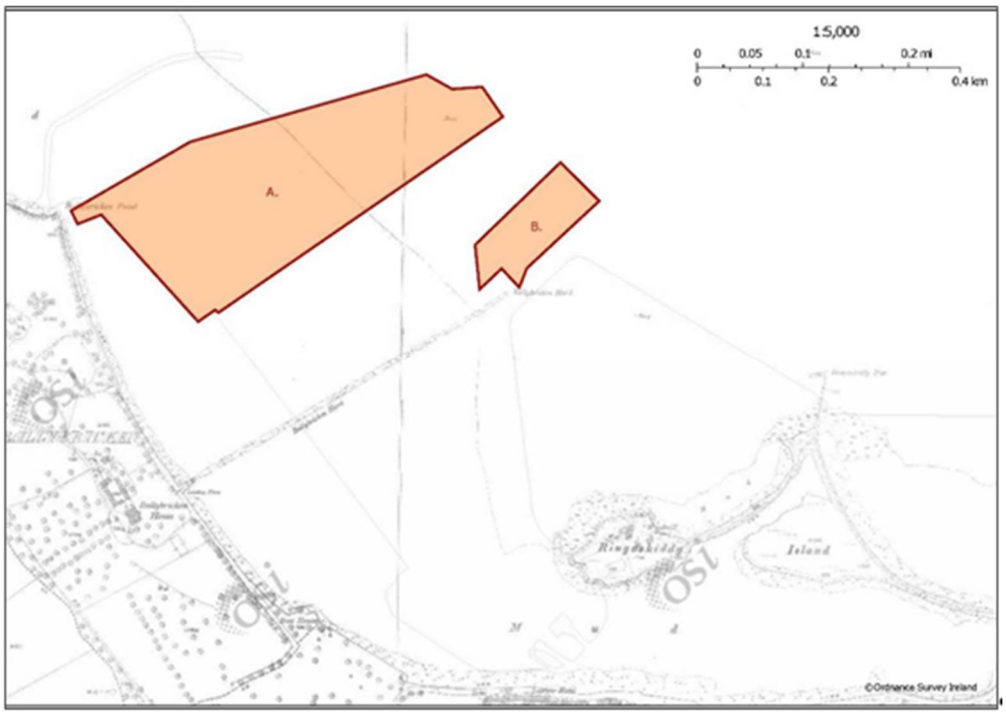


Figure 5 Extract from the 25-inch OS map (1928-9), showing the proposed dredge locations.

6.6.1.3.6 Recorded Monuments and known sites: RMPs and SMRs

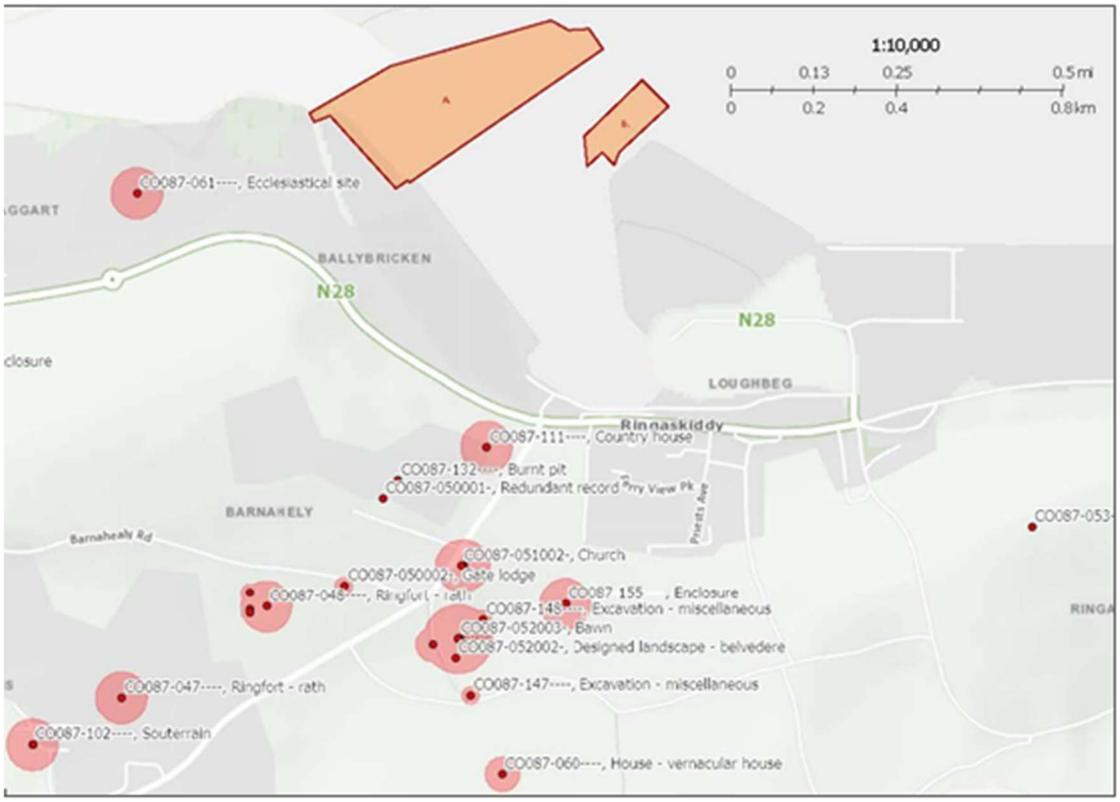


Figure 6 Locations of RMPs and SMRs surrounding proposed dredge pockets.

There are no SMR/RMP listings within the proposed dredge pockets. There are six listings within a 1km radius (Appendix 9.3). The closest of these was an ecclesiastical site, located c.

550m to the west of the proposed northwest dredge pocket, which was recorded to date back to c. 1100 AD, although it now lies in an industrial complex with no surface traces recorded.

There are no listings within the vicinity of the proposed disposal site.

6.6.1.3.7 Previous Archaeological Work

Five previous archaeological investigations (Appendix 9.1) have been recorded in Ringaskiddy Port and its immediate surrounds on the Excavations Bulletin. Of these, four specifically focused on the intertidal area or seabed, none of which identified archaeological material.

In advance of the Ringaskiddy Port Redevelopment, a cultural heritage assessment was carried out as a component of the Environmental Impact Statement. The assessment included a geophysical survey, conducted (2005-06), dive truthing of geophysical anomalies, intertidal survey, and dive surveys (12D016, 12R073). These surveys covered the entirety of the proposed dredge pockets, and did not identify any archaeological material.

A previously-identified anomaly is located c. 122m outside the northern edge of the disposal site (ITM E 588674m, N 554504m) (Figure 7).

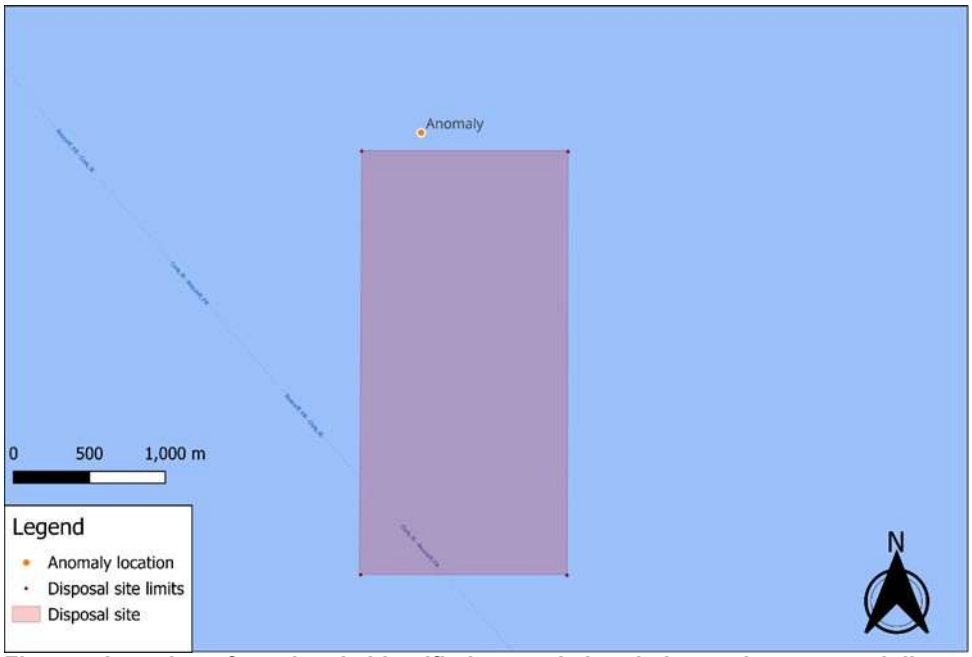


Figure 7 Location of previously identified anomaly in relation to the proposed disposal site.

Archaeological monitoring of dredging operations was undertaken during 2018 and 2019. The dredged material was exceptionally sterile, and overall there was very little debris noted. The material varied between silty clay, silty sand, and gravels. Two timbers were retrieved for close inspection, one during dredging works and the other during rock breaking activities.

6.6.1.3.8 Shipwrecks

56 ships are recorded as lost within or in proximity to Cork Harbour. No wreck is listed specific to 'Ringaskiddy' in the National Monuments Service's Wreck Inventory Database of Ireland (WIID). However, as many of the recorded losses are approximate, giving location details as general as 'Cork Harbour' or 'near Cork Harbour', it is not possible to say with certainty the no vessels were wrecked in Ringaskiddy or its immediate surrounds (Figure 8). What can be said is that the figures for ship loss are high, as a result of the intense maritime activity in the Lower

Harbour. Notably, many of the wrecks occurred in the Lower Harbour. Therefore, there is high potential for evidence of these losses, either as sites, residual wreck material or artefactual material, to be found in the deep waters of Cork Harbour.

Two unknown wrecks, W10714 and W10715, are located in reclaimed land of the port. No details are provided as to the probable date of either of these wrecks.

A full list is provided of the recorded wrecks for Cork Harbour below.

Two underwater obstructions fall within the northwest limit of the proposed disposal site (Table 1; Figure 9). Admiralty charts noted an 'obstruction' in the area, which was confirmed by the UK Hydrographic Office (UKHO) survey, and it appears that these two separate records refer to the same anomaly. The UKHO records it as an anomaly, measuring 35m long x 20m wide and rising 1.6m from the seabed. The record also states that it is a probable natural feature (Port of Cork 2015, Section 6.6.3). Multiple geophysical surveys have been carried out at the disposal site (Irish Hydrodata, 1999; INFOMAR 2008; and Irish Hydrodata 2013), which confirm the obstruction as a natural feature, possible a high-relief exposure of bedrock.

In addition, the Santo (SS) is located c. 350m northwest of the disposal site. The Santo (SS) was a 205-ton steel steam dredger from Glasgow, which encountered bad gales and foundered on the 26th December 1900. Of the 17 crew onboard, 12 were lost, and the dredger itself was a total loss (WreckViewer).

Name	Number	Type	Place of loss	Date of loss	Coordinates
Unknown	W11313	Unknown	Passage West, Co Cork/ Cobh, near	Unknown	51.84333 -8.32944
Unknown	W10715	Unknown	Ringaskiddy Terminal	Unknown	51.83250 -8.32028
Unknown	W10714	Unknown	Ringaskiddy	Unknown	51.83083 -8.32695
Alison (SS)/ Allison	W05372	Steamship	Cork, Haulbowline	22/10/1928	51.84333 -8.30167
Trident	W13086	Unknown	Cork Harbour	04/02/1804	
Unknown	W13439	Unknown	Cork Harbour	17/01/1825	
Joseph	W13626	Unknown	Cork Harbour	15/02/1838	
Alert	W13634	Unknown	Cork Harbour	16/02/1838	
Unknown	W13971	Unknown	Cork Harbour	05/12/1830	
Eglinton	W14001	Unknown	Cork Harbour	10/02/1840	
Clio	W14126	Unknown	Cork Harbour	20/03/1844	
Welcome Return	W14138	Unknown	Cork Harbour	16/09/1844	

Favourite	W14237	Unknown	Cork Harbour	26/12/1844	
Clifton	W14252	Unknown	Cork Harbour	24/03/1845	
Unknown	W14333	Schooner	Cork Harbour	03/10/1846	
Mary Elliot	W14367	Schooner	Cork Harbour	19/11/1846	
Eneas	W14369	Schooner	Cork Harbour	19/11/1846	
Unknown	W14401	Motor Boat	Cork Harbour	19/11/1934	

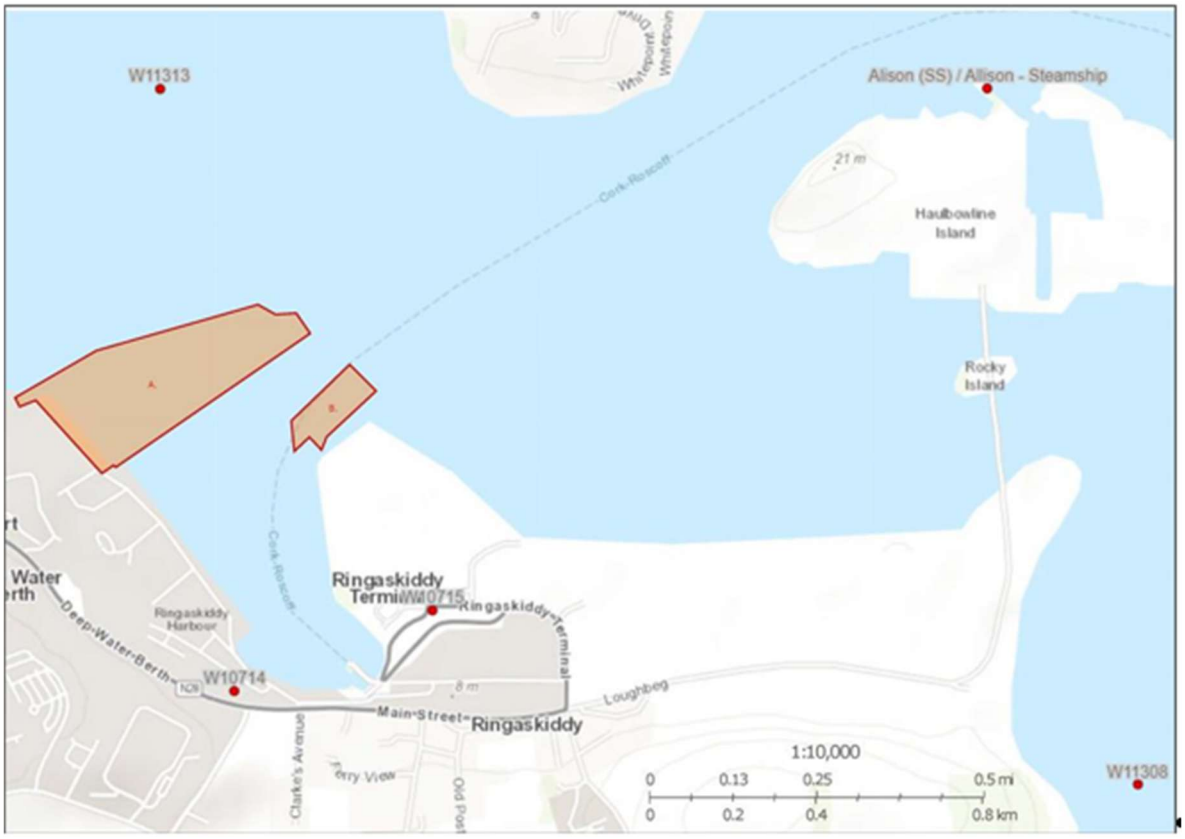


Figure 8 Recorded wreck sites (red) in the vicinity of the proposed dredge areas (orange).

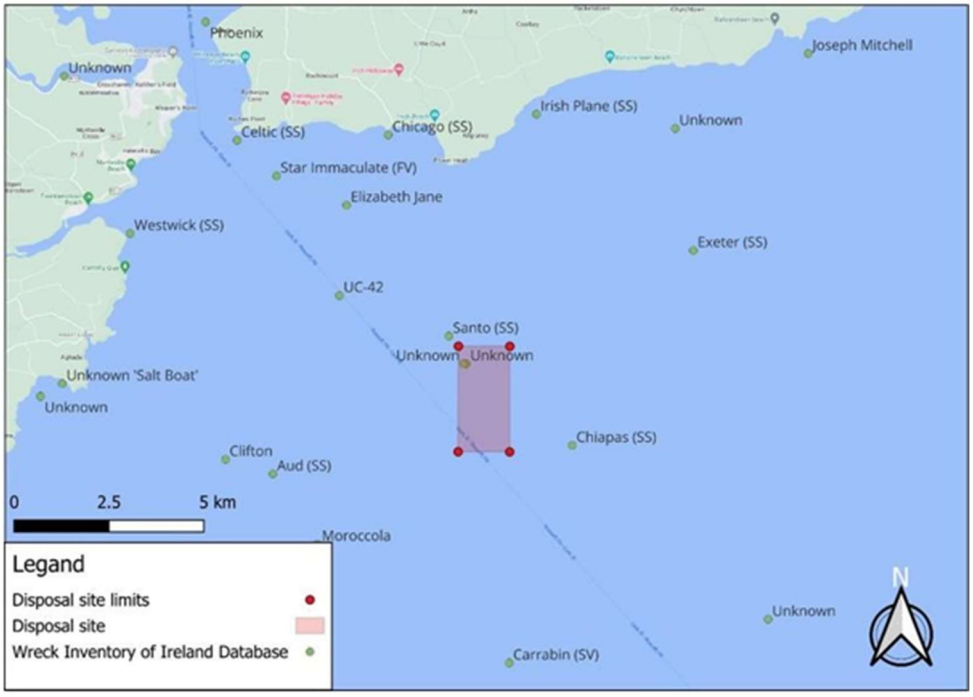


Figure 9 Recorded wreck sites (green) within and surrounding the disposal site (red).

Table 1 Locations of unknown wrecks within the northwest corner of the disposal site.

Wreck No.	Wreck Name	Location (ITM)
W09127	Unknown	E 588488m, N 553919m
W10422	Unknown	E 588422m, N 553923m

[6.7] Study Conclusion

While there are no recorded wrecking events within the proposed dredge pockets at Ringaskiddy, the silts of the seabed have to the potential to preserve unrecorded archaeological material. The intensity of maritime activity in and around Cork Harbour throughout history also increases the likelihood of a wrecking event having occurred within the dredge pockets. Although much of the Ringaskiddy area has been subject to previous dredging, the proposed dredge pockets are within virgin ground, where there is a higher potential for encountering archaeological material.

However, the entirety of the proposed dredge pockets have been subject to previous archaeological survey- whether geophysical, intertidal, dive, or a combination of these. No archaeological material has been identified within the proposed dredge pockets by these surveys.

The historic disposal site has been subject to repeated investigations since the late 1990s.Geophysical surveys have indicated that, despite the significant amounts of material dumped on the site, it has been largely unchanged. Notably, two records on the WreckViewer are located in the northwest corner of the disposal site, though repeated geophysical survey has indicated that these anomalies are likely natural in origin. Another geophysical anomaly has been identified just over 100m outside the northern boundary of the site.

[6.8] Potential Impacts

[6.8.1] The ‘do nothing’ scenario

No potential impacts are identified in the ‘do nothing’ scenario.

[6.8.2] Construction Phase

The three principal elements of the proposed works include construction in Ringaskiddy East quay wall extension, Ringaskiddy West construction and dredging,.. In all cases, the greatest impact will arise from dredging works. The fact that the landward sides of the development areas are on land reclaimed in the twentieth century suggests it is unlikely that new work will encounter levels of archaeological interest, unless it is intended to excavate to below the depth of reclamation. Any works that extend to below the depth of reclamation would represent excavation into unrecorded levels and would require an archaeological resolution.

Dredging is proposed in Ringaskiddy East and will extend from the current level of c. -1.5m CD at the shoreline to a level of -13m CD, which is 1.25m below the general basin level of 11.75m. It is a significant direct permanent impact on the seabed and will require an archaeological resolution.

A new 182m long extension to the existing DWB is proposed which will comprise of a filled quay structure (of approximately 231m) extending no further seaward than the edge of the existing DWB, . The affected area measures approximately 0.8 ha in size.

Dredging is proposed in Ringaskiddy West. The dredging will extend the width of the 231m-long extension of the existing DWB, and will reach seawards along the length of the ADM Jetty. Dredging will extend from the current level of c. -0.4m CD at the shoreline to a level of -13.4m CD at the new berth, and to -11.75m CD on the approach to the berths, to facilitate navigational access to the new facilities. The dredging will be a significant direct permanent impact on the seabed and will require an archaeological resolution.

Any fill material used for reclamation will be imported from local land sources or suitable dredge material will be utilised.

While there are no recorded wrecking events within the dredge pockets and the only feature shown on the mapping within the boundaries is 'Ballybricken Hard', on the early 20th century OS map, there is still potential for any of the wrecking events generally recorded as being in 'Cork Harbour' to have occurred there. As such, there is a potential for archaeological material to survive within the subsea sediments of Cork Harbour. Potential negative impacts on virgin ground where the level is to be dredged lower than historic levels, remains low, as a range of previous archaeological survey has covered the entirety of the proposed dredge pockets.

[6.8.3] Operation Phase

No potential impacts are identified at this moment during the operational phase as it is anticipated that the archaeological environment will have been resolved during the construction phase.

[6.9] Mitigation Measures

[6.9.1] Construction Phase

CH_01 Archaeological monitoring: It is recommended that archaeological monitoring by a suitably qualified and experienced maritime archaeologist licensed by the DAHG is conducted during all seabed, inter- tidal/foreshore and terrestrial disturbances associated with the development. Licence applications take a minimum of three weeks to process through the Department, and advance planning is required to ensure that the necessary permits are in place before site works commence.

CH_02 The monitoring will be undertaken in a safe working environment that will facilitate archaeological observation and the retrieval of objects that may be observed in the course of the works that require consideration.

CH_03 The monitoring will include a finds retrieval strategy that is in compliance with the requirements of the National Museum of Ireland.

CH_04 Retaining an archaeologist/s: An archaeologist experienced in maritime archaeology will be retained for the duration of the relevant works.

CH_05 The time scale for the construction phase will be made available to the archaeologist, with information on where and when ground disturbances will take place.

CH_06 Discovery of archaeological material: In the event of archaeologically significant features or material being uncovered during the construction phase, machine work will cease in the immediate area to allow the archaeologist/s to inspect any such material. The DAHG and the NMI will be notified of such discovery, in accordance with archaeological license requirements.

CH_07 Archaeological material: Once the presence of archaeologically significant material is established, full archaeological recording of such material will be recommended. If it is not possible for the construction works to avoid the material, full excavation will be recommended. The extent and duration of excavation will be a matter for discussion between the Port of Cork and the licensing authorities.

CH_08 Archaeological team: The core of a suitable archaeological team will be on standby to deal with any such rescue excavation. This would be complimented in the event of a full excavation.

CH_09 Archaeological dive team: An archaeological dive team will be retained on standby for the duration of any in-water disturbance works on the basis of a twenty-four or forty-eight hour call-out response schedule, to deal with any archaeologically significant/potential material that is identified in the course of the ground disturbance activities. The permits necessary for this aspect of the site work is additional to the excavation licence required by the archaeological monitor, and are generally held by the dive-team leader. The archaeological dive licence takes a minimum of three weeks to process. It is necessary to ensure that all permits are in place before site works commence.

CH_10 A site office and facilities will be provided by the Port of Cork on site for use by archaeologists.

CH_11 Secure wet storage facilities will be provided on site by the Port of Cork to facilitate the temporary storage of artefacts that may be recorded during the course of the site work.

CH_12 Buoying/fencing of any such areas of discovery will be carried out if discovered and during excavation.

CH_13 Machinery traffic during construction will be restricted to avoid any identified archaeological site/s and their environs.

CH_14 All Mitigation Measures in relation to archaeology and cultural heritage as set out in Section 7 of the submitted Underwater Archaeological Impact Assessment by Mizen Archaeology (2024) shall be implemented in full, except and may otherwise be required in order to comply with the conditions of the DaS permit.

CH_15 The Construction Environmental Management Plan (CEMP) shall include the location of any and all archaeological or cultural heritage constraints relevant to the proposed development as set out in the EIAR and UAIA and by any subsequent archaeological investigations associated with the project. The CEMP shall clearly describe all identified likely archaeological impacts, both direct and indirect, and all mitigation measures to be employed to protect the archaeological or cultural heritage environment during all phases of site preparation and construction activity.

CH-16 The Department of Housing, Local Government and Heritage shall be furnished with a final archaeological report describing the results of all archaeological monitoring and any archaeological investigative work/excavation required, following the completion of all archaeological work on site and any necessary post excavation specialist analysis. All resulting and associated archaeological costs shall be borne by the developer.

[6.9.2] Operation Phase

The above specific mitigation measures relevant to cultural heritage are deemed necessary for the operational phase of the development during maintenance dredging works i(if any). UAU compliance requirements are built into maintenance DaS permit S0013-03.

[6.10] Monitoring

[6.10.1] Construction Phase

CH_17 It is recommended that archaeological monitoring by a suitably qualified and experienced maritime archaeologist licensed by the DAHG is conducted during all seabed, inter- tidal/foreshore and terrestrial disturbances associated with the development. Licence applications take a minimum of three weeks to process through the Department, and advance planning is required to ensure that the necessary permits are in place before site works commence.

The monitoring will be undertaken in a safe working environment that will facilitate archaeological observation and the retrieval of objects that may be observed in the course of the works that require consideration.

[6.10.2] Operation Phase

No specific monitoring is required for the operation phase of the development.

[6.11]Residual Effects

[6.11.1] Construction Phase

It is not anticipated that here will be any residual impacts on archaeological features or sites encountered as it is understood that any archaeology encountered will be resolved in the construction stage of the proposed redevelopment.

[6.11.2] Operation Phase

It is not anticipated that any archaeological measures should be necessary during the operational phase as it is understood that any archaeology encountered will be resolved in the construction stage of the proposed redevelopment.

[6.12] Potential Interactions & Cumulative Impacts

A range of historic projects, comprising the Spike Island Masterplan, Monkstown Marina, and the East Tip Remediation Project on Haulbowline Island, have been taken into consideration as part of the cumulative assessment. When these projects have been considered as part of this assessment from a cultural heritage perspective, no significant cumulative effects are predicted.

[6.13] Summary

The cultural heritage assessment completed has been extensive and comprehensive, employing a wide range of resources and non-intrusive survey to make a coherent assessment of the cultural heritage risk associated with the present project. There are no upstanding remains of archaeological or architectural significance within the proposed development area. The locations remain areas of cultural heritage potential but there is no cultural heritage reason why the development should not proceed. The development will include direct impacts on the land surfaces and seabed areas, and archaeological monitoring is recommended as the most effective mitigation strategy to resolve further cultural heritage issues that may arise during construction and dredging works.

While there are no recorded wrecking events within the dredge pockets and the only feature shown on the mapping within the boundaries is 'Ballybricken Hard', on the early 20th century OS map, there is still potential for any of the wrecking events generally recorded as being in 'Cork Harbour' to have occurred there. As such, there is a potential for archaeological material to survive within the subsea sediments of Cork Harbour. Potential negative impacts on virgin ground where the level is to be dredged lower than historic levels, remains low, as a range of previous archaeological survey has covered the entirety of the proposed dredge pockets.

It is recommended that archaeological monitoring by a suitably qualified and experienced maritime archaeologist licensed by the DAHG is conducted during all seabed, inter-tidal/foreshore and terrestrial disturbances associated with the development. Licence applications take a minimum of three weeks to process through the Department, and advance planning is required to ensure that the necessary permits are in place before site works commence. It is noted that this is a requirement of the Foreshore Lease for the Phase 1b and Phase 2 quay structures contains provision for archaeological monitoring. This lease is valid until 2052.

The monitoring will be undertaken in a safe working environment that will facilitate archaeological observation and the retrieval of objects that may be observed in the course of the works that require consideration.

[7] Landscape & Visual

[7.1] Introduction

Chapter 7 of this EIAR examines the potential landscape and visual impacts of the proposed redevelopment works at Ringaskiddy, Co. Cork, on the surrounding areas. The landscape and visual impact assessment examines and evaluates the implications of the proposed redevelopment works in terms of landscape character and visual alterations arising from the development. The assessment also describes outline proposals to mitigate and attempt to achieve a long-term integration of the proposed redevelopment with its landscape setting.

[7.2] Assessment Methodology

The procedure used for the landscape and visual assessment entailed:

- A desk top study of the site in relation to its overall context both locally and regionally.
- Visiting the site and its environs to assess the following:
    - Quality and type of views of the area
    - The character and quality of the site area and the surrounding landscape

[7.2.1] Study Area

[7.2.2] Legislation & Guidance

The structure for assessing the landscape impact of the proposed development is based upon the following guidelines:

- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, May, 2022)
- Guidelines for Landscape and Visual Impact Assessment (Landscape Institute & I.E.M.A., UK 2013)

The criteria for describing the significance, quality and duration of the effects of the proposed development are outlined in Table 7.1 below:

Table 7.1: Landscape – Visual Assessment Criteria (as per Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA – May, 2022)

Significance of Effects	Criteria
Imperceptible	An effect capable of measurement but without significant consequences.
Not significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.

Slight Effects	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate Effects	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effects	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound Effects	An effect which obliterates sensitive characteristics

Quality of Effects	Criteria
Positive Effects	A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
Neutral Effects	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative/adverse Effects	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).

Duration and Frequency of Effects	Criteria
Momentary Effects	Effects lasting from seconds to minutes
Brief Effects	Effects lasting less than a day
Temporary Effects	Effects lasting less than a year
Short-term Effects	Effects lasting one to seven years.
Medium-term Effects	Effects lasting seven to fifteen years.
Long-term Effects	Effects lasting fifteen to sixty years.
Permanent Effects	Effects lasting over sixty years
Reversible Effects	Effects that can be undone, for example through remediation or restoration

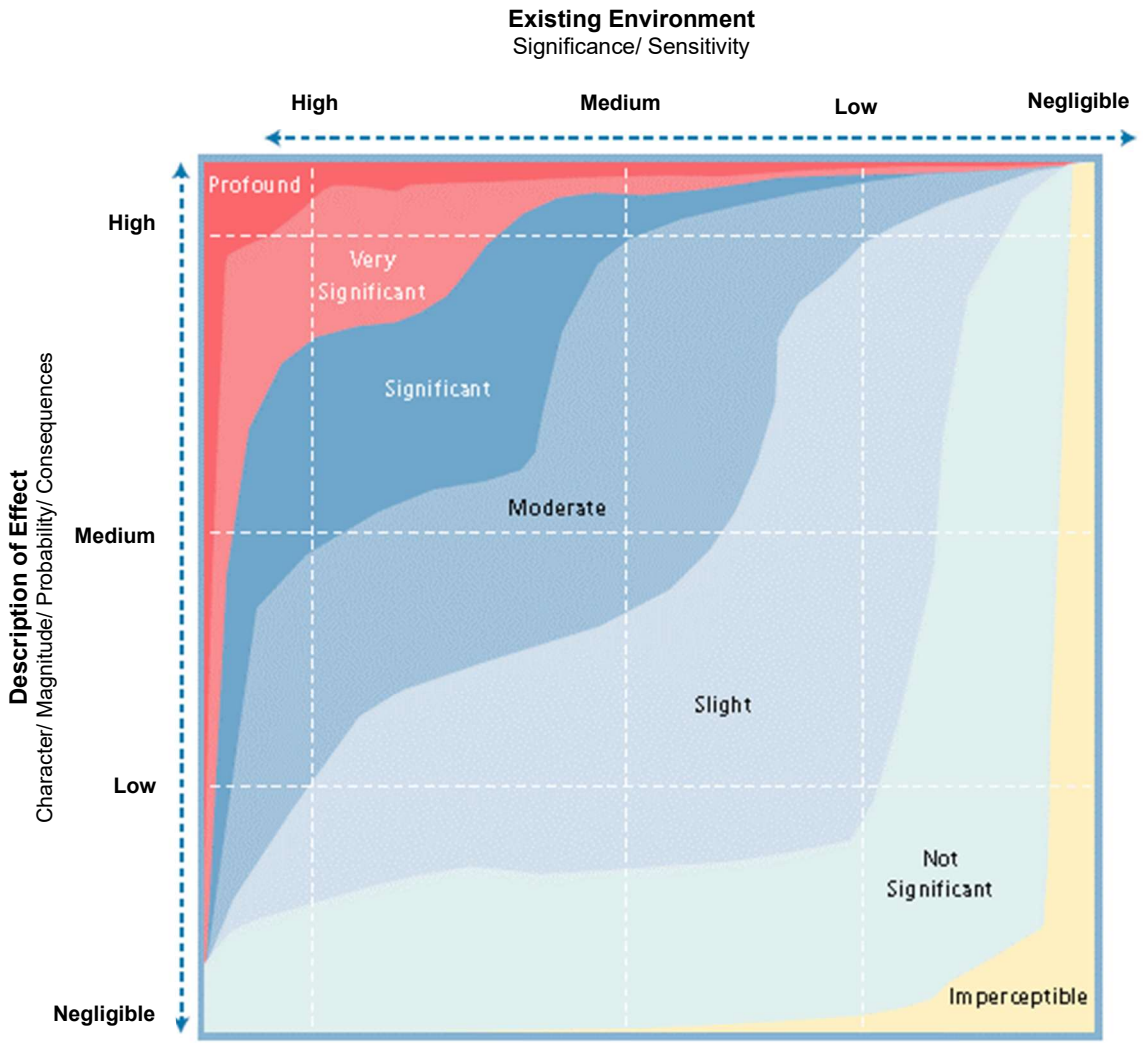


Figure 7.1: Figure . Chart Showing Typical Classifications of the Significance of Effects (Guidelines on the information to be contained in Environmental Impact Assessment Reports, EPA, May, 2022)

Photomontages:

A series of photomontages were prepared by Chris Shackleton Consulting to represent, as accurately as possible, the physical and visual characteristics of the proposed development from a variety of distances and directions around the site. Priority was given to views from the public domain, such as main roads and to views from potentially sensitive locations such as from scenic routes. The location of all views are shown on Figure 7.3. For each of the visuals, an existing and a proposed view is presented and where the proposed development is not visible in the view the elements of the development will be shown as a red outline.

[7.3] Baseline Environment

[7.3.1] Character & Context

The subject site within which the redevelopment works are proposed is located within the Port of Cork in the village of Ringaskiddy, which is located approximately 16km south-east of Cork City. The Port of Cork Ringaskiddy is a ferry and shipping port of national significance within Cork Harbour. The N28 road links Ringaskiddy to Carrigaline and Cork City where it connects with the N40, N25 and the M8 which links this area to the rest of the region. The Port of Cork Ringaskiddy contains a jetty, silos, warehouses, ferry terminal building, the port's maintenance and office building, quay, deep water berths, cranes, gantries, container storage area and the recreational area at Paddy's Point. While Ringaskiddy village contains a small residential area in Barnahely, the predominant land uses in this area are industrial, pharmaceutical, marine related and business. Some of the complexes in this area include: Pfizer, Janssen Bio, DePuy, Johnson & Johnson Loughbeg, Thermo Fisher Scientific and Ringport Business Park. The National Maritime College is also located on Cork Harbour between the subject site and Paddy's Point. Rocky Island (crematorium), Haulbowline Island (naval base and public park) and Spike Island (museum and heritage centre) are also located to the east of Ringaskiddy. Cobh and Monkstown are located across Cork Harbour to the north and west respectively.

Figure 7.2: Subject Site & regional context (TBS, 2024)

Figure 7.3: Subject site & Local Context (TBS, 2024)

[7.3.2] Planning Policy Context

The main texts that were referred to in the compilation of this report were:

- Cork County Development Plan (CCDP) 2022-2028
- Cork County Draft Landscape Strategy 2007

The subject site is located in an area zoned as 'Industry' and the CCDP 2022-2028 contains the following objective in relation to this land use zoning:

"Objective ZU 18-16: Industrial Areas
Promote the development of industrial areas as the primary location for uses that include heavy industry, manufacturing, repairs, medium to large scale warehousing and distribution, biomedical, pharmaceutical, bioenergy plants, open storage, waste materials treatment, port related facilities and port related activities and recovery and transport operating centres. The development of inappropriate uses, such as office based industry and retailing will not normally be encouraged. Subject to local considerations, civic amenity sites and waste transfer stations may be suitable on industrial sites with warehousing and/or distribution uses.
The provision of strategic large scale waste treatment facilities including waste to energy recovery facilities will be considered in 'Industrial Areas' designated as Strategic Employment Locations in this Plan subject to the requirements of National Policy, future Regional Waste Management Plans and the objectives set out in this Plan.
Appropriate Uses in Industrial Areas

Medium to large scale warehousing and distribution, bioenergy plants, open storage, recovery and transport operating centres, strategic large scale waste treatment facilities including waste to energy recovery facilities, port facilities and port related activities, logistics, heavy industry, offices ancillary to permitted use, laboratories, food related industry, marine related development, general industry, civic amenity site, plant storage, sustainable energy installation, heavy vehicle park, fuel depot/fuel storage, telecommunication structures, biomedical, pharmaceutical, data centres, childcare facilities, commercial film studio facilities."

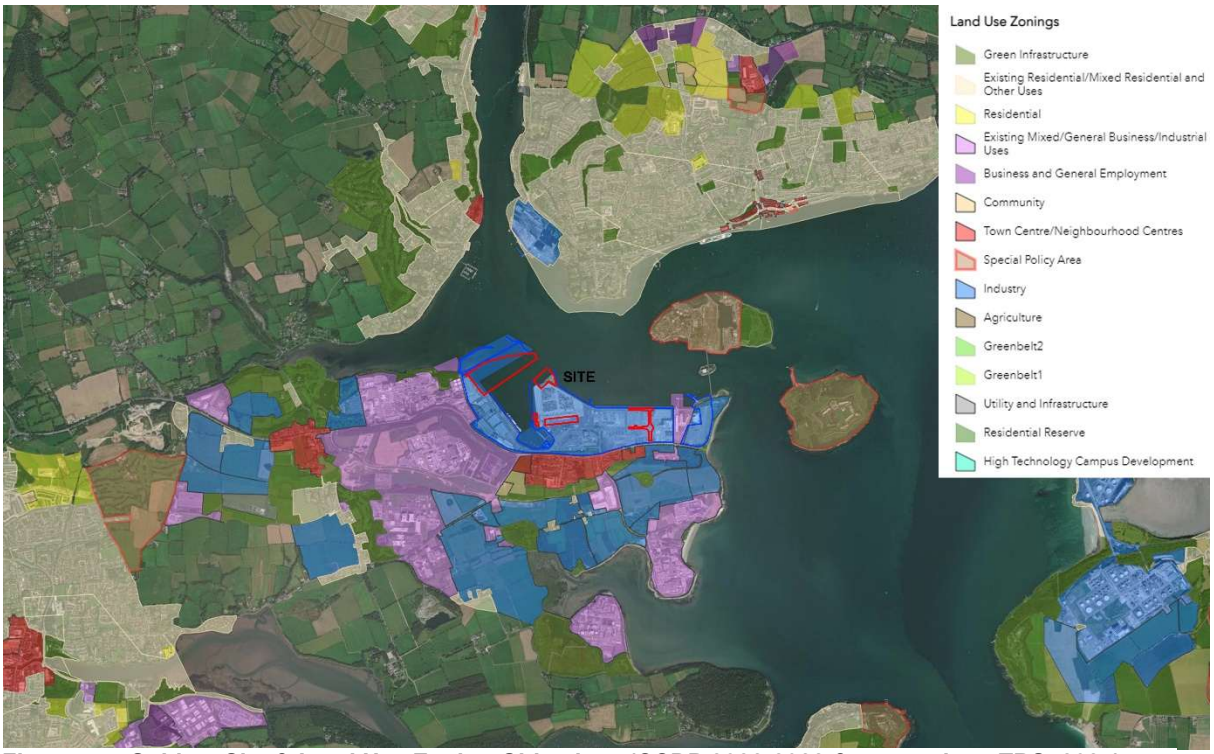


Figure 7.4: Subject Site & Land Use Zoning Objectives (CCDP 2022-2028 & annotations TBS, 2024)

The CCDP 2022-2028 contains specific objectives relating to the Port of Cork lands in Ringaskiddy:

"Development Objective RY-I-18: Port Facilities and Port Related Activities. This zone adjoins the Cork Harbour SPA and Monkstown Creek proposed Natural Heritage Area pNHA. Areas within this zone are used Special Conservation Interest bird species for which the Cork Harbour SPA is designated. Account will be taken of this when considering new development proposals in this area. Any development on this site will need to take account of the biodiversity sensitivities of the site and area."

The CCDP 2022-2028 also contains the Transport & Mobility Objective:
'*TM 12-15: Port of Cork and Other Ports'* which states:
"a) Ensure that the strategic port facilities at Ringaskiddy, Whitegate and Marino Point have appropriate road transport capacity to facilitate their sustainable development in future years.
b) Ensure delivery of the upgrading and realignment of the N28 Cork to Ringaskiddy Road and the upgrading of the R624 Regional Road linking N25 to Marino Point and Cobh and designation to National Road Status to provide appropriate road transport capacity to facilitate sustainable development of port facilities at Ringaskiddy, Whitegate and Marino Point.
c) Support the landside capacity of Port of Cork subject to consideration of environmental concerns including water quality, flood risks, human health, natural and built heritage.
d) Support the relocation of port activities and other industry away from the upper harbour on the eastern approaches to the city.
e) Support Ringaskiddy as the preferred location for the relocation of the majority of port related activities having regard to the need for a significant improvement to the road network. Also

recognising the key role that Marino Point can play in providing an alternative relocation option for some of the port related uses that could best be served by rail transport taking account of residential amenity, tourism, recreation and renewable energy. The Council is committed to engage with the Port of Cork and other relevant stakeholders in achieving this objective.
f) Future expansion or intensification of Port activities will have regard to environmental, nature conservation and broader heritage considerations at design, construction and implementation stages."

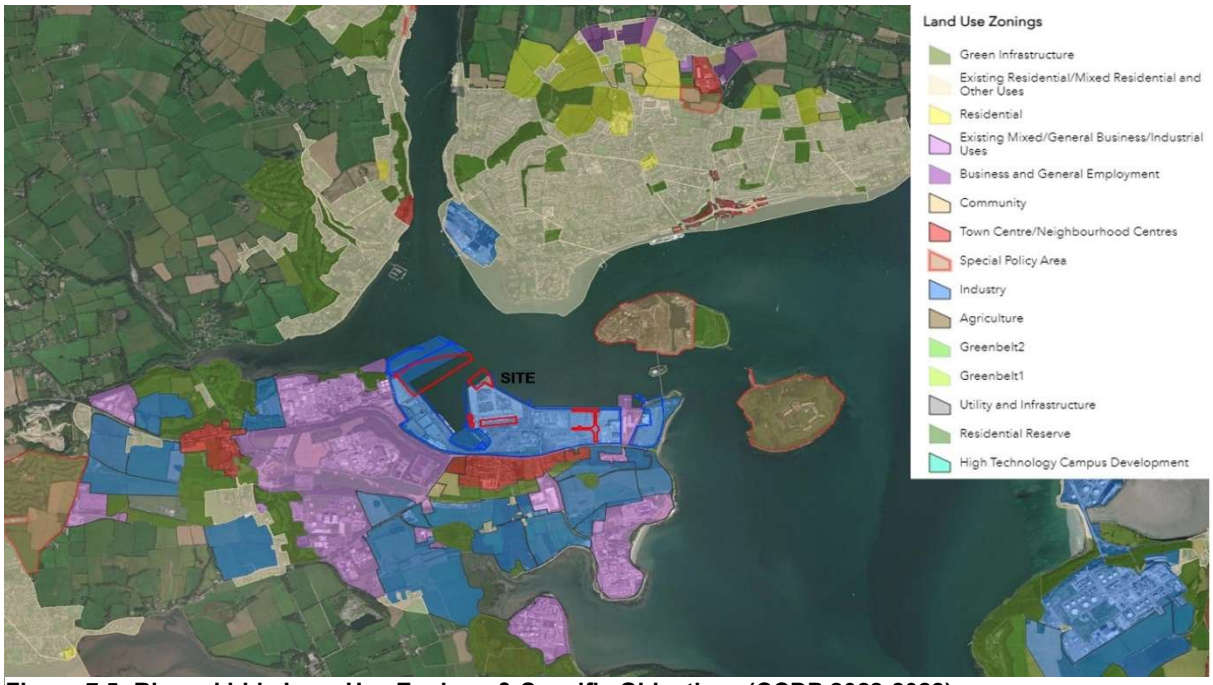


Figure 7.5: Ringaskiddy Lans Use Zonings & Specific Objectives (CCDP 2022-2028)

[7.3.3] Landscape Character Assessment

Cork County Council prepared a Draft Landscape Strategy in 2007 containing a Landscape Character Assessment (LCA) which identified 76 landscape character areas, which were "amalgamated into a set of 16 landscape character types based on similarities evident within the various areas". This LCA indicates that the subject site is located within *'Landscape Character Area 19 - Cork City and Harbour'* within the more general *'Landscape Character Type 1 – City Harbour and Estuary'* as shown on Figures 7.6 and 7.7. The Cork County Draft Landscape Strategy 2007 also identifies the key characteristics of *'Landscape Character Type 1 – City Harbour and Estuary'*, some of which are listed below:

- *"This landscape comprises a mix of rural and intensely urban areas, combined with a large expansive harbour.*
- *The harbour includes large islands, which, along with much of the harbour shore, comprises landscape of fertile farmland of mixed use and mature broadleaf hedgerows, which slope gently to the sea.*
- *The harbour area also has a wealth of natural heritage, including a number of important habitats and wetland areas, which are of international significance due to the number and diversity of bird species they support.*
- *The city docks area is characterised by tall cranes, warehousing, grain silos and large ships, while the wider harbour area comprises a mix of industrial, residential and recreational uses including marinas.*
- *Port facilities and related industries dominate much of the harbour area and to the south of the city, the western side of the harbour supports major industrial development.*

- *Telecommunication masts and water storage towers punctuate the skyline.*
- *The narrow harbour mouth is defined by two hilltops with old military fortifications on their summits. Attractive towns such as Cobh and Passage West/Monkstown, which contain Architectural Conservation Areas, contribute hugely to the rich built heritage of the area. The orientation of these towns towards the harbour and the existence of rows of terraced houses reflect their maritime heritage.*
- *The rural areas around much of the greater harbour area are now characterised by a prevalence of infrastructure such as roads, bridges and electricity power lines and some urban sprawl.*
- *The high-quality vernacular built environment is portrayed by the high concentration of Protected Structures that are evident throughout the landscape.*
- *This area has a strong economic base due to its strong urban character and diversity of economic activities.*
- *As a large population centre this area is not only important locally as a place to live and work but it also contributes significantly at regional and national scale.*
- *It is also home to a number of prime industrial/enterprise sites including one of the largest concentrations of pharmaceutical industries in the world.*
- *The Deep Water Berth and Ringaskiddy Ferry Port contribute greatly to the economic success, particularly the commercial, industrial and tourism well being of the southwest region."*

Figure 7.6: Map of Landscape Character Types of County Cork (CCDP 2022-2028 & annotations TBS, 2024)

Figure 7.7: Map of Landscape Character Areas of County Cork (Cork County Draft Landscape Strategy 2007 & annotations TBS, 2024)

The LCA also states that 'Landscape Character Type 1 – City Harbour and Estuary', is classified as landscape of 'Very High Value', 'Very High Sensitivity' and of 'National Importance as shown in Figures 7.8 and 7.9.

Landscape Value:

This LCA states that *"the assessment methodology for Landscape Value was based on the particular assessment of Natural Value, Scenic Value and Cultural value"*
The *'Type 1 – City Harbour and Estuary'* landscape character type is classified as a 'Very High Value' landscape which it defines:
"Very High Value - Scenic landscapes with highest natural and cultural quality, areas with conservation interest and of national importance."
Landscape Sensitivity:

This LCA states that: *"Landscape Sensitivity was defined through a combination of the sensitivity of the landscape resource (Landscape Character Sensitivity) and Visual Sensitivity of the landscape." "Landscape Character Sensitivity identifies the possibility of a landscapes ability to accommodate change without adverse impact on its character."*
"Visual Sensitivity is about identifying the visual effect which some development pressure can have on the landscape."
The *'Type 1 – City Harbour and Estuary'* landscape character type is classified as a 'Very High Sensitivity' landscape which it defines:
"Very High Sensitivity - Very high sensitivity landscapes are extra vulnerable landscapes likely to be fragile and susceptible to change."

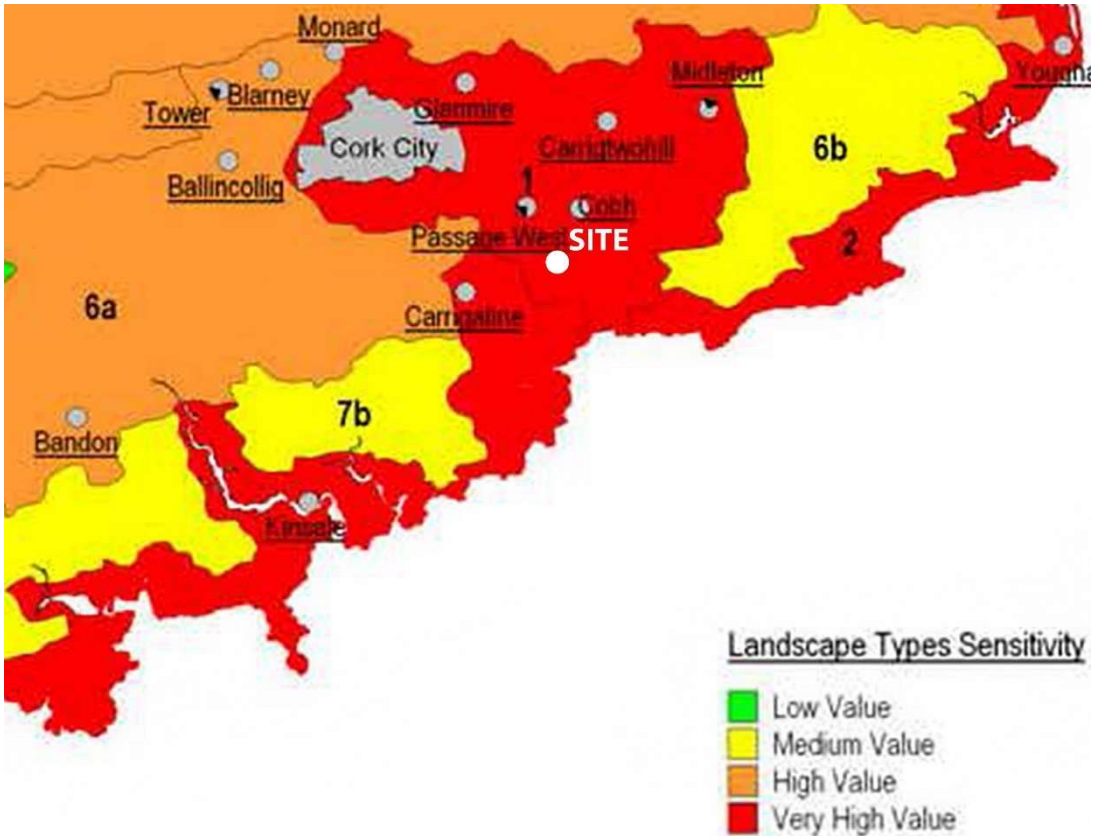


Figure 7.8: Landscape character types sensitivity (Cork County Draft Landscape Strategy, 2007 & annotations TBS, 2024

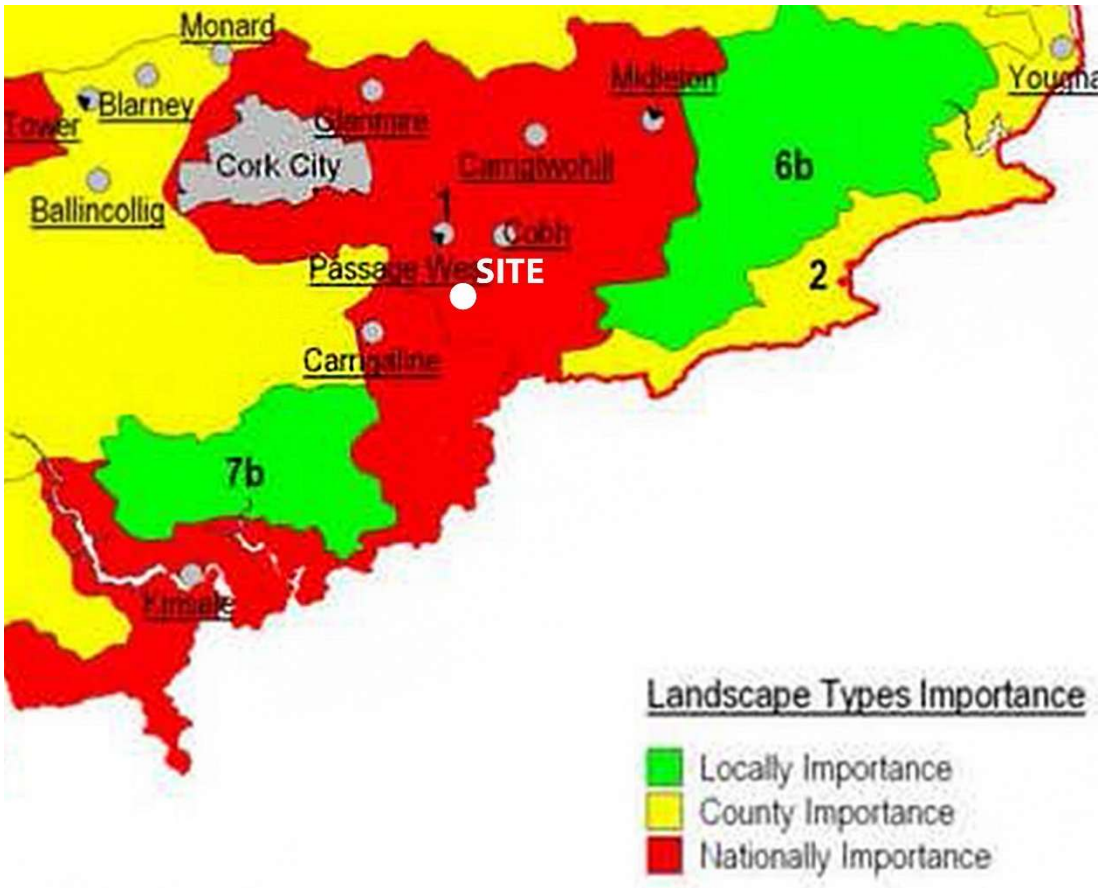


Figure 7.9: Landscape character types importance (Cork County Draft Landscape Strategy, 2007 & annotations TBS, 2024

While the majority of the lands that border Cork Harbour' and 'Landscape Character Type 1 – City Harbour and Estuary' are designated as 'High Value Landscape', the Port of Cork lands in Ringaskiddy are not designed as a 'High Value Landscape', as shown on Figure 7.10. High Value Landscapes are described as:

"Landscape Character Types which have a very high or high landscape value and high or very high landscape sensitivity and are of county or national importance are considered to be our most valuable landscapes and therefore are designated as High Value Landscapes (HVL)."

The Draft Landscape Strategy 2007 includes the following recommendations in relation to *'Landscape Character Type 1 – City Harbour and Estuary'*:

- *"Protect the north and south ridges and hillsides around the city, to ensure the protection of the visual backdrop to the city. These ridges would be adversely affected by unsympathetic development thus interfering with views of special amenity value to the city and surrounding area.*
- *Promote sustainable growth in the existing main settlements of Cobh, Passage West, Carrigtwohill, and Midleton by encouraging new development, which respects the existing character of these settlements in terms of both scale and design.*
- *Maintain and enhance views of the harbour. Proposals for development in the harbour should respect the sensitivity of this landscape and in particular should have regard to its rich and diverse natural heritage and concentration of Natural Heritage Areas that are designated for protection and the relationship between these and the built environment.*
- *Proposals for medium and large-scale business, retail and industrial uses, which may impact on the character of the harbour area, must consider the landscape implications at the outset and so a landscape scheme should be submitted with planning applications.*
- *Manage development that will adversely affect distinctive linear sections of the Lee River Valley, especially its open flood plains, when viewed from relevant scenic routes and settlements.*
- *Improve public access to the River Lee by enhancing it as a key recreational and amenity source.*
- *Recognise the potential constraints on development created by the River Lee flood plain and the value of this flood plain as an increasingly rare habitat.*
- *Support the development of rural Cork's inland and coastal marine leisure facilities, where this is compatible with the long-term wellbeing of this landscape character type.*
- *Promote the use of Spike Island as an amenity site.*
- *Protect the setting of existing promontories, which are part of the unique setting of this landscape type."*

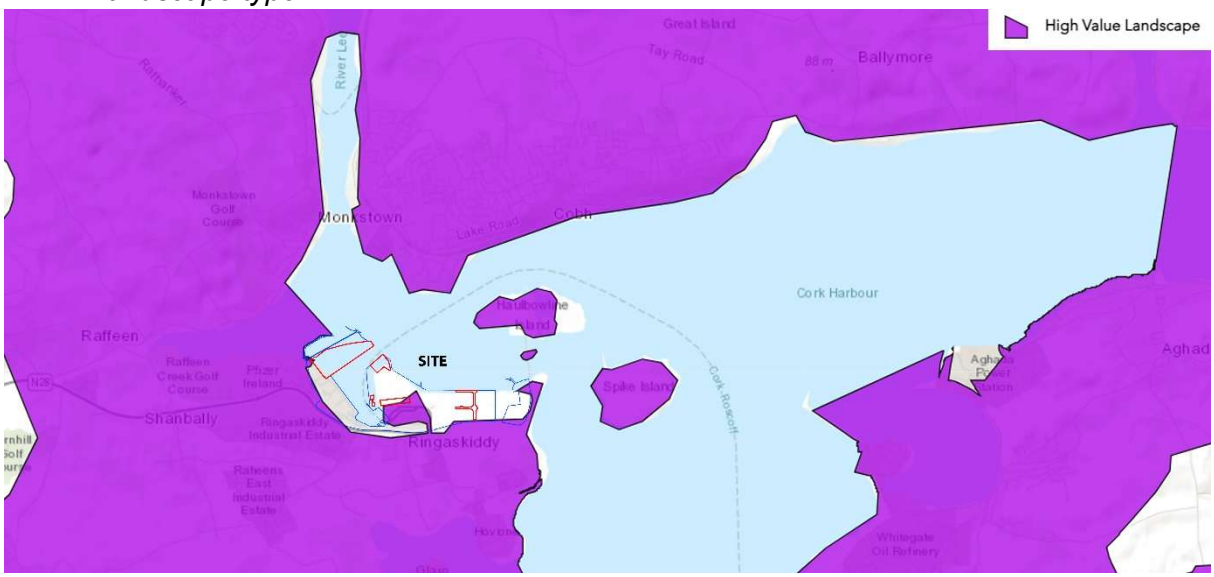


Figure 7.10: High Value Landscape (CCDP 2022-2028 & annotations TBS, 2024)

The CCDP 2022-2028 contains the following objectives in relation to landscape: *"Objective GI 14-9 - Landscape:*

a) *Protect the visual and scenic amenities of County Cork's built and natural environment.*
b) *Landscape issues will be an important factor in all land-use proposals, ensuring that a pro-active view of development is undertaken while protecting the environment and heritage generally in line with the principle of sustainability.*
c) *Ensure that new development meets high standards of siting and design.*
d) *Protect skylines and ridgelines from development.*
e) *Discourage proposals necessitating the removal of extensive amounts of trees, hedgerows and historic walls or other distinctive boundary treatments."*

"Objective GI 14-10 - Draft Landscape Strategy:
Ensure that the management of development throughout the County will have regard for the value of the landscape, its character, distinctiveness and sensitivity as recognised in the Cork County Draft Landscape Strategy and its recommendations, in order to minimize the visual and environmental impact of development, particularly in areas designated as High Value Landscapes where higher development standards (layout, design, landscaping, materials used) will be required."

[7.3.4] Views & Prospects

[7.3.4.1] Protected Views & Prospects

In relation to views and prospects the CCDP 2022-2028 contains the following objectives:

"Objective GI 14-12: General Views and Prospects - Preserve the character of all important views and prospects, particularly sea views, river or lake views, views of unspoilt mountains, upland or coastal landscapes, views of historical or cultural significance (including buildings and townscapes) and views of natural beauty as recognized in the Draft Landscape Strategy."

"Objective GI 14-13: Scenic Routes - Protect the character of those views and prospects obtainable from scenic routes and in particular stretches of scenic routes that have very special views and prospects identified in this Plan."
"GI 14-14: Development on Scenic Routes:

a) *Require those seeking to carry out development in the environs of a scenic route and/or an area with important views and prospects, to demonstrate that there will be no adverse obstruction or degradation of the views towards and from vulnerable landscape features. In such areas, the appropriateness of the design, site layout, and landscaping of the proposed development must be demonstrated along with mitigation measures to prevent significant alterations to the appearance or character of the area.*
b) *Encourage appropriate landscaping and screen planting of developments along scenic routes."*

<u>Scenic Routes & High Value Landscapes:</u>

The CCDP also states that:
"It is important to protect the character and quality of those particular stretches of scenic routes that have special views and prospects particularly those associated with High Value Landscapes."
The Landscape Character Assessment for Co. Cork indicates that the subject site is located with *'Landscape Character Type 1 – City Harbour and Estuary'* which contains 12 scenic routes. There are three scenic views within 5km of the subject site as shown on Figure 7.11 and listed in Table 7.2 below:

Table 7.2: Scenic routes with 5km of the subject site (as mentioned within CCDP 2022-2028)

Scenic Route No.	Description	Relevance to the subject site
S54	Road between Passage West and Ringaskiddy	This scenic route/ N28 runs along the southern boundary of the Port of Cork and along western side of Cork Harbour. Represented by Visuals 1, 5,6,7 & 10
S53	Road between Cobh and Belvelly	This scenic route is located to the north of the subject site, across Cork Harbour, in Cobh. Represented by Visual 18
S51	Road from Ballynacorra via East Ferry to Whitegate and Roche's Point	Scenic route S51 runs along the eastern side of Cork Harbour.

While the majority of the subject site is not designated as 'High Value Landscape', the area to the south of the site and the lands that surround Cork Harbour are designated as 'High Value Landscapes', as shown on Figure 7.10.

Figure 7.11: Scenic routes & subject site (Source: CCDP 2022-2028 & annotations TBS, 2024)

[7.3.4.2] Visibility into and from the site

Due to the low-lying nature of the subject site within the western park of Cork Harbour, the majority of views into the site are from lands bordering Cork Harbour to the north, west and east, such as Monkstown, Cobh, Rocky Island and Haulbowline Island.

[7.3.4.3] Protected Structures, Recorded Monuments & Architectural Conservation Areas

Recorded Monuments are structures that are protected under the National Monuments (Amendment) Act, 1994 and Protected Structures are structures that are considered to be of special architectural, historic, archaeological, artistic, cultural, scientific, social or technical interest.

CCDP 2022-2028 policy in relation to protected structures:

"Objective HE 16 – 14 c): Seek the protection of all structures within the County, which are of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest.

f) Ensure that development proposals are appropriate in terms of architectural treatment, character, scale and form to the existing protected structure and not detrimental to the special character and integrity of the protected structure and its setting."

There are a number of protected structures in close proximity to the site as shown in Figure 7.12 and listed in Table 7.3.

Table 7.3: Protected Structures within Ringaskiddy and Cork Harbour

RPS ID	Name	Townland
575	Martello Tower	Ringaskiddy
1260	Castlewarren Stronghouse	Barnahely
01272	Westmoreland Fort (Fort Mitchell)	Spike Island
01422 - 01426	Westmoreland Fort - Prison Jail, Barracks, Battery/Gun room	Spike Island
01427	Store/Warehouse Spike Island Spike Island	Spike Island
01428	Former Barracks including Chapel Spike Island Spike Island	Spike Island
01429	Officer's House Spike Island Spike Island	Spike Island
01430	Officer's House (West) Spike Island Spike Island	Spike Island
01431	Bleak House, Admiral's House Spike Island Spike Island	Spike Island
01432	Graveyard/cemetery Spike Island Spike Island	Spike Island
578	Martello Tower	Haulbowline Island
670	Range of Limestone Warehouses & Offices	Haulbowline Island

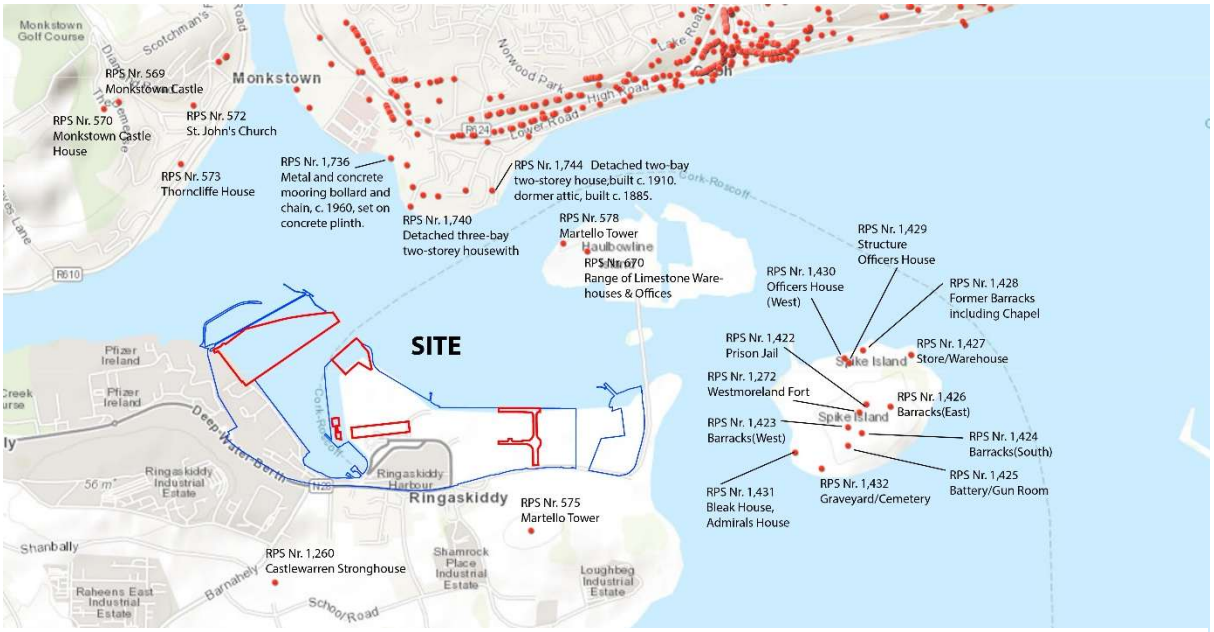


Figure 7.12: Record of protected structures (Source: CCDP 2022-2028 & annotations TBS, 2024)

Architectural Conservation Area (ACA): a place, area, group of structures or townscape that is of special architectural, historical, archaeological, artistic, cultural, scientific, social, or technical interest or value, or contributes to the appreciation of protected structures.

There are four ACAs within 3kms of the site as listed in Table 7.4 and shown in Figure 7.13.

Table 7.4: ACAs with 3km of the subject site (as mentioned within CCDP 2022-2028)

Architectural Conservation Area	Townland	Relevance to subject site
Haulbowline Conservation Area	Haulbowline Island	within 1km of the site
Cobh ACA	Cobh	within 2kms of the site
Lower Monkstown Conservation Area	Monkstown	within 2kms of the site
Upper Monkstown Conservation Area	Monkstown	within 2kms of the site

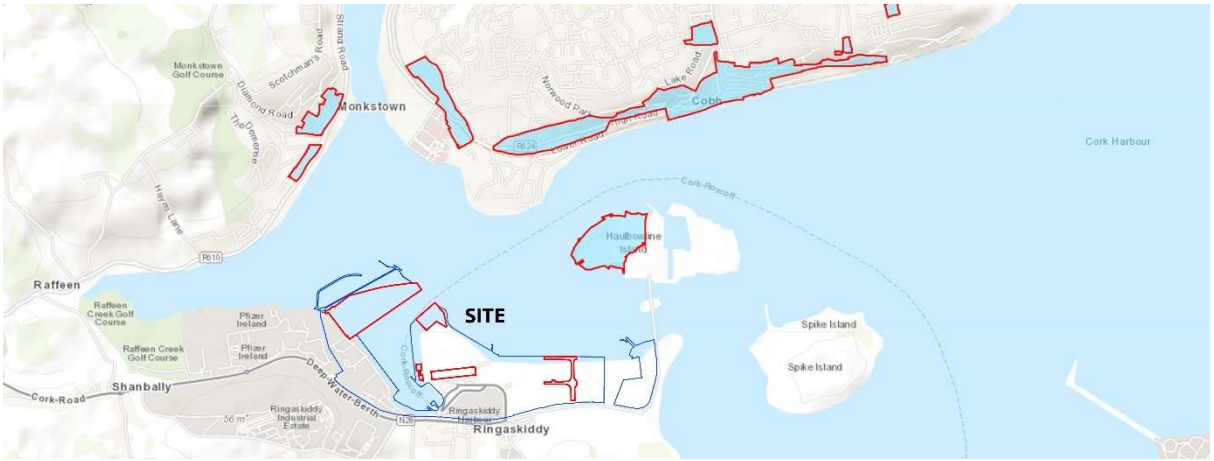


Figure 7.13: Architectural conservation areas (Source: CCDP 2022-2028 & annotations TBS, 2024)

[7.3.5] Statutory Designations

In relation to designated landscapes and protected environmental sites, such as Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Natural Heritage Areas (NHA), those that are within 5km of the subject site are shown on Figure 7.14 and listed on Table 7.5 The CCDP 2022-2028 states *"Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs) are sites that are designated or proposed for designation under the Wildlife (Amendment) Act 2000. These are sites that are of national importance and they generally support a range of habitats, plant and animal species and, in some cases, geological features."* The Development Plan contains the following relevant policy:

"Objective BE 15-2: Protect sites, habitats and species:
a) Protect all natural heritage sites which are designated or proposed for designation under European legislation, National legislation and International Agreements. Maintain and where possible enhance appropriate ecological linkages between these. This includes Special Areas of Conservation, Special Protection Areas, Marine Protected Areas, Natural Heritage Areas, proposed Natural Heritage Areas, Statutory Nature Reserves, Refuges for Fauna and Ramsar Sites.
c) Protect and where possible enhance areas of local biodiversity value, ecological corridors and habitats that are features of the County's ecological network. This includes rivers, lakes, streams and ponds, peatland and other wetland habitats, woodlands, hedgerows, tree lines, veteran trees, natural and semi-natural grasslands as well as coastal and marine habitats."

Table 7.5: Designated areas located within the vicinity of the subject site

Name	Designation	Reference
Cork Harbour SPA	Special Protection Area	4030
Monkstown Creek pNHA	Proposed Natural Heritage Area	1979
Lough Beg (Cork) pNHA	Proposed Natural Heritage Area	1066
Owenboy River pNHA	Proposed Natural Heritage Area	1990
Whitegate Bay pNHA	Proposed Natural Heritage Area	1084
Cuskinny Marsh pNHA	Proposed Natural Heritage Area	1987

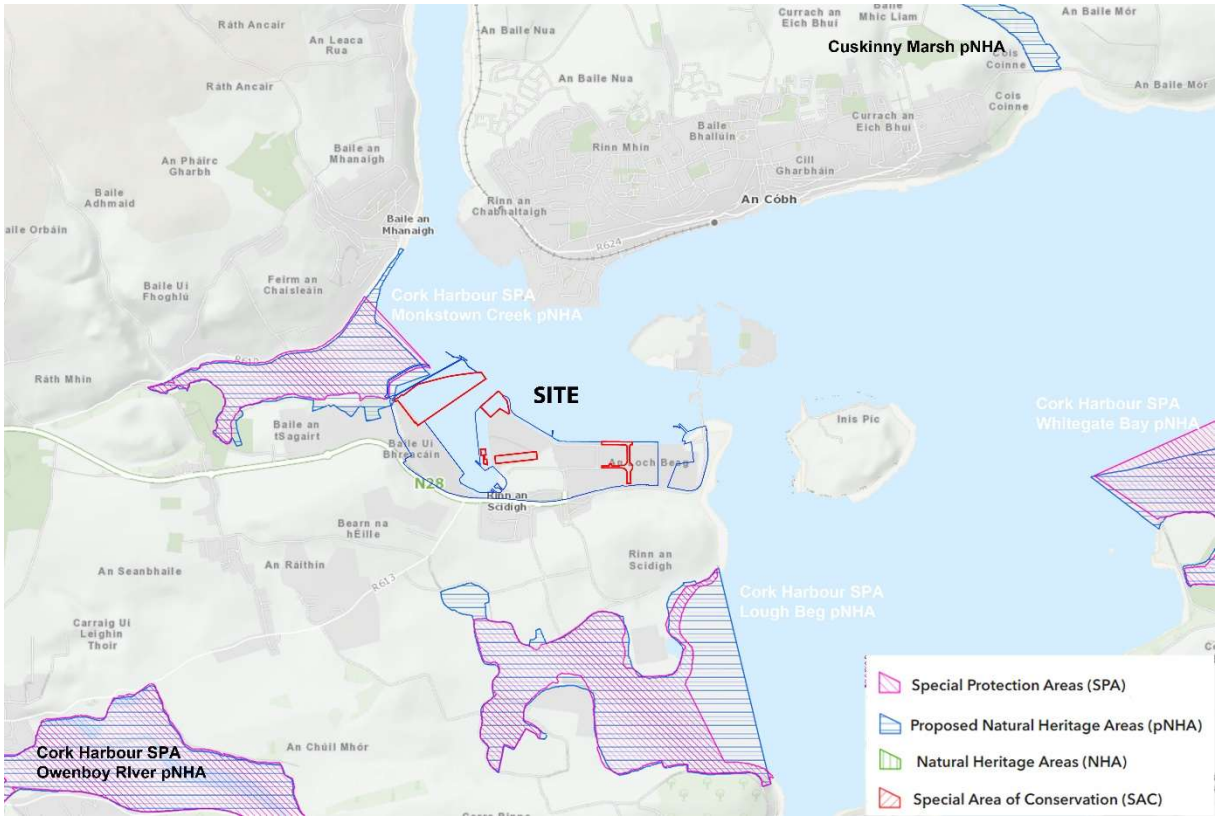


Figure 7.14: Designated sites (Source: NPWS, 2024 & annotations TBS, 2024)

[7.3.6] Existing Trees and Hedgerows

In relation to trees and woodlands the CCDP 2022-2028 contains the following objective:

"Objective BE 15-8: Trees and Woodlands:

d) Preserve and enhance the general level of tree cover in both town and country. Ensure that development proposals do not compromise important trees and include an appropriate level of new tree planting.

e) Where appropriate, to protect mature trees/groups of mature trees and mature hedgerows that are not formally protected under Tree Preservation Orders."

While there are no existing trees within the subject, there are a number of individual trees near the port's maintenance and administration building and along the N28. There is also a mature coniferous tree belt located along the southern boundary of the port's lands with the public open space.

[7.4] Potential Impacts

[7.4.1] Impact on Existing Trees and Hedgerows

There are no existing trees or hedgerows located within the subject site and therefore the anticipated that there will be no impact on the existing trees and hedgerows.

[7.4.2] Impact on Landscape Character

It is anticipated that the proposed redevelopment works within the subject site will be appropriate to the site's setting. During the construction phase, due to the presence of machinery and cranes required to carry out the modifications to the quay wall, container storage area and the dredging works at Ringaskiddy East and West, it is anticipated that there may be a slight and negative impact on the landscape setting. However, during the operational phase as the proposed redevelopment works will be experienced within the context of the existing port activities and structures, it is considered that the proposed redevelopment is consistent with the existing land use and developments in this area. Therefore, it is anticipated that the surrounding landscape has the capacity to absorb a redevelopment of this scale and nature without any significant and negative impacts in terms of visual and landscape character.

[7.4.3] Impact on Views

[7.4.3.1] General Impacts

Construction Phase:

During the construction phase, the following elements of the proposed redevelopment of the subject site have the potential to cause visual impacts, they will however be short term in duration:

- Temporary site works:
  - Lighting
  - machinery and cranes required to carry out the modifications to the quay wall, container storage area
  - dredging works at Ringaskiddy East and West
- Construction traffic – dust and emissions
- Laying of site services

Operational Phase:

The principal elements which are likely to give rise to landscape and visual impact visual impact in the long term are:

- Modifications to the quay wall and installation of the link-span pontoon and bridge
- Expanded container storage area and associated lighting and gantries

- Additional lighting and fencing

[7.4.3.2] Impacts on Scenic Routes

S54 - Road between Passage West and Ringaskiddy:

- This scenic route/ N28 runs along the southern boundary of the Port of Cork and along western side of Cork Harbour. The anticipated impacts from this scenic route are discussed in Section 7.6.9.3 - Visuals 1, 5,6,7 & 10.

S53 - Road between Cobh and Belvelly:

- This scenic route is located to the north of the subject site, across Cork Harbour, in Cobh. The anticipated impacts from this scenic route are discussed in Section 7.6.9.3 – Visual 18.

S51 - Road from Ballynacorra via East Ferry to Whitegate and Roche's Point:

- Scenic route S51 runs along the eastern side of Cork Harbour
- The majority of this scenic route, the R630, is located more than 5km east of the subject site and therefore it is anticipated that the proposed redevelopment works will not be visible from this location.
- The other section, Fort David Road, while closer to the subject site, views from this route looking towards the subject site would be obscured by the structures within refinery at Corkbeg Island in the foreground and by Spike Island closer to the subject site.
- It is anticipated that there will be no visual impact on this scenic route – imperceptible and neutral.

[7.4.3.3] Impact on Visibility into the site

For this visual impact assessment, viewpoints were selected to represent the likely visual impact from a variety of distances and direction around the site. Priority was given to views from the public domain, such as main roads and to views from potentially sensitive locations such as scenic routes and from the amenity areas. Photomontages were compiled from the viewpoints shown on Figure 7.3 (the visual analysis section below should be read in conjunction with the baseline and proposed visuals produced by Chris Shackleton Consulting, refer to Appendix 10.1). The baseline photography was obtained on the 23/06/2024.

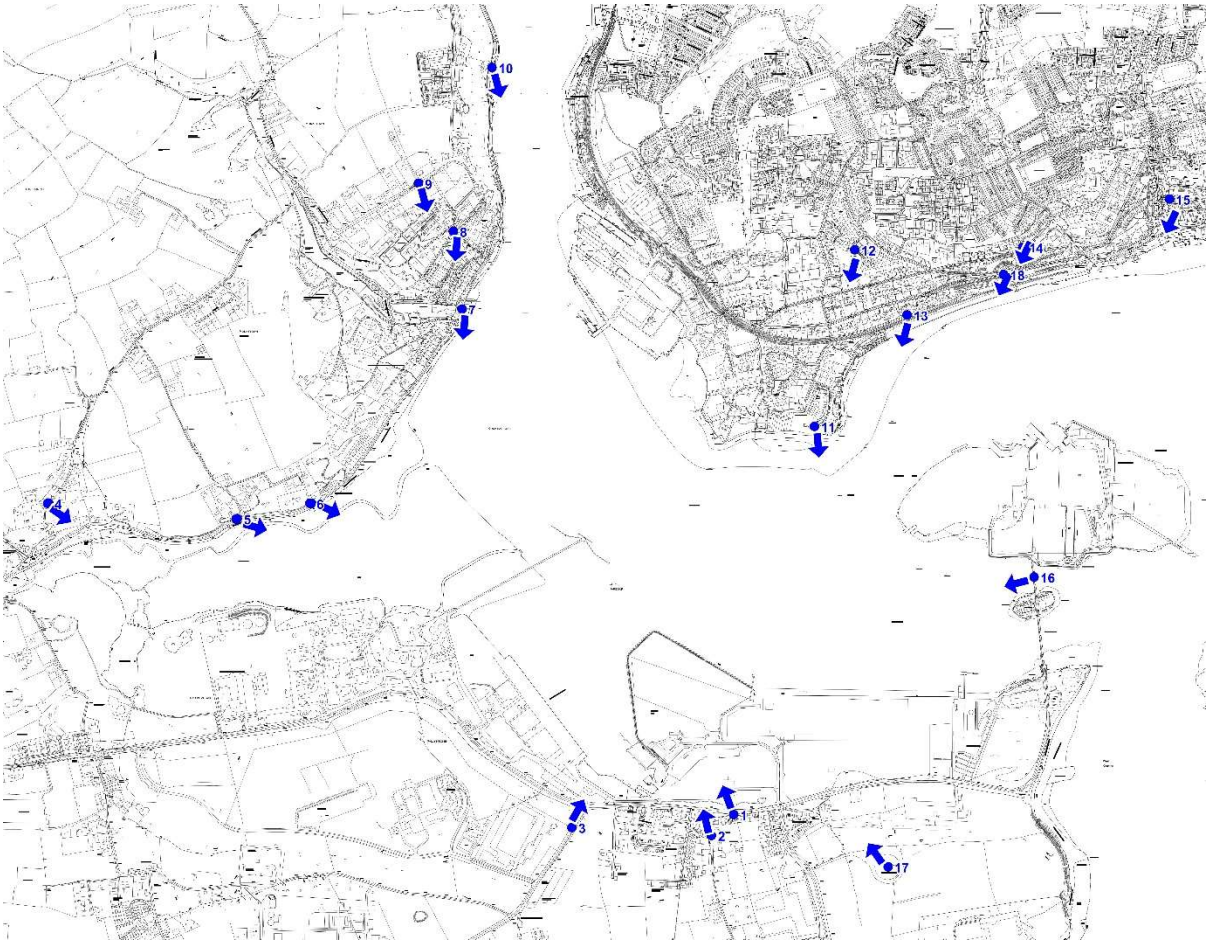


Figure 7.15: Viewpoint Location Map (CSC, 2024)

Visual 1: From N28 near public open space within Ringaskiddy (Scenic Route S54), looking north-west

Existing View:

This viewpoint is located within the low-lying lands of Ringaskiddy, along the N28 which forms part of Scenic Route S54, at the public open space to the south of the subject site. Views into the subject site are effectively screened by the coniferous tree belt that is located along the boundary fence to the Port of Cork lands. The local topography and the mature coniferous tree belt, prevent views into the subject site and of Cork Harbour and the surrounding lands

Proposed Changes and Visual Impact:

Due to the intervening topography and the existing trees located between the subject site and this viewpoint, it is anticipated that the proposed development will not be visible from this location.

Construction and Operational Phases:

During the construction and operational phases, it is anticipated that the proposed development will not be visible from this location and therefore the visual impact will be imperceptible and neutral.

Plate 7. 2: Visual 1 - Existing

Plate 7. 1: Visual 1 - Proposed

Visual 2: From Priest's Avenue, looking north–west

Existing View:

This view is from a slightly elevated position along Priest's Avenue, within the largely residential area of Barnahely, Ringaskiddy. This location permits views of The Ringaskiddy Community Centre in the foreground and the public open space located between the subject site and the N28 road. While the mature coniferous tree belt screens the majority of views into the subject site, the tall lighting columns and the upper parts of the cranes located within the Port of Cork lands are visible from this location. The mature vegetation located on the higher lands within Monkstown are also visible in the distant background from this location.

Proposed Changes and Visual Impact:

Due to the mature tree belt located around the perimeter of the site, it is anticipated that only the upper part of the proposed gantries associated with container storage area will be visible and that majority of the proposed development will not be visible from this location.

Construction Phase:

During the construction phase it is likely that there will be limited views of the construction cranes and scaffolding within the subject site from this location, resulting in a slight and negative visual impact.

Operational Phase:

During the operational phase the impact on views from this location may be not significant and negative in the short term. As the existing trees continue to mature it is anticipated that the proposed structures will no longer be visible from this location and therefore its impact will lessen to imperceptible and neutral in the long term.

Plate 7. 3: Visual 2 - Existing

Plate 7. 4: Visual 2 - Proposed

Visual 3: From R613 within Barnahely, looking north-east

Existing View:

This view from a slightly elevated position along the R613 is enclosed to the west by a high stone all and trees and to the east by a mature tree belt and embankment. The elevated position of this viewpoint permits views of the N28 junction at the entrance to the deepwater berth and the boundary fence associated with the Port of Cork lands. The open water of Cork Harbour, the existing quay, berths, cranes, container storage area and the ferry terminal facilities are visible from this location. The residential properties and mature vegetation located on the higher lands within Cobh are also visible in the distant background from this location on the R613.

Proposed Changes and Visual Impact:

It is anticipated that the modifications to the quay wall and the proposed linkspan bridge and pontoon will be visible from this location, however they will be visible within the existing context of the working nature of this part of the port's lands.

Construction Phase:

During the construction phase it is anticipated that there will be views of the machinery and cranes required to install the linkspan pontoon and bridge and to carry out the modifications to the quay wall, resulting in a not significant and negative impact.

Operational Phase:

During the operational phase the impact on views from this location will be not significant and neutral as the development is consistent with the existing land use and developments in this area.

Plate 7. 5: Visual 3 – Existing

Plate 7. 6: Visual 3 - Proposed

Visual 4: From L6470 Strawhall, Monkstown, looking south-east

Existing View:

This elevated position along the local road L6470 within Monkstown, permits views of the Monkstown Estuary and the surrounding lands, including many of the structures associated with the port and the various pharmaceutical and manufacturing complexes within Ringaskiddy. This location permits views of the following:

- Sloping lands with dwellings and vegetation associated with this part of Monkstown
- Monkstown Creek
- Structures with the Pfizer complex, which are partially screened by the dense vegetation located between the structures and the creek
- Port of Cork lands and structures such as
    - existing ADM jetty and wall,
    - quay, cranes, gantries and container storage area, tall lighting columns
- A water tower and partial views of the structures within the Janssen Bio complex
- Buildings, bridge and pontoon associated with the National Maritime College
- Wind turbine located near the DePuy complex/ Lough More
- bridge linking Rocky Island, Haulbowline Island to Ringaskiddy
- Spike Island
- Partial views of the structures within Whitegate refinery and the higher lands beyond

Proposed Changes and Visual Impact:

While it is anticipated that much of the proposed development will be screened by the intervening topography and vegetation located within the Pfizer lands, it is predicted that there may be glimpsed views of the gantries associated with container storage area. The existing structures such as the Pfizer plant, water tower, cranes and the wind turbine, continue to be the dominant features against the skyline from this location.

Construction Phase:

During the construction phase it is anticipated that there will be partial views of the machinery and cranes required to carry out the modifications to the quay wall and the dredging works at Ringaskiddy East and West, resulting in a not significant and negative impact.

Operational Phase:

During the operational phase the impact on views will be not significant and neutral as the development is consistent with the existing land use and developments in this area.

Plate 7. 7: Visual 4 - Existing

Plate 7. 8: Visual 4 - Proposed

Visual 5: From R610, Monkstown (Scenic Route S54) , looking south-east

Existing View:

This viewpoint is located within the low-lying lands on the R610, near Hayes Lane, where it follows the shores of Monkstown Creek. The open water of the creek dominates the foreground and the topography and mature vegetation to the north of the Pfizer buildings screens the majority of views into the subject site. However, this viewpoint does permit views of the following elements within the Port of Cork lands:

- the ADM jetty and wall,
- quay and deepwater berths
- cranes, gantries and container storage area, tall lighting columns

The buildings within the Pfizer complex are partially screened by the existing vegetation located between the creek and the complex. The following are also visible in the background:

- The buildings associated with the National Maritime College
- The wind turbine located near the DePuy complex/ Lough More
- Rocky Island, the buildings on Haulbowline Island and the bridge linking Haulbowline Island to Ringaskiddy
- The higher lands within Spike Island
- Partial views of the structures within the ESB Aghada Power Station, such as the tall chimney, and the higher lands to the east of Cork Harbour

Proposed Changes and Visual Impact:

While it is anticipated that much of the proposed development will be screened by the intervening topography and vegetation located within the Pfizer lands, it is predicted that there may be partial views of the modifications to the container storage area, which will be seen against the existing storage and structures within this part of the port. The existing structures such as the Pfizer plant, cranes and the wind turbine, continue to be the dominant features against the skyline from this location.

Construction Phase:

During the construction phase it is anticipated that there will be partial views of the machinery and cranes required to carry out the modifications to the quay wall and the dredging works at Ringaskiddy East and West, resulting in a not significant and negative impact.

Operational Phase:

During the operational phase the impact on views from this location will be not significant and neutral as the development is consistent with the existing land use and developments in this area.

Plate 7. 9: Visual 5 - Existing

Plate 7. 10: Visual 5 - Proposed

Visual 6: From R610 Monkstown (Scenic Route S54), looking south-east

Existing View:

The location of this viewpoint along the R610 bordering Monkstown Creek, permits views over the creek towards the Port of Cork lands and surrounding areas. The elevated land and vegetation located in the most eastern part of the Pfizer site prevents views of the majority of the structures within the Ringaskiddy West section of the Port of Cork Lands, however there are partial views of the Arkady building. This location also permits views of the following:

- the ADM jetty and wall,
- quay and deep water berths
- cranes, gantries and container storage area, tall lighting columns
- Buildings associated with the National Maritime College
- Rocky Island and the higher lands within Spike Island

The following elements are also visible in the background:

- The Martello Tower located on the elevated lands to the south of the subject site
- Partial views of the structures within the ESB Aghada Power Station, the Whitegate Refinery, building within the Glanagow AGI lands and the higher lands to the east of Cork Harbour

Proposed Changes and Visual Impact:

While it is anticipated that there may be partial views of the modifications to the quay wall and the upper sections of the proposed gantries within the container storage area, the majority of the proposed development will be screened by the existing structures within the port, such as the current container storage area and the ADM jetty and wall.

Construction Phase:

During the construction phase it is anticipated that there will be partial views of the machinery and cranes required to carry out the modifications to the quay wall, installation of the new gantries and the dredging works at Ringaskiddy West, resulting in a slight and negative impact.

Operational Phase:

During the operational phase the impact on views from this location will be not significant and neutral as the development is consistent with the existing land use and developments in this area.

Plate 7. 11: Visual 6 - Existing

Plate 7. 12: Visual 6 - Proposed

Visual 7: From Strand Road (R610) (Scenic Route S54), looking south

Existing View:

This viewpoint is located along the Strand Road (R610) near the junction with Castle Terrace at the Monkstown Sand Quay and slipways. The location of this viewpoint permits views of Cork Harbour Marina in the foreground and the structures within the Port of Cork lands across the waters of Cork Harbour. The buildings and structures within Ringaskiddy East and West are visible from this location, such as:

- the ADM jetty and wall,
- silos, warehouses and tall lighting columns
- quay and deepwater berths
- cranes, gantries and container storage areas,
- the port's maintenance & office building

The wind turbines located near the DePuy complex/ Lough More, the Johnson & Johnson Loughbeg complex and the Thermo Fisher Scientific complex at Currabinny, are also dominant features against the skyline from this location. The Martello Tower within Ringaskiddy and the elevated tree covered lands of Curraghbinny Woods are also visible in the background from this location.

Proposed Changes and Visual Impact:

It is anticipated that there will be partial views of the modifications to the quay wall, the expanded container storage area and the upper sections of the proposed gantries from this location. None of these proposals will break the skyline when viewed from this area and will be seen within the context of the existing structures and activities of the working port.

Construction Phase:

During the construction phase it is anticipated that there will be partial views of the machinery and cranes required to carry out the modifications to the quay wall, installation of the new gantries and the dredging works at Ringaskiddy West, resulting in a slight and negative impact.

Operational Phase:

During the operational phase the impact on views from this location will be not significant and negative as the development is consistent with the existing land use and developments in this area.

Plate 7. 13: Visual 7 - Existing

Plate 7. 14: Visual 7 - Proposed

Visual 8: From junction of Diamond Rd & Fairy Hill, Monkstown, looking south

Existing View:

The elevated location of this viewpoint permits views over the dwellings within this part of Monkstown, across Cork Harbour towards the Port of Cork and the lands to south of Ringaskiddy such as Curraghbinny and Crosshaven. The buildings and structures within Ringaskiddy East and West are visible from this location, such as:

- the ADM jetty and wall, silos, warehouses and tall lighting columns
- quay and deep water berths
- cranes, gantries and container storage areas,
- the port's maintenance & office building

The Martello Tower and residential buildings within Ringaskiddy are also visible from this location. The wind turbines located near the DePuy complex/ Lough More, the Johnson & Johnson Loughbeg complex and the Thermo Fisher Scientific complex at Currabinny, are dominant features against the skyline from this location. Buildings within the Ringpoint Business Park and the Thermo Fisher Scientific complex at Currabinny are visible beyond the structures associated with the Port of Cork lands. The elevated tree covered lands of Curraghbinny Woods and the higher lands within Crosshaven are also visible in the background from this location.

Proposed Changes and Visual Impact:

It is anticipated that there will be partial views of the modifications to the quay wall, the expanded container storage area and the proposed gantries from this location. None of these proposals will break the skyline when viewed from this area and will be seen within the context of the existing structures and activities of the working port.

Construction Phase:
During the construction phase it is anticipated that there will be partial views of the machinery and cranes required to carry out the modifications to the quay wall, installation of the new gantries and the dredging works at Ringaskiddy East and West, resulting in a slight-moderate and negative impact.

Operational Phase:
During the operational phase the impact on views from this location will be slight and negative as the development is consistent with the existing land use and developments in this area.

Plate 7. 15: Visual 8 - Existing

Plate 7. 16: Visual 8 - Proposed

Visual 9: From Scotsman's Road, Monkstown, looking south-east

Existing View:

The location of this viewpoint on the Scotsman's Road on the higher ridge line within Monkstown, permits views over the dwellings on the lower lying lands to the south, across Cork Harbour towards the Port of Cork and the lands to south of Ringaskiddy such as Curraghbinny and Crosshaven. The buildings and structures within the Port of Cork lands are visible from this location, such as:

- the ADM jetty and wall, quay and deep water berths
- silos, warehouses and tall lighting columns
- cranes, gantries and container storage areas,
- the port's maintenance & office building

The Yara building and the National Maritime College to east of the Port of Cork lands are also visible from this location. The Martello Tower and residential buildings within Ringaskiddy are also visible from this location. The wind turbines located near the DePuy complex/ Lough More, the Johnson & Johnson Loughbeg complex and the Thermo Fisher Scientific complex at Currabinny, are dominant features against the skyline from this location. Buildings within the Ringpoint Business Park and the Thermo Fisher Scientific complex at Currabinny are visible beyond the structures associated with the Port of Cork lands. The elevated tree covered lands of Curraghbinny Woods and the higher lands within Crosshaven are also visible in the background from this location.

Proposed Changes and Visual Impact:
It is anticipated that there will be views of the modifications to the quay wall, the expanded container storage area and the proposed gantries from this location. None of these proposals will break the skyline when viewed from this area and will be seen within the context of the existing structures and activities of the working port.

Construction Phase:
During the construction phase it is anticipated that there will be partial views of the machinery and cranes required to carry out the modifications to the quay wall, installation of the new gantries and the dredging works at Ringaskiddy West, resulting in a slight-moderate and negative impact.

Operational Phase:
During the operational phase the impact on views from this location will be slight and negative as the development is consistent with the existing land use and developments in this area.

Plate 7. 17: Visual 9 - Existing

Plate 7. 18: Visual 9 - Proposed

Visual 10: From Strand Rd (R610), Carrigmahon (Scenic Route S54), looking south-east

Existing View:

Cork Harbour and the buildings, cranes and quays associated with the Rushbrooke Docks and Commercial Park in Cobh dominate the view from this location on the Strand Road (R610). The buildings and structures within the Port of Cork lands are also visible, such as:

- the ADM jetty
- the port's maintenance & office building, warehouses and tall lighting columns
- quay and deepwater berths
- cranes, gantries and container storage areas,
- the port's maintenance & office building

The Martello Tower and residential buildings within Ringaskiddy are also visible from this location. The wind turbines located near the DePuy complex/ Lough More, the Johnson & Johnson Loughbeg complex and the Thermo Fisher Scientific complex at Currabinny, are dominant features against the skyline from this location. Buildings within the Ringpoint Business Park are visible beyond the structures associated with the Port of Cork lands. The elevated tree covered lands of Curraghbinny Woods and the higher lands within Crosshaven are also visible in the background from this location.

Proposed Changes and Visual Impact:

It is anticipated that there will be views of the modifications to the quay wall, the expanded container storage area and the proposed gantries from this location. None of these proposals will break the skyline when viewed from this area and will be seen within the context of the existing structures and activities of the working port.

Construction Phase:

During the construction phase it is anticipated that there will be partial views of the machinery and cranes required to carry out the modifications to the quay wall, installation of the new gantries and the dredging works at Ringaskiddy West, resulting in a slight and negative impact.

Operational Phase:

During the operational phase the impact on views from this location will be not significant and negative as the development is consistent with the existing land use and developments in this area.

Plate 7. 19: Visual 10 - Existing

Plate 7. 20: Visual 10 - Proposed

Visual 11: From Whitepoint Drive, Cobh, looking south

Existing View:

The location of this viewpoint within the residential area of Whitepoint, Cobh permits views of Port of Cork lands across Cork Harbour. The dominate features from this location include:

- The rock armoured revetment and quay
- The cranes are a dominant feature against the skyline from this location
- Tall lighting columns, container storage areas and gantries
- The silos and warehouses located within Ringaskiddy West

Ther are also views of the upper sections of the buildings within the Janssen Bio complex, which is partially screened by the topography and dense vegetation location between the complex and the N28 road.

Proposed Changes and Visual Impact:

It is anticipated that there will be views of the modifications to the quay wall, the expanded container storage area and the proposed gantries from this location. None of these proposals will break the skyline when viewed from this area and will be seen within the context of the existing structures and activities of the working port.

Construction Phase:

During the construction phase it is anticipated that there will be partial views of the machinery and cranes required to carry out the modifications to the quay wall, installation of the new gantries and the dredging works at Ringaskiddy West, resulting in a slight-moderate and negative impact.

Operational Phase:

During the operational phase the impact on views from this location will be not significant and negative as the development is consistent with the existing land use and developments in this area.

Plate 7. 21: Visual 11 - Existing

Plate 7. 22: Visual 11 - Proposed

Visual 12: From Brookvale, Cobh, looking south-west

Existing View:

This viewpoint is located within the elevated lands in Cobh at the public open space within the Brookvale residential development, which provides a panoramic view of Cork Harbour and the surrounding landscape. The mature trees and steeple of the church located on Norwood Grove, Rushbrooke are dominate features from this location. There are partial views of the cranes, revetments along the port and buildings within the Port of Cork lands from this location. There are also views of the upper sections of the buildings within the Ringpoint Business Park and the Thermo Fisher Scientific complex at Currabinny. The fields and wooded areas located within the higher lands of Curraghbinny and Crosshaven-Fountainstown areas are visible in the distant background.

Proposed Changes and Visual Impact:

It is anticipated that there will be partial views of the expanded container storage area and the proposed gantries from this location. None of these proposals will break the skyline when viewed from this area and will be seen within the context of the existing structures and activities of the working port.

Construction Phase:

During the construction phase it is anticipated that there will be partial views of the machinery and cranes required to carry out the modifications to the quay wall, installation of the new gantries and the dredging works at Ringaskiddy West, resulting in a slight and negative impact.

Operational Phase:

During the operational phase the impact on views from this location will be not significant and neutral as the development is consistent with the existing land use and developments in this area.

Plate 7. 23: Visual 12 - Existing

Plate 7. 24: Visual 12 - Proposed

Visual 13: From Lower Road, Cobh, looking south-west

Existing View:

The location of this viewpoint on Lower Road, Cobh permits views over the train line, car park and Cobh Playground, which are located along the edge of Cork Harbour. Views of the cranes and silos located with the Port of Cork lands are partially screened by the dwellings within the Whitepoint residential area of Cobh. There are also views of the revetments along the port, container storage areas, gantries and the port's maintenance and office building.

Proposed Changes and Visual Impact:

It is anticipated that there will be partial views of the expanded container storage area and the proposed gantries from this location. None of these proposals will break the skyline when viewed from this area and will be seen within the context of the existing structures and activities of the working port.

Construction Phase:

During the construction phase it is anticipated that there will be partial views of the machinery and cranes required to carry out the modifications to the quay wall, installation of the new gantries and the dredging works at Ringaskiddy West, resulting in a slight and negative impact.

Operational Phase:

During the operational phase the impact on views from this location will be not significant and negative as the development is consistent with the existing land use and developments in this area.

Plate 7. 25: Visual 13 - Existing

Plate 7. 26: Visual 13 - Proposed

Visual 14: From The Black Railings Viewing Point, Lake Rd, Cobh, looking south-west

Existing View:

The elevated position of the Black Railings Viewpoint Point at Lake Road, Cobh, provides a panoramic view of Cork Harbour. This location permits views of the western part of Haulbowline Island, the revetments along the port, container storage areas, gantries and the port's maintenance and office building. Views of the silos and warehouses within Ringaskiddy West are partially screened by the trees within Norwood Park from this location. There are also partial views of the upper part of buildings within the Pfizer complex, the Janssen Bio facility and the Ringpoint Business Park and the wind turbine within the Janssen Bio facility. The fields and wooded areas located within the higher lands of Crosshaven-Fountainstown area are visible in the distant background.

Proposed Changes and Visual Impact:

It is anticipated that there will be partial views of the expanded container storage area and the proposed gantries from this location. None of these proposals will break the skyline when viewed from this area and will be seen within the context of the existing structures and activities of the working port.

Construction Phase:

During the construction phase it is anticipated that there will be partial views of the machinery and cranes required to carry out the modifications to the quay wall, installation of the new gantries and the dredging works at Ringaskiddy West, resulting in a not significant-slight and negative impact.

Operational Phase:

During the operational phase the impact on views from this location will be not significant and neutral as the development is consistent with the existing land use and developments in this area.

Plate 7. 27: Visual 14 - Existing

Plate 7. 28: Visual 14 - Proposed

Visual 15: From Cathedral Place (St. Colman's Cathedral), Cobh, looking south-west

Existing View:

The location of this viewpoint on the elevated lands near St. Colman's Cathedral permits views over Cobh including:

- some of the buildings and mature vegetation located within The Crescent
- the buildings that line Pearse and Casement Squares
- structures with the John F. Kennedy Memorial Park

The structures and buildings on Haulbowline Island are visible across the harbour from this location. There are also partial views of the upper part of buildings within the Pfizer complex, the Janssen Bio facility and the Ringpoint Business Park and the wind turbine within the Janssen Bio facility. This location allows for views of the structures and buildings within the Port of Cork lands, such as:

- The rock armoured revetment and quay
- The cranes, container storage areas, gantries and tall lighting columns
- The silos and warehouses located within Ringaskiddy West

The fields and wooded areas located within the higher lands of Fountainstown-Willowhill area are visible in the distant background

Proposed Changes and Visual Impact:

It is anticipated that there will be views of the modifications to the quay wall, the expanded container storage area and the proposed gantries from this location. None of these proposals will break the skyline when viewed from this area and will be seen within the context of the existing structures and activities of the working port.

Construction Phase:
During the construction phase it is anticipated that there will be partial views of the machinery and cranes required to carry out the modifications to the quay wall, installation of the new gantries and the dredging works at Ringaskiddy West, resulting in a slight-moderate and negative impact.

Operational Phase:
During the operational phase the impact on views from this location will be not significant and negative as the development is consistent with the existing land use and developments in this area.

Plate 7. 29: Visual 15 - Existing

Plate 7. 30: Visual 15 - Proposed

Visual 16: From Haulbowline Bridge, looking west

Existing View:

The location of this viewpoint from the Haulbowline Bridge, connecting Rocky Island to Haulbowline Island, permits views across Cork Harbour towards the Port of Cork. There are partial views of the upper part of buildings within the Pfizer complex and the buildings and wind turbine within the Janssen Bio facility. This location also allows for views of the structures and buildings within the Port of Cork lands, such as:

- The rock armoured revetment and quay
- The cranes, container storage areas, gantries
- Tall lighting columns
- The silos and warehouses located within Ringaskiddy West

Proposed Changes and Visual Impact:

It is anticipated that there will be views of the modifications to the quay wall, the expanded container storage area and the proposed gantries from this location. None of these proposals will break the skyline when viewed from this area and will be seen within the context of the existing structures and activities of the working port.

Construction Phase:

During the construction phase it is anticipated that there will be partial views of the machinery and cranes required to carry out the modifications to the quay wall, installation of the new gantries and the dredging works at Ringaskiddy West, resulting in a slight-moderate and negative impact.

Operational Phase:

During the operational phase the impact on views from this location will be not significant and negative as the development is consistent with the existing land use and developments in this area.

Plate 7. 31: Visual 16 - Existing

Plate 7. 32: Visual 16 - Proposed

Visual 17: From Martello Tower, Ringaskiddy, looking north-west

Existing View:

The location of this viewpoint at the Martello Tower (Protected Structure No. 575) permits views over the Port of Cork and Cork Harbour towards the lands in Monkstown. This location allows for partial views of some of the structures and buildings within the Port of Cork lands, such as:

- The cranes, container storage areas, gantries
- Tall lighting columns
- The quay, cranes, silos and warehouses located within Ringaskiddy West

There are also views of the upper part of buildings within the Pfizer complex, beyond the structures within the Ringaskiddy West part of the Port of Cork. The sloping fields, tree belt, golf course and buildings within Monkstown are visible in the background from this location.

Proposed Changes and Visual Impact:

It is anticipated that there will be partial views of the expanded container storage area and the proposed gantries from this location. None of these proposals will break the skyline when viewed from this area and will be seen within the context of the existing structures and activities of the working port.

Construction Phase:

During the construction phase it is anticipated that there will be partial views of the machinery and cranes required to carry out the installation of the new gantries and the dredging works at Ringaskiddy West, resulting in a slight and negative impact.

Operational Phase:

During the operational phase the impact on views from this location will be not significant and neutral as the development is consistent with the existing land use and developments in this area.

Plate 7. 33: Visual 17 - Existing

Plate 7. 34: Visual 17 - Proposed

Visual 18: From High Road, Cobh (Scenic Route S53), looking south-west

Existing View:

The elevation location of this viewpoint on the High Road in Cobh, permits panoramic views over Cork Harbour, towards the higher lands located to the south-east of Carrigaline. Views of the antennae and crow's nest structure associated with Cobh Garda Station, which is located on Lower Road, the structures associated with the Cove Sailing Club Marina and dwellings within the Whitepoint residential area of Cobh, are also possible from this location. Several of the structures and buildings located within the western part of Haulbowline Island are also visible from this position on the High Road. This location also allows for views of the structures and buildings within the Port of Cork lands, such as: A number of structures and buildings within the Port of Cork area also visible from this location, such as:

- The rock armoured revetment and quay
- The silos and warehouses located within Ringaskiddy West
- The cranes, container storage areas, gantries
- The port's maintenance and office building
- Tall lighting columns

There are also partial views of the dwellings within the residential area of Barnahely and the buildings within the Pfizer complex behind the structures within the Ringaskiddy West. The upper part of buildings and the wind turbine within the Janssen Bio facility are seen against the skyline from this location, the buildings are partially screened by the dense vegetation located on the sloping lands between the facility and the N28 below. The higher lands within the townlands of Curraghbinny, Kilnaglery and Boycestown are also visible in the distant background.

Proposed Changes and Visual Impact:

It is anticipated that there will be views of the modifications to the quay wall, the linkspan pontoon, the expanded container storage area and the proposed gantries from this location. None of these proposals will break the skyline when viewed from this area and will be seen within the context of the existing structures and activities of the working port.

Construction Phase:

During the construction phase it is anticipated that there will be partial views of the machinery and cranes required to carry out the modifications to the quay wall, installation of the new gantries and the dredging works at Ringaskiddy West, resulting in a moderate and negative impact.

Operational Phase:

During the operational phase the impact on views from this location will be slight and negative as the development is consistent with the existing land use and developments in this area.

Plate 7. 35: Visual 18 - Existing

Plate 7. 36: Visual 18 - Proposed

[7.1.1] The 'do nothing' scenario

If these particular redevelopment works are not undertaken it is likely that the land will continue in its current configuration as a working port. However it is likely that some form of redevelopment works, similar in scale to those proposed, will take place on this site in the near future, due to the previously permitted application (ref: PA0035, as modified by PM0010, 304437-19 and 310847-21) and to meet the future demands on the port.

[7.5] Mitigation Measures

Consideration was given to the avoidance of impacts wherever possible during the design of the proposed scheme. However, as with any development some degree of impact is inevitable and wherever possible measures have been proposed to mitigate the adverse nature of these impacts.

[7.5.1] Construction Phase

It is proposed that careful attention will be paid to avoiding any potentially adverse construction-related effects on the local residences and to the wildlife associated with Cork Harbour. Operating a well-managed, organised and planned construction site, with adequate control of construction traffic and working activity, is key to avoiding/minimising such impacts.

Lighting:

- **LV_01** Any lighting required during the construction phase should be located sensitively to avoid unnecessary light spill into the surrounding residential areas and into Cork Harbour.
- **LV_02** Roadway lighting and lighting of construction compounds will be by means of high quality, modern standing fixtures. They will include full cut-off (FCO) and energy efficient lighting where practicable to reduce the impacts of light pollution on the surrounding area and sky.
- **LV_03** The use of flashing, moving, strobe, or blinking lights should be kept to a minimum

[7.5.2] Operation Phase

The careful and considered approach to the layout of the proposed redevelopment is to minimise negative visual impact both locally and from the wider surrounding area.

The key mitigation measures include:

- **LV_04** Trees & hedgerows:
  Due to the nature of the redevelopment works and the current operations within the port there is no opportunity for the implementation of a softworks/ planting scheme to assist in the integration of the proposed structures into the landscape. Therefore it is an important objective to retain the existing vegetation located between the southern boundary of the site and the N28. This helps to retain a mature, established character to the site and provide a unifying, cohesive landscape framework that relates it to the surrounding landscape, as well as being of ecological benefit.
- **LV_05** Colour of Tall Structures:

While the visual appearance of the containers cannot be mitigated against, as the colours depends upon on the owner of the containers, the appearance of the gantries that are located above them, can be managed. The visual appearance of the gantries can be lessened by the use of appropriate colours. The colour shall be based on mid-grey in colour, similar to the colour of the tall cranes installed during Phase 1 of the redevelopment works.

- **LV_06** Lighting:
  Roadway lighting and lighting of working areas will be by means of high quality, modern standing fixtures. They will include full cut-off (FCO) and energy efficient lighting where practicable to reduce the impacts of light pollution on the surrounding area and sky. The use of flashing, moving, strobe, or blinking lights should be kept to a minimum

[7.6] Monitoring

[7.6.1] Construction Phase

Monitoring, particularly during construction phase will be on an ongoing basis and will be crucial at certain stages such as:

- During site establishment stage: prior to any works taking place, clearly identify trees and hedgerows that are to be retained and protected – ensuring tree protection measures are in place. Clearly identify trees and hedgerows that are to be removed.
- During site excavation stage: ensure existing vegetation is being adequately protected and that topsoil is being correctly stripped and stored for landscape reinstatement
- During construction stage: ensure existing vegetation is being adequately protected.

[7.6.2] Operation Phase

- Post-construction stage: periodic visits will be required to ensure that the existing tree belts have not been negatively impacted by the construction works.

[7.7] Cumulative Impacts

There are already a number of tall structures and large facilities that have been constructed within this area that form part of the baseline for this landscape and visual impact assessment such as:

- Port of Cork: Tall cranes, lighting, container storage, quays, the port's maintenance & office building
- Wind turbines: Janssen Bio, DePuy complex/ Lough More, the Johnson & Johnson Loughbeg complex and the Thermo Fisher Scientific complex at Currabinny
- Industrial and pharmaceutical complexes such as: Pfizer, Janssen Bio, Thermo Fisher Scientific, DePuy, Johnson & Johnson

It is anticipated that there will be no significant cumulative effects for the combination of any proposed or planned projects within the vicinity of the Port of Cork and this part of Ringaskiddy.

[7.8] Residual Effects

Given the previously permitted application (ref: PA0035, as modified by PM0010, 304437-19 and 310847-21) and to meet the future demands on the port, the redevelopment of this site is inevitable and it is considered likely that any proposed viable redevelopment will give rise to impacts of a similar nature. The majority of local views, within the Ringaskiddy area, into the subject site are screened by the intervening existing mature tree belts and / or topography, resulting in an imperceptible-neutral to not significant and negative impact on views within this area. Due to the open nature of the lands within the Port of Cork, as clear access to the water is required at most areas, the proposed redevelopment works will by visible or partially visible from the lands across Cork Harbour, such as Monkstown and Cobh. However these proposed changes will be seen from some distance and against the context of the existing port activities and structures, resulting in a not significant-neutral to slight and negative impact on views within this area. It is illustrated within the photomontages that accompany this EIAR (Appendix 10.1) that the structures and modifications that form the proposed redevelopment works will not break the skyline and will be seen within the context of the existing structures and activities of the working port. While none of the proposed measures, as discussed in the previous section, can fully mitigate against the visual impacts of the proposed structures and modifications, it is considered that the proposed redevelopment is consistent with the existing land use and developments in this area. Due to the above reasons and discussions in Section 7.3 of this chapter, it is considered that the surrounding landscape has the capacity to absorb a redevelopment of this scale and nature without any significant and negative impacts in terms of visual and landscape character.

[7.9] Potential Interactions

[7.9.1] Population & Human Health

The proposed redevelopment works have the potential to have landscape and visual impacts as perceived by human beings, however no significant impacts are predicted during the construction or operational phases.

[7.9.2] Cultural Heritage & Archaeology

Section 7.6.3.3 - Visual 17, discusses the view from the Martello Tower (Protected Structure No. 575) located within Ringaskiddy:

> It is anticipated that there will be partial views of the expanded container storage area and the proposed gantries from this location. None of these proposals will break the skyline when viewed from this area and will be seen within the context of the existing structures and activities of the working port.
>
> During the construction phase it is anticipated that there will be partial views of the machinery and cranes required to carry out the installation of the new gantries and the dredging works at Ringaskiddy East and West, resulting in a slight and negative impact.
>
> During the operational phase the impact on views from this location will be not significant and neutral as the development is consistent with the existing land use and developments in this area.

[7.9.3] Transport and Traffic

The construction phase will involve an increase in construction traffic and activities in the local area which has the potential to have a visual impact on the surrounding area, however no significant impacts are predicted during the construction or operational phases.

[7.9.4] Noise & Vibration

The use of noise attenuation measures during the construction phase has the potential to have landscape and visual impacts, however no significant visual impacts are predicted during the construction and operational phases.

[8] Traffic & Transportation

[8.1] Introduction

The Port of Cork Company (POCC) was granted a 10-year Strategic Infrastructure Development (SID) permission by An Bord Pleanála on 28th May 2015 for the redevelopment of the port at Ringaskiddy (Planning reference PA0035). Much of the work permitted under the permission has been completed and the Ringaskiddy Container Terminal commenced operations in 2022. However, some elements of the permitted project remain to be developed. The planning permission expires on the 20th of October 2025, and it may not be possible to complete all the remaining elements of the permission within the lifetime of the current permission.

As it will not be possible to extend the duration of permission of the SID, POCC intend to apply for a 10-year permission to construct the remaining elements of the permitted development. The remaining redevelopment works include the extension to its deep-water berth at Ringaskiddy West, provision of a second Cork Container Terminal at Ringaskiddy East, provision of the roll-on / roll-off ramp and ancillary works. The remaining elements of the permission will require an EIA and AA/NIS.

SYSTRA have been appointed by POCC to assist with the preparation of the updated Strategic Infrastructure Development (SID) application to be submitted to An Bord Pleanála (ABP), in relation to Traffic and Transportation. The Systra Baseline Report (2024) describes the current situation at Ringaskiddy, Tivoli, and City Quays locations.

[8.2] Assessment Methodology

[8.2.1] Study Area

The current study conducts new assessments to describe the existing traffic situation in 2024 at Ringaskiddy and its connecting roads to the Cork City Quay locations, with a special focus on the N28 traffic. It aims to provide greater insight into the traffic issues in these areas in light of the recent traffic survey conducted this year.

The focus of this Traffic Assessment is to provide:

- Information on the travel patterns of POCC-related traffic, including vehicles transporting goods to and from port sites, as well as employees, and understanding their needs and views;
- A summary of current traffic conditions in the study area, in terms of infrastructure for each transport mode, utilisation of the infrastructure, and conditions experienced; and
- A review of national and regional guidelines, along with other transport studies relevant to the study area, specifically detailing the relative objectives and outcomes of each.

The study area for this investigation encompasses the three port sites: Ringaskiddy, Tivoli, and City Quays. It also includes all relevant major connecting roads, such as the N28, N40, Jack Lynch Tunnel, and Dunkettle Interchange. Figure 1 below illustrates the extent of the study area.

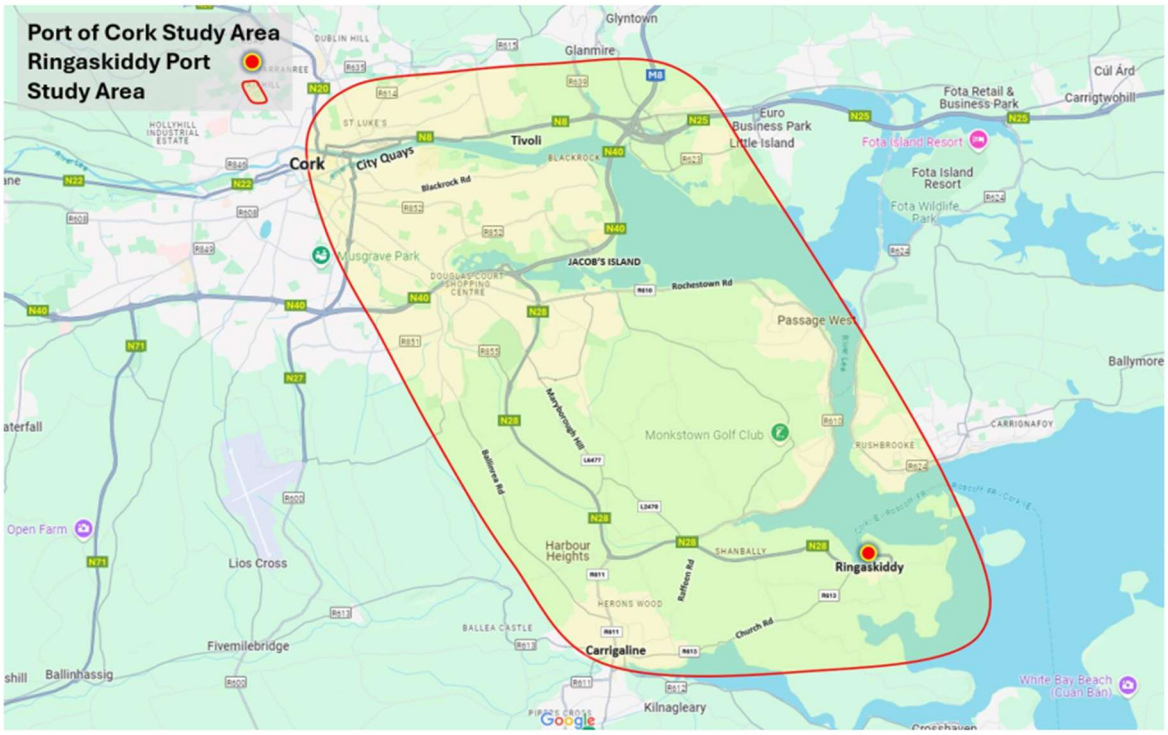


Figure 1. Study Area

[8.2.2] Legislation & Guidance

As part of the Baseline Evaluation, all relevant national, regional and local policy guidelines, along with other transport studies, have been reviewed in the context of this study. The following documents and studies are deemed relevant to the study and have therefore been reviewed:

National Context:

- National Planning Framework; Ireland 2040;
- National Development Plan 2021-2030;
- National Marine Planning Framework;
- National Ports Policy 2013;
- National Investment Framework for Transport in Ireland;
- Climate Action Plan 2024;
- National Sustainable Mobility Policy 2022; and
- Trans-European Transport Network.

Regional Context:

- Regional Spatial & Economic Strategy for the Southern Region. Southern Regional
- Assembly; and
- Cork Metropolitan Area Spatial Plan.

Local Context:

- Cork County Development Plan 2022-2028;
- Cork City Development Plan 2022-2028;
- Port of Cork Masterplan 2050;
- Cork Metropolitan Area Transport Strategy 2040; and
- National Cycle Design Manual.
- Local Improvement Schemes:
- M28 Cork to Ringaskiddy Upgrade; and
- Ringaskiddy Urban Realm and Active Travel Scheme.

[8.2.3] National Planning Framework (NPF) – Project Ireland 2040

The NPF heavily emphasises the importance of Ireland's ports in relation to the country's economic growth. In the context of this development, the expansion of the Port of Cork at Ringaskiddy would allow strategic development sites at the City Docks and Tivoli to be redeveloped into sustainable, mixed-use areas. The redevelopment of these two areas is key to the overall City's regeneration and the extension of port facilities at Ringaskiddy will facilitate this.

The Framework highlights in its National Strategic Outcome 6: 'High Quality International Connectivity' the importance of our airport and port connections to the UK and EU. It states that the National Ports Policy along with the national hierarchal tiering of ports recognises the global trend of increased consolidation of resources which leads to optimum efficiencies of scale. As a Tier 1 port, the Port of Cork is highlighted numerous times in the Framework and in this particular strategic objective, improving access to Ringaskiddy Port is outlined as a critically important infrastructure development for the long-term sustainable development of our ports on a national level. This development evidently answers to both national and European policies while catering for both the current and future needs of Cork's economy.

[8.2.4] National Development Plan (NDP)

The NDP states that strengthening access routes to Ireland's ports through investment in the enhancement of the road and rail network to improve journey times is and remains a government priority. The plan outlines the strategic importance of developing the port's facilities at Ringaskiddy. It states that the project will alleviate the physical constraints, such as the depth of water, of current operations at City Quays and Tivoli, allowing the Port to increase capacity and throughout, diversify customers, cater to the trend of increasing vessel sizes and free the City Quays and Tivoli properties for development and/or divestment. The proposed expansion of port facilities at Ringaskiddy answers directly to this part of the NDP.

[8.2.5] National Marine Planning Framework

The National Marine Planning Framework was published in 2021 and set out to produce a strategic framework for managing how we want to use, protect and enjoy our seas. It dedicates a chapter to the importance of 'Ports, Harbours and Shipping' and outlines in this a critical

challenge for the coming decades. It is expected that freight volumes are likely to increase over the coming years and decades which poses a difficult challenge to the ports in Ireland. The National Marine Planning Framework outlines that the allocation of sufficient space for future growth at our long-term port locations is crucial to addressing this challenge. The proposed expansion of port facilities at Ringaskiddy directly addresses this challenge and acts as a long-term strategic response to it.

[8.2.6] National Ports Policy 2013

The Port of Cork is outlined as being a Tier 1 port in the National Ports Policy (NPP). This means that it is identified as a critical asset in Ireland's national and regional infrastructure framework. There are just three Irish ports included in the European Union's Trans-European Transport Network (TEN-T) as part of the North Sea Mediterranean Corridor and the Port of Cork is one of them. The NPP outlines the government's position on the country's ports performance stating that the ports considered to be of national significance must provide the facilities and capacity which ensure continued access to regional and global markets for our trading economy.

The NPP also outlines the Port of Cork as being particularly important as it is capable of handling the Ireland iShip Index1 and is one of only two ports in Ireland that can manage this. The policy actively supports the Port of Cork's Strategic Development Plan and in particular, the expansion of facilities at Ringaskiddy. The proposed expansion at Ringaskiddy directly aligns with the NPP's strategic vision for the Port of Cork as such.

[8.2.7] Climate Action Plan

The Climate Action Plan (CAP) is a strategic framework in response to Ireland's climate targets and ambitions. The plan outlines a detailed strategy on how the country is to reach climate neutrality by 2050 at the latest. One of the objectives underlined in this plan is to re-evaluate the policy framework for the decarbonisation of ports as part of the overall review of National Ports Policy. The plan also emphasises the need for an overall improvement in rail connectivity to ports in the country.

[8.2.8] Trans-European Transport Network (TEN-T)

The Ten-T network is a network of roads, rail lines, ports and airports which span across Europe and aim to create a better-connected Europe. The core Ten-T network requires a certain standard of infrastructure to be delivered at each of its transport corridors. This standard is set out in the Ten-T Regulation which outlines a number of high priority 'European Transport Corridors', and Ireland are included in two of these; the Atlantic Corridor and the North Sea-Rhine-Mediterranean Corridor.

Reaching the standards that the EU have set for our port facilities is a task of national importance. One of the standards outlined in the Regulations is outlined as;

"The planning, development and operation of the trans-European transport network should enable sustainable forms of transport, provide for improved multimodal and interoperable transport solutions and for an enhanced intermodal integration of the entire logistic chain, thereby contributing to a smooth functioning of the internal market by creating the arteries that are necessary for smooth passenger and freight transport flows across the Union, and by establishing seamless transport connections with neighbouring countries." (5)

In addition to this, it is noted within the Regulations that Ireland does not have any rail connections with any neighbouring countries, and considerations have been made for this. There is a strong emphasis on the development of maritime ports and their importance to the Ten-T network in that they have the potential to make a "substantial contribution to the decarbonisation of transport" by carrying more passengers and freight by sea. The Regulations state that;

"The new overarching concept of the European Maritime Space should be promoted by creating or upgrading short-sea shipping routes and by developing maritime ports and their hinterland connections as to provide an efficient and sustainable integration with other modes of transport." (55)

The proposed development at Ringaskiddy answers directly to the Ten-T's regulations and is a step towards achieving the necessary European standards in Ireland. As one of Ireland's three Tier 1 ports, this development would be of significance on a European scale in this context.

[8.3] Regional Context

[8.3.1] Southern Assembly; Regional Spatial & Economic Strategy for the Southern Region.

The Regional Spatial and Economic Strategy (RSES) states as one of its objectives the plan to invest in the actions outlined in the National Ports Policy. The document highlights a strong understanding of the importance of ports for our international connectivity and how their efficiency impacts the region.

RSES states that investing in the sustainable development of improved access to ports across the region is a key objective within its strategy. The proposed development at Ringaskiddy answers directly to this strategy in that it will create a more efficient, successful port facility for the region with a higher capacity as required, as well as developing a more accessible port on a national and international scale.

[8.3.2] Cork Metropolitan Area Strategic Plan (MASP)

The Cork MASP highlights the importance of seeking investment for infrastructure led growth in the Cork Docklands and Tivoli areas in order to provide high quality, mixed use sustainable urban areas within the core of the city centre. The proposed development at Ringaskiddy is the enabler for such regeneration in the Cork Docklands and Tivoli areas as it removes the port operations from these sites and allows for such transformative developments to begin an unhindered development phase.

The plan outlines the importance of the Port of Cork as a strategic asset and highlights the importance of investment in Tier 1 port activity. The proposed Ringaskiddy port expansion will directly answer to this by vastly improving efficiency in connectivity and capacity at the Port of Cork, further strengthening one of Ireland's Tier 1 ports.

[8.4] Local Context

[8.4.1] Cork County Development Plan

Ringaskiddy is identified as a strategic employment location in the Cork County Development Plan (CDP). The plan is clear on its view that the strategic relocation of Port of Cork facilities

to Ringaskiddy is vital to the future success of not just the Cork Harbour area and the Port of Cork, but also of the Southwest region as a whole.

The CDP outlines in Objective TM 12-15 the plan's goal of:

"Ensuring that the strategic port facilities at Ringaskiddy, Whitegate and Marino Point have appropriate road transport capacity to facilitate their sustainable development in future years."

The upgrades to the M28 road from Cork at the Bloomfield Interchange to Ringaskiddy are part of the proposed development and answer directly to the targets of the CDP. There has been extensive preparatory works completed on the M28 and this project aims to significantly increase container trade.

The CDP promotes the Port of Cork as being crucial to the future growth of the economy in the region as well as being a significant employment location. It outlines its understanding of the future growth in shipping trends that the port will have to cater for and expresses the need for a larger capacity at Ringaskiddy to respond to this challenge. The CDP also highlights the positive impact this development will have on Cork City Centre as it will free up the space on the City Docks and Tivoli to make room for sustainable, urban, mixed-use developments on the waterfronts of these two sites. Policy Section 8.7.17 supports the proposed development and sets out to enhance the efficiency of port operations in Ringaskiddy through the accommodation of larger ships. This is possible through the larger water berth in Ringaskiddy in comparison to the city's facilities as it is a seaport rather than the city's river port.

343ha of land in Ringaskiddy is zoned for industrial use as of the CDP 2022. Along with the proposed concentration of port operations in the area, the CDP is outlining its intention to further promote Ringaskiddy as a main employment area in the county, likely leading to an intensification of traffic in the area in the coming years. Ringaskiddy is one of the areas highlighted in the BusConnects plan and so the development of a high-quality road network connecting the area is becoming more crucial to the development of the port and the zoned industrial land.

Under the CDP's Freight and Ports section (12.17) it is outlined that the plan aims to:

- Secure the appropriate infrastructure for the effective movement of goods, especially to and from the region's ports; and
- Facilitate the planned development of port infrastructure to enhance the region's sustainability and general economic competitiveness.

The plan necessitates the completion of these objectives and emphasizes the impact of Brexit on the demand for improved freight and port facilities and services.

The County Council emphasizes further support for the proposed development in Section 1.7.26 of Volume 4 stating:

"The Plan supports the Port of Cork's proposals to expand its facilities in Ringaskiddy so that port centred operations and logistics can become more efficient through the accommodation of larger ships and so that port traffic can directly access the National Road Network without passing through the city centre."

The County and City Councils' overarching aims align here in that both see the removal of port traffic from the city centre as a priority for the sustainable development of their respective Local Authority areas. Not only would this development see the abovementioned efficiency of port operations achieved, but it would also achieve a reduction in traffic congestion in the city centre

and the freeing up of brownfield sites in the strategic development areas of Tivoli and City Docks.

[8.4.2] Cork City Development Plan

The Cork City Development Plan (CCDP) 2022-2028 recognises the Port of Cork as being a port of national significance which drives economic development in the Cork region. The plan actively supports the relocation of port facilities from the City Docks and Tivoli to Ringaskiddy so that sustainable urban quarters on the City Docks and Tivoli waterfronts can be developed. The plan emphasizes the significance of these developments in reaching Cork's population and housing targets within the duration of this plan. The CCDP also outlines the Local Authority's commitment to supporting the Port of Cork's role as a nationally important strategic asset during its relocation to Ringaskiddy.

[8.4.3] Port of Cork Masterplan 2050

In conjunction with the National Ports Policy, a masterplan was created to act as a strategic framework to guide development at the Port of Cork to the year 2050. The masterplan outlines the vision for how the port will become solely a seaport, moving all port activities from the river port in the City Centre, to the sea port at Ringaskiddy.

[8.4.4] Cork Metropolitan Area Transport Strategy (CMATS)

CMATS was developed with the objective of creating a coordinated land use and transportation strategy for the Cork Metropolitan Area. It sets out a framework for the planning and delivery of transport infrastructure and services to support the CMA's development in the period up to 2040. The strategy discusses the importance of freight, delivery and servicing to the area in that the efficient movement of goods and services is vital to the area's economic competitiveness. The strategy highlights this by stating that 65% of our GDP is based on the export of goods and services whereas the EU-25 average is 30%. The relocation of port facilities to Ringaskiddy will dramatically increase the efficiency of imports and exports through the port of Cork.

The strategy looks at the proposed development through a transport lens and hence highlights how the relocation of port facilities to Ringaskiddy would free up a number of strategic brownfield sites which would allow for sustainable development along Cork's future sustainable travel and light rail corridor.

[8.4.5] National Cycle Design Manual

The Cycle Design Manual offers advice on delivering cycle infrastructure in Ireland and draws on the experience of delivering such infrastructure over the past decade as well as learning from international best practise and recognises the need to deliver this infrastructure for all ages and abilities.

[8.4.6] Local improvement Schemes

[8.4.6.1] M28 Cork to Ringaskiddy Upgrade

Figure 2 below shows the indicative route of the N28 upgrade. This upgrade consists of 12.5km of road connecting Cork at the Bloomfield interchange to Ringaskiddy that is to undergo improvements as part of the overall development of a successful relocation of port facilities to

Ringaskiddy. As part of the TEN-T core network, the Port of Cork is required to be served by a high-quality road network and this upgrade is to make sure the port at Ringaskiddy meets the requirements of this network. This improvement would see the existing N28 from the Bloomfield Interchange to Ringaskiddy upgraded to a motorway/dual carriageway. Preparatory works have already taken place and the project is now at the tender stage.

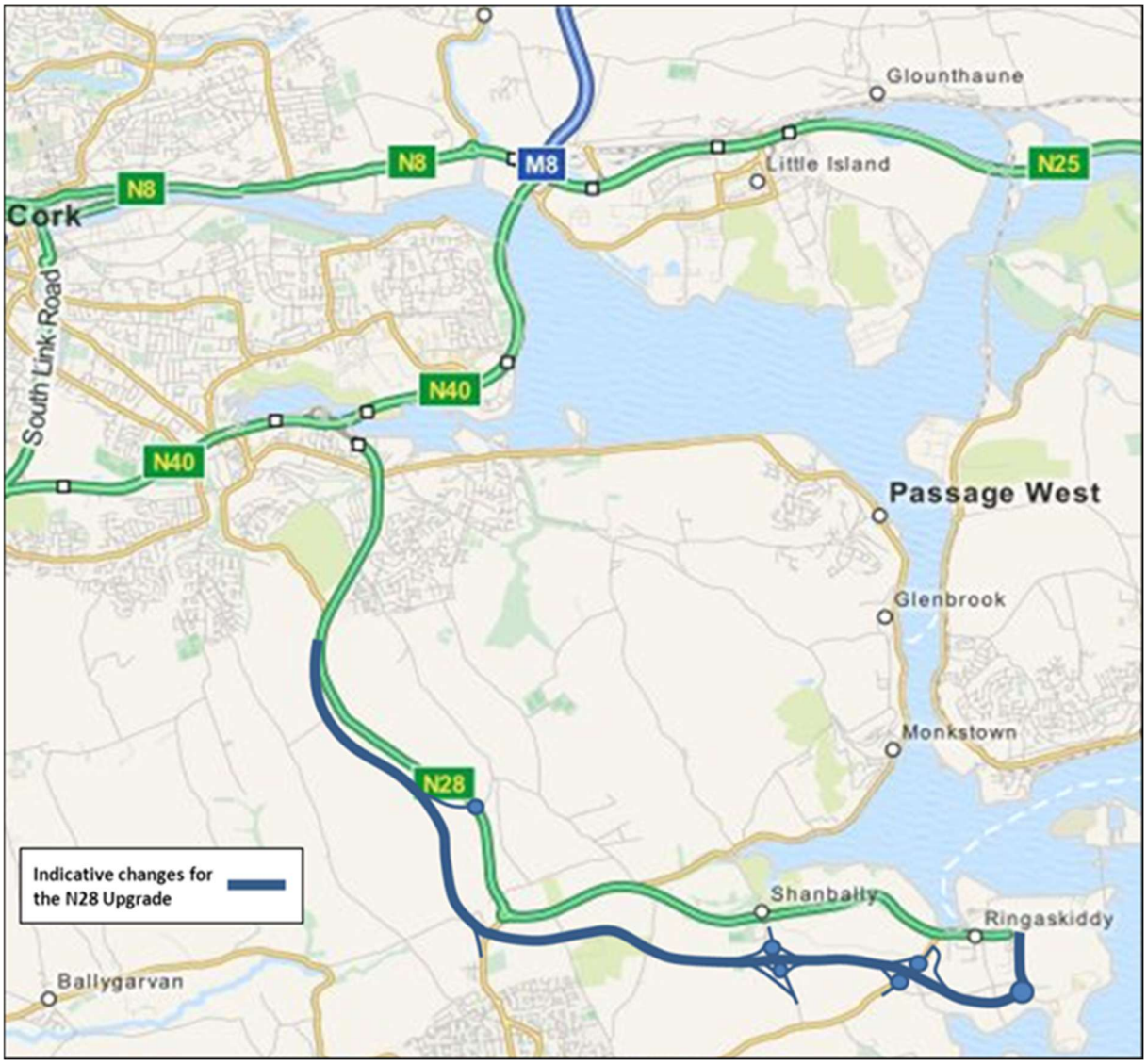


Figure 2 Indicative Route of the N28 Upgrade

[8.4.6.2] Ringaskiddy Urban Realm and Active Travel Scheme

Works have recently commenced in Ringaskiddy to provide an enhanced public realm in the village centre as well as a new active travel route along the existing N28, from the Port of Cork entrance to the car park at Gobby Beach. This will see the development of improved pedestrian crossing facilities in the village centre as well as widened footpaths and the provision of cycle infrastructure to promote active travel in the area and reduce car dependency.

[8.4.7] Data Sources

The traffic assessment considers Census Data from 2022.

Systra undertook Automatic Traffic Counts (ATCs) at 10 locations in the Ringaskiddy and wider traffic study area. The ATC location Map is shown below.

Junction Turning Counts were also undertaken in the JTC locations shown below.

The general profile of traffic volumes for containers as projected for the 2014 EIS was also considered.

AADT values from TII counters are referenced in this Chapter.

[8.4.8] Site Visits / Surveys

In order to facilitate an understanding of the transport environment and the general traffic conditions experienced, a series of site visits were undertaken in October and November 2024.

During the site visits, the following actions were undertaken:

- Detailed observations of current traffic management arrangements and their effects on each mode of transport;
- An examination of the conditions experienced by each type of road user, including pedestrians (such as school children), cyclists, cars, buses, and heavy goods vehicles);
- An analysis of travel behaviours of people [travelling] within the study area;
- Observations of local land uses and their influence on traffic and transport arrangements; and
- The compilation of an extensive set of photographic records.

In addition to the site visits detailed above, a series of traffic surveys were conducted in November 2024. These surveys were aimed at developing an understanding of the existing traffic conditions in the study area, which will later be used in the development of the POCC Strategic Traffic Model.

The traffic surveys undertaken for this study include the following:

- Junction Turning Counts (JTCs) at 33 junction locations along the N28, Ringaskiddy, Carrigaline, and key junctions near the city quays, as well as those that directly impact traffic to these areas;
- Automatic Traffic Counts (ATCs) at 10 link locations where traffic data is not captured by the defined JTCs, including some link locations deemed important for monitoring traffic, such as Ballinrea Road.
- Journey Time (JT) surveys on the national roads within the study area, divided into four sections. These sections cover the N28 from Ringaskiddy to the N40 (Douglas Flyover); from there to Blackpool via the N27-N20; from Blackpool to the Dunkettle Interchange via the N8;
- and finally, the JT survey concludes back at the Douglas Flyover, completing the loop.

Chapter 4 of the baseline report provides detailed information on the traffic surveys, including location maps for each, and discusses the existing traffic movements.

[8.5] Baseline Environment

This chapter considers the Port Access Corridor (i.e. the N28, N40, N8 and N25) in a transportation context and considers the following aspects:

- Overview of the N28 Corridor and its Environs; and
- Evaluation of Census Data.

[8.5.1] Overview of the N28 Corridor and Its Environs

[8.5.1.1] Land Use

The primary land use of Ringaskiddy is industrial and employment-related, with some residential, educational, and recreational land uses. The land uses which represent key destinations for trips in the Ringaskiddy area are located outside Ringaskiddy village, which is home to numerous large multinational companies.

In addition, the large deep-water harbour port facility is located in Ringaskiddy which serves as a hub for international freight and passenger traffic, including the weekly continental passenger ferry between Cork and Roscoff, which arrives in Cork every Saturday.

[8.5.1.2] Road Hierarchy

The roads in the Ringaskiddy study area include Motorway and National Primary Roads, National Secondary Roads, and Regional Roads. Figure 3 below illustrates the road hierarchy in the study area.

The national primary roads pass through the study area are as follows:

- N28 – Cork City to Ringaskiddy: This route offers connections from the wider national road network via the N40 to the major employers based in Ringaskiddy and Carrigaline, as well as to the national sea freight port and passenger terminal in Ringaskiddy;
- N40 – Cork South Ring Road: This major national distributor road allows access to the wider national road network, including the M8/N8 and the N25, via the Dunkettle interchange; the N27 via the Kinsale Road Interchange; the N20 via the N27 and the City Centre; and the N22 and N71 via the Bandon Road Interchange.
- M8/ N8 – Cork City to Dublin;
- N20 – Cork City to Limerick City;
- N22 – Cork City to Tralee/ Killarney to the west;
- N25 – Cork City to Waterford/ Rosslare Europort to the east; and
- N27 – Cork City to Cork Airport.

There is one National Secondary route in the study area, which is: N71 – Route between Cork City and Bandon, extending further south and south-west which can be accessed via the N40 South Ring Road or the N22.

The following are the regional and third-class roads in the study area:

- R610 – Cork City through Douglas and Passage West;
- R618 – Inniscarra Road;
- R635 – North Ring Road; and
- R639 – the old N8 primary road.

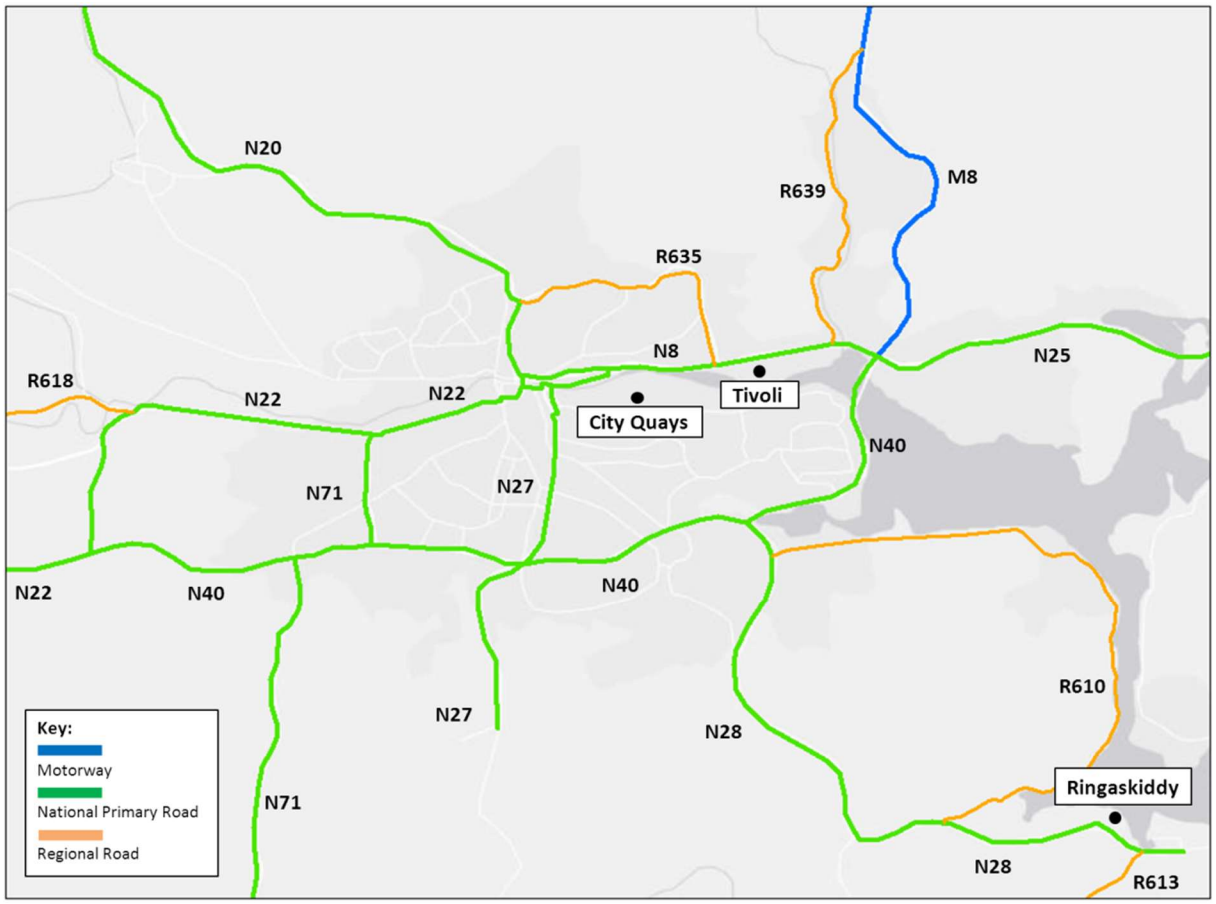


Figure 3 Road Hierarchy

[8.5.2] Evaluation of 2022 Census Data

This section provides the essential demographic context to the study area. It includes information about population, age and gender, car ownership, mode of transport, and journey time to work or education.

The data in this section is provided by the Central Statistics Office of Ireland (CSO), which offers information for this area through Small Area Population Statistics (SAPS) and Electoral Divisions (EDs).

This information is a crucial element in understanding how the transportation system operates in the study area and why it functions in a particular manner.

Figure 3 above shows the extent of the port access corridor study area that has been considered for the evaluation of the census data.

Table 2.1 below shows the population of Ringaskiddy, Cork City, and Cork County based on the 2022 census, as well as the figures from the 2016 census.

Area	2016 POPULATION	2022 POPULATION	% CHANGE
Ringaskiddy SAPS	1,649	1,702	3.21%
Ringaskiddy EDs: Carrigaline, and Monkstown	13,204	14,511	9.90%
Cork County	417,211	360,152	-13.67%
Cork City	125,657	224,004	78.26%

Table 2-1 Study Area Population

[8.5.3] Population

The 2022 Census data identify six SAPS for Ringaskiddy: 47072038, 47072039, 47072040, 47072041/2042, 47072002, and 47261001.

According to the CSO records shown in **Table 2.1**, the total population of the Ringaskiddy area, as calculated through SAPS, was 1,702 in 2022. This represents a 3.21% increase from the 2016 population record of 1,649.

In 2022, the population of the Ringaskiddy EDs: Carrigaline and Monkstown, was 14,511, representing a 9.90% increase from the 2016 figure of 13,204. It should be noted, however, that these EDs also cover areas outside of Ringaskiddy, such as Carrigaline, and therefore do not accurately reflect the population change in Ringaskiddy itself.

The 2022 census data for Cork City and County indicates that the County experienced a population decrease of 13.67%, declining from 417,211 in 2016 to 360,152 in 2022. In contrast, Cork City's population increased by 78.26%, rising from 125,657 in 2016 to 224,004 in 2022. This growth may be attributed to the overall population increase in the region, as well as the expansion of the Cork City area in 2019, which now encompasses a portion of the county's

[8.5.4] Age Distribution

Understanding the age distribution of a population in a given area is crucial for evaluating travel behaviour patterns. For instance, if the age distribution indicates a predominantly young population, much of the traffic is likely directed towards schools, colleges, or workplaces.

Figure 4 below shows the number of males and females in each age bracket in the Ringaskiddy area, as well as the total number in each age bracket. The total population in the area is 1,702, comprising 837 males and 865 females, according to the 2022 Census data.

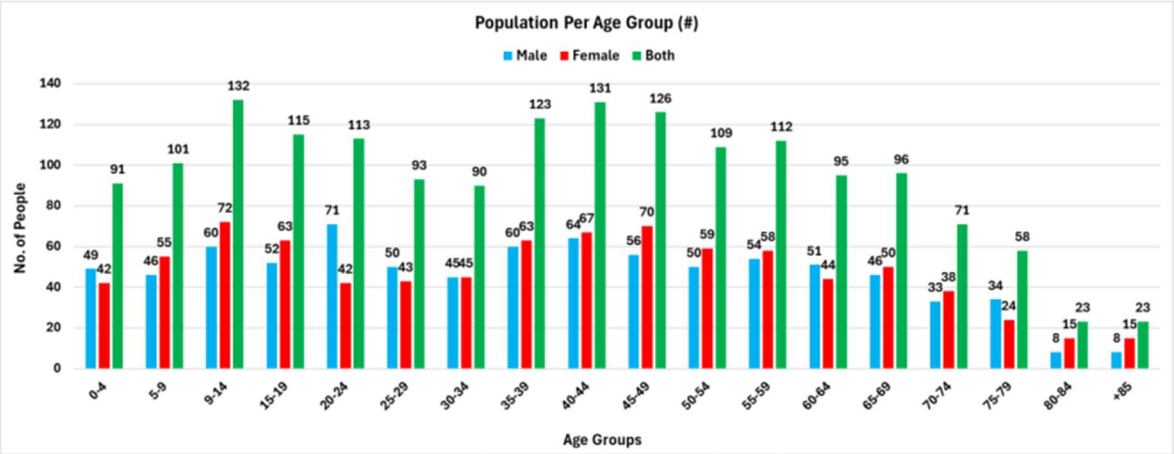


Figure 4. Age Groups by Gender (Counts)

Figure 5 also illustrates the percentage of the population, both male and female, in each age group relative to the total population in Ringaskiddy. This figure indicates that the age distribution is relatively even across most age ranges below 65, with the largest populations observed in the 9-14 age range, followed by the 40-44, 45-49, and 35-39 age brackets. The chart shows a low percentage of the population, around 10% of the total, to be above the age of 70.

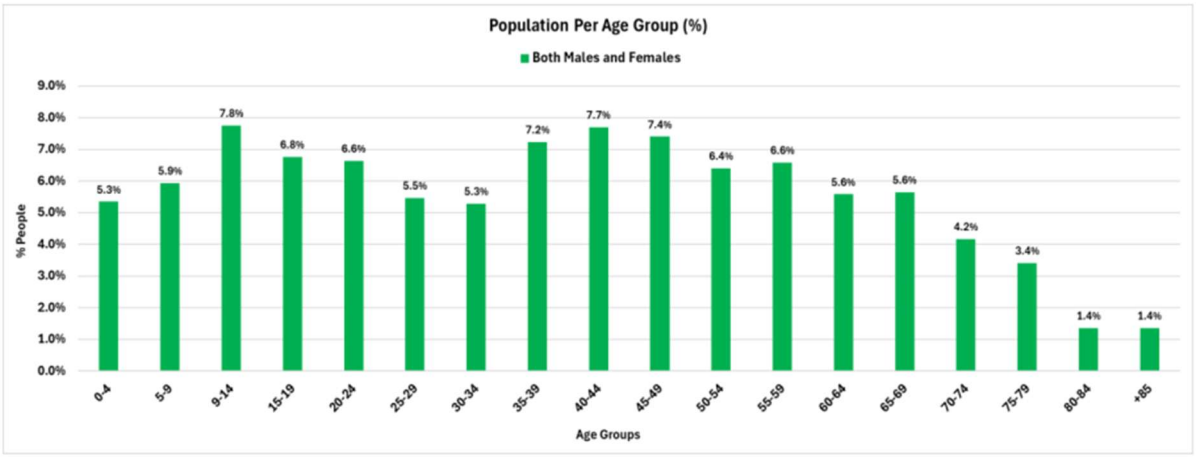


Figure 5. Age Groups by Gender (Percentage)

The metrics in this section could suggest that the area is relatively young, home to many families in active age ranges, and thus experiences relatively busy work and school traffic.

[8.5.5] Car Ownership

Car ownership is another key factor in understanding travel pattern behaviour. The availability of a car is a critical consideration when choosing a travel destination and mode of travel. For those without access to a car, accessibility to education, employment, and public facilities is limited to walking or cycling distances, or to areas served by the public transport network.

Figure 6 below demonstrates the percentage of car ownership per household in Ringaskiddy, Cork City, and County Cork. This data represents the percentage of households in each of these regions that have no car, one car, two cars, three cars, and more than four cars per household.

The data in Figure 6 shows that the level of car ownership in all three regions is relatively high, with over 34.5% and 30.6% of households in all three regions having at least one and two cars, respectively.

Car ownership in Ringaskiddy is relatively high, with 42.4% of households having two cars and 34.5% having one car. Only 6.9% of households have no car. The remaining households have three or more cars. This may indicate a reliance on private car transport as the dominant mode of transport in Ringaskiddy due to various reasons, including but not limited to the inadequate availability and frequency of public transport services, and long distances to the city centre for walking and cycling. The highest percentage of households (11.6%) with three or more cars may also indicate the availability of free car parking spaces, in addition to the households' financial capability to afford three or more cars.

A similar pattern to Ringaskiddy can be seen in County Cork, with slightly lower percentages for households with at least one car or more, and a slightly higher percentage (8.5%) of households with no car at all.

The car ownership pattern in Cork City differs somewhat from those in Ringaskiddy and County Cork. The highest car ownership is among households with one car, which is higher than in the other two regions. However, unlike the other regions, Cork City also has the highest percentage (19.8%) of households with no car. This can be attributed to various factors, including but not limited to the availability of car parking spaces in the city, the high cost of parking where applicable, proximity to the city centre accessible by walking and cycling, and better coverage of public transport services that reduces the need for owning a car.

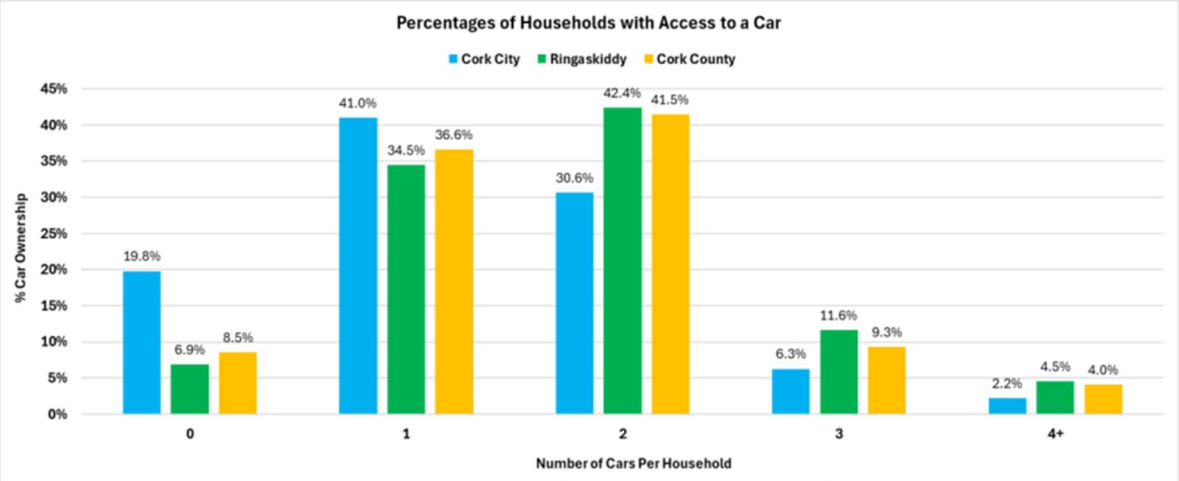


Figure 6. Percentage of Households with access to Car

Looking at the results in this section, the high level of car ownership can be attributed to the need for cars in rural areas, where development is more dispersed, making facilities inaccessible by walking or cycling. Dispersed populations are also challenging to serve with cost-efficient public transport. Consequently, private transport is often the only feasible mode of transport in rural areas such as Ringaskiddy.

In urban areas, there is generally a greater opportunity to access employment and education by walking, cycling, and public transport. Therefore, the need for a car is significantly reduced, and it is sometimes more cost-efficient not to own a car. Car parking within urban areas is also more restricted, which can limit the number of cars per household. This is illustrated in Figure 4, which shows much lower car ownership in Cork City compared to the surrounding, more rural, areas.

[8.5.6] Automated Traffic Counts (ATC) Overview

The ATC section of the traffic survey was conducted using 10 ATC sites. These were spread out across the study area at significant points in order to identify the existing trends and issues with regard to traffic in the surrounding road network.

[8.5.6.1] AM Traffic Flows

As outlined, the primary focus of the baseline investigation is to assess the impact of traffic movements to and from Ringaskiddy Port on the N28. For this purpose, and with regard to the total traffic flow in Table 4.4 of the Systra baseline report, it was deemed necessary to investigate the traffic flow at Shannonpark Roundabout in more detail.

Overall, it can be seen that the roundabout receives a significant amount of traffic from all directions. The N28 movements (in Arm A) carry the highest amount of traffic, with 1,222 vehicles entering the roundabout from the north and 1,357 leaving the roundabout towards the north (Bloomfield). A total of 944 vehicles travel towards Ringaskiddy (Arm B), and 539 come from this area. The traffic coming from Carrigaline (Arm C) is also significant, with 1,021 vehicles during the AM peak hour. All of this, in addition to the above, shows the important role of the N28 in catering to the main traffic in the study area.

[8.5.6.2] PM Traffic Flows

Similar to the traffic trend during the AM peak hour, the Shannonpark roundabout receives a significant amount of traffic from all directions. The N28 movements (Arm A) carry the highest volume, with 1,079 vehicles entering the roundabout from the north and 1,363 leaving towards the north (Bloomfield). As observed in the AM peak flows, this highlights the crucial role of the N28 in accommodating the main traffic in the study area.

A total of 462 vehicles travel towards Ringaskiddy (Arm B), which is lower than the AM peak traffic for this movement (944), while 896 vehicles come from this area (which is higher than its AM peak flow of 539 vehicles). This indicates higher traffic movement towards the Ringaskiddy port in the AM and more traffic from it during the PM.

Traffic coming from Carrigaline (Arm C) is also more significant in its westbound direction (950 vehicles) than eastbound (800 vehicles), further indicating a higher volume of outbound flows from the Ringaskiddy area compared to inbound flows.

[8.5.7] Traffic Flows Overview

Annual Average Daily Traffic (AADT) data provided by TII was reviewed. This data presents the average amounts of traffic which pass in both directions on an annual basis, at select locations. There are 10 AADT sites which give an overview of the current traffic situation in the area. All AADT figures presented in Table 3-1 are the 2024 figures except for site no.9 at Dunkettle which is showing the 2022 data. This is because there was no AADT data collected during 2023 and 2024 during the redevelopment of the interchange. The data for the 10 locations are presented in Figure 7 below.

Table 3-1: AADT and % HGV

Location ID	AADT	%HGV
1	10,710	9%
2	25,690	5%
3	48,341	3.30%
4	87,496	3%
5	71,805	3.60%
6	73,983	4.20%
7	69,833	4.60%
8	31,952	4.60%
9*	37,115	5.30%
10	56,899	4.70%

* 2022 Data

Figure 7: AADT Location Map

Table 4-1 below shows a comparison of the current 2024 data taken from TII as outlined above, and of modelling predictions for 2033 AADT with the Port Redevelopment operational. The modelled 2033 scenario was carried out to inform the original 2014 EIS, which assessed the traffic impacts of the proposed redevelopment using the Port of Cork Strategic Traffic Model (PoCSTM). Two scenarios were modelled in 2014, with traffic modelled *without* the port redevelopment (Do minimum – DM), and *with* the Port Redevelopment operational (Do Something – DS) as outlined in Appendix 8.5. As the Port Redevelopment is partially complete, the DM scenario is not considered further.

This model assumed the Dunkettle Interchange upgrade, and the full N28 upgrade were in place, the former of which is operational, but the latter is thus not yet finalised.

Table 4-1: Comparison of current scenario and 2033 modelling predictions

Location id	Current 2024 AADT	2033 AADT inclusive of Port Redevelopment (DS)
1*	10,710	7,027

		15,849**
2*	25,690	4,189
		28,347**
3	48,341	40,011
6	73,983	73,150
7	69,833	69,750
8	31,952	43,238
9	37,115	71,555

*In the modelled 2033 scenario, the upgraded N28 is operational and thus data is taken from two locations to correspond with locations from TII data.
**This data was taken from the 2014 modelled data from the upgraded N28 proximal to TII locations.

Locations 4, 5 and 10 from the TII data were not modelled as part of the 2014 EIS.

The AADT data and modelling shows capacity for increases in traffic associated with the Port Redevelopment.

[8.5.7.1] Traffic Flows at Ringaskiddy Port Overview

Further to the available information on AADT on key transportation routes, baseline information was also gathered indicating traffic flows at Ringaskiddy Port (Systra, 2024). This information is seen in Appendix 8.2 (EIAR Volume IV) and summarised below.

Figure 8 shows a total of 3,607 vehicles exiting the Ringaskiddy Port between 06:00 and 20:00, of which 2,535 are HGVs, accounting for 70.3% of all traffic.

The hourly traffic profile in Figure 9 indicates a sharp rise in the number of HVs leaving the port between 07:15 and 08:15, with approximately 60 HVs per hour. There is another peak at 10:00-11:00 showing 72 HVs per hour, with this trend continuing until 13:00, after which it gradually declines.

The LV traffic leaving the port is generally low during the day. This traffic flow is primarily associated with port employees. The data supports this observation, showing a gradual increase in LV flows from 3 vehicles in the early morning to 35 vehicles between 16:45 and 17:45. The highest volume of LVs exit the port between 18:00 and 19:30.

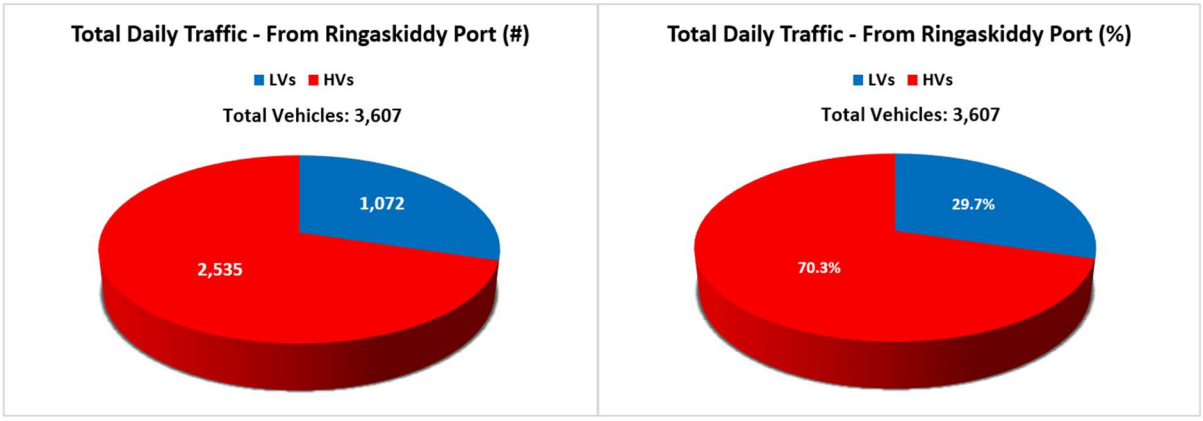


Figure 8 Share of Daily Traffic – From Ringaskiddy Port (Port Exit)

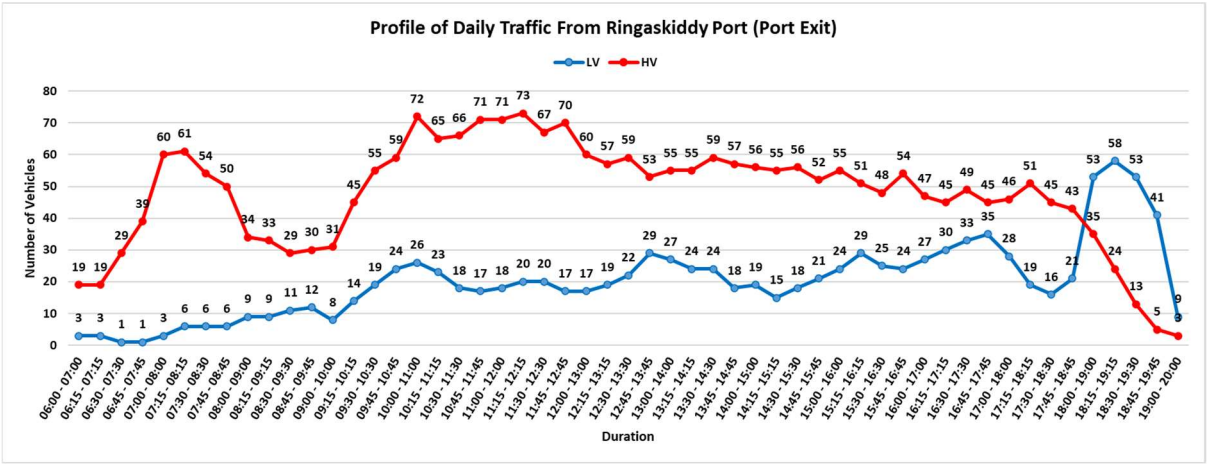


Figure 9 Daily Traffic – From Ringaskiddy Port (Port Exit)

As shown in **Figure 9**, a total of 3,423 vehicles enter Ringaskiddy Port between 06:00 and 20:00 on a typical day, of which 2,462 are HVs, accounting for 71.9% of all traffic.

Figure 11 illustrates two peak periods for the HV traffic entering the port. The first occurs between 09:15 and 10:30, and the second between 14:15 and 15:30, with 97 and 78 HVs per hour, respectively. The early morning period has a smaller peak, with 62 HVs per hour occurring between 06:30 and 07:30, after which this traffic flow decreases until 09:15, as outlined above. This is likely due to many HVs entering and leaving the port earlier in the morning to avoid the morning peak congestion on the N28.

The LV traffic profile begins with its highest volume, 58 vehicles, between 06:15 and 07:15, and then gradually decreases throughout the day. This is reasonable because these flows are predominantly related to employees, and delivery vans, who enter the port in the morning and leave the port between 18:00 and 19:30 in the evening.

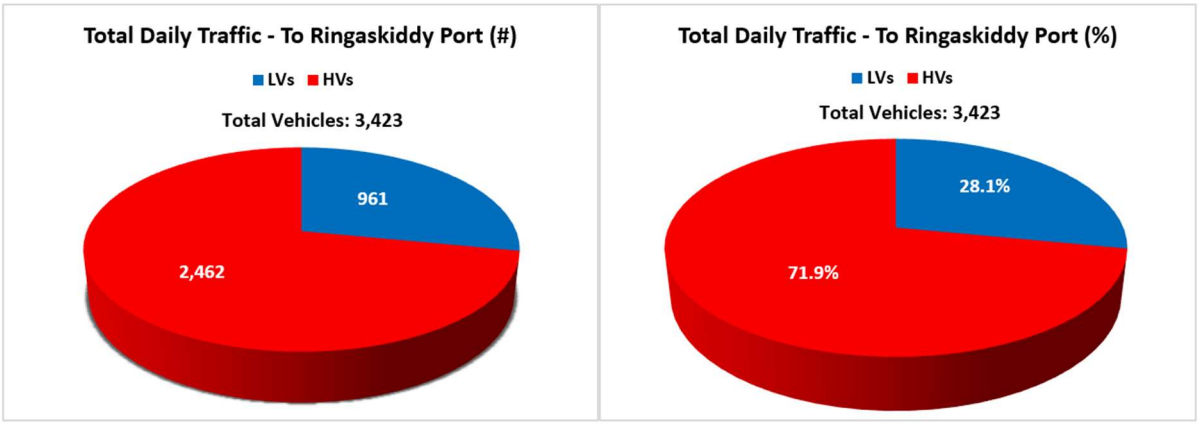


Figure 10 Share of Daily Traffic – To Ringaskiddy Port (Port Entrance)

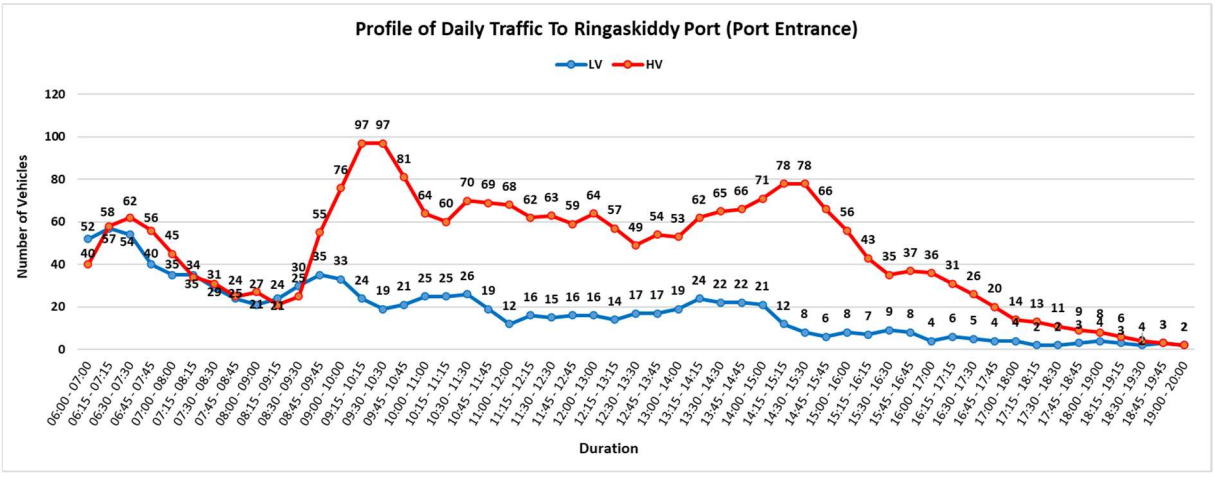


Figure 11 Profile of Daily Traffic to Ringaskiddy Port (Port Entrance)

[8.6] Potential Impacts

[8.6.1] Evaluation of Potential Effects

Following on from the identification of the baseline environment, the available data was utilised to identify and categorise potential effects likely to affect the local road network used for the Haul Route as a result of the Development.

The statutory criteria (EPA, 2022) for the assessment of effects require that likely effects are described with respect to their extent, magnitude, type (i.e. negative, positive or neutral) probability, duration, frequency, reversibility, and transboundary nature (if applicable).

The descriptors used in this Environmental Impact Assessment Report (EIAR) are those set out in EPA (2022) 'Glossary of Impacts'. Effects may be categorised as follows: •

- Direct: where the existing traffic and transport environment in proximity to the Development is altered, in whole or in part.

- Indirect: where the traffic and transport environment beyond the Development is altered by activities related to the construction or operation of the Development.

- No Effect: where the Development has neither negative nor positive effect upon the traffic and transport environment.

[8.6.2] Sensitivity

The sensitivity of the local transport infrastructure has been identified utilising the criteria outlined within the TII Guidance. These criteria are outlined within Table 5-1 below.

Table 5.1: Receptor Sensitivity

Importance	Description
High	Receptors of greatest sensitivity to changes in traffic flow including: People whose livelihood depends upon unrestricted movement within their environment including commercial drivers and companies who employ them, local residents, schools and colleges.
Medium	Traffic flow sensitive receptors including: People who habitually pass through the area, but whose livelihoods are not dependent on free access. Would also generally include: congested junctions, community services, parks, businesses with roadside frontage and recreation facilities.
Low	Receptors with some sensitivity to changes in traffic flow: People who occasionally use the road network. Would also include: public open spaces, nature conservation areas, listed buildings, tourist attractions, residential roads with adequate footway provision and churches.
Negligible	Receptors with very low sensitivity to traffic flows: People not sensitive to transport effects. Would also refer to receptors that are sufficiently distant from the affected roads and junctions.

[8.6.3] Magnitude

The magnitude of potential impacts has been defined in accordance with the criteria provided in the 2022 EPA publication 'Guidelines on the information to be contained in Environmental Impact Assessment Reports'.

The magnitude of the effect on the road network will determine the significance of any effects associated with the increase. An increase in traffic flows on existing roads with a low level of service which are experiencing capacity issues will result in significant effects on the road network.

[8.6.4] Significance of Effects

An assessment has been made of the significance of effects taking into account the sensitivity of the receptor, effect magnitude, duration and the likelihood of the effect. In consideration the of traffic data for all road links professional judgement has been applied to assess the significance of the effects.

[8.6.5] The 'do nothing' scenario

In the 'do nothing' scenario existing traffic volumes would remain similar to those outlined in the baseline assessment above.

[8.6.6] Construction Phase

The works are all taking place within the private lands at the Port of Cork, therefore the impacts from construction will be most notable on the adjacent national routes (N40 and N28). As noted in the previous sections, these roads are currently experiencing congestion during the AM and PM peaks. There is a high volume of traffic spread over the peak periods with ongoing travel delays.

The largest impacts on traffic will come from the HGV's delivering concrete which is anticipated to be 5-6 truck loads per day for small quantity pours. There will be a limited number of large pours which will require up to 25 truck loads per day. There may be a requirement to import infill material which will be imported at a rate of maximum 5-10 loads per day. The importation of steel required for construction will be via sea delivery and therefore will have no impact upon the traffic and transportation. Other material considerations are those of the dredged material. This will be disposed of at sea (with applications already submitted to EPA) and thus will have no impact upon traffic and transportation.

Further consideration is given to the movement of the vehicles of construction workers. These are anticipated to be 25 vehicles, likely entering and exiting at peak travel times, with limited movements during the day.

Considering this, the impact of construction traffic generated by the redevelopment of Port of Cork is anticipated to be negligible.

[8.6.7] Operation Phase

Given the vast majority of berth operations are now in place and this development represents an expansion of space rather than an intensification of development, operation phase impacts from traffic are not anticipated, over and above those envisaged in the RPS 2014 studies.

In the Ringaskiddy Re-development EIS, the 2033 the traffic modelling results show that, with the N28 Upgrade in place, there is significant spare road capacity to cater for the development HGV traffic levels during the AM and PM Peak periods along the N28. The 2033, the Dunkettle Interchange Upgrade is also complete, and this greatly improves the operating environment on the N40.

The aforementioned impact assessment applies equally to the current proposed development as the original modelled scenario included for the development of CCT 2 and DWB. The current cap of 322,000 TEU will remain in place until completion of the M28.

The development therefore is considered to have a negligible impact.

[8.7] Mitigation Measures

[8.7.1] Construction Phase

TT_01 The contractor responsible for the construction of the proposed redevelopment will be required to ensure that the number of construction vehicles entering the road network during these times will be limited to 12 and 14, per direction, in the AM and PM peaks respectively.

TT_02 Construction vehicles will be required to use the strategic road network to access the site i.e. using the N28 and N40.

TT_03 In addition construction vehicles will be restricted from using local roads or unsuitable roads on grounds of safety

Following mitigation, there will be no major impacts during the construction phase of the proposed redevelopment.

[8.7.2] Operation Phase

In the Ringaskiddy Redevelopment 2014 EIS, the 2033 the traffic modelling results show that, with the N28 Upgrade in place, there is significant spare road capacity to cater for the Development HGV traffic levels during the AM and PM Peak periods along the N28. Furthermore, in 2033, the Dunkettle Interchange Upgrade is also assumed and this greatly improves the operating environment on the N40.

Mitigation measures are developed for traffic impacts of major significance that are identified and the introduction of these measures is tested to demonstrate their effectiveness in avoiding, reducing or remedying these traffic impacts of major significance. The mitigation measures required may be categorised as traffic control measures.

The aforementioned mitigation measures apply equally to the CCT2 and DWB extension as to the ultimate Port redevelopment scenario.

[8.7.2.1] Mitigation Control (Pre- N28 Upgrade)

TT_04 Reduce Port HGV traffic volumes during the AM (07.45-09.00) and PM (17.00- 18.00) commuter peak periods by continuing the Ringaskiddy Mobility Management Plan (RMMP) to manage freight generated by the Port during these periods until the opening of the N28 Upgrade.

In 2033 (with the N28 Upgrade in place), there are no traffic impacts of major significance predicted as there is significant spare road capacity and therefore no mitigation is required.

[8.7.2.2] Management of Freight through the Ringaskiddy Mobility Management Plan

TT_05 This proposed mitigation control measure is to manage the additional Port related HGV traffic that is generated over Do Minimum levels during the AM and PM commuter peaks until the N28 Upgrade is in place. This means that the additional 'Do Something' LoLo, bulk and trade cars and related HGVs movements generated by the proposed redevelopment (i.e. above the existing 'Do Minimum' HGVs movement levels), would be managed and controlled to significantly reduce the additional numbers of Port HGVs travelling during the congested AM and PM Peak periods. All additional Port generated HGV traffic arising from the proposed redevelopment would be managed to operate in the non- congested inter-peak period of the day where there is significant spare road capacity available. It is important to note that currently less than 15% of all Port related HGVs travel during the AM and PM peak periods, whereas the remaining 85% currently travel outside of these times. Only a small proportion, therefore, of HGVs generated by the Port (i.e. only 15% of the additional HGV's generated by the proposed redevelopment require managing).

The benefit of introducing the RMMP, to manage freight generated by Ringaskiddy Port, enables the Port to operate more efficiently and importantly to manage how Port generated HGVs use the road network. Currently freight movement at the Port is demand driven with the Port offering extensive flexibility to its customers in determining the movement of freight. The introduction of the RMMP to manage freight will move the port from a demand driven freight

mobility operation to a fully planned and managed freight movement operation and cascade significant benefits to many aspects of Port operations including enhanced security, control and management and information systems. This progression to greater control and management of freight and cargo operations has been an ongoing element of the modernisation and efficiency drive at Port of Cork for the past decade.

The proposed redevelopment at Ringaskiddy and the requirement for the Port to introduce Port HGV traffic mitigation measures in order to mitigate the impact of the proposed redevelopment on peak traffic on the N28 presents a unique opportunity to Port of Cork to introduce a greatly enhanced freight management and control system incorporating the required traffic mitigation measures which will result in a step change in Port of Cork's current modernisation drive to become a best in Class International Port facility.

Ports that successfully operate mobility management include Rotterdam and Felixstowe for example.

The RMMP is based on international best practice and extensive consultation with other international Ports, Dublin Port and those involved with current Ports operations and haulage at Port of Cork sites (at Ringaskiddy, Tivoli and City Quays). This RMMP details 'how' the Port will successfully manage Port related HGVs during peak trafficked periods.

The freight traffic management systems and measures proposed as part of the RMMP include:

- The development of a booking system to manage the discharge of HGV traffic onto the strategic road network over the whole day, to minimise the impact of Port traffic on peak traffic periods and to reduce truck queuing in and out of the Port.

The specific measures include:

- Each haulier would be required to register an arrival/ departure online

- Hauliers collecting/ dropping off during peak hours would be required to book an arrival/ departure time.

- During peak periods, only hauliers with booked slots would be allowed to enter/ exit at the express gates. Non-scheduled arrivals would be facilitated at non-express gates (where they would be queued to discourage unscheduled arrivals / departures during Peaks)

- Each haulier would be given an allotted area to park

- Provision would be made for emergency loads

- Controlling and Optimising gate operations, to regulate the HGV traffic flow rate onto the strategic road network. The specific measures include:

- PoCC will introduce an automated gate operation in line with modern terminal best practice, taking account of volume throughput at the terminal

- Gated entry and exit lanes sited a significant distance back from the public road, allowing sufficient room for HGV queuing within the PoC boundary

- Express gates will facilitate those with bookings. Vehicles without a booking will be facilitated through non-express gates

- Sufficient space will be provided inside gates for dealing with issues that may arise with booking references, ID cards, etc.

- Extend operating hours, to facilitate Port HGV traffic spreading outside of AM and PM peak periods, in particular bulk related traffic. The specific measures include:

- Extended operating hours will facilitate hauliers to spread their arrival and departure times during off-peak periods within the managed access control system

- Opening hours will be adapted to suit traffic volumes and terminal operations and will be reviewed on an ongoing basis

- The use of IT solutions to transfer information and communicate with hauliers. The Specific measures include:

- POCC will introduce an information service for customers that wish to subscribe to provide information regarding port operations and road/ traffic conditions to hauliers

By introducing the above measures at Ringaskiddy Port the volume of HGVs entering and exiting the Port can be managed, in particular during peak hours, thereby significantly reducing the impact Port of Cork traffic will have on the surrounding road network.

The proposed gate system will allow for regulation and the control of traffic flows into and out of the Port. Vehicles will be released at regular intervals onto the strategic road network, and the volume can also be managed during peak hours, as required.

[8.8] Monitoring

[8.8.1] Construction Phase

No specific monitoring is proposed for the construction phase of the project, given the minimal traffic volumes anticipated to be generated.

[8.8.2] Operation Phase

The above RMMP measures will be implemented over time. As mentioned previously the Port of Cork has consulted with hauliers, line agents, bulk operators etc. through workshops and meetings to understand how they currently operate and to explain the concept of mobility management and describe how it will work. Hauliers are generally supportive of the proposed RMMP and the Port of Cork are in the process of getting hauliers to sign up to the management process set out in the RMMP.

As part of this programme, all measures will be reviewed and updated on a regular basis.

Monitoring and evaluation will be undertaken in three parts:

- during implementation
- after implementation, where the before and after situations are compared
- annual monitoring, in order to be able to adjust the measures set out in the RMMP according to changing circumstances

A key aspect of the success of the RMMP will be monitoring of HGV volumes generated by the Port from its operation in Ringaskiddy. Annual monitoring and evaluation will ensure the continued success of the RMMP. This process will involve consultation with hauliers, freight

forwarders and line agents and other stakeholders such as Cork County Council, Cork City Council, the NRA, the NTA and the local community. The results of this monitoring will be evaluated and the RMMP will be updated if required. Further details are included in Appendix 8.7 (refer to EIAR Volume IV).

[8.9] Residual Effects

[8.9.1] Construction Phase

No residual effects anticipated at the construction phase.

[8.9.2] Operation Phase

There will be a negligible effect upon the movement of traffic from Ringaskiddy from the operation of the Redeveloped Port of Cork.

[8.10] Summary

Having identified the baseline environment, the available data was considered in the identification of potential effects to the local road network used for the Haul Route as a result of the Development.

Construction impacts with be most notable on the N40 and N28 as these roads are currently experiencing congestion during the morning and evening peaks. The largest impacts on traffic will come from the HGV's delivering concrete which is anticipated to be 5-6 truck-loads per day for small quantity pours, although on rare occasions, there would be up to 25 truck-loads in a single day. The pours will be of short duration. If infill material is required, these will be imported at a rate of 5-10 loads per day. The importation of steel required for construction will be via sea delivery, and the disposal of dredged material will be at sea and therefore will have no impact upon the traffic and transportation. Construction workers are expected to increase the movement of vehicles by 25 per day, likely entering and exiting at peak travel times.

Considering this, the impact of construction traffic generated by the redevelopment of Port of Cork is anticipated to be negligible.

Operational impacts are not anticipated given the vast majority of berth operations are now in place, with this application for an expansion of space, rather than an intensification of development. There is significant spare road capacity to cater for the development traffic levels along the N28. The development therefore is considered to have a negligible impact.

[8.10.1] Mitigation Measures

During construction, the contractor will ensure that the number of vehicles entering the road network during morning and evening peak will be limited to 12 and 14 per direction respectively. These vehicles will be required to use the N28 and N40 and will be restricted from using local roads. Following mitigation, there will be no major impacts during the construction phase of the proposed redevelopment.

The mitigation measures required during operational phase may be categorised as traffic control measures. The Ringaskiddy Mobility Management Plan will be required to reduce port traffic volumes during peak morning and evening periods. All additional Port generated HGV traffic arising from the proposed redevelopment would be managed to operate in the non-

congested inter-peak period of the day where there is significant spare road capacity available. It is important to note that currently less than 15% of all Port related HGVs travel during the AM and PM peak periods, whereas the remaining 85% currently travel outside of these times. Only a small proportion, therefore, of HGVs generated by the Port (i.e. only 15% of the additional HGV's generated by the proposed redevelopment require managing).

The Ringaskiddy Mobility Management Plan will be implemented long-tern by the Port of Cork to monitor HGV volumes.

[9] Noise & Vibration

[9.1] Introduction

This Chapter includes an assessment of the likely noise and vibration impacts associated with the proposed Ringaskiddy Port Redevelopment. Full details of the proposed redevelopment are included in Chapter 3 Project Description of the EIAR and are not repeated in this Chapter.

Ringaskiddy Port is located in an area that contains a significant number of settlements. The nearest residential properties to the proposed Ringaskiddy Port Redevelopment works are the properties to the south of the existing N28 Main Street, properties to the west of the Port at Shanbally, properties to the northwest of the port at Monkstown and properties to the north and northeast at Cobh, Whitepoint and Blackpoint. In addition to the residential properties, there are other potentially noise sensitive receptors in the study area, including the National Maritime College of Ireland (NMCI), the Naval Base on Haulbowline Island and numerous schools, churches, clinics and leisure clubs.

The proposed redevelopment will be contained on the site of the existing Ringaskiddy Port, where there is an existing Deepwater Berth (DWB), Cork Container Terminal and ferry service which operates during day and night- time periods. On account of the aforementioned, there is a long history of noise from Port related activities in the vicinity of the proposed redevelopment. In addition, there are numerous existing industrial facilities located in the general study area. Road traffic noise is the dominant noise source in the vicinity of the majority of the nearest noise sensitive properties to the existing Port at Ringaskiddy.

During the construction phase of the proposed redevelopment, there is potential for noise impacts at the nearest noise sensitive properties from the use of plant and equipment and vibration impacts from the use a certain construction phase activities (e.g. piling). The assessment of operational phase noise includes an assessment of the noise impact from existing and additional plant/equipment at the Port as a result of the proposed redevelopment and the assessment of road traffic changes in the vicinity of the Port as a result of the proposed redevelopment.

There are no statutory noise limits that can be applied to the assessment of noise and vibration impacts from planned developments in Ireland. The assessment of noise and vibration impacts has been completed on the basis of recognised Irish and international guideline documents in the areas of noise and vibration assessment. A key component of the assessment process has been to determine the likely noise and vibration impacts in the context of the existing noise and vibration environment at the nearest sensitive properties to the proposed redevelopment.

This Chapter should be read in conjunction with Volume III Figure 9.1 - 9.21.

[9.2] Assessment Methodology – Noise

[9.2.1] Study Area

A number of noise surveys were reviewed in order to gather the appropriate baseline noise data for the purposes of completing the noise assessment. The POCC compliance monitoring quarterly noise monitoring data is considered representative of the baseline noise conditions at the CCT1 and DWB – pre-development.

Four separate surveys were completed in each calendar quarter to record the noise levels associated with a 24 hr period of operation for the container terminal and DWB operation at the Port.

The noise monitoring locations for the monitoring are illustrated in Figure 9.1 Below.

Figure 9.1 Noise monitoring locations

For this compliance monitoring, detailed unattended noise measurements were completed over a 24-hour period at each noise monitoring location.

Noise monitoring was undertaken in accordance with *International Standard ISO 1996-2:2017 Acoustics Description, Measurement and Assessment of Environmental Noise, Part 2: Determination of Environmental Noise Levels.*

In addition the RPS 2014 Environmental Impact Statement was considered with noise monitoring undertaken and noise impacts modelled at nearest noise sensitive receptors cited in Section 9.2.4 below.

[9.2.2] Legislation & Guidance – Noise and Vibration

This section includes a summary of Irish and international guidance documents that have been used as reference material for the purposes of completing the Noise and Vibration Assessment.

Environmental Protection Agency (EPA) Office of Environmental Enforcement (OEE) - Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4) This document relates primarily to noise surveys and assessments for EPA licensed facilities but in the absence of any other directly applicable guidance documents, it provides useful reference material for the purposes of completing the noise assessment for the proposed Ringaskiddy Port Redevelopment project.

The EPA published two earlier documents in relation to the survey, assessment and management of noise emissions from licensed facilities, namely the Environmental Noise Survey Guidance Document (commonly referred to as NG1) and Guidance Note for Noise in Relation to Scheduled Activities - 2nd Edition (commonly referred to as NG2). These two documents have been withdrawn with the publication of NG4.

NG4 provides detailed consideration of a range of noise related issues including basic background to noise issues, various noise assessment criteria and procedures, noise reduction measures, Best Available Techniques (BAT) and the detailed requirements for noise surveys. NG4 provides typical limit values for noise from licensed sites, namely:

- Daytime (07:00 - 19:00) - 55dB LAr,T;
- Evening (19:00 - 23:00) - 50dB LAr,T:
- Night-time (23:00 - 07:00) - 45dB LAeq,T.

In the description of the limits above, the LAeq,T is the equivalent continuous sound level over the measurement period and LAr,T is equal to the LAeq but includes an additional penalty of 5dB(A) to account for any tonal or impulsive characteristics to the noise source.

While consideration is given to these threshold limits in the general context of the noise assessment for the proposed redevelopment, the proposed redevelopment is located in the context of an urban/suburban environment where existing noise levels regularly exceed the typical noise limits set out in NG4 for EPA licensed sites.

Other EPA guidelines such as Guidelines on the Information to be Contained in Environmental Impact Statements [2002] and Advice Notes on Current Practice (in the Preparation of Environmental Impact Statements) [2003] have been considered also in the preparation of this Noise and Vibration Chapter.

National Roads Authority (TII) Guidelines for the Treatment of Noise and Vibration in National Road Schemes (2004)

This guidance document is primarily concerned with setting out the design criteria with regard to noise from new road schemes in Ireland, however it also provides useful reference material in terms of discussing suitable noise and vibration threshold limits for construction phase activities associated with road schemes in Ireland.

The TII Guidelines list maximum permissible noise levels typically deemed to be acceptable for the construction phase of road schemes (See Table 9.1). These values are indicative only and more stringent limits may be applied where pre-existing noise levels are low.

Table 9.1: Maximum Permissible Noise Levels at the Façade of Dwellings During Construction

Days & Times	$L_{Aeq\ (1\ hr)}$ dB	$L_{pA(max)slow}$ dB
Monday to Friday 07:00 – 19:00hrs	70	80

Monday to Friday 19:00 – 22:00hrs	60*	65*
Saturday 08:00 – 16:30hrs	65	75
Sunday Bank Holidays 08:00 – 16:30hrs	60*	65*

* Construction activity at these times. Other than that required in respect of emergency works, will normally require explicit permission of the relevant local authority

* Construction activity at these times. Other than those required in respect of emergency works, will normally require explicit permission of the relevant local authority.

British Standard BS5228:2009 Noise and Vibration Control on Construction and open Sites. This British standard consists of two parts and covers the need for protection against noise and vibration of persons living and working in the vicinity of construction and open sites. The standard recommends procedures for noise and vibration control in respect of construction operations and aims to assist architects, contractors and site operatives, designers, developers, engineers, local authority environmental health officers and planners.

Part 1 of the standard provides a method of calculating noise from construction plant, including:

- Tables of source noise levels;
- Methods for summing up contributions from intermittently operating plant;
- A procedure for calculating noise propagation;
- A method for calculating noise screening effects; and
- A way of predicting noise from mobile plant, such as on haul roads.

The standard also provides guidance on legislative background, community relations, training, nuisance, project supervision and control of noise and vibration.

Table 9.2 below outlines the applicable noise threshold limits that apply at the nearest noise sensitive receptors. The determination of what category to apply is dependent on the existing baseline ambient (LAeq) noise level (rounded to the nearest 5dB) at the nearest noise sensitive property. For daytime, if the ambient noise level is less than the Category A threshold limit, the Category A threshold limit (i.e. 65dB) applies. If the ambient noise level is the same as the Category A threshold limit, the Category B threshold limit (i.e. 70dB) applies. If the ambient noise level is more than the Category A threshold limit, the Category C threshold limit (i.e. 75dB) applies. The applicable limits that apply at each of the sensitive receptors included in the construction phase noise model are presented and discussed in Section 9.4 of this Chapter.

Table 9.2: Noise Threshold Limits at Nearest Sensitive Receptors for Drilling Rig Activities

	Threshold Limits [dB(A)]		
	Category A	**Category B**	**Category C**
Night-time (23:00 - 07:00)	45	50	55
Evening and Weekends (19:00 - 23:00 Weekdays, 13:00-23:00 Saturdays, 07:00-23:00 Sundays)	55	60	65
Weekday daytime (07:00-19:00) and Saturdays (07:00-13:00)	65	70	75

British Standard BS4142:1997 - Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas

BS4142: 1997 describes a method of determining the level of a noise of an industrial nature, together with procedures for assessing whether the noise in question is likely to give rise to complaints from persons living in the vicinity. In general, the likelihood of complaint in response to a noise depends on factors including the margin by which it exceeds the background noise level, its absolute level, time of day, change in noise environment etc, as well as local attitudes to the premises and the nature of the neighbourhood.

The standard is a useful reference document for this assessment and aspects of the methodology and guidance within the document have been used for the purposes of completing the noise assessment for the proposed redevelopment.

World Health Organisation (WHO) - Guidelines for Community Noise

In 1999, the World Health Organisation (WHO) proposed guidelines for community noise. In this guidance, a LA_{eq} threshold daytime noise limit of 55dB is suggested for outdoor living areas in order to protect the majority of people from being seriously annoyed. A second daytime limit of 50dB is also given as a threshold limit for moderate annoyance.

The guidelines suggest that an internal LA_{eq} not greater than 30dB for continuous noise is needed to prevent negative effects on sleep. This is equivalent to a façade level of 45dB LA_{eq}, assuming open windows or a free-field level of about 42dB LA_{eq}. If the noise is not continuous, then the internal level required to prevent negative effects on sleep is a $LA_{max,fast}$ of 45dB. Therefore, for sleep disturbance, the continuous level as well as the number of noisy events should be considered.

While consideration is given to these threshold limits in the general context of the noise assessment for the proposed redevelopment, the proposed redevelopment is located in the context of an urban/suburban environment where existing noise levels regularly exceed the typical noise limits set out in the WHO Guidelines.

World Health Organisation (WHO) - Night Noise Guidelines for Europe

The Night Noise Guidelines for Europe was published in 2009 on the back of extensive research completed by a WHO working group. Considering the scientific evidence on the threshold of night noise exposure indicated by $L_{night,outside}$ as defined in the Environmental Noise Directive (2002/49/EC), an $L_{night,outside}$ of 40dB should be the target of the night noise guideline (NNG) to protect public, including the most vulnerable groups such as children, the chronically ill and the elderly. An interim target of 55dB is recommended where the NNG cannot be achieved. These guidelines are applicable to Member States of the European Region and may be considered as an extension to the previous WHO Guidelines for Community Noise (1999). The guidelines do not expand on the noise limits applicable to non-continuous noise and hence the guidance included in the 1999 guidelines is still applicable in relation to this.

In the context of the existing environment in the vicinity of the proposed redevelopment, noise levels in the study area regularly exceed the 40dB night noise limit included in this document.

World Health Organisation (WHO) - Methodological Guidance for Estimating the Burden of Disease from Environmental Noise

In 2012, the WHO published the Methodological Guidance for Estimating the Burden of Disease from Environmental Noise. This document outlines the principles of quantitative assessment of the burden of disease from environmental noise, describes the status in terms

of the implementation of the European Noise Directive and reviews evidence on exposure-response relationships between noise and cardiovascular diseases.

UK Department of Transport (Welsh Office) - Calculation of Road Traffic Noise [CRTN]

This Calculation of Road Traffic Noise (CRTN) guidance document outlines the procedures to be applied for calculating noise from road traffic. These procedures are necessary to enable entitlement under the Noise Insulation Regulations (NI) 1995 to be determined but they also provide guidance appropriate to the calculation of traffic noise for more general applications e.g. environmental appraisal of road schemes, highway design and land use planning.

The document consists of three different sections, covering a general method for predicting noise levels at a distance from a highway, additional procedures for more specific situations and a measurement method for situations where the prediction method is not suitable. The prediction method constitutes the preferred calculation technique but in a small number of cases, traffic conditions may fall outside the scope of the prediction method and it will then be necessary to resort to measurement. The prediction method has been used in this instance to determine the likely traffic noise increases as a result of the proposed redevelopment.

Environmental Noise Directive (END) 2002/49/EC

END 2002/49/EC was transposed into Irish legislation in the form of the Environmental Noise Regulations, 2006. The legislation sets out the manner by which Strategic Noise Maps must be prepared in Ireland for large agglomerations, major roads, major railways and major airports. Strategic Noise Maps were prepared for the Cork Agglomeration in 2012 and a draft Noise Action Plan (NAP) was published for consultation.

The proposed redevelopment will alter the noise environment in the vicinity of Ringaskiddy Port and hence will alter the Strategic Noise Maps in this area. Under the requirements set out under END, the Strategic Noise Maps are required to be updated every five years. The changes brought about by the proposed redevelopment will be incorporated into the updated Strategic Noise Maps for the Cork Agglomeration as part of this ongoing update process.

[9.2.3] Vibration

The NRA Guidelines for the Treatment of Noise & Vibration in National Road Schemes is one of the few Irish guidance documents that gives recommendations relating to vibration from construction phase activities in Ireland. The guidelines recommend that vibration is limited to the values set out in Table 9.3 in order to ensure that there is little or no risk of even cosmetic damage to buildings. These values and the values indicated in Table 9.4 should be used as guidance for monitoring vibration levels from the construction phase of the proposed scheme.

Table 9.3: Recommended Vibration Level Thresholds for NRA Schemes

Allowable Vibration Velocity (Peak Particle Velocity) at the Closest Part of Any Sensitive Property to the Source of Vibration, at a Frequency of:		
Less than 10Hz	**10 to 50 Hz**	**50 to 100 Hz (and above)**
8mm/s	12.5mm/s	20mm/s

Limits of transient vibration, above which cosmetic damage could occur, are also given numerically in Table 9.4 (Ref: BS5228-2:2009). Minor damage is possible at vibration magnitudes which are greater than twice those given in Table 9.4, and major damage to a building structure can occur at a value greater than four times the tabulated values (definitions of the damage categories are presented in BS7385-1:1990, 9.9).

Table 9.4: Transient Vibration Guide Values for Cosmetic Damage (Ref BS5228-2:2009)

Type of Building	**Peak Particle Velocity (PPV) (mm/s) in Frequency Range of Predominant Pulse**	
	4 Hz to 15 Hz	**15 Hz and above**
Reinforced or framed structures. Industrial and heavy commercial buildings.	50 mm/s at 4 Hz and above	50 mm/s at 4 Hz and above
Unreinforced or light framed structures. Residential or light commercial buildings.	15 mm/s at 4 Hz increasing to 20 mm/S at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above.

British Standard BS 7385 (1993) Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration indicates that cosmetic damage should not occur to property if transient vibration does not exceed 15mm/s at low frequencies rising to 20mm/s at 15Hz and 50mm/s at 40Hz. These guidelines refer to relatively modern buildings and therefore, these values should reduced to 50% or less for more sensitive buildings.

The human body is a detector of vibration, which can become perceptible at levels which are substantially lower than those required to cause building damage. The human body is most sensitive to vibration in the vertical direction (foot to head). The effect of vibration on humans is guided by British Standard 6472:1992. This standard does not give guidance on the limit of perceptibility, but it is generally accepted that vibration becomes perceptible at levels of approximately 0.15 to 0.3 mm/s.

BS 6472 defines base curves, in terms of rms acceleration, which are used to assess continuous vibration. Table 5 of the Standard states that in residential buildings, the base curve should be multiplied by 1.4 at night and by 2 to 4 during the daytime to provide magnitudes at which the probability of adverse comment is low.

In order to assess human exposure to vibration, ideally, measurements need to be undertaken at the point at which the vibration enters the body, i.e. measurements would need to be taken inside properties. However, various conversion factors have been established to convert vibration levels measured at a foundation to levels inside buildings, depending on the structure of the building.

Where vibration is intermittent or occurs as a series of events, the use of Vibration Dose Values (VDVs) is recommended in BS 6472 for the assessment of subjective response to vibration. The VDVs at which it is considered there will be a low probability of adverse comment are drawn from BS 6472 and presented in Table 9.5.

Table 9.5: Threshold Values for the Evaluation of Disturbance due to Vibration

Place	Daytime 16 Hour VDV ($ms^{-1.75}$)	Night-time 8 Hour VDV ($ms^{-1.75}$)
Critical working Area	0.11	0.09
Residential	0.22 – 0.43	0.13
Office	0.43	0.36[1]
Workshops	0.87	0.73

These VDV thresholds do not apply unless night-time work was a regular activity at these premises.

[9.2.4] Data Sources

[9.2.5] Site Visits / Surveys

2013 RPS Noise Survey

Noise monitoring was undertaken in 2013 at 19 locations to determine the existing noise environment prior to development of CCT1 at the nearest noise sensitive properties and to inform predictive noise modelling for the proposed construction of CCT1. Noise monitoring at each location was conducted in the format of one 24-hour unattended measurement and short-term day and night-time attended measurements. The noise monitoring locations are illustrated in Figure 9.1 (EIAR Volume III) and described in Table 9.6. Subjective observations were recorded during each of the short-term measurements.

The noise monitoring was carried out in 2013 using Bruel & Kjaer Model 2250 and 2260, Type 1 Integrating Digital Sound Level Meters (SLMs), capable of measuring within +/- 0.1dB(A) in L_{eq} and sound pressure levels (SPL) in 'A' scale. The instruments record the LA_{eq}, LA10, LA90, LAMax and LA_{Min} percentiles simultaneously. The instruments were calibrated in accordance with ISO 1996 Acoustics - Description, Measurement and Assessment of Environmental Noise and BS4142 Method for Rating industrial noise affecting mixed Residential and Industrial areas prior to commencing the surveys using the recommended standard calibration procedure and a known pure tone noise source. The units were again calibrated on completion of the surveys to record drift. The units had not drifted during the surveys. Drift is normally associated with battery fade and/or temperature.

Measurements were made at a height of 1.2 – 1.5m above ground level and under free field conditions. The weather conditions were in accordance with the requirements of BS7445: Description and Measurement of Environmental Noise and ISO 1996: Acoustics - Description, Measurement and Assessment of Environmental Noise.

The following parameters were recorded during each monitoring period:

- L_{Aeq} The continuous equivalent A-weighted sound pressure level. This is an "average" of the sound pressure level.
- L_{Amax} This is the maximum A-weighed sound level measured during the sample period.
- L_{Amin} This is the minimum A-weighted sound level measured during the sample period.
- L_{A10} This is the A-weighted sound level that is exceeded for noise for 10% of the sample period.

- L_{A90} This is the A-weighted sound level that is exceeded for 90% of the sample period.

The noise monitoring was carried out in 2014 using Bruel & Kjaer Model 2250 and 2260, Type 1 Integrating Digital Sound Level Meters (SLMs), capable of measuring within +/- 0.1dB(A) in L_{eq} and sound pressure levels (SPL) in 'A' scale. The instruments record the LA_{eq}, LA_{10}, LA_{90}, LAMax and LA_{Min} percentiles simultaneously. The instruments were calibrated in accordance with ISO 1996 Acoustics - Description, Measurement and Assessment of Environmental Noise and BS4142 Method for Rating industrial noise affecting mixed Residential and Industrial areas prior to commencing the surveys using the recommended standard calibration procedure and a known pure tone noise source. The units were again calibrated on completion of the surveys to record drift. The units had not drifted during the surveys. Drift is normally associated with battery fade and/or temperature.

Measurements were made at a height of 1.2 – 1.5m above ground level and under free field conditions. The weather conditions were in accordance with the requirements of BS7445: Description and Measurement of Environmental Noise and ISO 1996: Acoustics - Description, Measurement and Assessment of Environmental Noise.

The following parameters were recorded during each monitoring period:

- L_{Aeq} The continuous equivalent A-weighted sound pressure level. This is an "average" of the sound pressure level.

- L_{Amax} This is the maximum A-weighed sound level measured during the sample period.

- L_{Amin} This is the minimum A-weighted sound level measured during the sample period.

- L_{A10} This is the A-weighted sound level that is exceeded for noise for 10% of the sample period.

- L_{A90} This is the A-weighted sound level that is exceeded for 90% of the sample period.

(Appendix 4.2 EIAR Volume IV) presents the noise graph for the ambient (i.e. L_{Aeq}) and background (i.e. L_{A90}) noise levels for the 2013 noise survey that were recorded at each of the noise monitoring locations for the 24-hour unattended measurements. The hourly noise measurements for each of these 24-hour measurement periods is included in the tables in (Appendix 4.1 EIAR Volume IV). Appendix 4.3 (EIAR Volume IV) includes details of all of the short-term noise measurements and associated subjective comments recorded at each of the noise monitoring locations.

2024 MKO Noise Survey

In addition to the above an updated attended baseline noise survey was carried out in 2024 by MKO Ltd to establish any potential for a change in background noise levels between the original noise surveys and time of writing. Alignment in this case would reinforce the suitability and continued applicability of the CADNA noise model, being previously validated to ambient measured noise levels from 2013.

Further to this, attended noise surveys were carried out at 11 of the original 19 noise baseline locations. These 11 locations were considered to be representative of the 19 due to proximity

and comparability between several of the original 19 locations. Results of these updated baseline surveys are presented in Appendix 4.4.

There is comparable agreement at these locations between 2013 and 2024 surveys particularly in the case of background noise levels. Any locations that showed variance in the L_{Aeq} values (between 2013 and 2024 surveys) were noted during the survey to have proximate and transient passing sources, such as idling buses and street sweepers during 2024 surveys. In the locations where these transient noise sources elicited variance in the L_{Aeq} values, the L_{A90} (background noise) levels remained directly comparable in the 2013 and 2024 surveys, confirming no significant change in background noise levels between the survey periods at these locations. As such it is deemed that the CADNA model and its predictions remain applicable and relevant to this assessment.

Table 9.6: Description of Background Noise Monitoring Locations

Reference	Description of Noise Monitoring Locations
N1*	Near entrance barrier to Naval college on Haulbowline Island.
N2*	Northern boundary of the National Maritime College of Ireland, near the Fire Fighting Training Facility.
N3*	Residential property near Rock Farm opposite existing car storage depot, Ringaskiddy Village.
N4*	Row of residential properties elevated above main road in Ringaskiddy village overlooking existing entrance to Ferry Terminal, Ringaskiddy Village.
N5*	Residential property near Community Centre in Ringaskiddy Village.
N6*	Residential properties elevated above main road in Ringaskiddy village overlooking existing entrance to DWB, Ringaskiddy Village.
N7	Northwestern end of DWB, near landward end of former ADM jetty.
N8	Near shoreline of Monkstown Creek to west of former ADM jetty
N9	Residential property at southern end of Bellevue Place, Monkstown.
N10*	Residential property just north of Bellevue Place, Monkstown.
N11*	Residential property in Monkstown Castle Demesne adjacent to Monkstown Golf Course.
N12	Residential property at southern end of Alta Terrace, Monkstown, elevated above the R610.
N13*	Residential property opposite Sand Quay, Monkstown.
N14	Residential property at northern end of Marine Villas, Monkstown.
N15	Residential property north of Blackpoint, just east of Cork Dockyard.
N16	Residential property immediately south of High Road and immediately north of railway line, near Wharton's Corner, Rushbrooke / Cobh.
N17*	Residential property in the vicinity of Blackpoint
N18*	Residential property at Whitepoint Drive near Cobh.
N19	Residential property located just north of Lower Road, overlooking Whitepoint Moorings, Cobh.

* Denotes re-surveyed in 2024.

In general, the baseline noise monitoring survey illustrated that road traffic noise is the most dominant noise source at the majority of locations. This is supplemented to a greater or lesser extent by a number of different noise sources including various industrial activities, the Port activities, various human activities and birdsong.

In Ringaskiddy, road traffic noise from the existing N28 road and the various local roads around the village was the dominant noise source. The influence of road traffic noise reduces as one travels from Ringaskiddy village out towards the NMCI and on to Haulbowline Island as various other noise sources contribute more to the overall ambient noise levels. A similar scenario prevails at Monkstown with road traffic noise from the R610 being the dominant source. Road traffic noise is dominant in Cobh also, however the further one travels from the main road links towards Whitepoint and Blackpoint, the influence of road traffic noise diminishes, and the overall ambient noise is derived from multiple and varied sources.

The proposed redevelopment was modelled in 2014 by RPS using CadnaA noise modelling software. The CadnaA noise modelling software package uses the ISO9613 prediction methodology along with a range of topographical and ordnance data collected on the surrounding area to build up a picture of the noise environment in the vicinity of sensitive receptors in the study area. The software was used to build a 3-dimensional model of all features which may affect the generation and propagation of noise in the vicinity of the existing and proposed Port.

The CadnaA noise model was used for predicting cumulative noise levels at various stage of the construction phase and for predicting the cumulative noise levels from existing and proposed scenarios for the operational phase of the proposed redevelopment. The noise model was validated using noise measurement data recorded within the existing port during operational hours.

[9.2.5.1] Noise Surveys of Ferry and Container Vessels

On the morning of 20/07/13, a noise survey was conducted by RPS to record the noise levels associated with the arrival and activities of the Brittany Ferries vessel at Ringaskiddy Port. The purpose of the noise survey was to record the noise environment before and during the arrival of a ferry vessel and to record if there was any significant difference to the overall noise environment as a result of the ferry movements. Table 9.7 below includes a range of noise measurements taken between 08:40 to 16:25 which includes the activities associated with the ferry. The noise monitoring location for this survey was at the side of one of the internal Port roads which was in relatively close proximity to the ferry landing point.

Table 9.7: Noise Survey of Brittany Ferries Activities at Ringaskiddy Port

Monitoring Time Period	L_{Aeq} dB(A)	L_{Amax} dB(A)	L_{Amin} dB(A)	L_{A10} dB(A)	L_{A90} dB(A)	Comments
08:40-08:50	57.7	78.0	42.5	60.3	50.5	Prior to ferry arrival. Birds (especially terns) prominent. Some ship cleaning. Car/HGV traffic.
08:54-09:04	58.7	79.2	42.6	60.0	49.4	Prior to ferry arrival. Birds (especially terns) prominent. HGV passing by and idling for short time.
09:22-09:32	64.1	91.3	42.3	66.7	46.3	Prior to ferry arrival. Birds (especially terns) prominent. HGV pass-by, horn and idle for short time.
09:38-09:48	61.7	85.2	49.5	62.9	53.1	Prior to ferry arrival. Birds (especially terns) prominent. On HGV pass-by.
09:48-09:58	62.3	77.0	56.9	63.4	59.7	Ferry Approach, idling and tannoy noise. Bird noise & HGV passing.
10:05-10:15	62.0	78.6	55.4	64.3	57.9	Ferry unloading. Ferry traffic. Bird noises.
10:18-10:28	63.5	74.0	59.8	64.9	61.6	Ferry unloading. Ferry traffic. Bird noises.
10:40-10:50	62.9	71.9	59.4	64.3	61.1	Ferry unloading. Ferry traffic. Bird noises.
13:45-13:55	60.0	75.3	52.7	61.8	55.2	Ferry idle. Bird noises, HGV traffic

13:58-14:08	63.0	76.2	53.7	64.4	56.5	Ferry idle. Bird noises, HGV traffic. Ferry start up and engine noise for approx 7.5 minutes of measurement.
14:12-14:22	63.4	74.4	58.6	64.6	61.0	Ferry loading. Bird noises and HGV movements. Ferry tannoy announcements.
14:45-14:55	63.0	75.3	58.6	64.4	60.7	Ferry loading. Bird noises and HGV movements. Ferry tannoy announcements.
16:04-16:14	59.1	63.2	56.8	60.2	57.9	Ferry idle and departure. Ferry tannoy. Ferry horn. Birds and HGV movements. Motorbike.
16:15-16:25	55.3	71.1	45.8	58.7	49.2	Ferry out of sight. Bird noises and HGV movements. Slight hum from moored vessel.

The noisiest early morning (i.e. night-time) activity at the existing Port in Ringaskiddy is the arrival and unloading of the Maersk container vessel once a week, generally on a Friday morning. On the morning the Maersk vessel arrives, activities commence at the Port at approximately 05.30 with the movement of the various mobile cranes and other relevant plant into position. Initially, only one mobile crane undertakes unloading activities in tandem with a reach stacker and the various terminal transporters and it is generally into the daytime hours (i.e. after 07.00) when the second mobile crane and associated reach stacker and terminal transporters are in full operation. Nevertheless, some of the most prominent noise sources from this activity, most notably the mobile crane movement alarms, are active during the night-time period (i.e. before 07.00).

In order the characterise the noise levels associated with the unloading of the Maersk vessel, a noise monitoring survey was undertaken on the morning of Friday 14th March 2014 by RPS. Noise monitoring was undertaken at various locations around Ringaskiddy village, Monkstown and inside the Port itself adjacent to the unloading activities. Table 9.8 includes measured noise levels at various locations with all activities including alarm and container handling activities taking place at the Port.

Table 9.8: Noise Survey of Maersk Vessel Unloading - 14/03/14

Monitoring Time Period	L_{Aeq} dB(A)	L_{Amax} dB(A)	L_{Amin} dB(A)	L_{A10} dB(A)	L_{A90} dB(A)	Comments (Location in Figure 9.1, Volume II)
06:04 - 06:05	52.0	63.1	47.0	54.3	48.9	Location 1 - Ringaskiddy Village (R1)
06:05 - 06:06	49.4	53.1	47.2	51.1	47.7	Location 1 - Ringaskiddy Village (R1)
06:13 - 06:14	47.1	51.9	42.6	49.0	44.1	Location 2 - Ringaskiddy Village (R2)
06:16 - 06:17	55.2	67.4	43.8	59.6	46.1	Location 3 - Ringaskiddy Village (R3)
06:17 - 06:18	55.0	67.1	44.1	59.3	45.7	Location 3 - Ringaskiddy Village (R3)
06:23 - 06:24	53.9	67.7	40.1	58.7	42.6	Location 4 - Ringaskiddy Village (R4)
06:24 - 06:25	53.8	66.3	38.9	56.9	42.2	Location 4 - Ringaskiddy Village (R4)
06:29 - 06:30	51.1	58.8	40.1	54.7	42.9	Location 5 - Ringaskiddy Village (R5)
06:36 - 06:37	47.4	56.8	43.2	48.7	44.0	Location 6 - Ringaskiddy Village (R6)
06:37 - 06:38	54.1	65.8	44.0	56.7	45.1	Location 6 - Ringaskiddy Village (R6)
06:55 - 06:56	42.8	54.1	39.9	43.8	40.9	Location 1 - Monkstown (M1)
06:56 - 06:57	42.8	53.0	40.2	43.7	41.4	Location 1 - Monkstown (M1)
06:57 - 06:58	45.5	55.1	41.8	47.7	43.0	Location 1 - Monkstown (M1)
06:58 - 06:59	70.2	87.9	62.2	72.3	64.4	Location 1 - Ringaskiddy Port (P1)
07:30 - 07:31	69.0	79.0	62.5	72.3	64.0	Location 1 - Ringaskiddy Port (P1)

07:31 - 07:32	66.1	79.2	61.4	67.2	62.4	Location 1 - Ringaskiddy Port (P1)
07:32 - 07:33	64.3	70.9	61.6	65.8	62.9	Location 1 - Ringaskiddy Port (P1)
07:33 - 07:34	70.1	86.3	62.2	70.5	63.3	Location 1 - Ringaskiddy Port (P1)
07:34 - 07:35	68.4	73.9	65.9	70.4	66.6	Location 2 - Ringaskiddy Port (P2)
07:36 - 07:37	70.3	76.3	66.2	73.3	67.4	Location 2 - Ringaskiddy Port (P2)
07:37 - 07:38	70.9	79.5	66.4	73.0	67.5	Location 2 - Ringaskiddy Port (P2)
07:38 - 07:39	70.4	80.0	64.8	73.9	65.8	Location 2 - Ringaskiddy Port (P2)
07:39 - 07:40	73.4	81.1	69.8	75.3	71.4	Location 3 - Ringaskiddy Port (P3)
07:41 - 07:42	73.9	79.6	69.1	75.9	70.2	Location 3 - Ringaskiddy Port (P3)
07:42 - 07:43	75.4	86.5	69.0	78.8	70.0	Location 3 - Ringaskiddy Port (P3)
07:43 - 07:44	76.7	86.2	69.9	78.4	72.2	Location 3 - Ringaskiddy Port (P3)
07:44 - 07:45	75.3	81.5	70.4	78.3	72.2	Location 3 - Ringaskiddy Port (P3)

In terms of subjective observations, noise from the Port activities were audible at all locations in Ringaskiddy village with alarm noises and banging from container handling being the most prominent noise sources at all locations. Although the alarm noise and banging were audible, the Port noise was not the dominant noise source at any of the locations.

For properties adjacent the existing N28 in the village, road traffic noise was clearly the most dominant noise source with Port noise becoming more audible in between car passing events. For locations behind the properties adjacent to the N28 road, birdsong was observed in real time to be the dominant noise source in terms of influencing the recorded noise level. In Monkstown, the noise from the Maersk unloading was barely audible with only the alarm noise being easily discerned (albeit quite faint) when no road traffic noise was passing on the R610.

A similar noise profile for this activity is anticipated following implementation of the proposed development.

[9.3] Baseline Environment - Noise

Compliance monitoring data for 2023 was reviewed to determine and further describe the baseline noise environment as current in 2024 (Representative of present day CCT1 and DWB noise emissions).

The CCT is subject to noise limits set out in strategic infrastructure development permission 04. PA0035 as amended by 04.PM0010 and PM 304437-19. The limits which apply at noise sensitive locations are as follows:

- 0700-1900h $L_{AReq30\ min}$ 55dB. This parameter is equal to the $L_{Aeq\ 30\ min}$ level plus a ranting correction for tonal and/or impulsive features. The $L_{Aeq\ 30\ min}$ level effectively describes the average noise level due to CCT noise emissions averaged over a 30-minute interval.

- 1900-2300h $L_{AReq30\ min}$ 50 dB. This parameter is identical to the daytime parameter, albeit with a lower limit.

- 2300-0700h $L_{AReq15\ min}$ 45db. This parameter describes the average CCT noise level averaged over a 15-minute interval without any rating correction for tonal and/or impulsive features.

Quarterly monitoring results recorded to date indicate that the Port is compliant with the agreed noise limits.

The results of the monitoring are set out below.

Table 9.8 Specific LAeqT levels due to CCT operations Q1

Station	Daytime	Evening	Night-time
N1 Monkstown	Container clangs and straddle carriers sporadically slightly audible, specific $L_{Aeq\,T}$ <45 dB	BJ Jade main engine faintly audible at start of interval, gradually fading $L_{Aeq\,T}$ <37 dB	Container clangs sporadically slightly audible, specific $L_{Aeq\,T}$ <45 dB
N2 Ringaskiddy village	Loudest container clangs slightly audible, specific $L_{Aeq\,T}$ <53 dB	Inaudible	Straddle carriers, gantry cranes and loudest container clangs audible, specific $L_{Aeq\,T}$ <43 dB
N3 Whitepoint	Container clangs sporadically clearly audible, straddle carriers slightly audible, specific $L_{Aeq\,T}$ <48 dB	Inaudible	Container clangs and straddle carriers sporadically slightly audible, specific $L_{Aeq\,T}$ <43 dB
N4 Ringaskiddy comm. centre	Loudest container clangs slightly audible, specific $L_{Aeq\,T}$ <55 dB	Inaudible	Loudest straddle carrier movements, container clangs and gantry cranes audible, specific $L_{Aeq\,T}$ <43 dB

Table 9.9 Specific LAeqT levels due to CCT operations Q2

Station	Daytime	Evening	Night-time
N1 Monkstown	Straddle carriers clearly audible and container clangs audible at a low level, specific $L_{Aeq\,T}$ <44 dB	Straddle carriers clearly audible and container clangs audible at a low level, specific $L_{Aeq\,T}$ <43 dB	Straddle carrier and container clangs sporadically slightly audible, specific $L_{Aeq\,T}$ <39 dB
N2 Ringaskiddy village	Loudest container clangs and straddle carrier movements sporadically clearly audible, specific $L_{Aeq\,T}$ <50 dB	Inaudible	Straddle carriers, gantry cranes and loudest container clangs audible, specific $L_{Aeq\,T}$ 31-38 dB
N3 Whitepoint	Regular straddle carrier movements and sporadic container clangs audible to varying degrees, specific $L_{Aeq\,T}$ <47 dB	Regular straddle carrier movements and sporadic container clangs clearly audible specific $L_{Aeq\,T}$ <49 dB	Loudest container clangs occasionally audible, specific $L_{Aeq\,T}$ <38 dB
N4 Ringaskiddy comm. centre	Loudest container clangs clearly audible, specific $L_{Aeq\,T}$ <51 dB	Inaudible	Loudest straddle carrier movements, container clangs and gantry cranes audible, specific $L_{Aeq\,T}$ 35-38 dB

Table 9.10 Specific LAeqT levels due to CCT operations Q3

Station	Daytime	Evening	Night-time
N1 Monkstown	Container clangs sporadically audible, specific $L_{Aeq\,T}$ <45 dB	Container clangs sporadically slightly audible, specific $L_{Aeq\,T}$ <45 dB; Reefers possibly audible	Container clangs sporadically slightly audible, specific $L_{Aeq\,T}$ <46 dB; Reefers possibly audible
N2 Ringaskiddy village	Loudest container clangs audible, specific $L_{Aeq\,T}$ <45 dB	Inaudible	Inaudible
N3 Whitepoint	Straddle carriers and container clangs slightly audible, specific $L_{Aeq\,T}$ 40 dB	Container clangs sporadically slightly audible, specific $L_{Aeq\,T}$ <46 dB	Container clangs sporadically slightly audible, specific $L_{Aeq\,T}$ <45 dB; Reefers possibly audible
N4 Ringaskiddy comm. centre	Loudest container clangs audible, specific $L_{Aeq\,T}$ <46 dB	Sporadic container clangs slightly audible, specific $L_{Aeq\,T}$ <44 dB	Loudest straddle carrier movements and container clangs audible, specific $L_{Aeq\,T}$ 37 dB

Table 9.11 Specific LAeqT levels due to CCT operations Q4

Station	Daytime	Evening	Night-time
N1 Monkstown	Container clangs and straddle carriers sporadically slightly audible, specific $L_{Aeq\,T}$ <52 dB	Inaudible	Loudest container clangs sporadically slightly audible, specific $L_{Aeq\,T}$ <40 dB;
N2 Ringaskiddy village	Loudest container clangs slightly audible, specific $L_{Aeq\,T}$ <50 dB	Straddle carriers, gantry cranes and loudest container clangs audible, specific $L_{Aeq\,T}$ <42 dB	Inaudible (no operations during measurement intervals)
N3 Whitepoint	Container clangs, straddle carriers, gantry cranes audible, specific $L_{Aeq\,T}$ <50 dB	Container clangs, gantry cranes and straddle carriers sporadically audible, specific $L_{Aeq\,T}$ <44 dB	Container clangs and straddle carriers sporadically slightly audible, specific $L_{Aeq\,T}$ <44 dB;
N4 Ringaskiddy comm. centre	Loudest container clangs slightly audible, specific $L_{Aeq\,T}$ <53 dB	Sporadic container clangs and straddle carriers slightly audible, specific $L_{Aeq\,T}$ <40 dB	Loudest straddle carrier movements and container clangs audible, specific $L_{Aeq\,T}$ <40 dB

The Port has installed two NTi permanent noise monitoring systems in Ringaskiddy, locations below

Figure 9.2 NTi Permanent Noise Monitoring Locations

On receipt of a noise complaint, the NTi system is used to review complaints expeditiously. An external consultant reviews the noise data gathered in relation to any such complaints. In 2023 the Port received 47 nr noise complaints in relation to port/vessel operations at Ringaskiddy Port (incorporating the Deepwater Berth, Cork Container Terminal and RoRo terminal.

The Port has noted a downward trend in noise complaints year-on-year since 2022.

Additional noise surveys representative of specific activities within Ringaskiddy Port are presented in Section 9.2.5.

[9.4] Sensitive Receptors

The noise sensitive receptors for this project are considered to be the following residential and commercial premises.

Table 9.12 Sensitive Receptors

Property Reference	Property Address (See Figures 9.2-9.4, Volume II)
1	Naval Base, Haulbowline Island
2	National Maritime College of Ireland
3	Detached dwelling on L2545
4	Rock Farm, Martello Park
5	Detached dwelling, Martello Park
6	1 Martello Park
7	9 Martello Park
8	Church at Shamrock Place
9	1 St. Joseph's Terrace
10	2A Main St
11	7 Main St
12	13 Main St
13	Ferry Boat Inn, Main St
14	Reamur, Old Post Office Road
15	Thornberry, Old Post Office Road
16	Sun View, Old Post Office Road
17	Island View, Main St

18	Sheen House, Main St
19	Roughty House, Main St
20	Bay Tree House, Main St
21	Allenvale, Main St
22	26 Ferry View
23	Leeview, Main St
24	4 Riverview
25	2 Main St
26	Lackendarra, Main St
27	Drouch Na Mara, Warren's Court
28	Robin Hill, R610
29	Ardnaree, Strand Road
30	Ivy Cottage, Strand Road
31	Dwelling, Bayview Cottages, Strand Road
32	2 Strand Road
33	The Lodge, Strand Road
34	5 Belle Vue Place
35	14 Belle Vue Place
36	Grants Cottage, Strand View
37	Fir Hill House, Strand Road
38	Detached dwelling, The Demense
39	Summerland, Strand Road
40	Crowery, Alta Terrace
41	Thorncliffe, Alta Terrace
42	1 Alta Terrace
43	Rinnacoltaigh House, Rinacoltig
44	Travara, Rinacoltig
45	Cooleen House, Rinacoltig
46	Coolgrena House, Rinacoltig

[9.5] Potential Impacts

[9.5.1] The 'do nothing' scenario

The Existing Environment/Do Nothing Scenario, is a scenario in which the existing Port arrangements remain as is. The site would, therefore, remain without the construction of CCT2, Ringaskiddy West DWB extension and container handling and stacking arrangements. The predicted impacts of noise emissions as well as traffic emissions would remain similar to current levels. The Do-Nothing scenario is considered neutral in terms of noise.

[9.5.2] Construction Phase

The quay walls at the berths of the proposed redevelopment are likely to be Combi-wall type comprising large tubular steel piles separated by sheet piles. The tubular piles for the construction of the Berth 2 quay will be about 1.4m in diameter and range from 32m in length numbering 225 in total. Piles driven in water give rise to noise levels normally well above ambient. Tubular piles such as those which will be used in the project give rise to higher noise outputs than sheet piles and the following assessment will concentrate on the potential impacts from these piles.

Impact pile driving entails use of a heavy weight (hammer) to ram piles into the substrate at a strike rate of about one every 1.5 seconds. The noise generated is intermittent consisting of discrete noise outputs for each hammer impact. The sound generated also has several features, which characterise it. Firstly, it is a loud sound i.e. it generally has high amplitude. It is also a sharp sound with a very short rise time to reach peak pressure (measured in

milliseconds). It has a broad spectrum i.e. the sound is spread over a wide range of frequencies from a few hertz (Hz) to several thousand hertz. Sound is measured in units of pressure i.e. Pascals. Sound is generally expressed in decibels (dB), which is a log scale of the ratio between a reference pressure to the actual measured pressure.

While there are a significant number of sensitive receptors in the vicinity of the proposed activities that have the potential to be impacted by construction phase noise associated with the proposed redevelopment 2014 modelling for the CCT1 berth construction which was by the same methodology has shown that construction noise is likely to be within the threshold limits set out in the TII Guidelines and within applicable daytime limits. Sensitive receptors are generally grouped together in three approximate areas in relation to the Port, namely:

- South of the Port, along and south of the existing N28 Main Street.
- North-west of the Port in Monkstown and
- North and North-east of the Port in Cobh and the surrounding areas.

It is anticipated that construction noise impacts will be temporary and transient. Compliance monitoring shows that operational noise is currently within the threshold limits.

[9.5.3] Operation Phase

[9.5.3.1] Noise Impact from Deepwater Berth (DWB) extension

The main elements influencing noise emissions from any industrial site include traffic, intermittent noises, machinery noise, reverse alarms, etc. As this is not a green field site but an existing industrialised port, background noise levels are already in existence, and it is likely that background noise from the adjoining N28 traffic will be the dominant noise source that could be generated on this site (especially given existing design mitigations).

This section includes an assessment of the potential noise impact associated with the addition of new plant/equipment associated with the proposed extension to the DWB. Currently, there are three mobile cranes, one rail mounted grab crane (electrical), three hoppers, one reach stacker and numerous terminal transporters operating on the existing DWB during busy periods. The proposed redevelopment will extend the length of the DWB and will potentially introduce one additional mobile crane and one additional hopper in the future.

The increased use of plant/equipment in the ultimate development and the fact that the DWB quayside operation area will extend by 231m has been simulated in a comparative noise modelling exercise conducted by RPS. This additional activity will only occur during daytime hours. The comparative noise modelling exercise conducted 2014 EIS (RPS 2014) illustrated that the addition of an extra mobile crane and hopper on the DWB will result in minor noise level increases in the vicinity of Ringaskiddy village (i.e. <1dBA) and Whitepoint/Blackpoint (1-2dBA).

The most significant effects from this additional plant at the DWB will be an increase in the noise levels of 2-5dB(A) at noise sensitive receptors in Monkstown. However, these increased noise levels from the DWB activity will not result in any significant alteration to the daytime noise levels experienced at sensitive receptors in Monkstown as they are significantly below the existing permitted noise levels (AER 2023). (EIS Volume III - Appendices 9.1 to 9.3).

In summary, the changes to the DWB as a result of the proposed redevelopment have the potential to increase noise levels from the DWB to a minor/moderate extent during worst-case scenario. However, as these increases are significantly below existing daytime ambient noise

levels at the nearest noise sensitive properties, there will be no significant noise level increases as a result of these changes at the nearest noise sensitive properties.

[9.5.3.2] Noise Impact from the Proposed Container CCT2.

The main elements influencing noise emissions from any industrial site include traffic, intermittent noises, machinery noise, reverse alarms, etc. As this is not a greenfield site but an existing industrialised port, background noise levels are already in existence, and it is likely that background noise from the adjoining M28 traffic will be the dominant noise source that could be generated on this site (especially given existing design mitigations).

This section includes an assessment of the potential noise impact associated with the addition of new plant/equipment to the proposed site as a result of the new CCT2 berth at Ringaskiddy East.

In terms noise emitting plant/equipment, all of the plant/equipment operating at the proposed Berth 2 will be new plant/equipment to the Port.

Table 9.12 includes reference data for the various plant and equipment that will operate on the proposed Berth 2. The data for each item of plant/equipment has been taken from a number of different sources including the SourcedB database (EU Imagine Project), the Dublin Port EFFORTS Study and detailed plant specification sheets.

Table 9.12: Source Noise Data for the Proposed Berth 2

Item of Plant/Equipment	Sound Power Level (L_W) dB(A)
Ship	101.5
Ship to Shore Gantry (SSG) Crane	97.0
Gantry (RTG) Crane	97.0
Reefer container	90.6
Reach Stacker (LRS 645)	104.5
Terminal Transporter	103.8
Mobile Crane (LHM 550)	106.4
SSG/RTG/Mobile Crane Alarm/Beacon	116.0*
Container Handling Activity	112.0*

* Additional 5dB has been added to these Lw Noise Levels to account for tonal/impulsive nature

In Table 9.12, an entry has been included for general container handling noise in addition to the plant noise from the various items of plant that will be handling the containers. This noise level was taken from direct measurements completed as part of the Dublin Port EFFORTS Study and has been included here in order to incorporate the various banging noises associated with container handling. The noise level for the container handling noise has been increased by 5dB(A) as a penalty to account of the impulsive nature of this noise (i.e. 107dB + 5dB = 112dB).

For the proposed operational phase, two different scenarios were considered in the 2014 EIS for day and night-time periods and these are detailed in the bullet points included below:

- Scenario 1 - Daytime: CCT 1 and 2 operating at 100% capacity with 3 ships, 2 SSG cranes, 1 harbour mobile crane, 6 RTG cranes, 2 reach stackers, 12 terminal transporters and reefer noise active simultaneously. This option includes two simultaneous container handling events (LW -112dB) to account for bangs from terminal containers being moved and two alarms/beacons (Lw - 116dB) being active simultaneously;

- Scenario 2 - Night-time: CCT 1 and 2 operating with 1 ship, 1 SSG crane, 2 RTG cranes, 1 reach stacker, 4 terminal transporters and reefer noise active simultaneously. This option includes two simultaneous container handling events (LW -112dB) to account for bangs from terminal containers being moved and two alarms/beacons (Lw - 116dB) being active simultaneously;

Table 9.13 contains the predicted noise levels relative to background for Scenarios 1-2 as described above. The nearest noise sensitive properties listed in the table are the same as those used for the construction phase noise assessment and are illustrated in Figures 9.2 - 9.4 (EIS Volume II). All predicted noise levels are at a height of 4m to reflect the height of a first-floor window.

Table 9.13: Noise Model Predictions of Proposed Operational Phase Noise from Activities at CCT

Property Reference	Property Address (See Figures 9.2-9.4, Volume II)	Predicted Operational Phase Noise (dBA)		
		Scenario 1 (Day)	Scenario 2 (Night)	Scenario 2 (No Alarm)
1	Naval Base, Haulbowline Island	43.4	42.3	38.4
2	National Maritime College of Ireland	44.3	43.1	38.9
3	Detached dwelling on L2545	49.5	48.5	42.9
4	Rock Farm, Martello Park	50.5	49.6	43.9
5	Detached dwelling, Martello Park	51.1	50.1	44.4
6	1 Martello Park	51.7	50.8	45.0
7	9 Martello Park	49.2	48.1	43.6
8	Church at Shamrock Place	52.3	51.4	45.6
9	1 St. Joseph's Terrace	49.0	47.8	43.8
10	2A Main St	52.8	51.9	46.0
11	7 Main St	53.1	52.1	46.1
12	13 Main St	53.4	52.4	46.3
13	Ferry Boat Inn, Main St	54.1	53.1	46.9
14	Reamur, Old Post Office Road	48.5	48.5	43.7
15	Thornberry, Old Post Office Road	45.1	44.2	40.1
16	Sun View, Old Post Office Road	43.9	43.0	39.1
17	Island View, Main St	54.8	53.8	47.5
18	Sheen House, Main St	55.7	54.6	48.0
19	Roughty House, Main St	55.9	54.8	48.1
20	Bay Tree House, Main St	56.0	54.8	48.1
21	Allenvale, Main St	56.0	54.8	48.0
22	26 Ferry View	51.0	49.7	45.5
23	Leeview, Main St	56.2	54.9	48.1
24	4 Riverview	56.0	54.7	48.0
25	2 Main St	55.8	54.6	47.9
26	Lackendarra, Main St	55.8	54.6	47.9
27	Drouch Na Mara, Warren's Court	52.1	51.3	44.6
28	Robin Hill, R610	42.9	42.4	35.4
29	Ardnaree, Strand Road	43.6	43.0	36.0
30	Ivy Cottage, Strand Road	43.7	43.2	36.2
31	Dwelling, Bayview Cottages, Strand Road	43.9	43.3	36.3
32	2 Strand Road	44.0	43.5	36.5
33	The Lodge, Strand Road	43.1	42.5	35.7
34	5 Belle Vue Place	43.9	43.3	36.4
35	14 Belle Vue Place	43.9	43.3	36.5
36	Grants Cottage, Strand View	43.8	43.3	36.4
37	Fir Hill House, Strand Road	43.2	42.7	35.9
38	Detached dwelling, The Demense	42.0	41.4	34.9
39	Summerland, Strand Road	43.6	43.1	36.2
40	Crowery, Alta Terrace	43.5	43.0	36.1
41	Thorncliffe, Alta Terrace	43.4	42.8	36.0

42	1 Alta Terrace	43.0	42.4	35.7
43	Rinnacoltaigh House, Rinacoltig	46.1	45.4	38.8
44	Travara, Rinacoltig	45.3	45.4	39.5
45	Cooleen House, Rinacoltig	48.2	47.5	40.9
46	Coolgrena House, Rinacoltig	47.4	46.6	40.1

Table 9.14: Predicted Night-time Noise Levels from CCT and Existing Noise Levels at Nearest Noise Sensitive Properties

Property Reference (Fig 9.2-9.4, Vol. II)	Existing Night-time Ambient L_{Aeq} dB(A)	Existing Night-time Background L_{A90} dB(A)	Worst-Case Predicted Noise Levels - Night (No Alarm) L_{Aeq} dB(A)
1	39-49	32-38	42.3 ((38.4)
2	31-40	28-30	43.1 (38.9)
3	37-45	29-34	48.5 (42.9)
4	44-52	29-34	49.6 (43.9)
5	44-52	29-34	50.1 (44.4)
6	44-52	30-44	50.8 (45.0)
7	44-52	30-44	48.1 (43.6)
8	44-52	30-44	51.4 (45.6)
9	44-52	30-44	47.8 (43.8)
10	44-52	30-44	51.9 (46.0)
11	44-52	30-44	52.1 (46.1)
12	40-54	30-44	52.4 (46.3)
13	40-54	30-44	53.1 (46.9)
14	40-54	30-44	48.5 (43.7)
15	-	-	44.2 (40.1)
16	-	-	43.0 (39.1)
17	40-54	28-40	53.8 (47.5)
18	40-54	28-40	54.6 (48.0)
19	40-54	28-40	54.8 (48.1)
20	42-52	36-50	54.8 (48.1)
21	42-52	36-50	54.8 (48.0)
22	40-54	28-40	49.7 (45.5)
23	42-52	36-50	54.9 (48.1)
24	42-52	36-50	54.7 (48.0)
25	42-52	36-50	54.6 (47.9)
26	42-52	36-50	54.6 (47.9)
27	-	-	51.3 (44.6)
28	43-58	34-50	42.4 (35.4)
29	43-58	34-50	43.0 (36.0)
30	43-58	34-50	43.2 (36.2)
31	43-58	34-50	43.3 (36.3)
32	43-58	34-50	43.5 (36.5)
33	30-52	26-42	42.5 (35.7)
34	38-48	30-34	43.3 (36.4)
35	38-48	30-34	43.3 (36.5)
36	38-48	30-34	43.3 (36.4)
37	30-52	26-42	42.7 (35.9)
38	30-52	26-42	41.4 (34.9)
39	42-52	36-40	43.1 (36.2)
40	42-52	36-40	43.0 (36.1)
41	42-52	36-40	42.8 (36.0)
42	39-49	38-40	42.4 (35.7)
43	36-48	32-44	45.4 (38.8)
44	38-44	30-40	45.4 (39.5)
45	38-44	30-40	47.5 (40.9)
46	38-44	30-40	46.6 (40.1)

47	38-44	30-40	46.4 (39.9)
48	33-42	30-40	46.3 (39.8)
49	33-42	30-40	46.2 (39.7)
50	33-42	30-40	45.7 (39.3)
51	33-47	32-44	41.0 (37.0)
52	33-42	32-44	40.6 (36.7)
53	34-47	31-36	39.2 (35.3)

In Monkstown, worst-case predicted night-time noise levels from the proposed upgraded CCT with alarms will be in the lower to middle portions of the range of ambient noise levels currently recorded in the area and above or at the upper portion of the range of background noise levels (RPS 2014).

Without the additional alarm noise, worst-case predicted night-time noise levels is expected to be below or at the lower end of the range of existing ambient noise levels and will be below or at the lower end of existing background night-time noise levels. In the context of the existing noise environment at Monkstown, worst-case predicted noise levels from the proposed upgraded CCT are expected to be a low-level contributor to background noise levels at night-time in Monkstown. However, with alarm noise, worst-case predicted noise levels will become a prominent and audible part of the night-time ambient noise levels in Monkstown. Mitigation measures for the noise from the proposed upgraded CCT are discussed further in Section 9.6.

[9.5.3.3] Noise impacts from Traffic Movements in and out of Port

This section includes an assessment of the potential noise impact associated with the change in traffic movements on the local road network as a result of the proposed redevelopment.

Chapter 8 Traffic and Transportation of the RPS 2014 EIS for the original Ringaskiddy Redevelopment Project includes a detailed assessment of the traffic impact associated with the proposed redevelopment and based on container traffic growth projections. As part of the transport assessment, detailed traffic flow information has been derived for the base year (2012), the year of opening (2018) with and without the proposed redevelopment in place and future year scenarios (i.e. 2023 & 2033) with the proposed redevelopment in place. In the case of the 2033, different potential options were considered for the proposed M28 scheme was considered. Table 9.15 includes details on the percentage increase and decrease in traffic flow levels on all the principal roads in the study areas that have the potential to be impacted by the proposed redevelopment.

Table 9.15: Traffic Flow Changes on Local Road Network as a Result of Ringaskiddy Port Redevelopment

Road Link	Percentage Change in Traffic Flow as a Result of Proposed Re-development			
	2018	2023	2033 (Full New N28)	2033 (New N28)
N28 West of R613	+5.8	+7.3	-0.4	+3.0
Board of Works Road	-3.9	-2.9	+0.5	-0.2
Rock Road	+22.1	+12.4	-0.1	-0.8
Raffeen Cross	+0.9	-0.3	+0.1	+0.3
R613 @DWB Junction	+1.9	+1.4	+10.5	+34.0
R613 Coolmore Cross East	+0.4	+2.6	+0.7	+3.7
R613 Coolmore Cross West	+12.2	+10.1	+0.2	+0.4
R613 Carrigaline. Church/Rock Road	+12.2	+10.1	+0.7	+0.4
R610 Raffeen Cross West	+4.7	+3.9	+0.8	+1.4
Ballyorban	+2.7	+1.8	+0.5	+1.1
L6477 Monees	+4.0	+4.8	+0.1	-0.5

Ballinrea Road	+3.3	+1.4	+0.7	-0.1
N28 East of Shanbally	+3.4	+4.6	+0.6	+1.3
N28 West of Shanbally	+0.4	+1.5	+0.9	+0.4
N28 Raffeen Cross East	+0.8	+1.7	+1.1	-0.1
N28 Raffeen Cross West	-0.5	+0.3	+0.1	-0.3
N28 East of Shannonpark	-0.5	+0.3	+0.1	+0.4
N28 Shannonpark East	-0.9	+0.2	0.0	-0.3
N28 North of Shannonpark	-0.3	+0.1	-0.3	-0.3
N28 Hilltown	-0.1	+0.3	-0.3	-0.3
N28 South of B.O.W. Road	0.0	+0.5	+3.1	+3.2
N28 Carr's Hill	+0.4	+0.8	+3.7	+2.8
N28 East of R613 - Old Post Office Road	-3.1	-2.8	+0.7	+0.7
Shanbally underbridge				+17.0
Novartis Link Road				+57.6
N28 Carrigaline Road	+0.4	+0.8	+3.7	+2.8
Barnahealy Southern Link Road	+7.5	+5.6	-1.0	-5.7
Hilltown Road	+20.7	+18.7	0.0	0.0
L6477 Raheenering	-1.6	-1.7	0.0	+0.1
R611 Shannonpark	-1.9	-1.9	-0.3	-0.2
L2492	-7.8	-7.3	+1.7	+1.1
N28 East of R613	-2.7	-2.4	+0.5	+0.7
R613 Coolmore Cross North	-9.2	-8.6	+2.9	+7.2
Shanbally Mews	-5.4	-3.7	0.0	-1.1
R610 Raffeen Cross East	+0.4	-1.3	-0.2	-0.1
Castletreasure Road	-0.3	-0.3	+0.5	-0.1
Upgraded N28 Carr's Hill	NB*	NB*	+6.7	+5.6
Upgraded N28 South of Carr's Hill	NB*	NB*	+6.7	+5.6
Upgraded N28 South of Hilltown Diverge	NB*	NB*	+10.6	+9.3
Upgraded N28 East of Shannonpark	NB*	NB*	+21.5	+18.6
Upgraded N28 East of Shanbally	NB*	NB*	+30.8	+22.1
Upgraded N28 West of Shanbally	NB*	NB*	+21.5	+18.6
Upgraded N28 at Barnahealy	NB*	NB*	+11.4	+22.1
Upgraded N28 Shanbally Diverge	NB*	NB*		+22.1
Upgraded N28 Last Section Ringaskiddy	NB*	NB*	+59.4	NB*
Upgraded N28 Loughbeg	NB*	NB*	+53.2	NB*

The traffic changes included in Table 9.15 illustrate that there will be traffic flow increases and decreases on various routes in the study area with the proposed redevelopment in place. The table below: illustrates that other than in a small number of cases, all traffic flow increases in the various scenarios will be less than 25%. The only scenarios where this will not be the case will be for the 2033 where the new N28 stops at the R613 (i.e. R613@DWB Junction +34%, Novartis Link Road +57.6%) and for the full new M28 in 2033 (i.e. Upgraded N28 East of Shanbally +30.8%,, Upgraded N28 Last Section Ringaskiddy +59.4%, Upgraded N28 Loughbeg +53.2%). In the case of the Novartis Link Road, while the percentage change is significant, the actual noise impact associated with this is negligible on account of the very low traffic flows on this road link (i.e. less than 500 vehicles 24-hour AADT).

The UK Design Manual for Roads and Bridges (DMRB, Volume 11, Section 3, Part 7) states that it takes a 25% increase or a 20% decrease in traffic flows in order to get a 1dB(A) change in traffic noise levels. The majority of the most significant traffic flow increases and decreases listed above are less than a 25% increase or a 20% decrease in traffic flows. Therefore, the majority of traffic flow increases or decreases will result in a less than 1dB(A) change in the traffic noise levels at properties adjacent to these routes.

It is generally accepted that it takes an approximate 3dB(A) increase in noise levels to be perceptible to the average person (Ref: NRA Guidelines for the Treatment of Noise and Vibration in National Road Scheme, 2004). Using this reference in the context of the proposed

redevelopment, the traffic noise increases and decreases associated with the proposed redevelopment will be imperceptible to receptors in the vicinity of these roads.

The assessment of traffic noise impacts concludes that there will be no significant traffic noise impact on sensitive receptors in the study area as a result of the proposed redevelopment.

[9.5.3.4] Construction Phase Vibration Impacts

There is no published Irish guidance relating to vibration during construction or operational activities. Common practice in Ireland has been to use guidance from internationally recognised standards. Vibration standards come in two varieties: those dealing with human comfort and those dealing with cosmetic or structural damage to buildings. In both instances, the magnitude of vibration is expressed in terms of Peak Particle Velocity (PPV) in millimetres per second (mm/s).

In the case of nominally continuous sources of vibration such as traffic, vibration is perceptible at around 0.5mm/s and may become disturbing or annoying at higher magnitudes. However, higher levels of vibration are typically tolerated for single events or events of short duration. For example, intermittent blasting and piling, two of the primary sources of vibration during construction, are typically tolerated at vibration levels up to 12mm/s and 2.5mm/s respectively. This guidance is applicable to the day-time only; it is unreasonable to expect people to be tolerant of such activities during the night-time.

Guidance on the relationship between the magnitude of vibration and peoples' reaction to it is contained in BSI Standards BS5228-2:2009 - Code of Practice for Noise and Vibration Control on Construction and Open Sites – Part 2: Vibration Table B1

[9.6] Mitigation Measures

[9.6.1] Construction Phase

Section 9.4 contains an assessment of the noise impact associated with the construction phase of the proposed redevelopment at the nearest noise sensitive properties. The assessment of the worst-case predicted construction noise levels using the ABC Method (BS5228:2009) and the TII Guidelines (2004) indicates that worst-case construction noise levels will be within the required threshold limits cited in these guidance documents.

NV_01 There will be an onus on the contractor to reduce construction noise levels from the construction phase to the lowest possible levels to ensure that no significant noise impact is experienced at the nearest noise sensitive receptors. The contractor must comply with all of guidance included in British Standard BS5228:2009 – Noise and vibration control on construction and open sites: Part 1 - Noise in relation to reducing construction noise levels.

NV_02 A complaints procedure must be operated by the Contractor throughout the construction phase and all efforts should be made to address any noise issues at the nearest noise sensitive properties.

NV_03 During the works, best practice noise reduction measures described in British Standard 5228-12009+A1:2009, Code of Practice for Noise and Vibration Control on Construction and Open Sites must be incorporated into the Construction and Environmental Management Plan.

NV_04 For mobile plant items such as cranes, HGV's, excavators and loaders, maintaining enclosure panels closed during operation can reduce noise levels over normal operation.

NV_05 Mobile plant will be switched off when not in use and not left idling.

NV_06 For steady continuous noise, such as that generated by diesel engines, noise reduction can be achieved by fitting a more effective exhaust silencer system.

NV_07 No machinery should be left running outside of the agreed operation hours, which must limit any noise emissions from the site in the late evenings and early mornings when mammal (i.e., otter) activity is at a higher level.

[9.6.2] Operation Phase

The assessment of the proposed CCT 2 and DWB extension illustrated that there was limited potential for significant additional operational day and night-time noise impacts at the nearest noise sensitive properties.

Notwithstanding, there is some potential for significant isolated increases in noise levels, particularly during the night-time period, if mitigation measures are not in place to reduce noise from the proposed redevelopment to the lowest possible levels.

One of the most prominent features of the detailed noise assessment of activities associated with the proposed redevelopment is that alarm/beacon noise is a major contributory factor to creating potential significant noise impacts at properties in all areas under consideration in this assessment. If alarm/beacon noise was significantly reduced, a large proportion of potentially significant noise impacts associated with the proposed redevelopment would be eliminated.

The need for alarms is clearly a health and safety issue and therefore, the use of an alternative alarm system cannot compromise the required health and safety standards for the Port. In recent years, various technological solutions have been developed in terms of modifying alarm systems or developing new alarm systems that significantly reduce the noise impact at adjacent sensitive receptors. Options include visual warning systems, proximity sensor alarms, self-adjusting or smart alarms, focussed tonal alarms, broadband alarms and directional alarms. Of the potential alternatives to standard 'beeper' alarms that are listed above, self-adjusting 'smart' alarms and broadband alarms offer the most significant improvement in terms of noise impacts.

NV_08 The mitigation measures for alarm/beacon noise associated with the proposed redevelopment will involve setting a noise threshold limit of 100dB Lw (95dB Lw with tone) for the selected alarm system to be used. There is a range of self-adjusting 'smart' and broadband alarm systems that are capable of achieving the required noise threshold limit (e.g. manufacturers - bbs-tek, Ecco, Fleet Electrical).

NV_09 In addition to the alarm noise, a series of noise barriers (block walls) have been constructed as part of the Ringaskiddy Port redevelopment to ensure that a significant proportion of ground- based noise activities are reduced as much as possible. Figure 9.15 (EIS Volume III) illustrates the location of three 4m high noise barriers which have been installed in the design of the proposed redevelopment. These barriers have resulted in significant attenuation to noise from a range of plant such as terminal transporters, reach stackers and reefers. Additional noise barriers were installed in Phase 1a development.

It is proposed that the mitigation measures outlined earlier in this section for alarm noise will be extended to any existing and proposed plant in the extended DWB and CCT2. The provision of alternative alarm systems at the DWB will ensure that with the proposed development in place, an overall improvement will be experienced in terms of worst-case noise levels from the extended DWB as compared with the existing operations at the DWB and CCT2.

NV_10 The Port shall issue periodic Notice to Mariners regarding the request for all vessels to take steps to reduce their potential noise impacts and reminding vessel operators that Ringaskiddy Basin has berths that are adjacent to residential areas in Ringaskiddy village.

NV_11 The Port shall utilise sound matting in strategic locations to address noise issues.

[9.7] Monitoring

[9.7.1] Construction Phase

The NTi programme of monitoring will be undertaken and continuously reviewed during construction phase for the proposed development.

[9.7.2] Operation Phase

The existing programme of quarterly compliance monitoring as well as the NTi programme will be undertaken during operation phase for the proposed development

[9.8] Residual Effects

[9.8.1] Construction Phase

A detailed noise assessment of the construction phase impacts has shown that compliance with limit values can be achieved. Noise and vibration monitoring will be undertaken in areas where residential properties are directly adjacent to the works, as outlined in Section 9.6.1. No significant residual impacts are predicted.

[9.8.2] Operation Phase

Some residual impacts for noise may be experienced during operation of the Port in the long term particularly at periods of high activity are predicted during the operational phase of the project. These are assessed as slight temporary and long-term impacts and are managed on an ongoing basis at the Port.

No residual vibration impacts are predicted as a result of the project.

[9.9] Potential Interactions & Cumulative Impacts

There a range of projects in the study area that are in different stages of planning and have the potential to influence the noise environment in the vicinity of the proposed redevelopment. These have all been considered in the context of the proposed redevelopment and the potential for cumulative noise impacts at the nearest noise sensitive receptors.

The proposed redevelopment has been assessed against a quieter background noise environment not including any potential noise from the above sources (i.e. worst-case

assessment). The above-mentioned projects have the potential to increase noise levels at sensitive locations in the immediate vicinity to them, making any noise from the redeveloped Port less prominent at those receptors.

[9.10] Summary

Description of Potential Impact	Significance Pre-Mitigation	Impact Duration	Suggested Mitigation and Monitoring	Residual Significance
Construction Phase Impacts				
Impact from construction noise	Imperceptible	Temporary	A complaints procedure must be operated by the Contractor throughout the construction phase and all efforts should be made to address any noise issues at the nearest noise sensitive properties.	Imperceptible
Operation Phase Impacts				
Operational Noise	Slight	Long-Term	Notice to Mariners to Reduce Shipping noise levels 4m noise barriers already in place. NTi programme continued Reduce levels of alarm noise where feasible	Slight

[10] Air Quality

[10.1] Introduction

This Chapter assesses the impacts to air quality associated with the proposed Ringaskiddy Port Redevelopment. It should be read in conjunction with the site layout plans and project description in Chapter 3.

Existing operations at the site involve the handling of bulk grains and container handling and the site had previously examined fugitive dust release issues although this has been addressed through comprehensive mitigation measures defined by the Port of Cork. These existing operations and measures of control are detailed further in this chapter. There are three Bergerhoff dust monitoring gauges at the Port of Cork which were compliant with EPA Dust Limits in 2023.

Impacts to air quality will arise during the construction phase of the proposed redevelopment, such as from the generation of construction dusts. In addition, potential sources of other air quality impacts such as odours from dredging have been identified. The construction activities have been examined to identify those that have the potential for emissions to the atmosphere. Where applicable, a series of suitable mitigation measures have been listed.

During the operational phase discharges to the air will be in the form of slightly increased exhaust emissions from engines (including road traffic, internal Port vehicles/engines and shipping) and ongoing dust from bulk grain handling at the Deep Water Berth (DWB) at Ringaskiddy West

Harbour mobile cranes will be used for cargo handling in line with existing activities, with loose bulk materials being lifted using a grab bucket and deposited via hoppers into awaiting lorries. The materials will then be transferred into bulk stores situated in the existing hinterland areas. A series of detailed mitigation measures are in operation at the existing DWB and will continue to be applied at the new extended portion of Ringaskiddy West. These are discussed and detailed in this Chapter.

[10.2] Assessment Methodology

[10.2.1] Study Area

The study area for the purposes of the air quality assessment encompasses the representative sensitive receptors highlighted in Section 10.4.

The desktop assessment considers the results of previous modelling conducted to assess the likely operational impacts of the Ringaskiddy redevelopment and temporal and spatial effects relating to air quality impacts.

[10.2.2] Legislation & Guidance

Irish Ambient Air Standards

The relevant Irish ambient air standards have been adopted from the European Commission Directives 1996/62/EC, 1999/30/EC and 2000/69/EC and are cited as the Air Quality Standards

Regulations, which came into force on 17th June 2002 (Irish Legislation S.I. No. 271 of 2002). In May 2008, these European Directives on air quality were replaced with a new Directive on ambient air quality and cleaner air for Europe (2008/50/EC). The Clean Air for Europe Directive (2008/50/EC) (now transposed into Irish Law) and the Fourth Daughter Directive (2004/107/EC) set limits and target values for ambient concentrations of air pollutants harmful to human health and the environment.

The CAFE Directive was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011). It replaces the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and S.I. No. 33 of 1999. The 4th Daughter Directive was transposed by the Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations 2009 (S.I. No. 58 of 2009).

The Air Quality Standards Regulations specify limit values in ambient air for sulphur dioxide (SO_2), lead, benzene, particulate matter (PM_{10} and $PM_{2.5}$) and carbon monoxide (CO), nitrogen dioxide (NO_2) and oxides of nitrogen (NOx). These limits are for the protection of human health and are largely based on review of epidemiological studies on the health impacts of these pollutants.

Table 10.1 Air Quality Standards Regulations 2011

Pollutant	Criteria	Value
Nitrogen Dioxide	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 μg/m³ NO_2
	Annual limit for protection of human health	40 μg/m³ NO_2
	Annual limit for protection of vegetation	30 μg/m³ NO + NO_2
Benzene	Annual limit for protection of human health	5 μg/m³
Carbon Monoxide	Maximum daily 8-hour running mean	10 mg/m³
Lead	Annual limit for protection of human health	0.5 μg/m³
Sulphur dioxide	Hourly limit for protection of human health - not to be exceeded more than 24 times/year	350 μg/m³
	Daily limit for protection of human health - not to be exceeded more than 3 times/year	125 μg/m³
	Annual limit for protection of vegetation	20 μg/m³
Particulate Matter PM_{10}	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 μg/m³ PM_{10}
	Annual limit for protection of human health	40 μg/m³ PM_{10}
Particulate Matter $PM_{2.5}$	Annual target value for the protection of human health	20 μg/m³ $PM_{2.5}$

The limits presented in the EU Directives on Air Quality consider people with respiratory illness and the limits include a margin of tolerance for such conditions, as well as children and the elderly. The limits mimic those based on World Health Organisation (WHO) review of epidemiological studies on health impacts around the world. For example, oxides of nitrogen (NO, NO_2 and NOx) are known to affect the pulmonary function of the lungs in short term doses. Of all of the medical literature reviewed by the WHO, the lowest adverse effect of exposure was recorded at about 560ug/m3 which showed a reduced lung function in asthmatics. The WHO uses this lowest adverse impact and apply a margin of tolerance (usually 50%) to generate a limit of 200ug/m3 for 1-hour human exposure to oxides of nitrogen. This approach is then replicated for all pollutants.

The IAQM Guidance on Air Quality Monitoring in the Vicinity of Demolition and Construction Sites document provides updated guidance on air quality monitoring in the vicinity of demolition and construction sites. It should be read and applied in conjunction with the Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance that was published by the IAQM in January 2012. Constructing buildings, roads and other infrastructure can have a substantial, temporary impact on local air quality. The most common of these impacts are augmented particulate matter (PM) concentrations and dust soiling. Depending on the possibility of dust effects occurring, monitoring may need to be undertaken during both demolition and construction activities to make sure that the applied mitigation measures are effectual in controlling dust emissions, and that there are no significant impacts on the surrounding environment.

The Local Air Quality Management Policy Guidance - LAQM.PGNI(09) (UK Guidance, no Irish equivalent) sets out those circumstances under which air quality may be a material issue for planning applications and provides guidance to planning authorities on making these decisions. Section B3, Chapter 5 Page 24 sets outs guidance on the assessment of shipping.

Dust

There is no legislative limit for total suspended particles so the guidelines presented by the German Government TA Luft guidance are employed. Under this guidance the construction contractor would be required to maintain monthly dust levels below the guideline of 350mg/m2/day as an annual average at sensitive receptors. The EPA have adopted this standard for all licensable activities. The standard method of measurement of dust deposition is outlined in VDI 2119 – Measurement of Particulate Precipitations. Determination of Dust Precipitation with collecting pots made of glass (Bergerhoff Method) or Plastic. This standard measures total dust deposition i.e. all particle sizes, including soluble, insoluble and respirable (PM10) dusts.

[10.2.3] Data Sources

The methodology used as part of this assessment involved undertaking a desk-based study to examine all relevant information relating to air quality conditions in the vicinity of the application site.

The air quality assessment has been carried out following procedures described in the publications by the EPA (EPA, 2015; 2020; 2022) and using the methodology outlined in the guidance documents published by the USEPA (USEPA, 2017; 2021).

Historically air dispersion modelling was undertaken in 2014 to assess the dust deposition flux at the land ownership boundary, and the PM_{10} and $PM_{2.5}$ concentrations associated with the activities at sensitive locations beyond the land ownership boundary. Modelling using the

United States Environmental Protection Agency (USEPA) new generation dispersion model AERMOD (USEPA, 2021) (Version 22112) was used as recommended by the USEPA (2017) and Irish EPA (2020). The steady-state Gaussian plume model is used to assess pollutant concentrations associated with industrial sources. The model has been designed as the regulatory model by the USEPA for modelling emissions from industrial sources in both flat and rolling terrain (USEPA, 2017). The AERMET meteorological pre-processor (USEPA, 2018) was used to generate hourly boundary layer parameters for use by AERMOD. Dust generation rates were calculated from factors derived from empirical assessment and detailed in the USEPA database entitled “Compilation of Air Pollution Emission Factors”, Volume 2, AP-42 (1986, updated periodically) (USEPA, 1986). The emission factors have been presented in Appendix 2.

Compliance monitoring undertaken at the Port of Cork in 2023 is also referenced in this assessment.

[10.3] Baseline Environment

The main existing sources of pollution in the area around Ringaskiddy Port are from road traffic, shipping traffic, space heating, industrial emissions, residential emissions and fugitive emissions from fuel/gas storage. Existing Port operations including shipping emissions (both docked emissions and at sea emissions) and land operations (cranes, trucks, etc.) will also give rise to combustion emissions. These emissions are dependent on the fuel employed, the size of the vessel and the duration of the operations.

Sources of nuisance dust in the area include bulk cargo unloading operations at the existing DWB and bulk grain storage facilities at Ringaskiddy West. There are also bulk grain warehouses located to the east along the N28 east of Ringaskiddy village Main Street. Depending on operational conditions and prevailing wind conditions, these sources have the potential to impact on nuisance dust levels in the area. The Port of Cork has implemented an action plan in accordance with their EMS (Environmental Management System) to combat the dust nuisance arising from bulk operations at the DWB. Measures such as new plant, a simulator to train new crane operatives and dust reduction mechanisms have been undertaken to mitigate against these dust issues. Limited operational dust impacts arise and will arise at the Ringaskiddy East (CCT2) as it will be handling containers or project cargo.

The site of the proposed development is at the existing Port of Cork facility. The port landside entrance/exit is at Ringaskiddy. The proposed site is bordered to the south by Ringaskiddy village and further south by agricultural lands and industrial facilities. Haulbowline Island is located to the northeast of the port. The Irish Naval base and the decommissioned Irish steel plant are located on Haulbowline Island. Across Cork Harbour, to the northwest and northeast are Monkstown and Cobh respectively.

The proposed redevelopment area is in a suburban setting surrounded by various existing port business and commercial properties. Ringaskiddy consists of a wide main road with residential dwellings situated adjacent to the road and further back onto elevated lands. The main road carries local traffic, naval staff traffic as well as heavy goods vehicles using the Port and other commercial businesses. The level of increased traffic in the town centre is likely to generate amounts of dust and traffic-derived pollution (i.e. nitrogen oxides, benzene and sulphur dioxide from diesel exhausts) under the existing conditions.

The nearest sensitive receptors to the proposed CCT2 and Ringaskiddy West DWB extension are approximately 200m from the site. These receptors consist of terraced dwellings, housing

estates and associated amenities, as well as Paddy's Point Amenity Area. The naval college is approximately 400m from the site. Monkstown and Cobh are at their closest point, 800m and 500m from the landownership boundary respectively. Paddy's Point Amenity Area and a new park at Haulbowline are also within 2km of the site.

Identifying sensitive receptor locations is an important step in locating areas that may be more susceptible to potential impacts from changes in air pollution concentrations. In general, sensitive receptors include areas such as residential housing, school, hospitals, places of worship, sports centres and shopping areas. The longer-term standards, such as the 24-hour and annual means, would not apply at such kerbside locations, as they would not reasonably represent longer-term public exposure. There are a number of environmental designations, including Cork Harbour Special Protection Area (SPA) and Monkstown Creek proposed Natural Heritage Area (pNHA). Sensitive receptor locations are highlighted in Section 10.4 of this Chapter.

The main existing sources of pollution in the area around Ringaskiddy Port are from road traffic, shipping traffic, space heating, industrial emissions, residential emissions and fugitive emissions from fuel/gas storage. Existing Port operations including shipping emissions (both docked emissions and at sea emissions) and land operations (cranes, trucks, etc.) will also give rise to combustion emissions. These emissions are dependent on the fuel employed, the size of the vessel and the duration of the operations.

Sources of nuisance dust in the area include bulk cargo unloading operations at the existing CCT1 and DWB and continued bulk grain storage facilities at Ringaskiddy West extension and CCT1 unloading activities at Ringaskiddy East. There are also bulk grain warehouses located to the east along the N28 east of Ringaskiddy village Main Street. Depending on operational conditions and prevailing wind conditions, these sources have the potential to impact on nuisance dust levels in the area. The Port of Cork has implemented an action plan in accordance with their EMS (Environmental Management System) to combat the dust nuisance arising from bulk operations at the DWB. Measures such as new plant, a simulator to train new crane operatives and dust reduction mechanisms have been undertaken to mitigate against these dust issues.

The Environmental Objectives of the Port of Cork aims to manage cargo handling, cargo storage and port industry activities to minimise emissions to air, particularly odour, dust and noxious fumes. These objectives will be applied to the proposed re-development. Port of Cork currently operates an Environmental Management System (EMS) which complies with ISO 14000. The current adopted practices are detailed below:

- Maintaining an Environmental Management System compliant with European Sea Ports Organisation ECOPORTS criteria and certified to ISO 14001.
- The principle of 'pollution prevention' through operational best practice, emissions management, waste minimisation, efficient resource use, and conservation awareness.
- Compliance with relevant environmental legislation, regulations and industry codes of practice.
- Continual environmental performance improvement, by achieving realistic objectives and targets in the context of a systematic management programme.

- Communicating and implementing this environmental policy statement with all employees and providing appropriate training.
- Making the EMS available to our stakeholders and the general public and supporting local community liaison.
- Public reporting on environmental performance.
- Ensure the availability of necessary resources to implement this policy.

The Port of Cork have incorporated significant operational procedures in relation to bulk cargo handling. Specific dust mitigation measures in use at Ringaskiddy include:

- Two Dustboss sprays have been in use at Ringaskiddy West from 2013.
- Three hoppers in operation on the quay at Ringaskiddy West have dust controls incorporated. The oldest hopper is ten years old the newest is three years old.
- A road sweeper is used on the quay for all bulk discharges in use from circa 2008.
- All operators are trained and passed out internally before operating either the hoppers or the cranes.
- Cork County Council is notified of all bulk discharges by email. The information supplied would include the product being discharged, the number of days the discharge will take, the name of the receiver, the name of the stevedore and the name of the agent.
- All bulk discharges are monitored to ensure all operating procedures are being followed.
- The weather forecast is monitored prior to the days of the discharge operation to see if wind speeds and direction are going to be a problem.
- During the discharge the wind speed and direction are monitored regularly from an on-site weather station at Ringaskiddy West (located on top of lamppost).

The Standard Operating Procedures currently implemented at the Port of Cork, Ringaskiddy are outlined further below:

Port of Cork Checks to be Carried out Prior to Discharge of Dusty Cargos

1. Hopper operators to check all dust control systems are in good working order.

2. Hopper operator to check chutes etc. are in good working order. Check list to be filled in and returned to Terminal Manager.

3. Crane drivers are to check that grabs & cranes to be used for discharge are in good working order. Check list to be filled in and returned to Terminal Manager.

4. Any problem to be immediately notified to Terminal Manager or Operations Supervisor.

5. Terminal Manager to notify Senior Engineer Maintenance.

6. Maintenance work to be carried out as matter of urgency.

7. If dust control systems are not fully functional hopper not to be used in discharge of ship.

8. Alternative hopper to be used with procedure as outlined above followed.

9. On the day of discharge of a potentially dusty cargo, all crane drivers & hopper operators to be reminded to follow procedures for discharge of dusty cargos & not to do so is a disciplinary matter.

10. Where possible single chute hoppers to be used.

Terminal Representatives (Stevedore) / Receiver Responsibility

1. Day prior to discharge Operations Supervisor to be notified as to which hatches are being used & how much product is expected to be discharged from each hatch.

2. Trucks to be used in discharge to have no cross bars or spines.

3. Truck drivers to be instructed to ensure tail gates are fully closed.

4. Truck drivers to be instructed to take particular care to enter hopper centrally under chute.

5. On leaving hopper all trucks which are going on to the main road to be covered immediately.

6. Trucks which are taking product within the site to be filled only to 3/4 level.

7. All spills to be cleaned up immediately & removed.

8. Dedicated person (Terminal Representative) to be appointed by receiver/stevedore to liaise with Operations Supervisor.

9. All discharge matters to be relayed to Port of Cork staff through Operations.

10. On finish of discharge of vessel stevedores / receivers to clean up quay as a matter of urgency.

Work Instruction - Operation of Crane for Dusty Cargos

1. Lower grab into vessel.

2. Close grab.

3. Lift hold, shake (to ensure grab is fully closed & get rid of excess).

4. Lift & swing grab.

5. Lower grab into hopper as much as possible.

6. Release grab.

7. Do not over fill hopper beyond max fill mark on hopper.

8. Hold grab in open position within hopper.

9. Repeat above procedure.

Work Instruction - Operation of Hoppers for Dusty Cargoes

1. Instruct trucks to get in correct position centrally on chute.

2. Product released by removing slide, controlled by hopper operator.

3. Chute is lifted as product is released, forming pyramid in truck.

4. Several loads released into the awaiting truck.

5. Truck moves forward for additional product on driver's instructions.

6. Do not over fill truck.

7. When truck is loaded inform truck driver to proceed from hopper.

These operational procedures will be continued at the proposed CCT2 and DWB extension at Ringaskiddy West.

Baseline Air Quality Levels at Port of Cork

Air quality monitoring programmes have been undertaken in recent years by the EPA. The most recent annual report on air quality in Ireland is Air Quality In Ireland 2020 (EPA 2021a). The EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments (EPA 2021).

As part of the implementation of the Air Quality Standards Regulations 2002 (S.1 No. 271 of 2002, four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA 2021). Dublin is defined as Zone A and Cork as Zone B.

The Port of Cork Monitoring Station 112 In Ringaskiddy is an hourly updated Air Quality Index of Health (AIQH) monitoring station and was inspected on 15/08/2024. The PM_{10} Average on this date was 6.11 µg/m^3. The $PM_{2.5}$ average on this date was 2.76 µg/m^3. The Air Quality Index for the Port of Cork Station is classed as Good.

There were no exceedances of Air Quality Standards in 2022 based on EPA Air Quality Report for 2022 for SO_2, $PM_{2.5}$, NO_2, NOx, O_3, CO, C_6H_6, Heavy Metals and PAH where they were measured.

There are three Bergerhoff dust monitoring gauges at the Port of Cork which were compliant with EPA Dust Limits in 2023.

[10.4] Sensitive Receptors

The nearest sensitive receptors to the proposed works are approximately 200m from the proposed site. These receptors consist of terraced dwellings, housing estates and associated amenities. The naval college is approximately 400m from the existing site. Monkstown and

Cobh are at their closest point, 800m and 500m from the site perimeter respectively, Haulbowline Pak and Paddy's Point amenity area are both within 2km of the site.

Identifying sensitive receptor locations is an important step in locating areas that may be more susceptible to potential impacts from changes in air pollution concentrations. The residential properties are considered to be medium sensitivity receptors.

Given the low number of sensitive receptors in terms of household and the distance from the source the sensitivity of the area to dust soiling effects on people and property is considered medium to low (IAQM 2024).

Receptor name	X(m)	Y(m)	Z(m)
1.Ringaskiddy Main St	177675	64219	1.5
2.4 Riverview Ringaskiddy	177706	64219	1.5
3.Ringaskiddy Main St 2	177755	64221	1.5
4.Ringaskiddy Footpath	177832	64242	1.5
5.Ringaskiddy Main St 3	177852	64218	1.5
6.Ringaskiddy Main St 4	177864	64218	1.5
7.Ringaskiddy Main St 5	177970	64205	1.5
8.Ringaskiddy Main St 6	178192	64202	1.5
9.Ringaskiddy Main St 7	178253	64210	1.5
10.Marello Pk Ringaskiddy	178313	64199	1.5
11.Harbour 1 Ecological Designation	178010	64803	0
12.Harbour 2 Ecological Designation	177615	64791	0
13.Off Main N28	177611	64052	1.5
14.Layby N28	177327	64336	1.5
15.Shanbally Cross 1	175756	64457	1.5
16.Shanbally Cross 2	175715	64376	1.5
17.Shanbally Cross School	175670	64363	1.5
18.Shanbally Cross 3	175635	64439	1.5
19.Shanbally Cross 4	175608	64436	1.5
20.Shanbally Cross 5	175481	64392	1.5
21.Paddy's Point Amenity Area	179174	64719	1.5

[10.5] Potential Impacts

[10.5.1] The 'do nothing' scenario

The Existing Environment/Do Nothing Scenario, is a scenario in which the existing Port arrangements remain as is. The site would, therefore, remain without the construction of CCT2, Ringaskiddy West DWB Extension and container handling and stacking arrangements. The predicted impacts of dust deposition, PM_{10} and $PM_{2.5}$ emissions as well as traffic emissions would remain similar to current levels. The Do-Nothing scenario is considered neutral in terms of air quality and climate.

[10.5.2] Construction Phase

There are four potential impacts to atmosphere from the construction stage of the proposed redevelopment works:

- Dispersion of construction dusts/pollutants during the proposed works (earth/soil movements, waste treatment, piling and re-instatement);
- Emissions associated with construction traffic;
- Greenhouse Gas emissions from construction operations (traffic, materials and plant); and,
- Potential odours (such as during dredging).

The high-level assessment for each of these impacts are summarised as follows:

Dust Dispersion

Construction dusts have the potential to cause local impacts through dust deposition and exposure at the nearest sensitive receptors and also to sensitive ecosystems. Air quality impacts on property may arise during the construction phase and may result in dust deposition on residential and development property.

The potential for dust generation from the construction activities associated with the proposed development has been assessed on the basis of a review of the construction methodologies and the proximity of these methodologies to sensitive receptors. Construction activities such as material movement and earthworks may generate quantifies of dust, particularly in dry weather conditions. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction.

The Institute of Air Quality Management (IAQM) guidance aims to estimate the effects of both PM_{10} and nuisance dusts, together, through a single risk-based assessment procedure. The IAQM guidance document states that 'As the effects depend to a large extent to the mitigation measures adopted, the emphasis has been on classifying sites according to the risk of the effects, to identify the mitigation appropriate to the risk'. The IAQM guidance provides a methodological framework, but notes that professional judgement is required to assess effects noting that 'the diverse range of projects that are likely to be subject to dust impact assessment means that it is not possible to be prescriptive as to how to assess the impacts. Also a wide range of factors affect the amount of dust that may arise, and these are not readily quantified'.

Quantities of dust will be generated during construction. Most nuisance dust generated will be deposited close to the source. A more qualitative approach is made to predict potential impacts from the anticipated construction works associated with the redevelopment. Potential fugitive release of pollutants to the atmosphere during the construction phase can be identified as being from emissions from associated machinery and plant and airborne dust from earth movement and general movement in the working areas. With respect to emissions from traffic, construction of the project would generate vehicle movements on the local road network, which would include contractors' vehicles and Heavy Goods Vehicles (HGVs), diggers, and other diesel-powered vehicles. This would result in emissions of nitrogen oxides (NOx), particulates and other combustion-related pollutants.

The main emphasis throughout this phase will be to minimise the potential dust impacts at source through appropriate site management, control mechanisms, and practices. It is common practice to use a distance of 100m as the radius within which significant dust effects may occur. However, smaller particles may travel greater distances. Therefore, the consideration of baseline conditions has included an area extending up to 350m of proposed

development site. As indicated in the latest IAQM guidance, nuisance dust effects would not be expected at distances more than 350m from the source (IAQM, 2012).

The proposed redevelopment is a significant project in terms of construction with the programme requiring minor earthworks, piling and dredging.

During the construction phase of the proposed redevelopment an important impact to consider is dust generating activities such as movement of plant vehicles both on and around the working area. Nuisance caused by the deposition of construction dust is likely to be the most significant issue in relation to local air quality impacts.

Levels and distribution of dust created during construction are likely to vary according to factors such as the type of dust, duration and location of dust-generating activity, the effectiveness of suppression measures and the weather conditions. The assessment of construction dust is normally confined to an evaluation of the likelihood that emissions may give rise to some perceptible nuisance. This is assessed on the basis of the distance from construction works of sensitive receptors such as residential properties. It is normally possible, by proper control, to ensure that dust deposition does not give rise to nuisance effects. Routine dust control measures would normally ensure that the risk of long-term impacts are insignificant but there is a risk that short-term events may occur, for example, technical failure or exceptional weather conditions. The potential environmental impact from construction dust is therefore assigned as a slight negative impact.

Construction Traffic

The proposed construction operation will involve a movement of materials such as dredging, etc. All dredged material will be moved by barge minimising the potential impact through road traffic. While some material transport and personnel transport is predicted during the construction phase, the total contribution of this traffic to the existing volumes of the road network is very low and hence will not be significant in terms of air quality. A specific construction phase air quality model was constructed and indicate that all predicted air quality concentrations at selected receptors are below relevant threshold levels. The projected impact to air quality from construction traffic is therefore described as an imperceptible neutral effect.

Greenhouse Gas Emissions

This assessment carried out to identify sources and quantify total Greenhouse Gas (GHG) emissions generated from the construction activities has been presented in Chapter 11. The assessment has been carried out using the carbon calculator tool developed by the Environment Agency in the UK specifically for construction projects. The carbon Calculator calculates the embodied carbon dioxide (CO_2) of materials plus CO_2 associated with their transportation. It also considers personal travel, site energy use and waste management.

Odour

The main potential odour from the construction stage relates to the potential for fugitive odours from the dredging operation. Odour mitigation measures have been presented to minimise the impact of this operation to prevent any nuisance.

Dredging works will be carried out to -13.0m Chart Datum adjacent to the new quay structures to provide sufficient water depths for vessels at all stages of the tide. Bed conditions comprise uncompacted silts overlying gravel, clay and limestone depending on location. Dredging will be required in all materials including bedrock.

Dredging to the required depths will therefore either be by backhoe or trailing suction hopper dredger, and disposed of at a sea disposal site. Again, the disposal of the dredged material will require application for a Dumping at Sea Permit from the Environmental Protection Agency through a separate consenting process. Excavation of approximately 215,000m3 of material is estimated.

The proposed dredging works as part of the construction phase may produce a certain amount of odour. An odour associated with dredging activity is Hydrogen Sulphide (H2S). It is a colourless gas with the characteristic foul odour of "rotten eggs". These potential dredging odours are likely to be limited to the immediate area of works. Should an odour issue become apparent specific issues can be put in place to address the problem. The mitigation section of the chapter details appropriate action to be carried out during the construction/dredging phase.

There is a relatively low potential for odour generation and nuisance to occur during the construction phase. The potential exists where decayed organic material has the potential to release sulphurous compounds (such as H_2S) or where solvent contamination is uncovered. Both of these potential sources will be released under water during the dredging operations.

Hydrogen sulphide is water soluble so the majority of H_2S released during dredging will dissolve in the water to form sulphuric acid at very trace concentrations which will rapidly dilute and disperse in the estuary.

Low levels or organic solvents are predicted in the dredged material and any vapour released will quickly condense into the liquid phase and either dissolve in the water (such as water soluble solvents such as alcohols) or form a residue on the water surface where not water soluble (such as aromatics). In both cases the impact is considered to be imperceptible.

[10.5.3] Operation Phase

[10.5.4] Potential Operational Impacts - Container Handling

The container terminal will be provided with various items of equipment for the handling and movement of containers and other cargo.

A list of terminal equipment is listed below as per Chapter 3.

Ship to Shore Gantry Cranes (existing)	-	2 nr
Gantry Cranes		6 nr
Harbour Mobile Cranes		1 nr
Terminal Transporters	-	12 nr
Reach Stackers		2 nr

The emissions from the diesel-powered container handing units/vehicles can be further minimised during the lifetime of the equipment through preventative maintenance and correct operating procedures. Replacement of equipment will be required after its useful life (approximately 25 years).

The Environmental Objectives of the POCC include the aim to manage cargo handling, cargo storage and port industry activities to minimise emissions to air including and noxious fumes.

These objectives will be applied to the proposed CCT2 and DWB extension and the wider operation.

The nearest sensitive receptors are more than 200m from the loading area. In general, air pollutant concentrations reduce as the distance from the source increases. The distance between source and receptor and the potential for pollutant dispersion away from the receptors will reduce the likelihood of significant impacts from noxious emissions during the operational phase of the project. This conclusion is supported by information contained in the UK Local Air Quality Management Guidance and studies carried out at large Ports in the UK.

Based on consideration of the sources described above the proposed operation CCT2 and associated traffic impacts are considered to be consistent with the scope of the activity described by RPS 2014 EIS. The dispersion model prepared for this assessment showed no operational breaches of Irish Air Quality Objectives or European Limit Values for annual mean or 24hour mean. On this basis, the impacts assigned to the CCT2 extension from an air quality perspective are of slight negative impact.

[10.5.5] Potential Operational Impacts – Bulk Cargo Handling (Proposed DWB extension)

As the proposed DWB extension is a direct extension of the existing bulk handling facilities there is limited opportunity for the consideration of alternative methods of port operations as any operations on this new section would need to be consistent with similar operations on the existing bulks berths.

Consideration has been given to various additional options for the handling of bulk materials on the entire DWB including the proposed extension. These include;

- Maintaining existing mobile hoppers/cranes with truck feed, and with improvements to existing infrastructure.
- Existing mobile hoppers/dockside cranes/truck feed plus mobile inclined belt conveyors to feed conveyor system to 3 x port operators.
- Mechanical ship unloader - (rail or tyre Mounted). Truck feed only.
- Mechanical ship unloader - (rail mounted). Truck feed plus rail mounted inclined belt conveyor to feed conveyor system for 3 x port operators.
- Existing mobile hoppers & or a new mechanical ship unloader - (Rail or Tyre Mounted) Truck Feed with a High-Capacity Quayside General Tip Point.

It is the intention of the Port of Cork that the current method of handling cargoes be continued and extended to service the proposed berth extension. The Port will continue to adopt best practice and will actively review with the receiving companies what other measures might be implemented to control release of dust during unloading operations. The existing comprehensive mitigation measures adopted by Port of Cork will be used on the area of operation of the new extended DWB.

[10.5.6] Potential Operational Impacts – Shipping Emissions

The principal pollutants related to shipping are those from internal combustion engines. These are CO, VOC, NOx and PM derived from soot which mainly have to do with engine technology, and CO_2, SO_x, heavy metals and further PM (mainly sulphate-derived) which originate from the fuel speciation. On a European scale, SO_2 and NOx emissions from national shipping can be important with respect to total national emissions.

Shipping volumes to the port are predicted to increase annually during the period 2024 to 2050 and this increase in shipping numbers will have a resultant increase in shipping emissions. Full details of shipping volumes are detailed in EIAR Volume IV a - Appendix 2.1 Socio-Economic Assessment of Proposed Ringaskiddy Port Redevelopment.

EU Directives are in force which relate to the content of sulphur in marine gas oil (EU Directive 93/12 and EU Directive 1999/32) and the content of sulphur in heavy fuel oil used in SECA (EU-Directive 2005/33).

The Marine Environment Protection Committee (MEPC) of IMO has approved amendments to Marpol Annex VI in October 2008 in order to strengthen the emission standards for NOx and the sulphur contents of heavy fuel oil used by ship engines.

The current Marpol 73/78 Annex VI legislation on NOx emissions, formulated by IMO (International Maritime Organisation) is relevant for diesel engines with a power output higher than 130 kW, which are installed on a ship constructed on or after 1 January 2000 and diesel engines with a power output higher than 130 kW which undergo major conversion on or after 1 January 2000.

The Marpol Annex VI, as amended by IMO in October 2008, considers a three-tiered approach as follows:

- Tier I: diesel engines (> 130 kW) installed on a ship constructed on or after 1 January 2000 and prior to 1 January 2011;
- Tier II: diesel engines (> 130 kW) installed on a ship constructed on or after 1 January 2011;
- Tier III (1): diesel engines (> 130 kW) installed on a ship constructed on or after 1 January 2016.

Given the existing legal requirements around fuel and emissions for shipping, the extent of emissions are gradually reducing and will continue to reduce in future years. The total numbers of all ships currently using the port is presented in EIS Volume IV a - Appendix 2.1. The change in emissions have been quantified by RPS 2014 using the emission factors presented in the EMEP/EEA Emission Inventory Guidebook 2013, Section 1.A.3.d.i international water borne navigation. Calculation outputs are shown in EIS Volume IV – Appendix 5.1.

It has previously been assessed by RPS 2014 that based on 2033 operational estimates, VOC's per annum, NOx per annum and Total TSPs per annum will remain below legal limits, even with the growth of container traffic to the Port.

2033 OPERATIONAL ESTMATES (WITH - Do Something)			
Vessel Type	**Total NOx per annum (tonnes)**	**Total VOCs per annum (tonnes)**	**Total TSP per annum (tonnes)**
Ro-Ro	2640	84	150
Lo-Lo	383	14	31
Bulk Liquid	416	14	31
Bulk Solid	380	17	38
Break Bulk	28	1	2
Cruise	32	2	3
Total	**3879**	**132**	**255**

[10.6] Mitigation Measures

[10.6.1] Construction Phase

[10.6.1.1] Dust mitigation

AQ_01 A dust minimisation plan will be developed and implemented during the construction phase of the project.

AQ_02 A site dust monitoring programme will be put in place during the construction phase with secure monitoring locations to ensure compliance with dust deposition limits. There are already three monitoring points near the site, samples can continue to be recorded at these sites and compared to the historical trend. Monitoring must also consider recording on the peripheries of the construction site in order to confirm dust deposition is within acceptable limits.

[10.6.1.2] Odour Mitigation

AQ_03 An odour management plan will be adopted during the construction phase of the proposed development to mitigate potential odour issues and implement remedial action through agreement with Cork County Council. The management plan will include but not be limited to odour monitoring proposals, odour control mechanisms and an odour complaint procedure.

AQ_04 Within the management plan, monitoring proposals for odour emissions will be submitted for agreement to the planning authority prior to the commencement of dredging activities in the construction phase of the proposed development. Such measures will include but not be limited to monitoring at the site perimeter and at nearby residential locations on an ongoing basis. The management plan must include diffusion tube monitoring at a minimum of 8 locations during dredging to obtain measurements of fugitive odour and to help ensure levels are below relevant limits.

AQ_05 A Construction Environmental Management Plan (CEMP) will be developed and implemented. The CEMP will provide a framework for the management and implementation of construction activities incorporating the mitigation measures identified in the relevant chapters

of this EIS, including dust and odour. The CEMP will be reviewed regularly, and revised as necessary, to ensure that the measures implemented continue to be effective.

[10.6.2] Operation Phase

AQ_06 The emissions to air from berthed shipping will be controlled by strict international limits. Good cargo unloading practices will minimise the impact of exhaust fumes from HGVs. The emissions modelled for this report are based on a worst-case scenario.

AQ_07 It should also be recognised that the vehicular emissions from any generated traffic are predicted to decrease over time due to improvements in engine efficiency and stricter enforcement of vehicle emission standards. Bulk grain cargo unloading will be undertaken in a manner that minimises cargo spillage. All loading/unloading will be subject to appropriate operation specific control and containment protocols as adhered to by Port of Cork and detailed in section 10.3 of this Chapter. The current method of handling cargoes will be continued and extended to service the proposed berth extension and dust monitoring at site peripheries will be continued.

AQ_08 The Port shall maintain its EMS system in accordance with established principles and standards and continue its current SOPs in relation to handling of bulks, cargoes and containers.

[10.7] Monitoring

[10.7.1] Construction Phase

Bergerhoff dust gauge monitoring will be undertaken during construction phase at appropriate locations on the periphery of the construction site.

[10.7.2] Operation Phase

The ongoing dust monitoring programme will be reviewed annually to ensure representative sampling locations are in place following the construction of CCT2 and DWB extension.

[10.8] Residual Effects

[10.8.1] Construction Phase

Residual impacts from the construction phase are not anticipated as mitigation measures have been identified to control potential dust impacts.

[10.8.2] Operation Phase

Residual impacts from the operational phase are not anticipated as it is considered that impacts will be ‘negligible’.

The changes in traffic associated with the Ringaskiddy Port Redevelopment will not have a significant negative impact on sensitive receptors at Ringaskiddy. The proposed N28 tie-in resulted in the removal of future Port traffic from Ringaskiddy Main Street. Overall the

Ringaskiddy Redevelopment project of which this development forms part has resulted in a net positive impact on air quality in Ringaskiddy.

[10.9] Potential Interactions & Cumulative Impacts

[10.9.1] Construction Phase

There are no existing or proposed projects in the vicinity likely to result in an accumulation of effects to air quality during construction phase.

[10.9.2] Operation Phase

The existing CCT1 and DWB activities in the vicinity are likely to result in an imperceptible accumulation of effects to air quality during operation phase.

[10.10] Summary

Description of Potential Impact	Significance Pre-Mitigation	Impact Duration	Suggested Mitigation and Monitoring	Residual Significance
Construction Phase Impacts				
Increased air emissions through dust	Imperceptible	Temporary	Site Dust minimisation plan Ongoing dust monitoring	Imperceptible
Increased potential for odour	Imperceptible	Temporary	Preparation of odour management plan for the facility	Imperceptible
Operation Phase Impacts				
Increased air emissions from plant and shipping	Imperceptible	Long-Term	Maintenance of fleet Maintenance of EMS	Imperceptible

[11] Climate

[11.1] Introduction

This chapter assesses the likely significant effects of the proposed development on climate, including a quantitative carbon impact assessment which was prepared as part of the original EIS. This chapter will consider:

- A description of the factors in relation to climate (for example greenhouse gas emissions, impacts relevant to adaptability) likely to be significantly affected by the project;
- A description of the likely significant effects of the project on the environment resulting from, inter alia, the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change.

This chapter will examine two distinct aspects of climate:

- Climate change mitigation: this considers the impact the Project will have on climate change, through greenhouse gas emissions primarily; and
- Climate change adaptation: this considers the vulnerability of the Project to future changes in the climate, and its capacity to adapt to the impacts of climate change, which may be uncertain.

[11.2] Assessment Methodology

The following sections outline the approach taken when assessing climate change vulnerability and adaptability in this EIAR.

[11.2.1] Study Area

Given the nature of the topic under consideration, the study area is considered to be the whole of Ireland.

[11.2.2] Legislation & Guidance

[11.2.2.1] International

11.2.2.1.1 The Paris Agreement

The Paris Agreement is a legally binding international treaty on climate change. It was adopted by 196 Parties at the UN Climate Change Conference (COP21) in Paris, France, on 12 December 2015. It entered into force on 4 November 2016.

Its overarching goal is to hold “the increase in the global average temperature to well below 2°C above pre-industrial levels” and pursue efforts “to limit the temperature increase to 1.5°C above pre-industrial levels” (UNFCCC, 2024).

The UN's Intergovernmental Panel on Climate Change (IPCC) indicates that crossing the 1.5°C threshold risks unleashing far more severe climate change impacts, including more frequent and severe droughts, heatwaves and rainfall. The IPCC has concluded that greenhouse gas emissions due to human activities are having an unprecedented effect on the earth's climate.

Multiple lines of evidence have shown that the climate is already changing across the globe as a result of increased concentrations of greenhouse gases such as carbon dioxide (CO_2), methane (CH_3), and nitrous oxide (N_2O). The effects of a human induced changing climate are predicted to vary across the globe, resulting in increased frequency of extreme weather and temperature fluctuations outside of the natural climate variability (IPCC, 2022).

11.2.2.1.2 Directive 2014/52/EU

Climate change has been addressed in EU Directives surrounding EIAR, specifically Directive 2014/52/EU which specifies that:

Climate change will continue to cause damage to the environment and compromise economic development. In this regard, it is appropriate to assess the impact of projects on climate (for example greenhouse gas emissions) and their vulnerability to climate change.

EU Guidance on integrating climate change and biodiversity into EIA (2013) recommends that climate change should be addressed in an EIAR through the following approach:

- Consider climate change at the outset of a project;
- Analyse evolving environmental baseline trends by using a vulnerability assessment to help assess the evolution of the baseline environment and identify the most resilient alternative;
- Take an integrated approach to planning and assessment, investigating relevant thresholds and limits;
- Seek to avoid biodiversity and climate change effects from the start, before considering mitigation or compensation;
- Assess alternatives that make a difference in terms of climate change and biodiversity;
- Use ecosystem-based approaches and green infrastructure as part of project design and/or mitigation measures; and
- Assess climate change and biodiversity synergies and cumulative effects, which can be significant.

In addition to assessing the vulnerability of a project to climate change, it is important to assess whether a project is adaptable under changing climate conditions. Climate change mitigation and adaptation actions are framed and informed by policy from within the UN, EU, and have been transposed into Irish Law.

[11.2.2.2] National

Ireland is committing to achieving climate neutrality no later than 2050 with a 51% reduction in GHG emissions by 2030 (Government of Ireland, 2024).The National Adaptation Framework

(2024) recognises that extreme weather and flooding are some of the most likely effects of climate change, to which Ireland will need to adapt in the future. The framework outlines the uncertainty regarding future climate scenarios, as variability is expected due to natural changes in the climate in addition to human induced climate change.

The Government of Ireland's Climate Action Plan (2024) and Climate Action and Low Carbon Development Bill (2020) set out a national objective of transitioning to a competitive, low carbon, climate resilient and environmentally sustainable economy and the detailed sectoral road map to deliver a cumulative reduction in emissions.

The Climate Action and Low Carbon Development Act provides for the approval of plans by the Government in relation to climate change for the purpose of pursuing the transition to a low carbon, climate resilient and environmentally sustainable economy; to establish a body to be known as the National Expert Advisory Council on Climate Change; and to provide for matters connected therewith. The Act is Ireland's first framework piece of climate change legislation and lays the ground for transition towards a low carbon economy.

Ireland has a 2030 target to achieve a 30% reduction of non-Emissions Trading Scheme (ETS) sector emissions on 2005 levels with annual binding limits set for each year over the period 2021-2030.

The EU ETS is implemented under SI 490 of 2012 (and amendments) and SI no. 261 of 2010 (and amendments). In 2018, the legislative framework of the EU ETS was revised to enable it to achieve the EU's 2030 emission reduction targets in line with the 2030 Climate and Energy Policy Framework. This also forms part of the EU's contribution to the 2015 Paris Agreement.

Currently the transport sector in Ireland contributes over 18% of national carbon dioxide emissions. In the CAP 2024, the main approach for the reduction of transport carbon dioxide from the transport sector is through fuel efficiency measures, modal shift and demand management. In relation to the Port of Cork, the CAP 2024 highlights the adoption of key EU files such as the Alternative Fuels Infrastructure Regulation, FuelEU Maritime regulation that will enable further emissions abatement. Further, this plan outlines the deployment of sustainable biofuels as a key action to reduce greenhouse gas emissions in hard-to-abate transport sectors such as maritime.

The National Ports Policy (2013) is currently under review for updating. This will include the re-evaluation of the policy framework for the decarbonisation of our ports as a key consideration (Government of Ireland, 2024).

[11.2.2.3] Local

Draft Cork County Adaptation Strategy (2024-2029) outlines Cork County Council's strategic priorities, measures and responses for climate adaptation in the county. This strategy sets out adaption goals, objectives and actions including:

- To integrate climate action considerations into land use planning;
- To support sustainable offshore wind energy projects at appropriate locations and scales & the development of associated infrastructure at ports to facilitate these developments whilst promoting the need to consider environmental protection requirements at the outset of and during such projects;

- To address coastal erosion and implement coastal flooding prioritising ecosystem-based adaptation actions, having due regard to environmental sensitivities such as European sites and biodiversity; and.

- To encourage the promotion of sustainable land use practices and nature-based solutions to water resource management and flooding which can enhance community resilience by providing natural flood defences, promoting climate adaptation, having due regard to environmental sensitivities, including Biodiversity, European sites, water quality and sensitive human receptors.

11.2.2.3.1 Port of Cork Masterplan 2050

As the country, and the world, move away from fossil fuel consumption to tackle the effects of climate change, the Port of Cork will continue to play a key role in facilitating the future energy needs of the country as a hub for renewable fuels, transition fuels, and offshore energy streams. Moreover, there is an ambition to achieve at least a 51% reduction in overall greenhouse-gas emissions by 2030 and to reach net-zero emissions by 2050. It is a Strategic Goal of this Masterplan to “put decarbonisation at the centre of future infrastructure development to respond to the national Climate Action Plan 2023” (Port of Cork, 2023).

[11.2.3] Data Sources

This chapter has been informed primarily by the following documents:

- Port Climate Action Roadmap 2023 (Port of Cork, 2023)

- Port of Cork Masterplan 2050 (Port of Cork, 2023)

- Flood maps from Floodinfo.ie (OPW, 2024)

[11.3] Baseline Environment

[11.3.1] Macroclimate of Ireland

On a macro scale the dominant feature on Irelands climate is the Atlantic Ocean. Generally speaking, winters tend to be cool and windy, whilst summers are mostly mild and less windy. The Atlantic low -pressure systems are well established in December, and depressions tend to move quickly eastward in December and January, conveying strong winds with substantial frontal rainfall to Ireland. Occasionally, cold anticyclones over Europe extends its influence westwards to Ireland, giving dry, cold periods lasting several days.

Approaching late June or early July the rise in pressure over Atlantic and an associated fall in pressure over Europe results in a general wind flow at the surface becoming westerly. This brings air with a long ocean track over Ireland, so that cloud cover, humidity and rainfall all increase. From mid-July, clear nights tend to be accompanied by heavy dew. Warm air masses of high humidity and daytime heating sufficient to cause thunderstorms and may be a regular feature of mid to late summer weather. Towards the start of August there are infrequent incursions into the Atlantic of cold northerly air masses. These produce active depressions in late August and September. In September the humid air is readily influenced to increasing periods of cooling by night and fog is frequent around dawn in low-lying districts.

From late summer through Autumn there is a risk of former tropical depressions mixing in with the North Atlantic weather pattern depressions to produce severe storms. These are quite rare but are very significant weather events (Met Eireann, 2014).

Coastal regions in general see less of a temperature range and air temperature for the mean period at the proposed development site is 11 - 12 °C. Most of the eastern half of the country gets between 750 and 1000 (mm) of rainfall in the year. Rainfall in the west generally averages between 1000 and 1400 mm. In many mountainous districts rainfall exceeds 2000mm per year. The wettest months, in almost all areas are December and January. The proposed development area has an annual mean 1981 - 2010 of 1000 - 1200 mm.

Wind blows most frequently from the southwest and northwest for open sites while winds from the northeast or north occur least often. In January the southerly and south-easterly winds are more prominent than in July, which has a high frequency of westerly winds. Easterly winds occur most often between February and May and are commonly accompanied by dry weather. The dominant wind direction recorded for Cork Airport are south westerly.

[11.3.2] Existing Green House Gas Emissions Sources

The site of the proposed development is at the existing Port of Cork facility. The port landside entrance/exit is at Ringaskiddy. The proposed site is bordered to the south by Ringaskiddy village and further south by agricultural lands and industrial facilities. Haulbowline Island is located to the northeast of the port. The Irish Naval base and the decommissioned Irish steel plant are located on Haulbowline Island (the decommissioned plant is now a public park). Across Cork Harbour, to the northwest and northeast are Monkstown and Cobh respectively.

The proposed redevelopment area is located in a suburban setting surrounded by various existing port business and commercial properties. Ringaskiddy consists of a wide main road with residential dwellings situated adjacent to the road and further back onto elevated lands. The main road carries local traffic, naval staff traffic as well as heavy goods vehicles using the Port and other commercial businesses. The level of traffic in the town centre is likely to generate amounts of dust and traffic- derived pollution (i.e. nitrogen oxides, benzene and sulphur dioxide from diesel exhausts) under the existing conditions.

Existing Port operations including shipping emissions (both docked emissions and at sea emissions) and land operations (cranes, trucks, etc.) will give rise to combustion emissions. These emissions are dependent on the fuel employed, the size of the vessel and the duration of the operations. It is noted in the Climate Action Roadmap that The largest source of emissions across the organisation is in transport which accounts for 61% of the total CO_2 emissions in 2021. This is related to diesel use and includes the land-based container handling equipment (straddle carriers, LHMs, etc) and marine vessels (pilots, tug, etc.) (Port of Cork, 2023).

The CAP 2024 notes that Emissions from the domestic maritime and aviation sectors form less than 5% of sectoral emissions (Government of Ireland, 2024). Further, ports and airports are key to our connectivity as an island nation and ports act as key strategic delivery partners for other sectoral decarbonisation plans.

[11.3.3] Existing Climate and Flood Risk

The topography of the site is flat reaching sea level at the harbour's edge. Further inland to the southwest, beyond the N28 and Ringaskiddy village, the landscape becomes increasingly

rural. The topography also rises steadily to a crest over 50m OD. The even and level nature of the proposed development site is contrasted by the steep, rising elevations of lands that surround the inner Cork Harbour at Ringaskiddy, Monkstown, Cobh, Western Great Island, Aghada, Whitegate, and Crosshaven.

The Port of Cork at Ringaskiddy has a weather station that records detailed information every 30 minutes. The information recorded includes; date, time, Temperature, High Temperature, Low Temperature, Humidity, Dew Point, Wind Speed, Wind Direction, High Wind Speed, High Wind Direction, Wind Chill, Heat Index, Pressure, Rainfall and Rainfall Rate. All this data, most importantly wind speed and wind direction can lend to an understanding of fugitive dust behaviour and can aid in addressing a potential dust dispersion episode on sensitive receptors on the peripheries of the working site.

It is acknowledged nationally that climate change is likely to have a significant effect upon flood risk in Ireland due to rising sea levels and more intense rainfall events and storms (Office of Public Works, 2019) however there remains uncertainty in relation to the rate and scale of this change.

Met Éireann has predicted that in Ireland the autumns and winters may see a rise in rainfall events of approximately 20%, and that the summer period may become drier. However, the change in precipitation patterns in Ireland, particularly at a local level and for shorter (sub-seasonal) durations, remains uncertain and is the subject of ongoing research (Office of Public Works, 2019). The Climate Change Sectoral Adaptation Plan for Flood Risk Management (2019 - 2024) reports that since the early 1990s, a rise in mean sea level of approximately 3.5 cm per decade has been observed and various studies have shown that during the 20th century, sea level rise has been accelerating. To add to this, an increase in storm events over the North Atlantic Region are predicted to have a direct impact upon storm surges on the coast of Ireland (Office of Public Works, 2019).

Rising sea levels and increased rainfall predictions place parts of Ireland at greater risk of flooding from coastal, groundwater pluvial and fluvial flooding. Currently, flooding has already been identified as a key concern for County Cork, and current levels of adaptation are projected to be insufficient to avoid flooding for current global warming. This calls for a greater need for planning and development in vulnerable areas.

[11.4] Sensitive Receptors

The receiving environment/receptors consists of the general environment in respect of the climate change impacts, such as greenhouse gas (GHG) emissions, and the surrounding environment and people in respect of vulnerability issues, such as flooding.

[11.5] Potential Impacts

The effects of climate change are likely to result in increased sea level and subsequently increased flood levels and greater frequency of flooding.

Regional Climate Modelling (RCM) simulations for Ireland have predicted a number of changes to various climatic variables by 2050 and beyond, notably:

- Significant projected decreases in mean annual, spring and summer precipitation amounts by mid-century. The projected decreases are largest for summer, with

reductions ranging from 0% to 20%. Heavy rainfall events will increase in winter and autumn (Nolan, 2015);

- Storms affecting Ireland will decrease in frequency, but increase in intensity, with increased risk of damage (Nolan, 2015);
- Intensification of the hydrological cycle, leading to both increased incidences of high and low flow periods in rivers and lakes (Nolan, 2015);
- Mean sea level rise by 0.5m in the OPW's Medium Range Future Scenario (MRFS) and 1m in the High-end Future Scenario (HEFS);
- Fluvial flows are projected to increase by 20% and 30% respectively; and
- Frost days averaged over the whole country, the number of frost days (defined as a day when the minimum temperature is less than 0°C) is projected to decrease by over 50%.

The scheme has been designed specific to the 1% AEP present day flood extent and has provided foundations to be adaptable to the MRFS climate change scenario.

The predicted impacts with regards to climate change vulnerability and adaptability are discussed below for the Do-Nothing Scenario, Construction Phase, and Operation Phase. Potential impacts in relation to climate change can consist of:

- the contribution by the scheme to climate change.
- the vulnerability and adaptability of the scheme to climate change effects.

[11.5.1] The ‘do nothing’ scenario

In the ‘do nothing’ scenario the Ringaskiddy Redevelopment project construction will remain as is and the benefits of ORE and containerised shipping development will not be fully realised. Thereby positive climate impacts in Ireland may be hampered and not fully realised. Therefore, in the ‘do nothing’ scenario there would be a significant negative impact over time.

[11.5.2] Construction Phase

[11.5.2.1] Contribution to GHG emissions

Impacts to climate during the construction phase include emissions from transport of materials to the site, embodied CO_2 in construction materials (such as cement, steel, etc.), emissions from plant machinery and other ancillary areas such as contractor compounds, waste management, etc. The tonnage of construction materials to be utilised in the construction of the Port of Cork Redevelopment is shown in Table 11-1. The GHG emissions resulting from these construction materials have been quantified using the Environment Agency carbon calculator for construction sites and the results are presented in Table 11-2

It is predicted that the greatest contribution of GHG emissions during the construction phase will be due to the movement of HGVs to and from the site. Emissions of GHG will also occur as a result of the use of diesel-fuelled generators onsite, and of plant during the construction phase. This is assessed in Chapter 10, Air Quality and is not considered to be significant.

Table 11-1: Tonnage of Construction Materials

Material	Tonnage
Phase 1b Quay	
Steel Piles	2,700 tonnes
Steel Reinforcement	1,600 tonnes
Concrete Piles	2,600 tonnes
Concrete Deck Slabs	26,000 tonnes
Concrete Yard Slab/ancillaries	10,000 tonnes
Phase 2 Quay	
Steel Piles	3,750 tonnes
Steel Reinforcement	1,600 tonnes
Concrete Piles	3,500 tonnes
Concrete Deck Slabs	36,000 tonnes

Table 11-2 Summary of Greenhouse Emissions from Construction (Tonnes of Carbon Dioxide Equivalent - Estimates from length of Phased Construction Programme).

Item	Estimated GHG Emissions (tCO_2eq)
Imported Material (embodied and transport)	8,000
Waste Removal (including dredging)	200,000
Material Transport	2,000
Personnel Transport	600
Total Estimated GHG Emissions	**210,600**

The results indicate that the main emissions of Greenhouse Gas are from the removal of material from the area (including dredging by sea and other materials by road). The total estimated Greenhouse Gas emissions associated with the proposed construction is calculated at 210,600 tonnes of tCO_2eq.

Secondary contributions as a result of embodied CO_2 in construction materials (such as cement, steel, etc.) will also occur. Embodied carbon is calculated as outlined in Table 11-3 (The Institution of Structural Engineers, 2020). In terms of national emissions, this project is unlikely to be significant as embodied carbon in construction accounts for 14% of national emissions (Jammet, 2024).

Table 11-3: Embodied Carbon of Construction Materials

Material	Total Tonnage Quantity	Carbon Factor[1]	Embodied Carbon (= quantity X carbon factor)
Structural Steel	9,650	1.13	10,904.5 tCO_2eq
In Situ Concrete	78,100	0.103	8,044.3 tCO_2eq

[11.5.2.2] Climate change vulnerability and adaptability

The scheme will be vulnerable to weather and flood events throughout the construction phase, however as the construction phase will be short-term (36 months), impacts are considered imperceptible.

[11.5.3] Operation Phase

[11.5.3.1] Contribution to GHG emissions

Operational engine emissions have been incorporated into the assessment for the existing activities at Ringaskiddy West and for the proposed redevelopment activities on Ringaskiddy West and Ringaskiddy East CCT. The redevelopment of the Port of Cork will, in the short term, mean that locally there will be an increase in emissions as there is an increase in the number of ships docking at Ringaskiddy, that previously would have docked at Tivoli or City Quay.

The principal pollutants related to shipping are those from internal combustion engines. These are CO, VOC, NOx and PM derived from soot which mainly have to do with engine technology, and CO_2, SOx, heavy metals and further PM (mainly sulphate-derived) which originate from the fuel speciation. On a European scale, SO_2 and NOx emissions from national shipping can be important with respect to total national emissions.

Shipping volume to the port are predicted to increase annually during the period 2023 to 2033 from approximately 9 million tonnes to 10.7 million tonnes. This increase in shipping numbers will have a resultant increase in shipping emissions. Full details of shipping volumes are detailed in EIAR Volume IV- Appendix 2.1 Socio-Economic Assessment of Proposed Ringaskiddy Port Redevelopment and Port of Cork Masterplan.

EU Directives are in force which relate to the content of sulphur in marine gas oil (EU Directive 93/12 and EU Directive 1999/32) and the content of sulphur in heavy fuel oil used in SECA (EU-Directive 2005/33).

[1] Carbon factors are outlined in The Institution of Structural Engineers 'Guide to calculating embodied carbon'.

The Marine Environment Protection Committee (MEPC) of IMO has approved amendments to Marpol Annex VI in October 2008 in order to strengthen the emission standards for NOx and the sulphur contents of heavy fuel oil used by ship engines.

The current Marpol 73/78 Annex VI legislation on NOx emissions, formulated by IMO (International Maritime Organisation) is relevant for diesel engines with a power output higher than 130 kW, which are installed on a ship constructed on or after 1 January 2000 and diesel engines with a power output higher than 130 kW which undergo major conversion on or after 1 January 2000.

The Marpol Annex VI, as amended by IMO in October 2008, considers a three-tiered approach as follows:

- Tier I: diesel engines (> 130 kW) installed on a ship constructed on or after 1 January 2000 and prior to 1 January 2011;
- Tier II: diesel engines (> 130 kW) installed on a ship constructed on or after 1 January 2011;
- Tier III (1): diesel engines (> 130 kW) installed on a ship constructed on or after 1 January 2016.

Given the existing legal requirements around fuel and emissions for shipping, the extent of emissions are gradually reducing and will continue to reduce in future years. The total numbers of all ships currently using the port is presented in EIAR Volume IV - Appendix 2.1. The change in emissions have been quantified using the emission factors presented in the EMEP/EEA Emission Inventory Guidebook 2013, Section 1.A.3.d.i international water borne navigation.

It is important to note that the Port of Cork are introducing a number of initiatives to decarbonise their operations (Port of Cork, 2023). These initiatives include:

- The introduction of renewables on Port lands (solar PV and wind turbines) to power Port equipment such as our cranes and reefers.
- The planning for electrification of future Port equipment and the supply of electricity to vessels berthed at Port facilities – onshore power supply (OPS).
- Pilot the use of HVO with a view to utilising the fuel as we transition towards net zero.
- Continue to purchase efficient equipment as per the recent investment in diesel-battery-hybrid straddle carriers.

With the completion of the Port Extension, the above initiatives can more readily be introduced facilitated by the new infrastructure to decarbonise the operations.

[11.5.3.2] Climate change vulnerability and adaptability

There are no specific climate change policies relating to Ports and shipping. The Kyoto Protocol contains provisions for reducing GHG emissions from international aviation and shipping and treats these sectors in a different way to other sources due to their global activities that is, pursuing though the International Civil Aviation Organization (ICAO) and the International Maritime Organization (IMO) respectively (IMO, 2024). Emissions from domestic

aviation and shipping are included in national targets for Annex I countries. ICAO and IMO regularly report progress on their work to UNFCCC.

Scheme specific measures to minimise CO2 emissions include good environmental management procedures during the operational phase of the project, which aim to minimise the use of fossil fuels and efficient operation of space heating.

The more efficient use of ships and their respective turn-around time will help reduce emissions coupled with the reduced travel time from no longer having the requirement to go to existing up river facilities. Larger ships will also prove to be more efficient (in terms of energy consumption) and will avail of the use of the proposed DWB extension and CCT 2 and negate the existing journey up river.

In relation to wider impacts with regard to climate change, the implementation of the proposed development will not impact significantly on levels of Greenhouse Gases emitted on a national scheme. Regional impact assessment has been completed using the DMRB Screening Model. The change in regional atmospheric levels is not significant with the proposed development in place and percentage increases are all below 5%. Baseline outputs are shown in Volume IV - Appendix 5.2.

11.5.3.2.1 National climate change adaption

The proposed development, particularly the construction of the CCT extensions, will contribute to the energy security of Ireland, facilitating offshore renewable energy from wind, wave and tidal sources. This new infrastructure will have the capacity to facilitate the fixed Offshore Renewable Energy sector and contribute to the decarbonisation of the National Energy Grid. The development of port infrastructure to facilitate ORE will be central to the delivery of Irish ORE targets.

The redevelopment of Cork Port will have an overall positive long-term impact by facilitating the decarbonisation of the National Energy Grid.

[11.6] Mitigation Measures

[11.6.1] Construction Phase

During the construction phase, best environmental practices will be followed in order to mitigate for greenhouse gas emissions. These are detailed in Chapter 10, Air Quality.

[11.6.2] Operation Phase

The emissions to air from berthed shipping will be controlled by strict international limits. Good cargo unloading practices will minimise the impact of exhaust fumes from HGVs. The emissions modelled for this report are based on a worst-case scenario. It should also be recognised that the vehicular emissions from any generated traffic are predicted to decrease over time due to improvements in engine efficiency and stricter enforcement of vehicle emission standards. Bulk grain cargo unloading will be undertaken in a manner that minimises cargo spillage. All loading/unloading will be subject to appropriate operation specific control and containment protocols as adhered to by Port of Cork and detailed in section 11.3.2.1 of this Chapter. The current method of handling cargoes will be continued and extended to service the proposed berth extension and dust monitoring at site peripheries will be continued.

[11.7] Monitoring

[11.7.1] Construction Phase

No climate specific monitoring will be undertaken during the construction of the development.

[11.7.2] Operation Phase

No climate specific monitoring will be undertaken during the operations phase.

[11.8] Residual Effects

[11.8.1] Construction Phase

During the construction phase, HGV movements and machinery operating on site will contribute GHG emissions, which will be managed through mitigation measures as described in Chapter 10, Air Quality.

[11.8.2] Operation Phase

During the operation phase, the residual impact will come from the growth of the shipping traffic at the Port which will see continued emissions of greenhouse gases through the movements of ships. As noted in 11.6.2, improvements in engine efficiency and fuels will see a likely decrease of emissions.

Further, Port of Cork Masterplan 2050 outlines a number of measures that are planned that will result in the lessening of this residual effect. More efficient port operations were proposed through ideas that included low-emission lighting, a ban on ships idling and using individual generators, the use of solar power for land- based activities, and a reduction in fees for low-emissions vessels (Port of Cork, 2023).

[12] Soils, Geology & Hydrogeology

[12.1] Introduction

The geological regime has been established from the results of ground investigations, a review of geological mapping records and walkover surveys of the site.

The objective of this assessment is to identify key issues that could impact the proposed future development on these natural resources and, where necessary, mitigating measures to reduce the impact of the proposed development at the site. This Chapter should be read in conjunction with Chapter 3 of the EIAR which provides a full and detailed description of the proposed redevelopment.

[12.2] Assessment Methodology

[12.2.1] Study Area

The Ringaskiddy Port Redevelopment is located within Cork Harbour which represents the closest surface water body to the site. The River Lee flows into Cork Harbour approximately 1.5km north of the site where it is classified as Transitional water (not fully saline and not fully freshwater).

Under the Water Framework Directive, Cork Harbour is classified as being of Moderate Ecological status (2016-2021), with the WFD Risk Level being classified as *At Risk*. Cork Harbour is failing to achieve good chemical surface water status for Chemical Status at IE_SW_060_0000.

Cork Harbour is designated as a Special Protection Area (SPA) and as an important Shellfish area.

The study area is for the purposes of Soils, Geology and Hydrogeology is considered to be the immediate area of CCT2 and the DWB Extension footprint, as well as the footprint of the road network upgrade.

[12.2.2] Legislation & Guidance

With regard to soils and geology, the assessment presents the baseline conditions of these features based on readily available information and data provided during the course of the Project (previous Site Investigation works) and determines how the construction and operation of the Project will cause potential impact to these features. The following guidance was used specifically in the assessment of impacts to soils, geology and hydrogeology:

- IGI (2013) Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements.
- Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (Institute of Geologists of Ireland, 2013).
- National Road Authority (NRA) 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes', by the National Roads Authority (2009).

- Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, May 2022).

- Draft Advice Notes on Preparing Environmental Impact Statements (EPA, September 2015).

- The requirements of Part X of the Planning and Development Act, 2000, as amended, and Part 10 of the Planning & Development Regulations, 2001, as amended.

The impact assessment ranking methodology and terminology used in this section is in line with Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2008). A summary of the NRA (2008) methodology is provided in (IGI, 2013). The (NRA, 2008) impact assessment methodology provides a robust assessment for ranking potential impacts to geology, soil and hydrogeology and has been successfully adopted for environmental impact assessment outside of road sector projects in Ireland. The process is summarised as follows:

- Step 1: Quantify the 'Importance' of a feature for geology, soils and hydrogeology using criteria based on quality, significance, scale, and extent attributes for a feature. Importance is qualified in terms of 'low', 'medium', 'high', or 'very high' (see box 4.1, box 4.2 and box 4.3 in (NRA, 2008).

- Step 2: Estimate the 'Magnitude' of the impact on the feature from the proposed development using criteria based on degree of loss, change of gain in terms of volume, quality or integrity attributes for a feature. Magnitude of impact is qualified in terms of 'large', 'moderate', 'small', or 'negligible' as well as 'beneficial' or 'adverse' (see box 5.1, box 5.2 and box 5.3 in (NRA, 2008).

- Step 3: Determine the rating of 'Significance' of the impact using the matrix shown below using the outcome from steps 1 and 2 (see box 5.4 in (NRA, 2008). This is also provided in Table 12-1 below.

Table 12 1: Rating of Significant Environmental Impacts for Soil (NRA, 2008)

Importance of attribute	**Magnitude of impact**			
	Negligible	**Small**	**Moderate**	**Large**
Extremely High	Imperceptible	Significant	Profound	Profound
Very high	Imperceptible	Significant/ Moderate	Profound/ Significant	Profound
High	Imperceptible	Moderate/ Slight	Significant/ Moderate	Profound/ Significant
Medium	Imperceptible	Slight	Moderate	Significant
Low	Imperceptible	Imperceptible	Slight	Slight/ Moderate

[12.2.3] Data Sources

Information from a number of sources was collated in preparation of this section and are outlined below:

- Ordnance Survey of Ireland, Discovery Series,
- Ordnance Survey of Ireland online historical maps and aerial photographs,
- Ordnance Survey of Ireland online Environmental Report,
- Geological Society of Ireland, Geology of Cork (1:100,000) Sheet 25,
- Geological Society of Ireland online Groundwater Database, Aquifer Classification, Aquifer Vulnerability, Teagasc Soil Classification,
- National Parks and Wildlife Service online database,
- Environmental Protection Agency online mapping,
- National Maritime College, Ringaskiddy, Co. Cork. Site Investigation Contract, Interpretive Report No. 179116. Geotech Specialists Limited,
- Implementation of Port of Cork Strategic Development Plan, Ringaskiddy, Co. Cork, Site Investigation. Report No. 05-653. Glover Site Investigations Limited 2006,
- Site Investigation for a Proposed Development at the National Maritime College, Cork. Interpretive Report. Site Investigations Limited (Contract No. 4900) 2009,
- Marine Energy Research Centre, Ringaskiddy. Preliminary Site Investigation Factual report. No. P11038. PGL Priority Geotechnical August 2011.

A glossary of terms used to explain the quality and significance of impacts used in this assessment are outlined below:

- Positive Impact – a change which improves the quality of the environment.
- No Change Impact – a change which does not affect the quality of the environment.
- Negative Impact – a change which reduces the quality of the environment.
- Slight Impact – an impact which causes noticeable changes in the character of the environment without affecting its sensitivities.
- Moderate Impact – an impact that alters the character of the environment in a manner that is consistent with existing and emerging trends.
- Substantial Impact – an impact which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.

[12.2.4] Site Visits / Surveys

A number of site investigations have been carried out in the area surrounding the site.

National Maritime College – Geotech Specialists Ltd, 1999

During May and June 1999, Geotech Specialists Ltd carried out a geotechnical site investigation on a site for the proposed National Maritime College, located immediately south-west of Paddy's Point. Although not directly relevant to the project, for completeness details of the survey work in the wider vicinity of the port are included. The investigation comprised 8 No. boreholes advanced via cable percussive boring techniques with follow on rotary percussive methods.

Ground conditions encountered during the investigation comprised Topsoil and Hydraulic Fill (medium dense silty Sand) overlying Glacial Clay (firm to stiff sandy gravelly Clay) or Gravel above Bedrock. Bedrock was encountered in one location only at a depth of 5.2m below ground level. No description of the rock is provided and the report assumes from the published geology that the rock is likely to be sandstone.

Marine Energy Research Centre – PGL Priority Geotechnical 2011

During May 2010, PGL Priority Geotechnical carried out a site investigation on a site for a proposed University College Cork marine research centre, located immediately south of Paddy's Point. The investigation comprised 2 No. cable percussion boreholes, 6 No. rotary cored boreholes and 9 No. trial pits.

Port of Cork Strategic Development Study – Glover Site Investigations Ltd 2006

During November 2005 and again during March 2006, two phases of intrusive site investigation were completed by Glover Site Investigations Ltd. The site investigations were carried out within Cork Harbour in the area immediately adjacent to Ringaskiddy Pier (Oyster Bank) and also in the area adjacent to the existing Deepwater Berth (DWB). One borehole (RPSBH18) was advanced on land within the current site area. The investigation made provision for the advancement of 17 No. boreholes by means of a Dando 2000 shell and auger drilling rig using light cable percussion techniques. These boreholes were drilled from a jack-up platform, manoeuvred around the site by tugboat.

The site investigation also made provision for eleven vibrocores, driven to practical refusal using a seabed vibrocore unit lowered to the seabed over the side of a workboat. These vibrocores were undertaken between 21st February 2006 and 2nd March 2006. During this time 4 No. cone penetration tests (CPTs) were completed by Lankelma from the jack-up platform using the shell and auger drilling rig to lower the facilitating casing and CPT rods to the required depth.

Twenty-one (21 No.) grab samples were taken from the service boat at locations determined using GPS. Sediment contamination testing parameters and detection limits were recommended by the Marine Institute and the samples were sent to the Environment Agency (UK) for contamination analysis.

Marine Site Investigation – IDL 2016

A site investigation was carried out to provide detailed factual geotechnical information of the underlying ground conditions for the proposed port redevelopment. Fieldwork comprised the boring of 5 land-based cable percussive boreholes at Ringaskiddy and the drilling of 5 land-based follow-on rotary core boreholes at Ringaskiddy, the boring of 37 marine based cable percussive boreholes at Ringaskiddy port and the drilling of 34 marine based follow-on rotary core boreholes at Ringaskiddy Port.

In-Situ testing consisting of Standard Penetration Testing and In-Situ sampling including disturbed and undisturbed soil samples was carried out. Rock core samples were also recovered and logged.

Laboratory tests conducted included the following on soil samples

- Natural Moisture Content
- Atterberg Limits
- Bulk Density
- Particle Size Distribution
- Sedimentation
- Consolidation
- Triaxial
- Shear box

Terrestrial Site Investigation- PGL 2024

In March 2024, Priority Geotechnical (PGL) were requested on behalf of the Port of Cork Company to undertake a supplementary ground investigation at Ringaskiddy Redevelopment Phase 1b CCT2 located at the Cork Container Terminal.

The scope of the ground investigation comprised of:

- 4Nr Boreholes to a depth of 40 m
- Associated in situ testing,
- Associated sampling,
- Laboratory testing and
- Factual reporting

Full details of the ground conditions are included in Section 12.3.3.

[12.3] Baseline Environment

[12.3.1] Regional Geology

The geology of County Cork presents a simplistic geological structure (Figure 11.1 - EIS Volume II). The surface geology is controlled throughout by folds in the rock sequence, with the axis considered to run approximately from east to west. These folds were created during the Variscan Orogeny (a period of mountain-building caused by continental collision) between approximately 390 and 310 million years ago.

The ridges which are evident across southern Cork comprise of Devonian age (roughly 415 to 360 million years ago) sandstones and mudstones. However, the valleys are considered to consist of much softer limestones from the Carboniferous period (roughly 360 to 300 million years ago) which have been eroded into u-shaped valleys by ancient rivers and glaciers.

Geologically recent Quaternary sediments cover many of the rocks, particularly in the valleys and are mostly of glacial origin, ranging from approximately 1.6 million years to the present day. These sediments have been deposited either directly from glacier ice during an Ice Age, or by glacial meltwater flowing from the ice. The sediments may be up to 100m thick in deep-cut valleys and are considered to represent a major resource in the Cork area, through sands and gravels which they are predominantly composed, of groundwater, and also of geothermal energy. Two buried valleys in the Cork Syncline can be classed as high yield regional aquifers.

[12.3.2] Local Geology

The proposed development area is located north of the “Ringaskiddy Anticline” – which is described as a small wedge of older sandstones and mudstones, known as the “Kinsale Formation” which have been thrust upwards by faulting. The site is underlain by the Waulsortian Mudbank which comprises pale grey massive Limestones (Figure 11.2 - EIAR Volume III).

The geological map indicates that there are a number of geological faults which occur around the site (see Figure 11.3 - EIAR Volume III). However, these faults are not currently active and the previous intrusive ground investigations undertaken at the site, confirm that these faults do not represent a threat to the stability of the site.

An area to the east of the site is designated as a Geological Heritage Site by the Geological Survey of Ireland (Ringaskiddy, Golden Rock) due to the presence of exposed Limestone bedrock at the surface.

[12.3.3] Soils

‘Brown Podzolic’ is the principal soil type in County Cork, which is a soil highly suited to agricultural use and in particular for pasture. When sufficiently supplemented with lime and fertiliser, it is possible for this type of soil to sustain 185 livestock units per 100ha. This soil is generally well drained and has good moisture holding capacity. The lime-deficient Acid Brown Earth, mainly found to the north of the county but also present at Ringaskiddy, is also free draining with good moisture holding capacity. The soil originates from glacial drift of sandstone-limestone mix and is generally of good structure. Although the soil is of relatively low nutrient status, it is considered to respond well to additives and is a desirable soil for both tillage and pasture lands.

A significant proportion of the Ringaskiddy Harbour has been constructed on reclaimed land. Therefore, the site is underlain by fill material (Made Ground). Information provided by Port of Cork indicated that fill material for Ringaskiddy East was pumped ashore from Curlane Bank whilst Ringaskiddy West was filled with sands recovered from Spit Bank PGL 2024, IGL 2016).

These are underlain by the Waulstorian Mudbank, consisting of pale grey massive limestones. There are geological faults in the vicinity however they are not thought to be currently active (IDL 2016).

[12.3.4] Hydrogeology

Eighty percent of Cork County Council's drinking water is provided from surface water resources, with approximately 94% of South Cork's total water supply originating from rivers and lakes (Cork City WMP, 2004-2009). However, in contrast to this, North Cork is highly dependent on groundwater supplies.

Groundwater is water found below the surface of the earth, often occurring in natural reservoirs in permeable rock layers. Bedrock formations or sand and gravel deposits which yield significant quantities of water are called aquifers. The type of rock affects the volume and chemistry of the water. The dominant sandstone and limestone rock types around Cork are classified as aquifers but vary significantly in productivity. Figure 11.4 (EIAR Volume III) represents the aquifer classification within the area. It is apparent that the majority of the site has not been classified by GSI as it comprises reclaimed land. The land to the south of the site is classified as; a Locally Important Karstified aquifer

(Lk) and also as a Locally Important aquifer (Li) which is only productive in local zones. The area of the site around Paddy's Point is classified as Lk; a Locally Important Karstified aquifer.

The majority of the site has not been assigned a Groundwater Vulnerability rating by the GSI. The area to the south of the site is classified as having an Extreme vulnerability ('E'). A small area just south of the site has been classified as 'X' which indicates the presence of rock at or near the surface.

There are currently no potable groundwater abstraction wells within a 1km radius of the site. The EPA Abstraction Register (https://www.epa.ie/publications/monitoring--assessment/freshwater--marine/epa-water-abstraction-register---dec-2024.php) identifies 2 wells within a 1km radius of the site at Pfizer Ringaskiddy.

[12.3.5] Observations of Previous Ground Investigations

[12.3.5.1] Port of Cork Strategic Development Study- Glover Site Investigations Ltd 2006

The general progression identified by the ground investigation was as follows:

- Uncompacted organic silt with occasional layers of sand, clay or shells (marine silt)
- Firm brown and grey-brown very gravely sandy clay with some cobbles and boulders (glacial till)
- Very weak grey highly weathered fine-grained carboniferous limestone
- Moderately strong grey fine-grained carboniferous limestone

In some areas the cores contained mostly oyster shells (70%) in a matrix of uncompacted silt.

The borehole advanced on land within the site area encountered Made Ground to a depth of 4.6m which was underlain by Sand to the borehole completion depth of 10m. The Made Ground comprised; Limestone quarry fill underlain by Loose to medium dense grey slightly silty fine to medium Sand with occasional shells. The Sand was described as; medium dense grey slightly silty fine to medium Sand with occasional shells.

Extensive testing of sea-bed sediments for chemical quality was carried out within the Oyster Bank and at the area adjacent to the existing ferry terminal at Ringaskiddy. Testing was also carried out in the area of Paddy's Point.

The sediment sampling results demonstrated that the sediments were not contaminated and would be therefore suitable for re-use where appropriate, or for disposal at sea where not suitable as engineering fill material.

[12.3.5.2] Marine Energy Research Centre Study- PGL Priority Geotechnical 2011

This study was located immediately south of Paddy's point. Although no works are proposed at Paddy's Point for completeness the details of the study are included. The site was characterised by glacial deposits of slightly sandy gravelly Clay/Silt, slightly sandy slightly gravelly organic Silt, clayey/silty very gravelly Sand and very clayey/silty very gravelly Sand and silty sandy Gravel to depths of 10m below existing ground level.

Limestone bedrock was encountered at four test locations at depths of; 5.6m, 6.5m, 8.7m and 10.0m below ground level where it was described as moderately strong to very strong.

Groundwater was encountered at shallow depths within the Sand and Gravel deposits and at greater depth upon encountering the Limestone bedrock.

A limited number of sub-soil samples were analysed for metal, Hydrocarbon and Polycyclic Aromatic Hydrocarbon (PAH) contaminants. The laboratory results indicated that contaminant levels were low overall.

[12.4] Sensitive Receptors

Sensitive receptors in the case of soils and geology include the soils underlaying the site.

[12.5] Potential Impacts

[12.5.1] The 'do nothing' scenario

The Existing Environment/Do Nothing Scenario, is a scenario in which the existing Port arrangements remain as is. The site would, therefore, remain without the construction of Berth 2, Ringaskiddy West DWB Extension and container handling and stacking arrangements. The predicted impacts to soils and geology would remain similar to current levels. The Do-Nothing scenario is considered to be of negligible impact in terms of soils and geology.

[12.5.2] Construction Phase

[12.5.2.1] Soils and Geology

It is anticipated that earthworks will be required during the construction of the development. It will be necessary to utilise a piled foundation solution to construct the combi-walls required for the new quay walls of the CCT2 berth. The combi-wall will comprise tubular steel piles installed at intervals with traditional steel sheet piles filling the space in-between. The tubular piles will be drilled and driven or grouted into the bedrock.

Dredging works will be carried out to -13.4m Chart Datum maximum adjacent to the new quay areas to provide sufficient water depths for vessels. Bed conditions comprise uncompacted silts overlying Gravel, Clay and Limestone bedrock depending on location (bedrock is not likely to be encountered at the DWB extension at Ringaskiddy West). Dredging will be required in all materials including bedrock.

The soft overlying silt material is unsuitable for use in the works and therefore this will be removed, either by backhoe or trailing suction hopper dredger, and disposed of at a sea disposal site. The quantity involved is in the order of 50,000 m^3 in the area of Ringaskiddy East and approximately 390,000 m^3 in the area of the Ringaskiddy West DWB extension. The disposal of the dredged material will require application for a Dumping at Sea Permit from the Environmental Protection Agency; this will be subject to a separate consenting process.

Bedrock and other hard strata will most likely be removed by a combination of drilling and blasting, and/or the use of mechanical plant working from a floating or jack-up barge. Dredged rock and other suitable material will be re-used in the reclamation works.

Construction activities may also include noise, dust, odour and site traffic generation impacts as well as potential contamination arising from the use of fuel storage tanks, vehicles and the use of paints and oils.

The impact to soils and geology are considered to be slight and short term in nature.

[12.5.2.2] Hydrogeology

At the construction stage during piling undertaken as part of the earthworks, groundwater may be encountered. Any potential groundwater encountered would require careful management in order to prevent further degradation of its quality. As there are no current potable groundwater abstractions within a 1km radius of the site, there will be no impact upon potable water supplies as a result of piling (GSI Wells Dataset 2024).

[12.5.3] Operation Phase

[12.5.3.1] Potential Impacts to Groundwater

A number of activities can have an impact on groundwater resources, including:

- Excessive pumping e.g. from wells/excavations for water supply
- Saline intrusion (risk of over-abstraction in coastal areas pulling sea water into the groundwater body
- Pollution from nutrients, e.g. nitrates and phosphates
- Pollution from chemicals.

The proposed redevelopment is not anticipated to have an impact on the groundwater as it will not involve any abstraction of water and all surface run-off will be collected and diverted to the local stormwater treatment system. Clean fill material will be used therefore aquifer protection zones do not need to be specified. Day to day operation of the Port will involve the use of diesel, crude and hydraulic oil, however contingency measures will be put in place in the unlikely event of any oil spills as is best practice in all harbour developments.

[12.5.3.2] Port Activity

Pollution from oils, diesels or chemicals is a potential impact during the operation of the CCT2 and DWB extension. This may arise from the vehicles operating in the terminal vicinity as well as directly from the ships. If vessels are being re-fuelled on site, any fuel spillages would potentially have adverse impacts on water quality in the area depending on the volumes released. Even small leaks and spills may have localised affects near the berths. Storage of chemicals or fuels and oils on-site for activities such as re-fuelling also has the potential to result in leaks or spillages which may enter groundwater.

[12.5.3.3] Contaminant Pathways

The majority of the development will be covered in hard-standing which will minimise contaminant transport/exposure pathways in relation to human health. Under the source-pathway-receptor model, where there is no transport mechanism contamination is considered unlikely

[12.6] Mitigation Measures

[12.6.1] Construction Phase

The construction activities should be conducted in a safe environmentally conscious manner and in line with all health and safety guidelines. The following practical steps will be followed:

- **SGH_01** A Groundwater Management Plan will be prepared and implemented to minimise the potential risk to groundwater from construction activities and piling. Reference should be made to CIRIA C515 Groundwater Control – Design and Practice. Any contaminated groundwater encountered during earthworks or piling will be disposed off-site to a licensed waste disposal facility or by passing it through a three-stage interceptor and discharged to sewer under license from the Local Authority.

- **SGH_02** Material imported onto the site will be assessed to ensure that contamination is not introduced to the site. Any topsoil which is imported onto the site will be chemically analysed and screened against generic screening values for a commercial end use to ensure that it does not pose a risk to human health.

- **SGH_03** Any fill material imported onto the site will undergo Waste Acceptance Criteria (as per BS 12457/3) testing to ensure that the material is classified as inert and does not pose a risk to the underlying groundwater through leaching of contaminants.

[12.6.2] Operation Phase

The Port of Cork operates an Oil/HNS Spill Contingency Plan (Port of Cork Company, July 2019) which outlines the measures to be undertaken in the event of an oil spill or spillage of Hazardous Noxious Substances.

SGH_04 This contingency plan is to be maintained and will be effective in dealing with any operational incidents associated with the development.

[12.7] Monitoring

[12.7.1] Construction Phase

SGH_05 Monitoring for land and soil will consist of weekly monitoring inspections for signs of pavement cracks, inspection of bunds and oil containers present on site for minor storage, inspection of integrity of spill kits, vehicle inspections. These will be recorded on the weekly monitoring checklist for the site by the Site Manager.

[12.7.2] Operation Phase

Operation phase monitoring will build on the construction phase monitoring and consist of weekly inspection for pavement cracks, inspection of bunds and oil containers onsite for minor storage, inspection of integrity of spill kits and vehicle inspections.

[12.8] Residual Effects

[12.8.1] Construction Phase

Given the use of clean soils only and the instruction that spills will be dealt with expeditiously by the contractor, residual effects of the development are not anticipated.

[12.8.2] Operation Phase

Given the limited potential for a contaminant transport pathway due to the surfacing of the development with hardstanding operational phase impacts to soil and groundwater are not anticipated Implementation of the mitigation measures outlined in Section 12.8 will ensure that the potential impacts of the proposed development on land and soils do not occur during the operational phase and that any residual impacts will be short term. The residual impact is therefore considered to be imperceptible overall.

[12.9] Potential Interactions & Cumulative Impacts

[12.9.1] Construction Phase

A range of projects has been taken into consideration as part of the cumulative assessment. When these projects have been considered as part of this assessment, no significant cumulative effects are predicted.

[12.9.2] Operation Phase

A range of projects has been taken into consideration as part of the cumulative assessment. When these projects have been considered as part of this assessment, no significant cumulative effects are predicted.

[12.10] Summary

Description of Potential Impact	Significance Pre-Mitigation	Impact Duration	Suggested Mitigation and Monitoring	Residual Significance
Construction Phase Impacts				
Impact to land and soil from spills	Imperceptible	Temporary	Weekly monitoring for cracks, inspection of bunds and oil containers onsite.	Imperceptible
Operation Phase Impacts				
Impact to land and soil from spills	Imperceptible	Long-Term	Weekly monitoring for cracks, inspection of bunds and oil containers onsite.	Imperceptible

[13] Coastal Processes

[13.1] Introduction

This Chapter presents an assessment of the potential impacts of the re-development of Ringaskiddy Port on coastal processes. Specifically, it examines how the proposed development could affect hydrodynamic and sediment transport during both the construction and operational phases. These potential impacts were analysed using numerical modelling techniques. This chapter references information, findings and results from the modelling study reports supplied by RPS (RPS 2014, 2024).

The RPS (2014) study was conducted to investigate the potential impact of the re-development, which included the 4 distinct project phases encompassing the entirety of the construction of CCT and DWB. Their model assessed the overall impact of the re-development rather than evaluating the construction phases separately. As such, the RPS (2014) report is essential in 2024 for assessing the impacts of the re-development at operational stage. RPS (2014) showed no significant cumulative impact from the re-development at Paddy's point and Ringaskiddy, and the 2014 results and findings can be applied in 2024 to demonstrate the effects of the re-development at Ringaskiddy. At the time of writing, the construction of phase 1a has already been completed. Therefore, this chapter focusses on assessing the potential impacts of post phase 1a dredging process and construction operation.

[13.2] Assessment Methodology

The hydrodynamic and sediment plume dispersion simulations were undertaken using the coupled MIKE FM model. The FM model is a state-of-the-art modelling system based on a flexible mesh approach. The modelling system was developed by the Danish Hydraulics Institute (DHI) for applications within oceanographic, coastal and estuarine environments. The MIKE modelling software package has been approved by numerous leading institutions and authorities including the US Federal Emergency Management Agency (FEMA). The Hydrodynamic Module is the basic computational component of the entire MIKE 21 FM modelling system providing the hydrodynamic basis for the advection/dispersion Module, ECO Lab Module, Mud Transport Module and Sand Transport Module. For this study the Hydrodynamic and Sediment transport Modules were utilised.

The models were calibrated and verified by comparison of tidal elevation across the model domain with tide gauge network data and by comparison with recorded current meter readings collected by Irish Hydrodata, the calibration and verification results are detailed in RPS (2014, 2024). The calibrated and verified coastal process models were then applied for the existing Port layout to provide a baseline for comparison with the proposed re-development once constructed. The models were also used to quantify the impact of the proposed re-development during the construction phase due to dredging. Impacts on the coastal process regime were identified and quantified by means of difference plots (proposed minus existing) so that the extent and nature of the impact of the proposed re-development could be clearly identified.

[13.2.1] Study Area

As the proposed capital dredging operations included dredging within Ringaskiddy and the dumping of dredge material at the licence site c. 8km south of Roches Point, therefore, two

individual numerical models were developed for the 2024 study, and these study areas are shown in

Figure 13-1. Bathymetry data for both models was based on data from the Irish National Seabed Survey (INSS), INFOMAR, and other local bathymetry surveys undertaken within Cork Harbour in support of previous studies.

The inner Cork Harbour flexible mesh model developed to simulate the dispersion of spilled material during dredging, is illustrated in Figure 13-2. This high-resolution model had a mesh size ranging from $30m^2$ at Ringaskiddy and within the fairway approach channels to approximately $70m^2$ across the wider flat areas, with a refined mesh size of $14m^2$ in the harbour itself. The mesh structure and resolution of this model is illustrated in Figure 13-2.

The outer Cork Harbour model (with bathymetry) developed to simulate the dispersion of dumped material at the licensed disposal site is illustrated in Figure 13-3 below. This model extended approximately 40km offshore and encompasses Ballycotton at the east boundary to the Old Head of Kinsale at the west boundary. As the model was developed using flexible mesh technology, it was possible to define the disposal site using a high-resolution mesh with an effective cell size of $50m^2$. The model resolution was decreased to c. $1,500m^2$ at the offshore boundary to increase computational efficiency.

The RPS (2014) model was used to assess the impact of the re-development on the hydrodynamic process in the area, which covered the same area with the inner Cork Harbour model of RPS (2024), and they were calibrated to the same level of accuracy. This model has a southern boundary near Roberts Cove and this tidal station was used to drive the tidal model. The model has graded grid spacing; with areas of fine cells in the vicinity of the re-development in the order of 5-10m in resolution with cells more concentrated in locations with rapidly varying bed profiles. This means the model has sufficient detail for the modelling of the coastal processes and dredging activity associated with the proposed re-development.

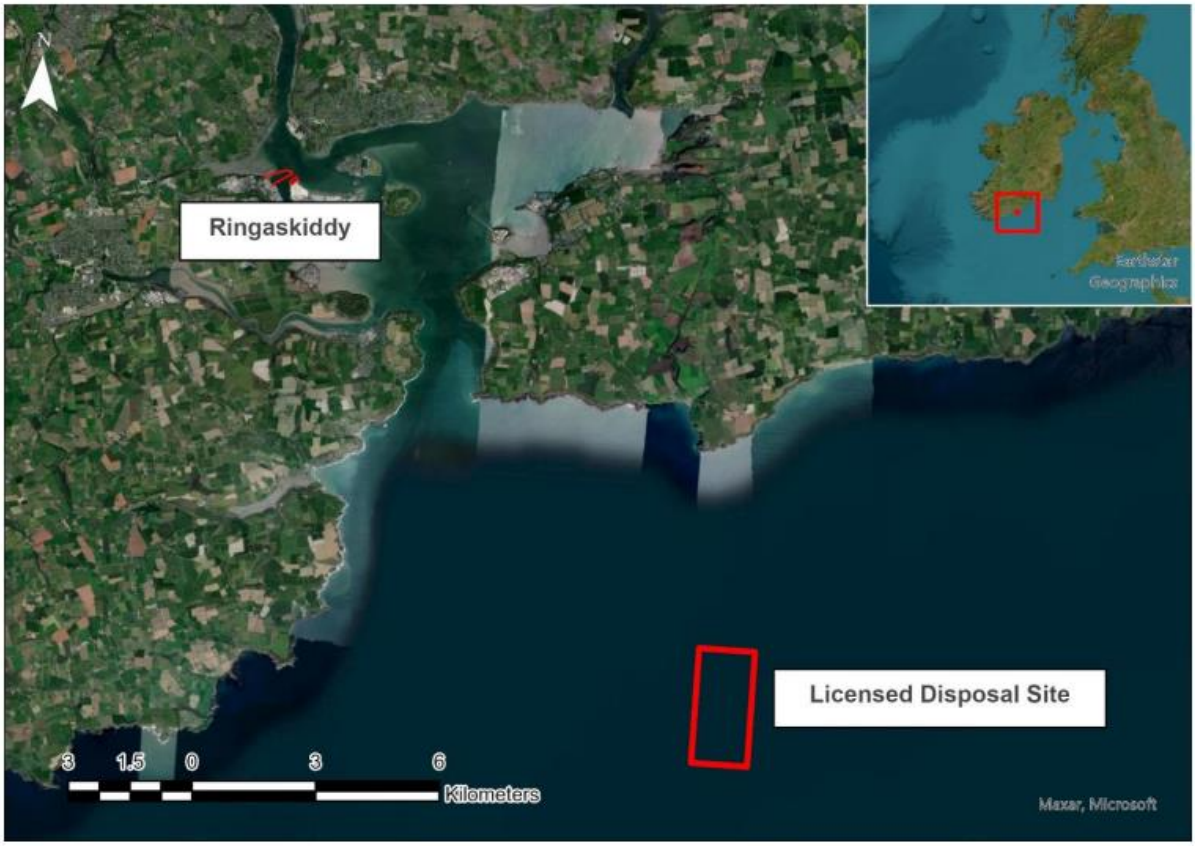


Figure 13-1:Ringaskiddy and the Licensed Disposal Study Areas (red boxes) (RPS 2024)

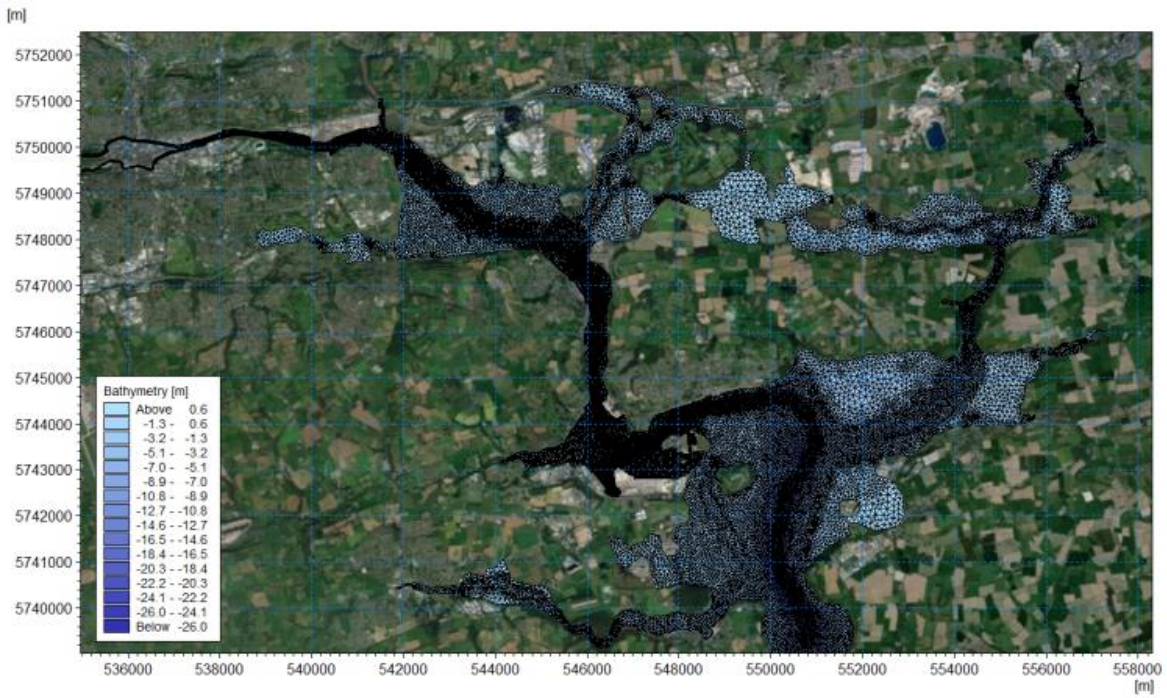


Figure 13-2: The inner Cork Harbour flexible mesh RPS tidal model (RPS 2024)

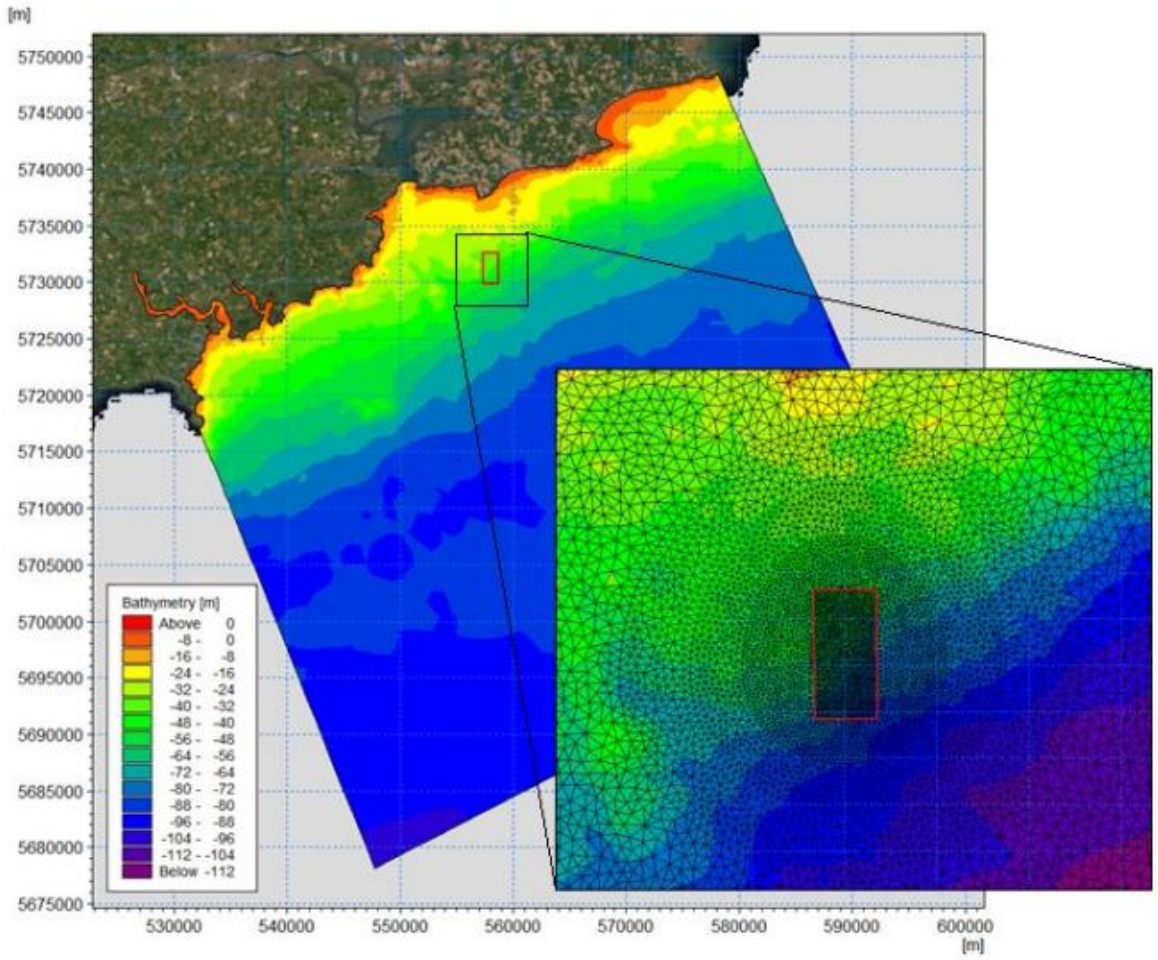


Figure 13-3: Outer Cork RPS model and bathymetry (RPS 2024)

[13.2.2] Legislation & Guidance

Cork Harbour is approximately 28km^2 in area, and takes in the areas of Ringaskiddy, Monkstown, Cobh, Rostellan and Whitegate in County Cork. Relevant legislation and guidance considered in this chapter include: European Communities (Marine Strategy Framework) Regulations 2011 (S.I. No. 249 of 2011); 2000 Planning and Development Act 2000 (as amended)(Minister for Housing, Local Government and Heritage); 1992 European Union (EU) Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna (the 'Habitats Directive') (European Commission); 2008 Marine Strategy Framework Directive (MSFD) (EU, 2008); 2021 National Marine Planning Framework (The Department of Housing, Planning and Local Government (DHPLG)); 2023 Coastal Change Management Strategy Report (DHPLG and Office of Public Works (OPW)).

[13.2.3] Data Sources

The RPS (2014) model was developed from an existing RPS model. The original model which used a nested rectangular grid at 30m/10m resolution was created using a combination of bathymetry data taken from local hydrographic surveys and supplemented by Admiralty Chart Data (as digitally supplied by C. Map of Norway). The bathymetric data was transferred from the existing model to a new flexible mesh model and supplemented by more recent surveys. Information from three additional surveys was also incorporated into the model; the first related to the maintenance dredging carried out in the River Lee in 2011, the other two were undertaken specifically for this study. The areas covered by the three of the surveys is shown

in Figure 13-4.

Figure 13-4: Extent of bathymetric data survey datasets (RPS 2014)

The tidal boundary data used for the Cork Harbour RPS (2024) model was generated using an RPS' Irish Sea Tidal and Storm Surge model. This model stretches from the North-western end of France, including the English Channel as far as Dover, out into the Atlantic to 16° west, including the Porcupine Bank and Rockall. In the other direction it stretches from the Northern part of the Bay of Biscay to just south of the Faeroes Bank. Overall, the model covers the Northern Atlantic Ocean and UK continental shelf up to 600km from the Irish Coast as illustrated in Figure 13-5. This model was also constructed using flexible mesh model technology; along the Atlantic boundary the model features a mesh size of 13.125' (24km). The Irish Atlantic coast has been described using cells of on average 3km size while in the Irish Sea the maximum cell size is limited to 3.5 km decreasing to 200m along the Irish coastline. The bathymetry of this model was generated from several different sources including digital chart data and surveys of several banks and coastal areas. This model is driven by astronomic tides generated using a global tidal model designed by a team at the Danish National Survey and Cadastre Department (KMS) and include pressure wave fields based on forecast data from the ECMWF.

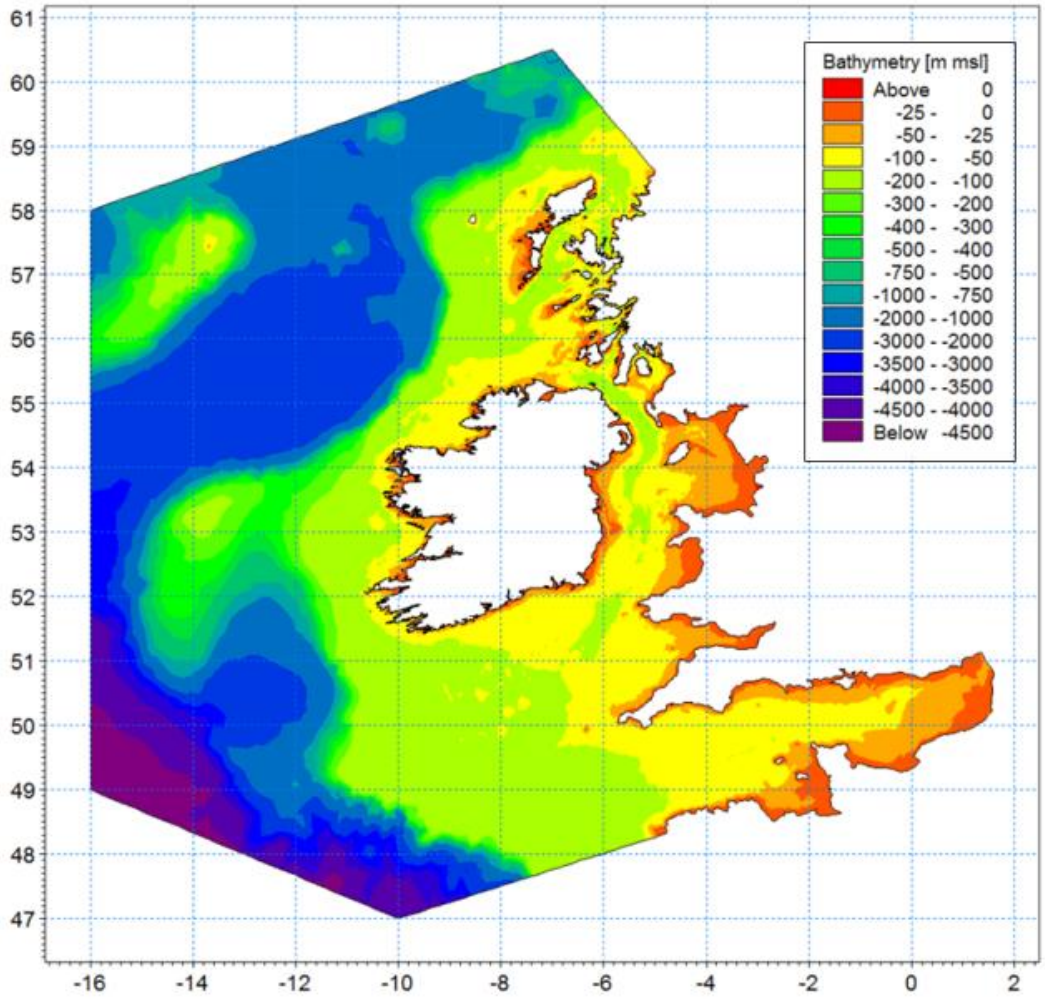


Figure 13-5: Extent and bathymetry of RPS' Irish Sea Tidal and Storm Surge model (RPS 2024)

[13.2.4] Site Visits / Surveys

The relevant bathymetry surveys used in developing the RPS model are shown in Figure 13-4. As part of the Dumping at Sea application process as it was necessary to collect and analyse sediment samples to determine potential contamination and the physical nature of the sediment to be dredged. Socotec was commissioned to analyse 20 discrete sediment samples collected from Ringaskiddy. In addition to examining the potential for contaminants, the material was also examined to quantify the percentage of sand and silt material. The results of this assessment are presented in Table 13-1 in the next section. As demonstrated by this analysis, approximately 78.8% of the material to be dredged was identified as silt whilst the remaining 21.19% of material had a grain size equivalent to or greater than that of sand material. This information was subsequently used to in establishing the numerical model for dredging and dumping.

[13.3] Baseline Environment

Tidal regime

The most recent Ringaskiddy tidal gauge data is shown below in Figure 13-6.

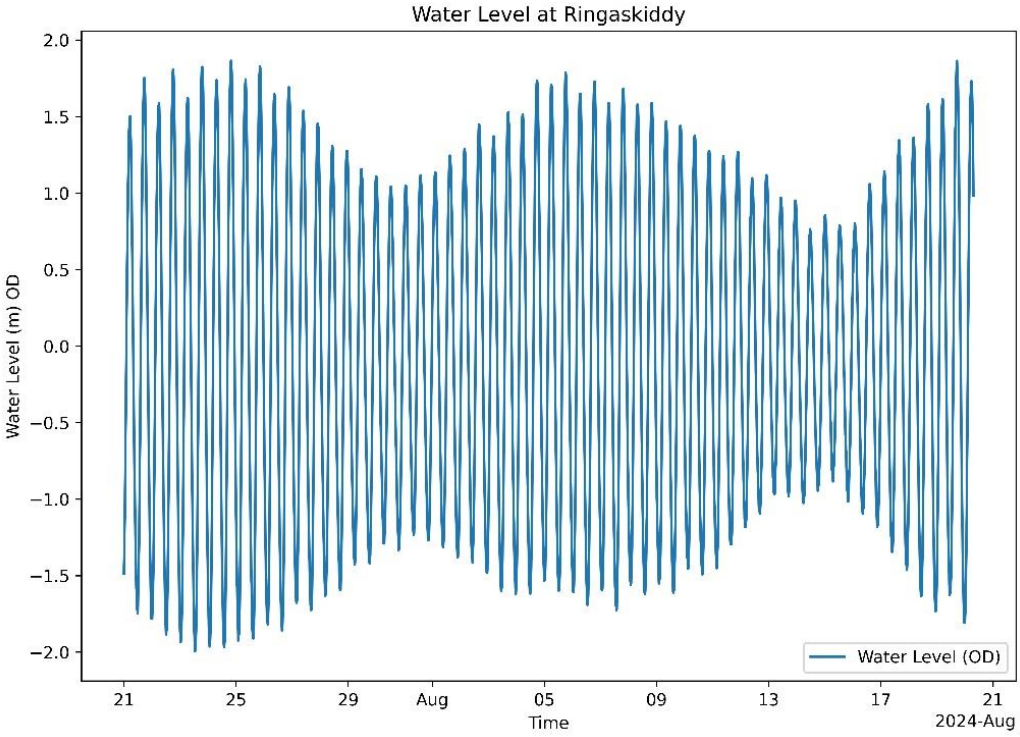


Figure 13-6: Ringaskiddy tidal gauge data

Tidal currents

The tidal currents in the area are strongly bi-directional within the main channel; however, in the lee of Paddy's Point and behind the Ringaskiddy ADM training wall, at the mouth of the Monkstown Creek, the current speeds are less with some circulatory currents being evident, as shown in Figure 13-11 and Figure 13-12. The maximum tidal currents speed distribution based on the RPS (2014) modelling study are shown below in Figure 13-7 and Figure 13-8 for the ebb and flood tide respectively.

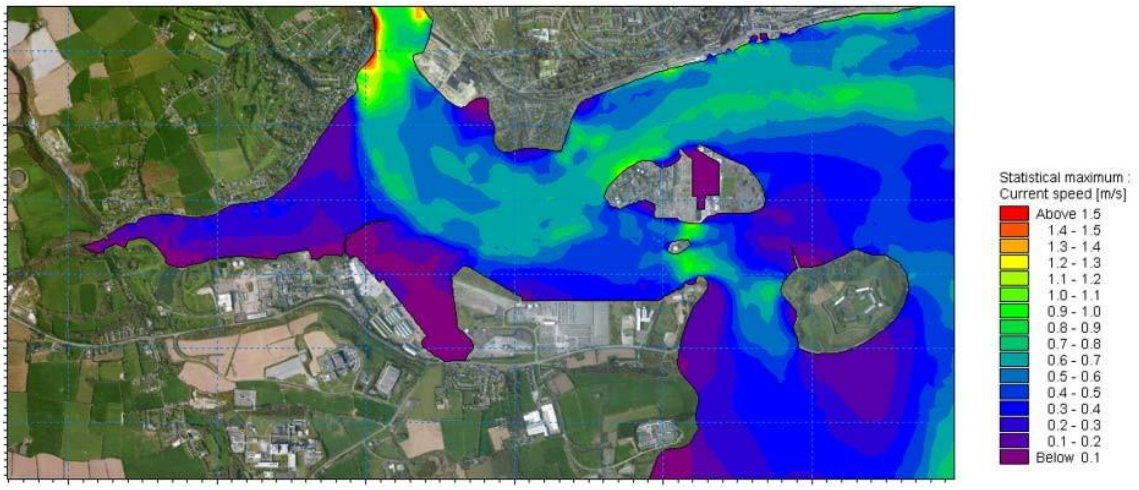


Figure 13-7: Peak Ebb Current Speeds (RPS 2014)

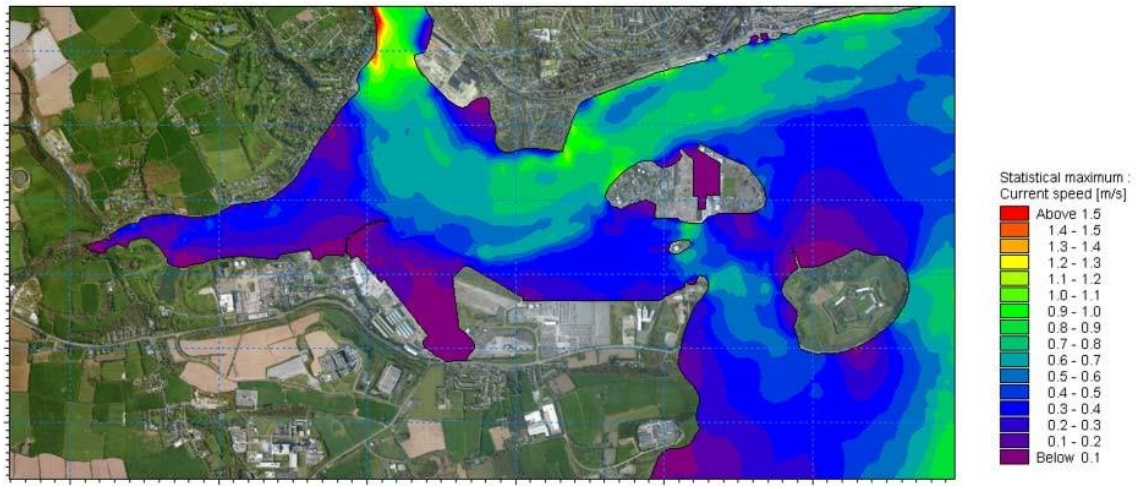


Figure 13-8: Peak Flood Current Speeds (RPS 2014)

Sediment

The composition of the material to be dredged was determined by the analysis of sediment samples. The analytical results indicated that approximately 78% of material to be dredged was comprised of silt. The characteristics of the silt fraction in the numerical modelling therefore used these coarse silt and fine silt fractions. Key sediment parameters also included the mean grain diameter and fall velocities associated with these fractions are summarised in Table 13-1 below.

Table 13-1 Summary of the Dumping at Sea sediment analyses report for Ringaskiddy (RPS 2024)

Sample ID code	Particle size >2mm %	Particle size <2mm >63um %	Particle size <63um %
MAR02152.001	0	13.87	86.13
MAR02152.002	8.16	22.49	69.35
MAR02152.003	5.02	25.56	69.42
MAR02152.004	0	17.08	82.92
MAR02152.005	1.28	9.69	89.02
MAR02152.006	2.42	7.68	89.9
MAR02152.007	3.25	19.61	77.14
MAR02152.008	0.63	16.1	83.27
MAR02152.009	0	12.58	87.42
MAR02152.010	0	15.04	84.96
MAR02152.011	1.91	15.83	82.26
MAR02152.012	0	13.42	86.58
MAR02152.013	0	14.45	85.55
MAR02152.014	0	64.31	35.69
MAR02152.015	0	28.69	71.31
MAR02152.016	0	17.84	82.16
MAR02152.017	0	16.53	83.47
MAR02152.018	0	20.58	79.42
MAR02152.019	0	18.54	81.46
MAR02152.020	8.17	23.19	68.65
AVERAGE [%]	**1.54**	**19.65**	**78.80**

[13.4] Sensitive Receptors

Designated sites within the Ringaskiddy study area that could be affected by construction, operational phases of the proposed re-development were identified. The designated sites considered in this report are presented and identified in Figure 13-9 below.

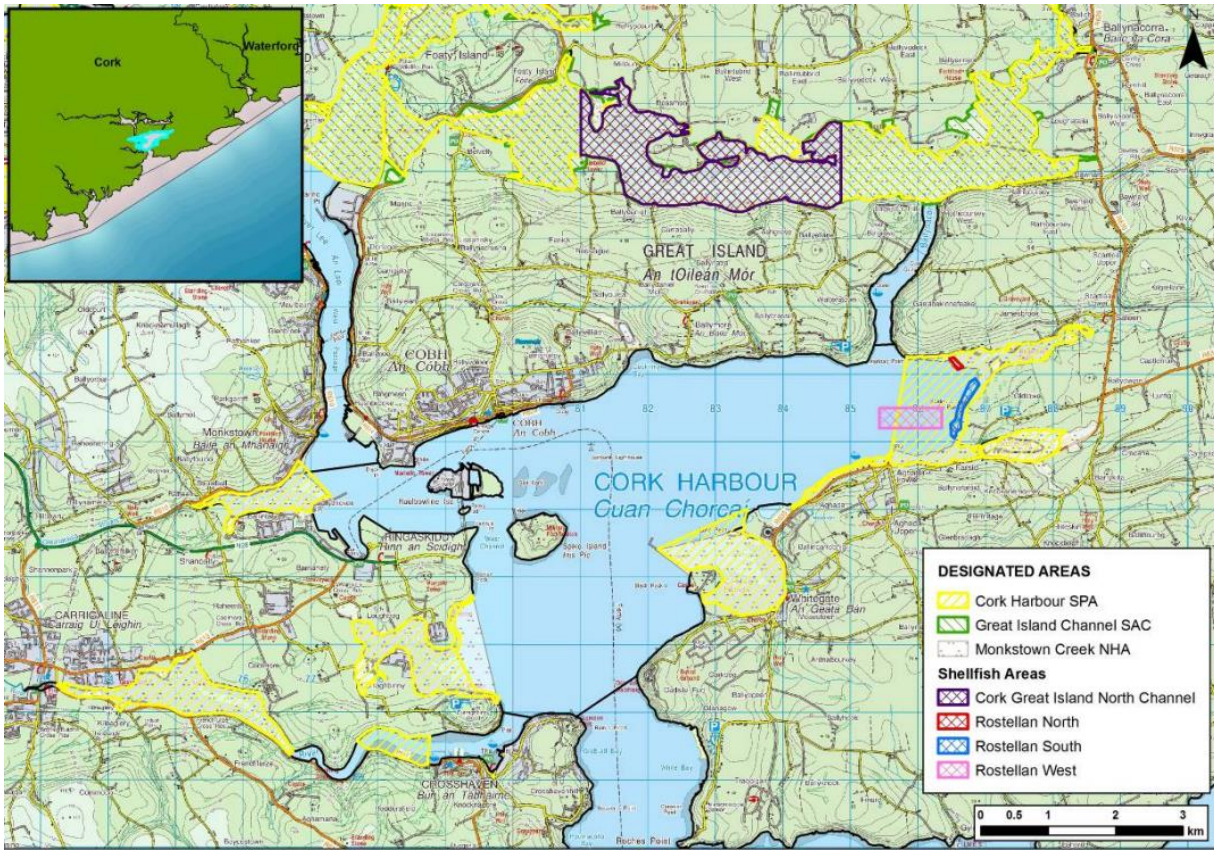


Figure 13-9: Designated areas of interest in proximity to Cork Harbour (RPS 2014)

[13.5] Potential Impacts

[13.5.1] The 'do nothing' scenario

The RPS hydrodynamic model was developed using the existing bathymetry as shown in Figure 13-10 in the vicinity of Ringaskiddy for do nothing scenario. In Figure 13-10 the areas of proposed reclamation are shown by yellow hatching and the dredging areas are outlined in yellow. The model was run for a series of tidal cycles; Figure 13-11 and Figure 13-12 show the mid-ebb and mid-flood flow patterns, respectively in the vicinity of the Port area.

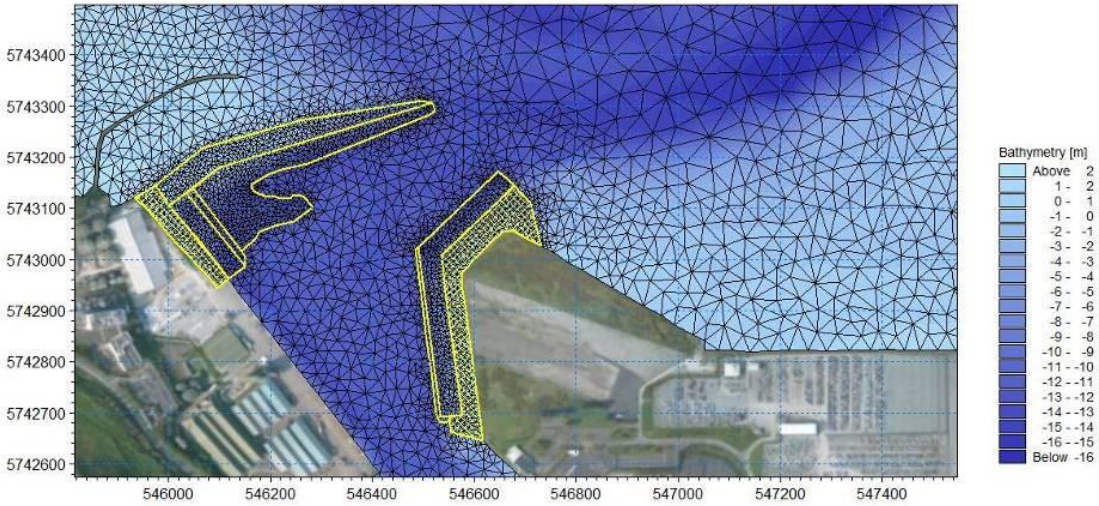


Figure 13-10: Existing bathymetry Ringaskiddy (proposed re-development yellow outline) (RPS 2014)

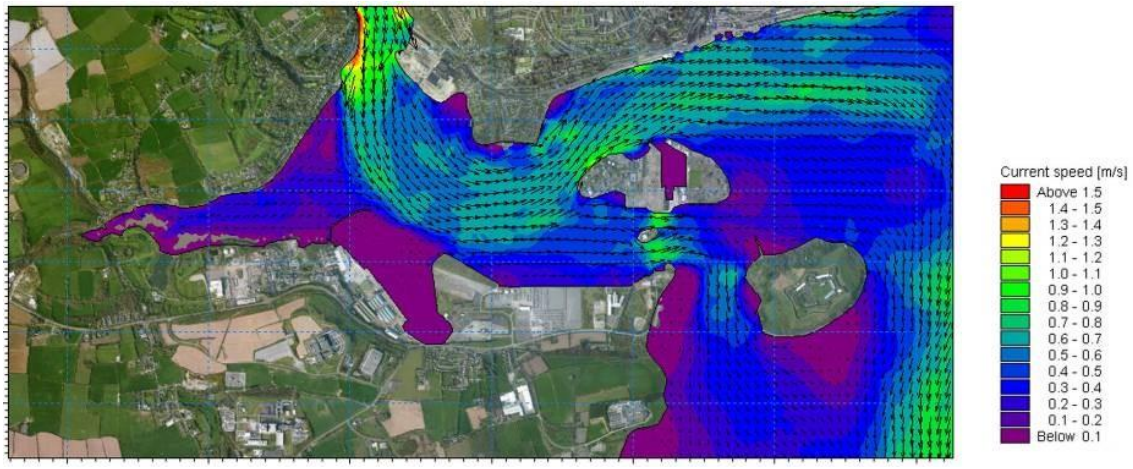


Figure 13-11: Existing Current Regime Mid-ebb (RPS 2014)

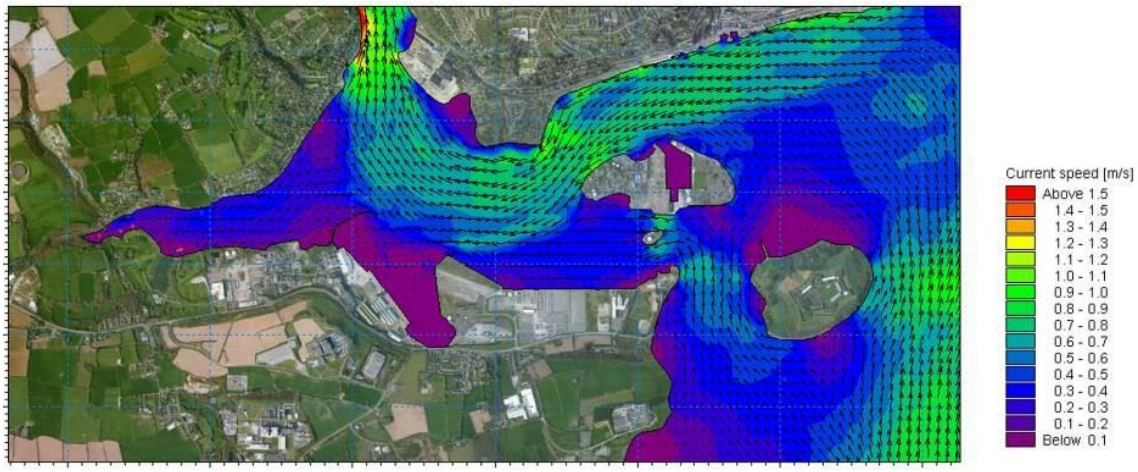


Figure 13-12: Existing Current Regime Mid-flood (RPS 2014)

The tidal currents in the area are strongly bi-directional within the main channel however in the lee of Paddy's Point and behind the Ringaskiddy ADM training wall, at the mouth of the Monkstown Creek, the current speeds are weaker with some circulatory currents being evident.

[13.5.2] Construction Phase

Sediment plumes generated from the dredging activity

During the construction process, the total volume of material to be dredged are 375,355m^3 and 47,862m^3 from sites A and B respectively, as shown in Figure 13-13. Taking a "worst case scenario" approach, the RPS (2024) model assumed that the dredging operations would be undertaken on a 24/7 basis. A typical dredging cycle was then used for this modelling study and is presented in Table 13-2 below.

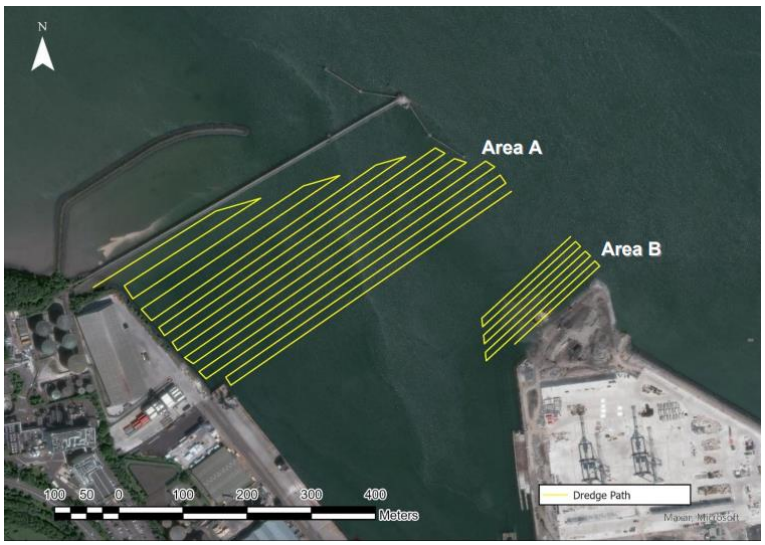


Figure 13-13: The path used to define the location and movement of the dredging source term (RPS 2024)

Table 13-2 Typical dredging cycle commensurate with historical operations (RPS 2014)

Cycle Phase	Duration [min]	Comment
Loading time	50	Consists of 20mins of manoeuvring and 30 mins of dredging
Sailing to Dump	90	
Dumping	10	
Sailing from Dump	90	

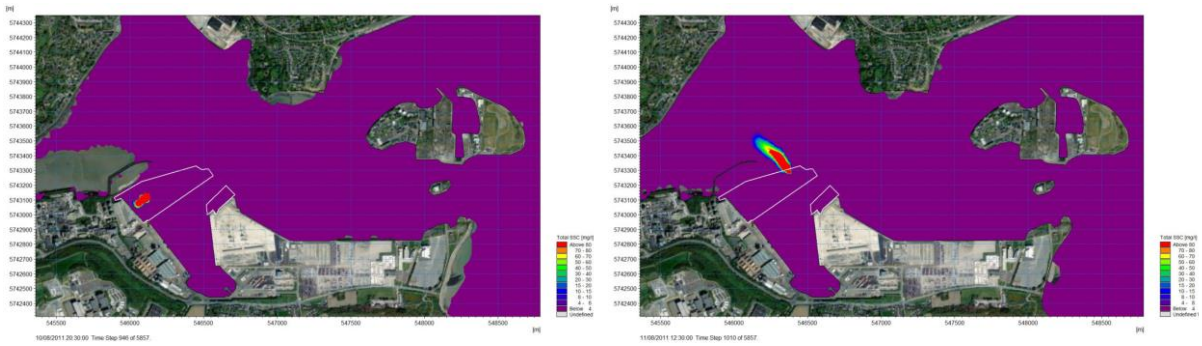
The composition of material to be dredged was determined by the analysis of sediment samples. The analytical results of these samples indicated that approximately 78% of sediment material to be dredged was comprised of silt. This silt fraction was then characterised into the numerical model using a distinct coarse silt and fine silt fraction. Key parameters including the mean grain diameter and fall velocities associated with these fractions are summarised in Table 13-3 below.

Table 13-3 Specification of silt material used in the dredging simulations (RPS 2024)

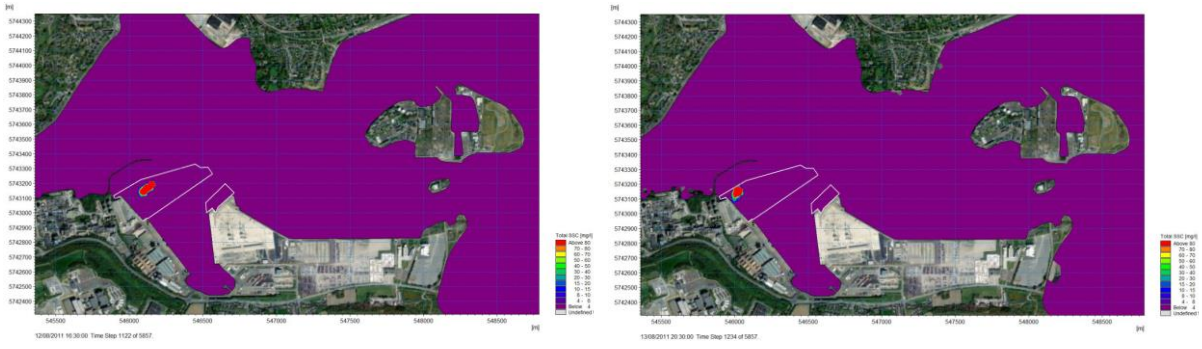
Representative material	Fraction	Class	Mean Diameter [mm]	Fall Velocity [m/s]	Proportion of source [%]
Silt	3	Coarse Silt	0.0467	0.001054	50
	4	Fine Silt	0.0023	0.000265	50

In the interest of presenting a conservative assessment and considering a worst-case scenario, RPS modelling simulations were based on dredging operations being undertaken using a Trailing Suction Hopper Dredger (TSHD) as opposed to a backhoe dredger. The percentage of lost sediment at the dredger head was assumed to be 3%, this equated to a loss of c. 45.3kg/s during active dredging times (i.e. 30 minutes of every 4hr dredging cycle). This loss was introduced by RPS as a source term that traversed the dredger path illustrated in Figure 13-13. It should be noted that the remaining 21.2% of material which comprised of sand material was not included in the modelling simulations. This was because sand fractions have a much higher fall velocity and would therefore quickly re-settle onto the seabed before being removed by the dredger.

The total suspended sediment concentrations (SSCs) during typical dredging operations at different tidal stage within Area A of the Ringaskiddy Ferry Port are presented in Figure 13-14. Figure 13-15 represents total suspended concentrations within Area B.

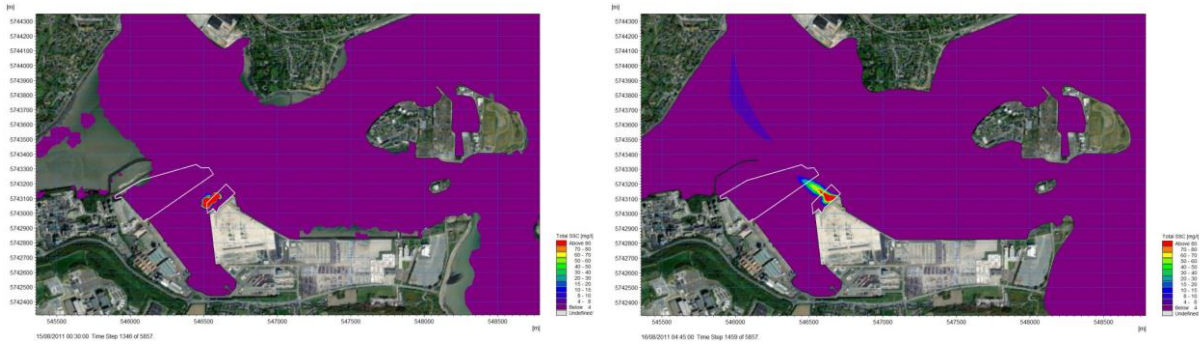


a) Low Water **b) Mid Flood**

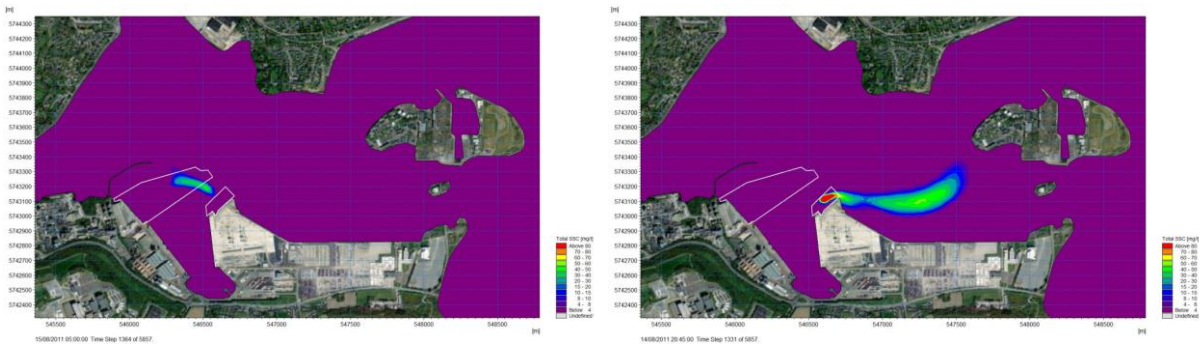


c) High Water **d) Mid Ebb**

Figure 13-14: Sediment plume envelope created from dredging operations in Ringaskiddy Ferry Port Area A at a) Low Water; b) Mid Flood; c) High Water d) Mid Ebb (RPS 2024).



a) Low Water **b) Mid Flood**



c) High Water **d) Mid Ebb**

Figure 13-15: Sediment plume envelope created from dredging operations in Ringaskiddy Ferry Port Area B at a) Low Water; b) Mid Flood; c) High Water d) Mid Ebb (RPS 2024).

Figure 13-16 illustrates the statistical mean total suspended sediment plume envelope, demonstrating that the average total SSC throughout Cork harbour does not generally exceed 0.2mg/L during the dredging operations. This SCC is valid for most of the harbour except at Ringaskiddy Ferry Port, whereby the constrained nature of the tidal currents restricts initial mixing and results in a marginally higher average total SSC of up to 6mg/L. The maximum total SSC plume envelope observed from the dredging simulations is presented in Figure 13-17. This figure should be interpreted with caution, as it represents the maximum suspended sediment concentration experienced in each mesh element over the course of the simulation. It reflects a worst-case scenario, assuming all contributing factors occur simultaneously. These values are unlikely to occur simultaneously nor will persist for any significant period. In Figure 13-17 beyond Areas A and B the maximum total SSCs do not generally exceed 150mg/L. Within the active dredge areas, the maximum SSC can, on occasions, exceed 1,000mg/L. It should be noted that these maximum total SSCs almost always related to times when the dredger was active and therefore represents the sediment source before any mixing or dispersion had occurred.

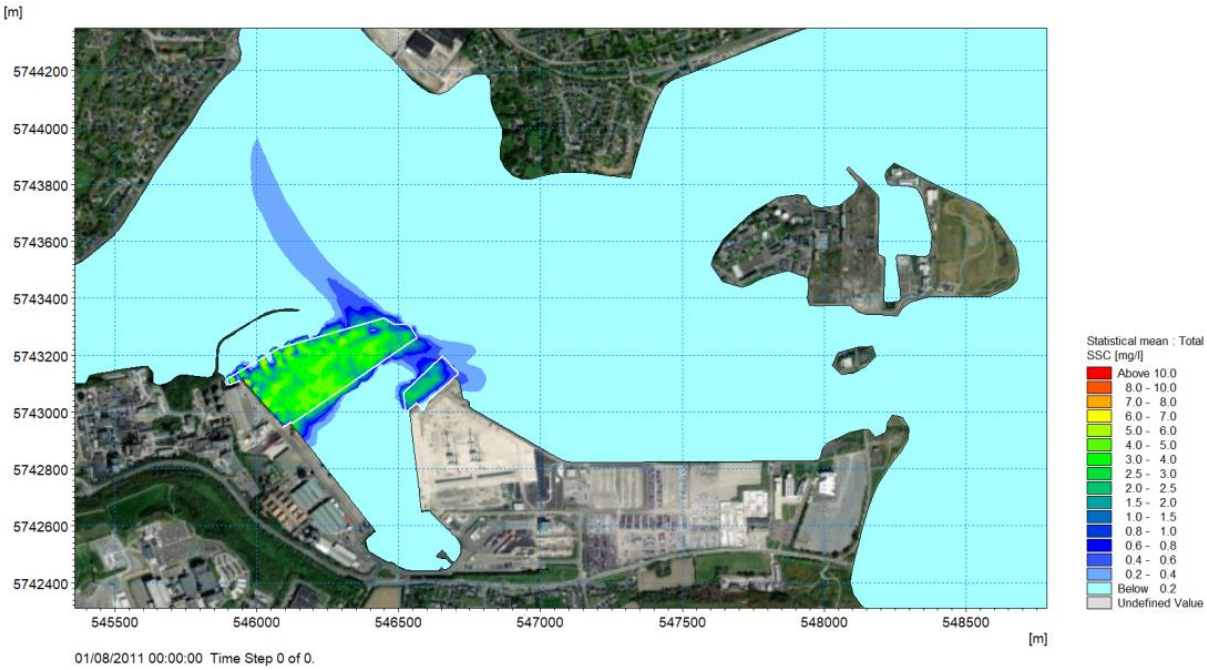


Figure 13-16: Average total suspended sediment concentration (SSC) (mg/L) within Ringaskiddy Ferry Port during the course of the proposed dredging operations (RPS 2024)

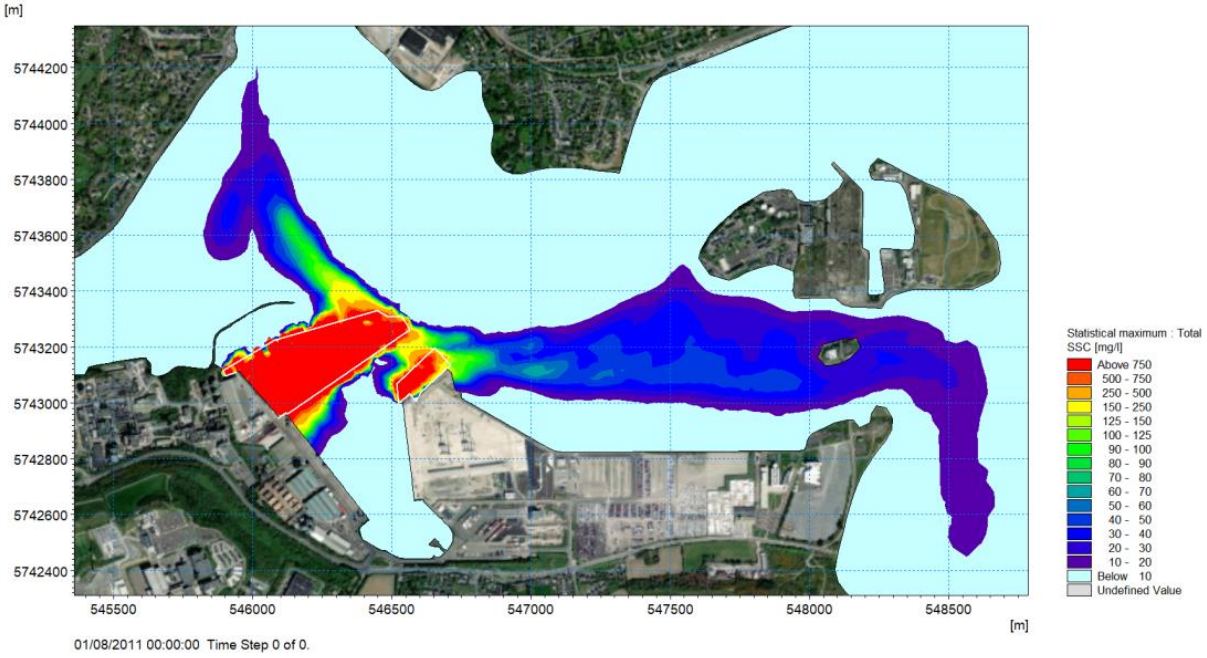


Figure 13-17: Maximum total suspended sediment concentration (SSC) (mg/L) within Ringaskiddy Ferry Port during the course of the proposed dredging operations (RPS 2024)

Sediment plumes generated from the dumping activity

The RPS (2024) model also assessed the dispersion and settlement of material released from dumping dredged material at the licensed disposal site approximately 8km south of Roches Point. Dumping activities would last for approximately 10min in every 4-hour dredging cycle. Given that the proposed dredger has a hopper capacity of 8,000m^3, a spill rate was determined for the model. As described in section 13.3 of this report, analysis of sediment samples taken throughout Cork Harbour demonstrated that the material to be dredged comprised 78% of silt

material, with the remaining 21% being sand material. These sediment fractions where therefore defined in the numerical model as per the specifications presented in Table 13-4 below. This dumped material was introduced as a source term that traversed the disposal site illustrated in Figure 13-18: The track used to define the location and movement of the dumping source term.

Table 13-4 Specification of the silt and sand material used in the dredging simulations (RPS)

Representative material	Fraction	Class	Mean Diameter [mm]	Fall Velocity[m/s]	Proportion [%]
Sand	1	Medium Sand	0.250	0.021870	6.40
	2	Fine Sand	0.125	0.006920	6.40
Silt	3	Coarse Silt	0.0467	0.001054	43.60
	4	Fine Silt	0.0023	0.000265	43.60

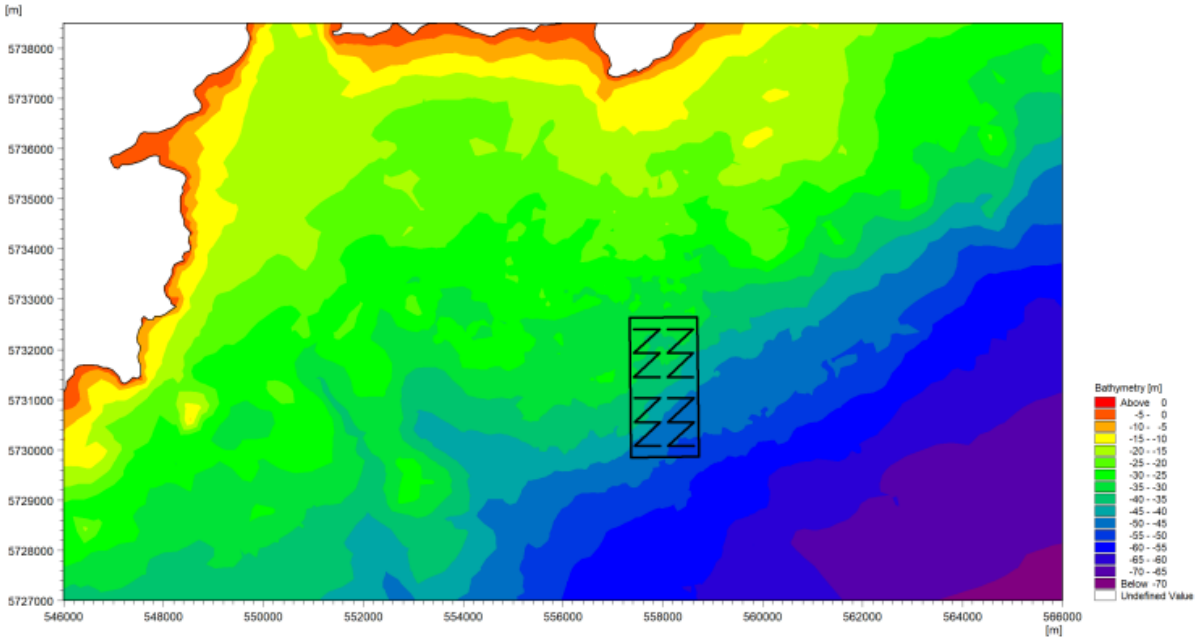


Figure 13-18: The track used to define the location and movement of the dumping source term (RPS 2024)

The average total suspended sediment concentration across at the disposal site as a result of the dumping operation is presented in

Figure 13-19. As demonstrated by this Figure, the highest total SSC are observed within the confines of the licensed disposal site. The average total SSC beyond the immediate vicinity of the licensed disposal site does not generally exceed 3mg/L and is quickly dispersed to less than 1mg/L approximately 2km from the disposal site boundary.

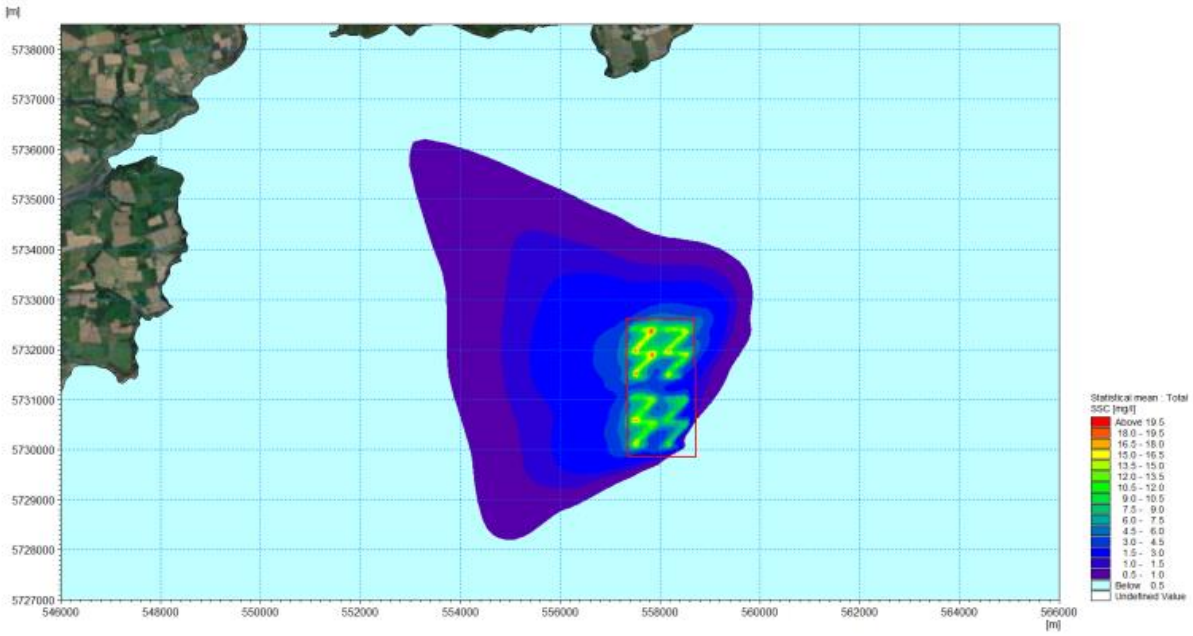


Figure 13-19: Average total suspended sediment concentration (mg/L) at the licensed disposal site during the capital dredging operations (RPS 2024)

[13.5.3] Operation Phase

The existing model bathymetry was modified by RPS to represent the proposed re-development plan. This comprised the re-development at Ringaskiddy East and Ringaskiddy West as shown in Figure 13-20; reclaimed areas are shown in solid yellow whilst dredging extents are outlined in yellow.

RPS re-ran the model for the re-development scenario, which has the same period as the calibration and do nothing (existing) scenario and the identical periods were compared with differences in mid-tide current speed, peak and residual currents being calculated in each case. The different figures presented in this document show the current speed for the proposed development minus the existing current speed. All calculations, except peak current speeds, were carried out on a vector basis. This means that changes in direction are considered, i.e. the magnitude of the change is indicated by the contour colour whilst the direction is indicated by the arrows. The calculation of peak current speed does not take account of directionality; therefore, the difference (proposed minus existing) may be a positive increase or negative reduction.

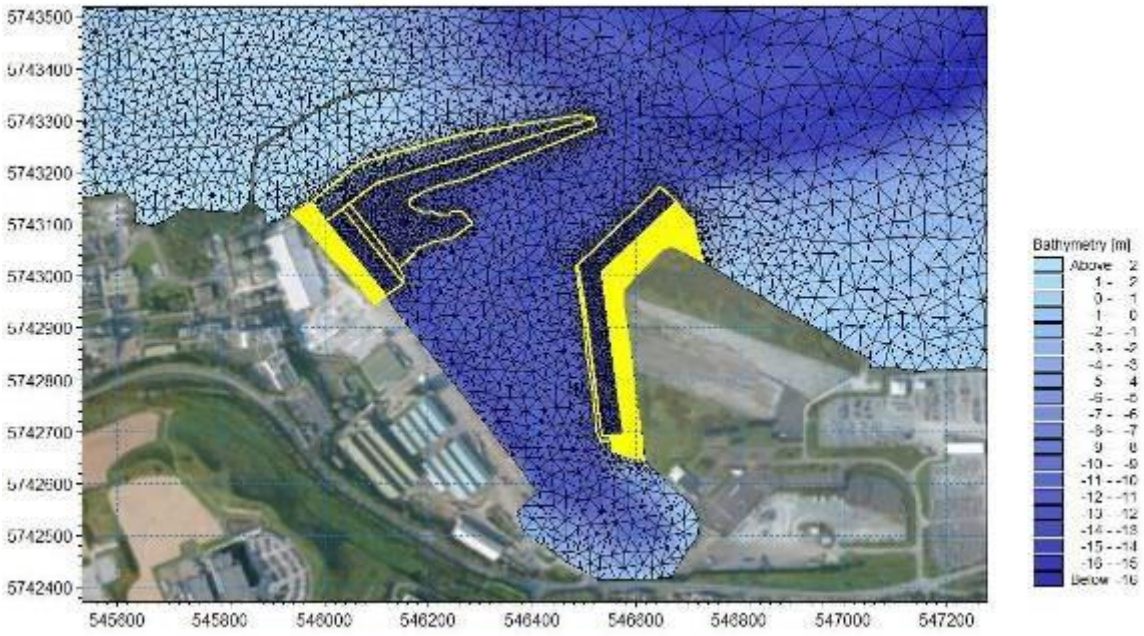


Figure 13-20: Proposed Redevelopment Bathymetry (m) – Ringaskiddy (RPS 2014)

Figure 13-21 and Figure 13-22 show the difference in current speed from the existing condition for ebb and flood tide, respectively. Within Ringaskiddy the existing circulatory current is increased slightly. The changes in current speed at Ringaskiddy are directly attributed to changes in water depth due to dredging rather than any change to the flow regime. The changes are within the immediate vicinity of the development, and the area beyond them remains unaffected.

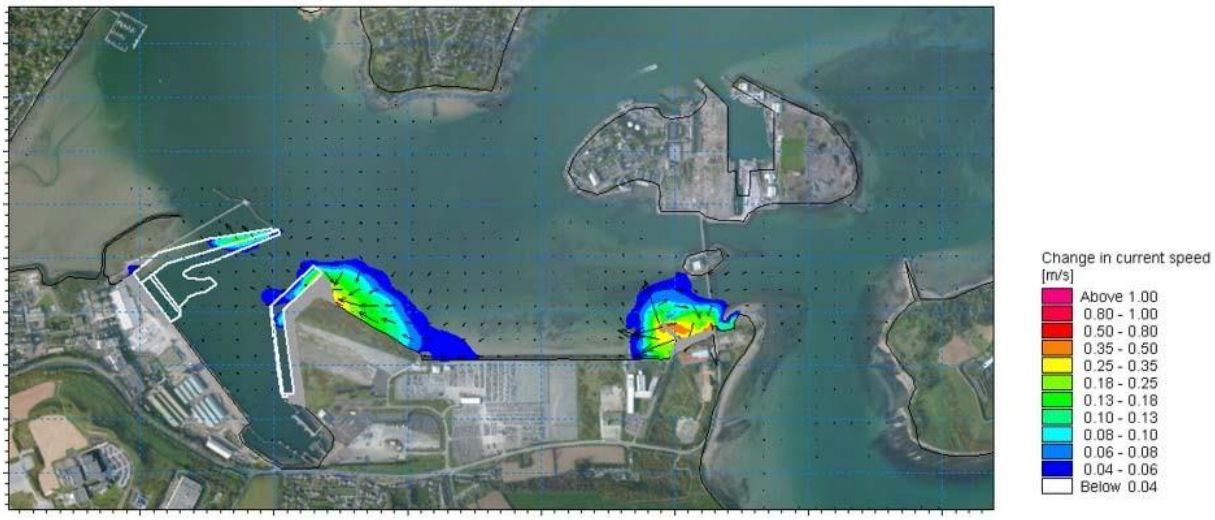


Figure 13-21: Vector Difference in Current Speed (m/s) Mid-ebb (proposed minus existing) (RPS 2014)

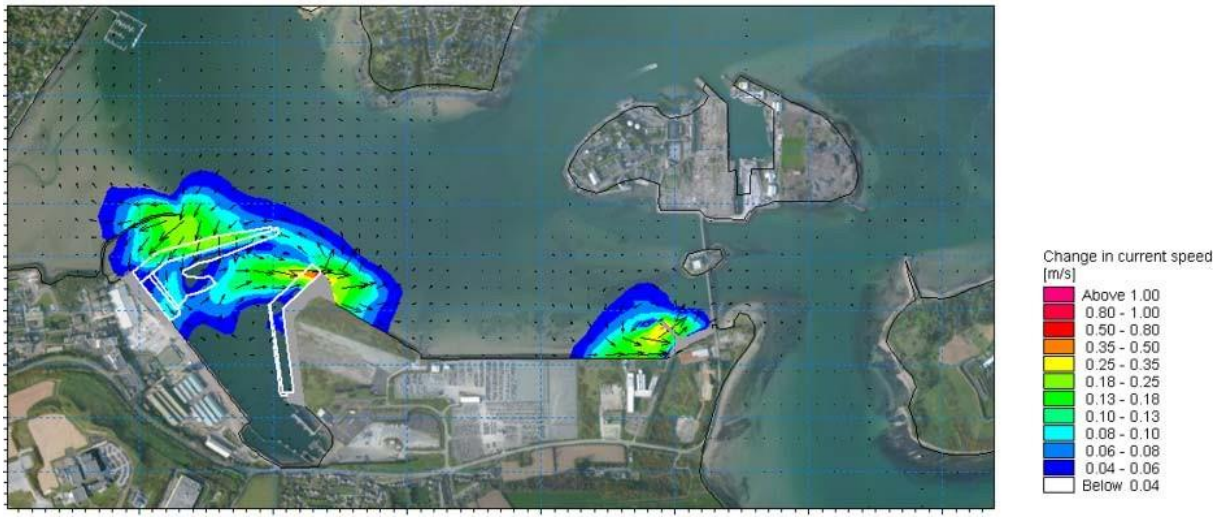


Figure 13-22: Vector Difference in Current Speed (m/s) Mid-flood (proposed minus existing) (RPS 2014)

Figure 13-23 and Figure 13-24 show the changes in the peak current speeds for ebb and flood tides respectively. As previously stated, the changes are limited to the vicinity of the re-development with reduced peak currents in the lee of the structures on each of the tides and localised increases where the flow is redirected further offshore around the structures. The velocities experienced are within the range of those currently seen but are relocated due to the construction.

Figure 13-23: Difference in Peak Current Speed (m/s) Ebb- (proposed minus existing) (RPS 2014)

Figure 13-24: Difference in Peak Current Speed Flood (m/s) (proposed minus existing) (RPS 2014)

To demonstrate the impact on current speed beyond the re-development, six locations were examined in the model on a timeseries basis; the locations are shown in Figure 13-25, with the corresponding plots shown in Figure 13-26 to Figure 13-31. Very limited changes were observed.

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Figure 13-25: Timeseries Locations for Current Speed Analysis (RPS 2014)

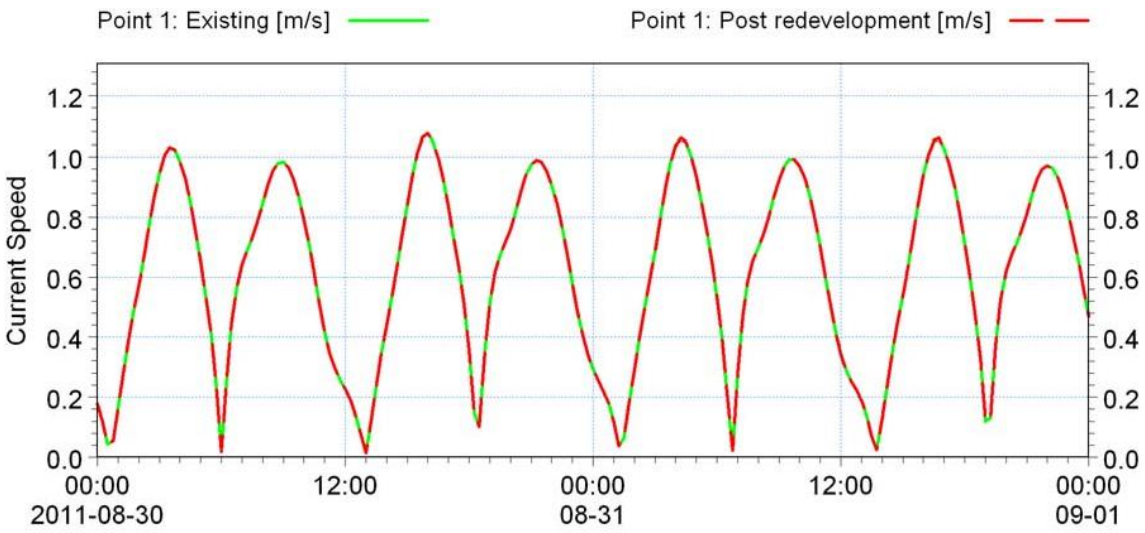


Figure 13-26: Comparison of Current Speed (m/s) Point 1: Lee (RPS 2014)

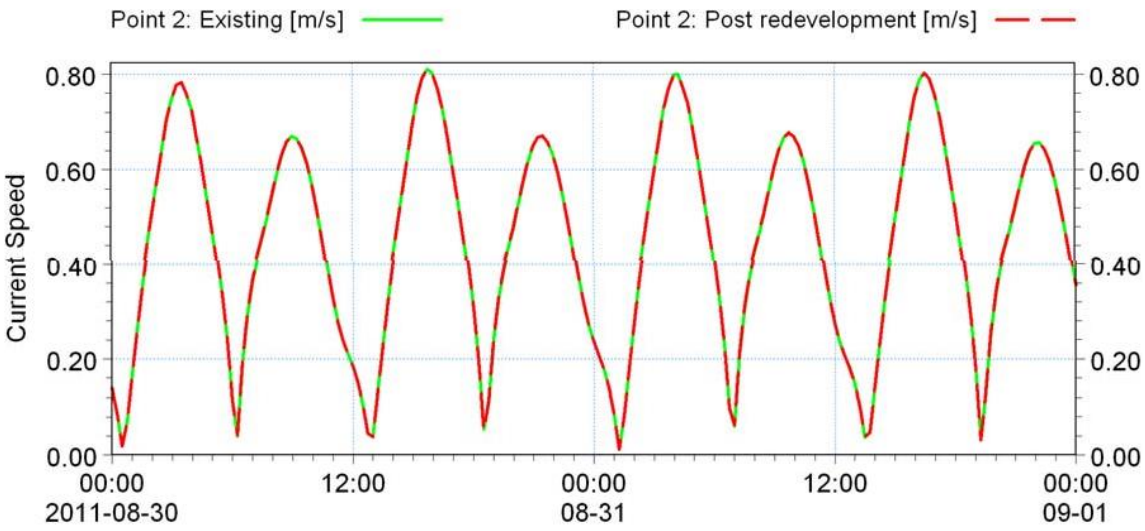


Figure 13-27: Comparison of Current Speed (m/s) Point 2: Cobh Road (RPS 2014)

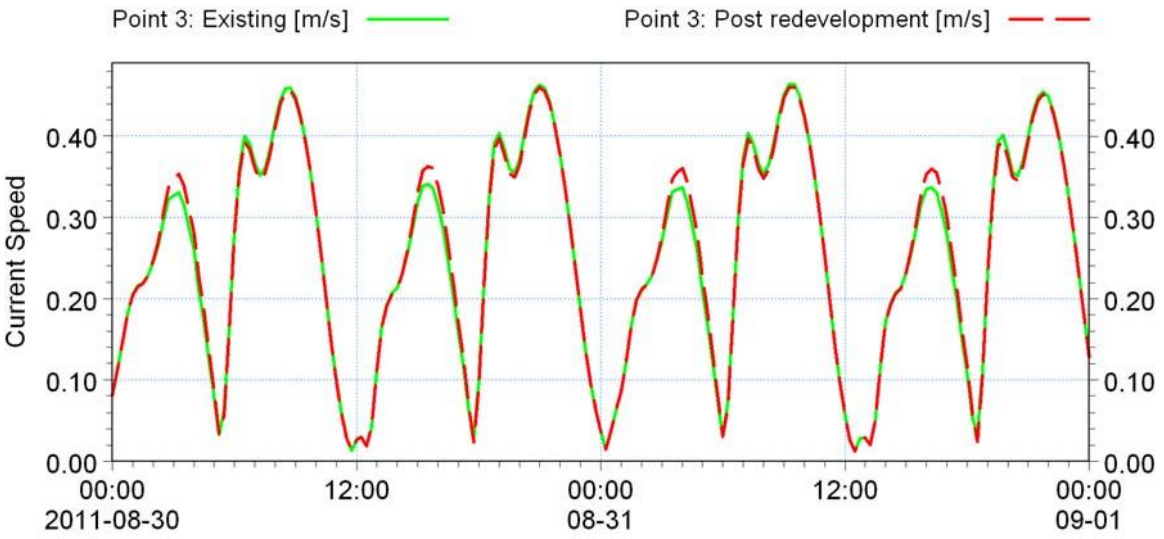


Figure 13-28: Comparison of Current Speed (m/s) Point 3: Oyster Bank (RPS 2014)

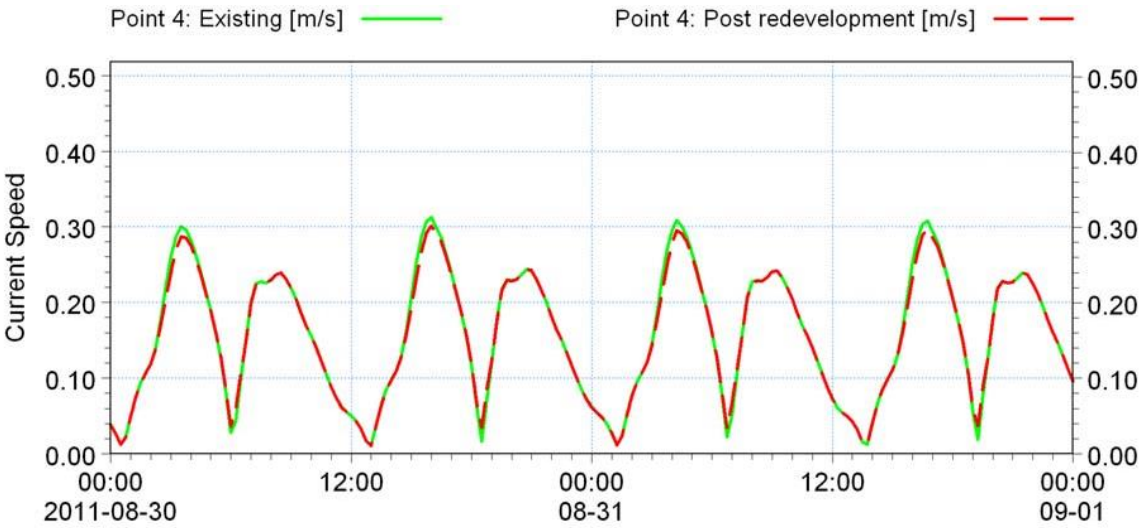


Figure 13-29: Comparison of Current Speed Point (m/s) 4: Monkstown Approaches (RPS 2014)

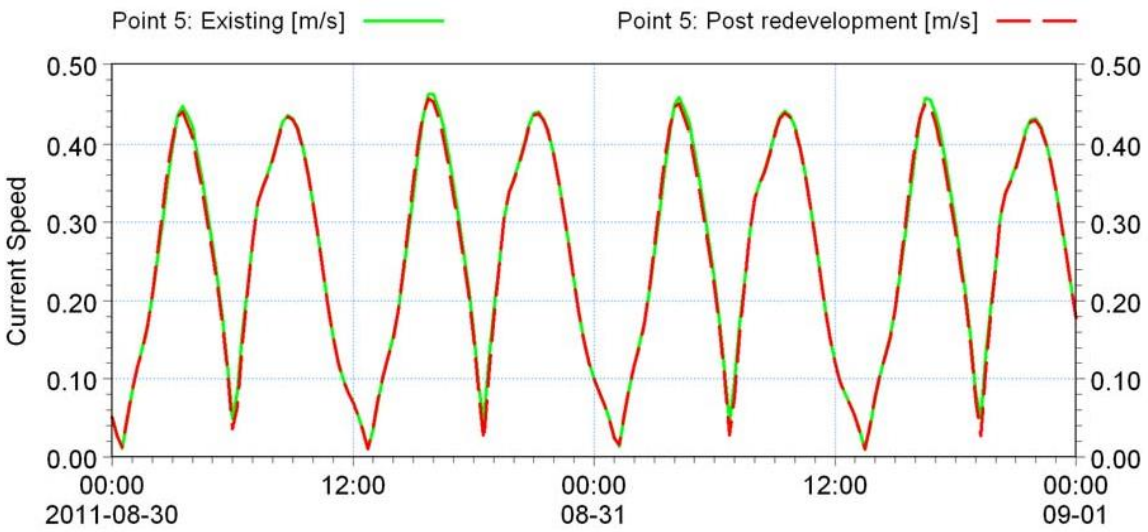


Figure 13-30: Comparison of Current Speed (m/s) Point 5: Monkstown Approaches (RPS 2014)

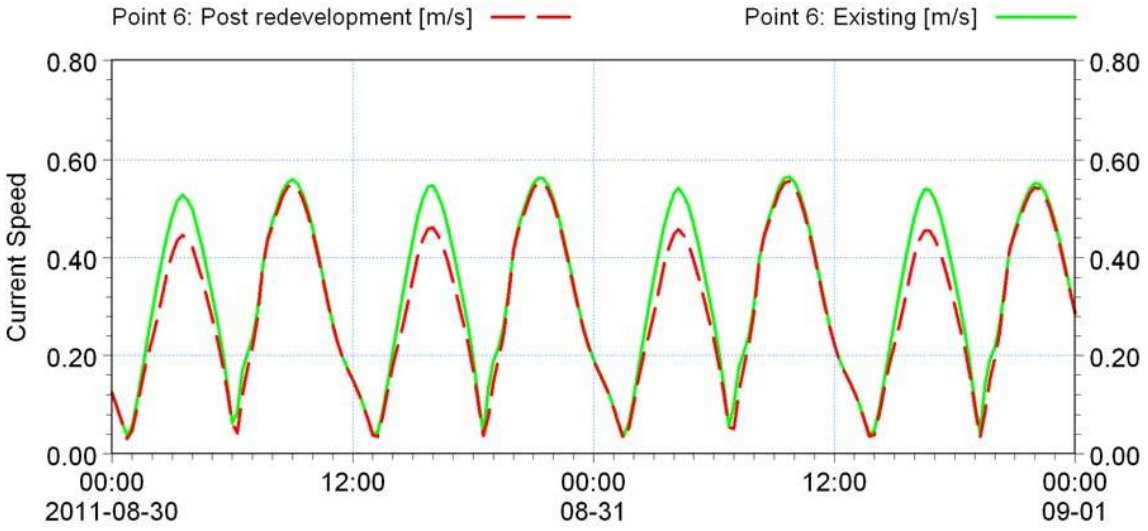


Figure 13-31: Comparison of Current Speed (m/s) Point 6: Ringaskiddy Approaches (RPS 2014)

The residual currents for the proposed re-development and calculated changes are shown in Figure 13-32 and Figure 13-33 respectively. Figure 13-33, the difference plot, shows that there will be very little change in residual current beyond the development, so sediment transport will remain unchanged. The only localised changes are near the site and maintenance dredging within Ringaskiddy will remain at the current scale and frequency.

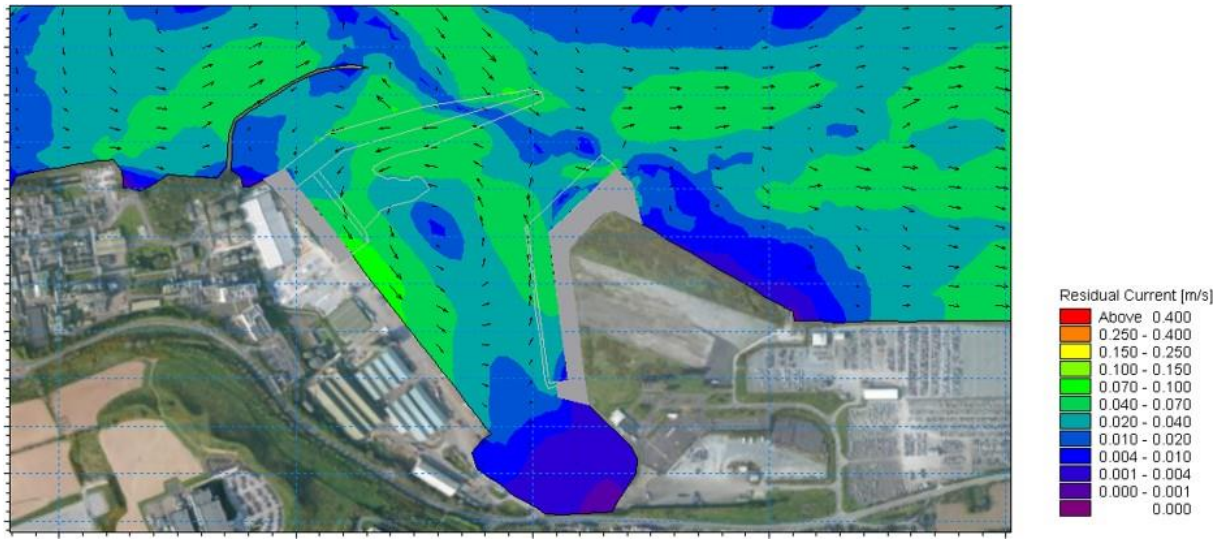


Figure 13-32: Proposed Re-development Residual Current (m/s) – Ringaskiddy (RPS 2014)

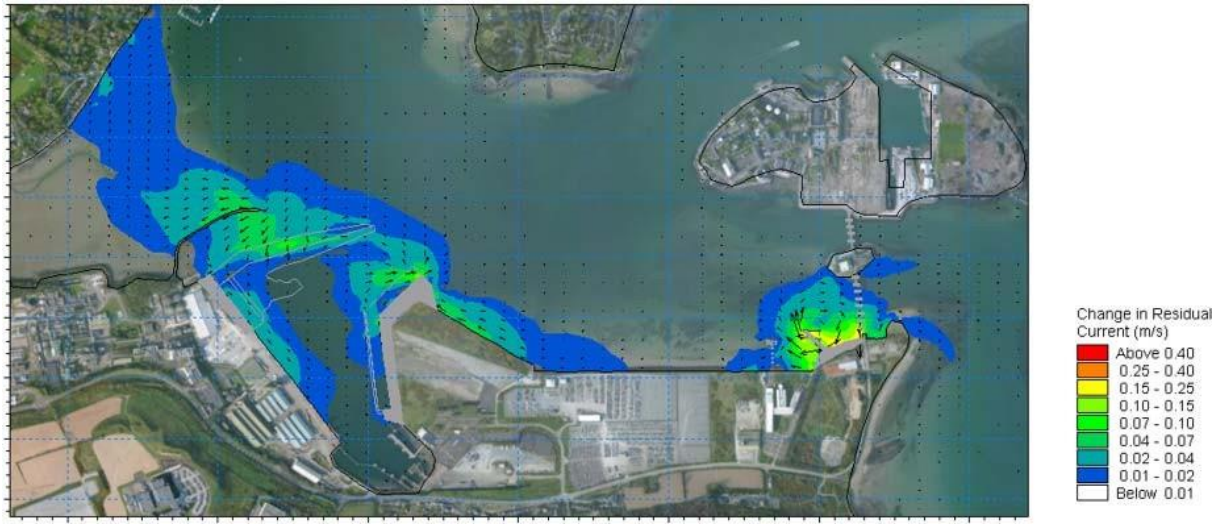


Figure 13-33: Vector Difference in Residual Current (m/s) (proposed minus existing) (RPS 2014)

To further demonstrate the changes in current pattern in the immediate vicinity of the proposed re-development, two locations were examined regarding both current speed and direction at Ringaskiddy, as indicated on Figure 13-34. In each case the upper plot shows the current speed (m/s) comparison, and the lower plot shows the direction.

Figure 13-34: Timeseries locations for Current Analysis (RPS 2014)

The impact on currents at the Ringaskiddy site, C and D are shown in Figure 13-35 and Figure 13-36; these indicate that the current speed has once again been slightly altered; however, flow directions remain largely unchanged.

It can be concluded that the proposed re-development will have no discernible impact beyond the immediate vicinity of the construction in terms of tidal flow and sediment transport regimes. Maintenance dredging will continue to be required at Ringaskiddy, as is currently the case.

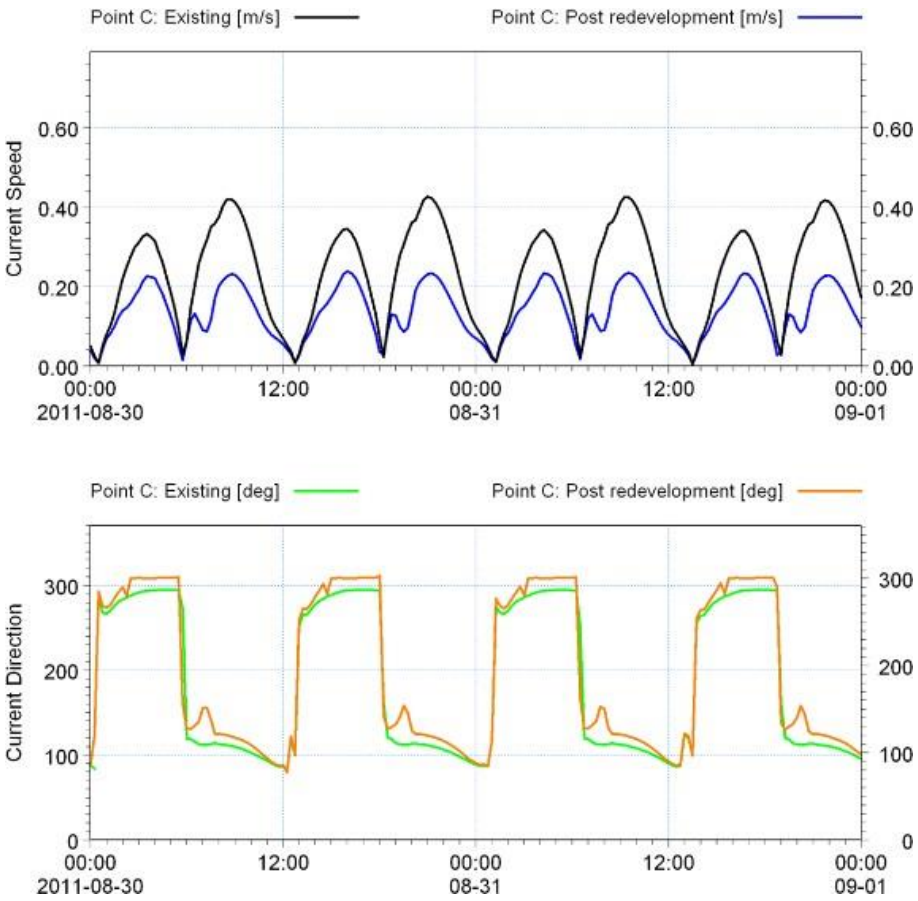


Figure 13-35: Model Current Speed (m/s upper plot) and Current Direction (lower plot) Location C (RPS 2014)

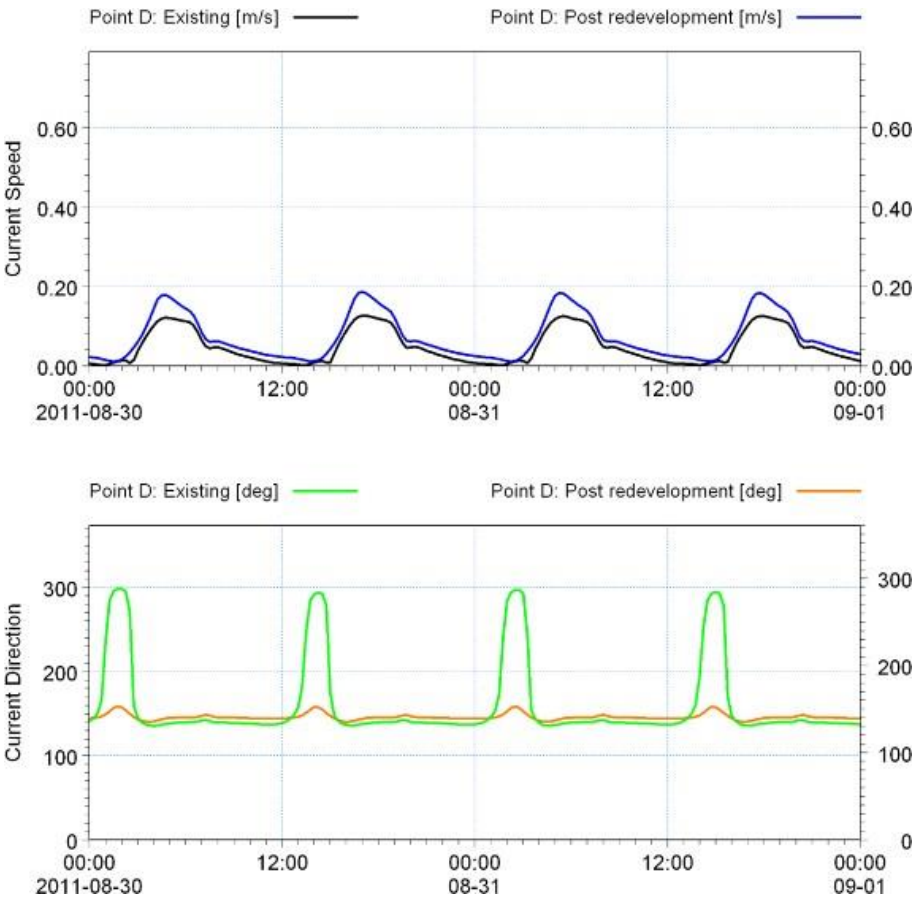


Figure 13-36: Model Current Speed (m/s upper plot) and Current Direction (lower plot) Location D (RPS 2014)

[13.6] Mitigation Measures

[13.6.1] Construction Phase

POCC has requested a permit be granted for a maximum dredge volume of 375,355m^3 and 47,862m^3 to be dredged from sites A and B, respectively. Figure 13-13 shows the locations of Area A and Area B in relation to Ringaskiddy. It is envisaged that all dredging works will be undertaken using a backhoe dredger and/or a Trailing Suction Hopper Dredger (TSHD) with a capacity of not exceeding c. 8,000m^3 with the load per day being not greater than c.29,376 dry tonnes. As illustrated in Figure 13-1 the licensed disposal site is located approximately 8km south of Roches Point.

To reduce sediment dispersion, dredging operations will be undertaken with no overspill from the hopper. Several mitigation measures will be applied during the operation, which are outlined below:

- **CP_01** A full record of loading and dumping tracks and record of the material being dumped will be maintained for each trip
- **CP_02** No over-spilling (overflowing) from the dredger(s) will be permitted
- **CP_03** Dumping will be carried out through the vessel's hull

- **CP_04** Dumping will be limited to 29,376 dry tonnes per day
- **CP_05** No dumping will occur in either November or February
- **CP_06** No dumping will occur at the same time as the Port of Cork's maintenance dredging permit
- **CP_07** The dumpsite will be divided into subsections with each used sequentially to ensure uniform spread of the dredged sediments
- **CP_08** A 250m radius exclusion zone will be implemented around an archaeological anomaly at location 188723.5, 54463.1 (ITM coordinates)
- **CP_09** An Archaeologist will witness all the work in line with the Underwater Archaeology Impact Assessment
- **CP_10** A Marine Mammal Observer will witness all the work in line with the Species Risk Assessment
- **CP_11** Water Quality monitoring of the loading areas will be undertaken at locations to be agreed with the EPA
- **CP_12** A documented Accident Prevention Procedure will be put in place prior to commencement
- **CP_13** A documented Emergency Response Procedure will be put in place prior to commencement.

[13.6.2] Operation Phase

Figure 13-40 shows the residual current with the Cork Estuary after completion of the re-development. The general trend for sediment transport is easterly along the stretch between Ringaskiddy and Paddy's Point. Within the Ringaskiddy Basin the residual current is circulatory in nature with some maintenance dredging being required.

[13.7] Monitoring

[13.7.1] Construction Phase

The suspended sediment concentration will vary significantly over the course of the dredging operations depending on tidal levels, flows and due to the operations. Therefore, the sediment concentrations outside the operation sites are suggested to be monitored. Water Quality monitoring of the loading areas will be undertaken at locations to be agreed with the EPA.

[13.7.2] Operation Phase

The two tidal gauge locations at Cobh and Ringaskiddy (indicated in Figure 13-37), will be monitored continuously. Within the Ringaskiddy Basin the residual current is circulatory in nature with some maintenance dredging being required, therefore the bed elevation needs to be monitored accordingly.

Figure 13-37: Location of tidal gauge (Black text) (RPS 2014)

[13.8] Residual Effects

[13.8.1] Construction Phase

Sediment deposition in the Ringaskiddy area upon completion of the dredging operations is illustrated in Figure 13-38, which demonstrated that the deposition levels within the study area were generally less than 0.016m.

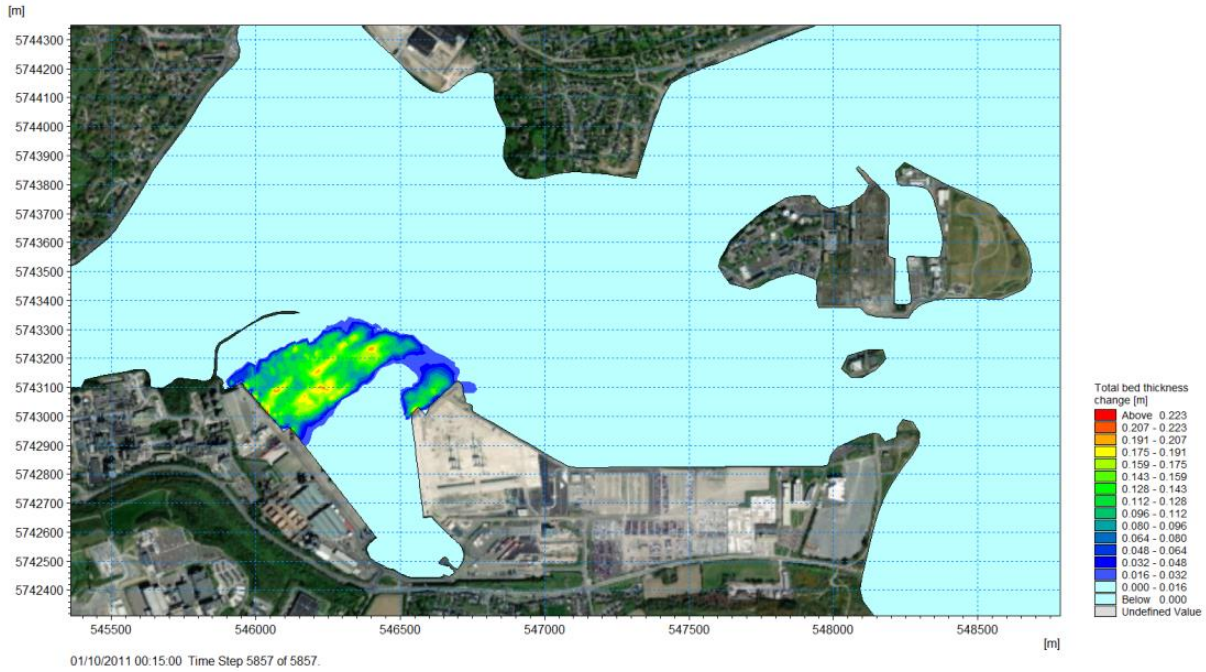


Figure 13-38: Total bed thickness (m) change within Ringaskiddy Ferry Port following the proposed dredging operations (RPS 2024)

Sediment deposition at the licensed disposal site at the end of the dredging operation is illustrated in Figure 13-39. It will be seen from this figure that almost all the sediment dumped

during the primary dredging operation remains within the confines of the licensed disposal site. Beyond the immediate vicinity of the licensed disposal site, change in bed levels do not generally exceed 5mm.

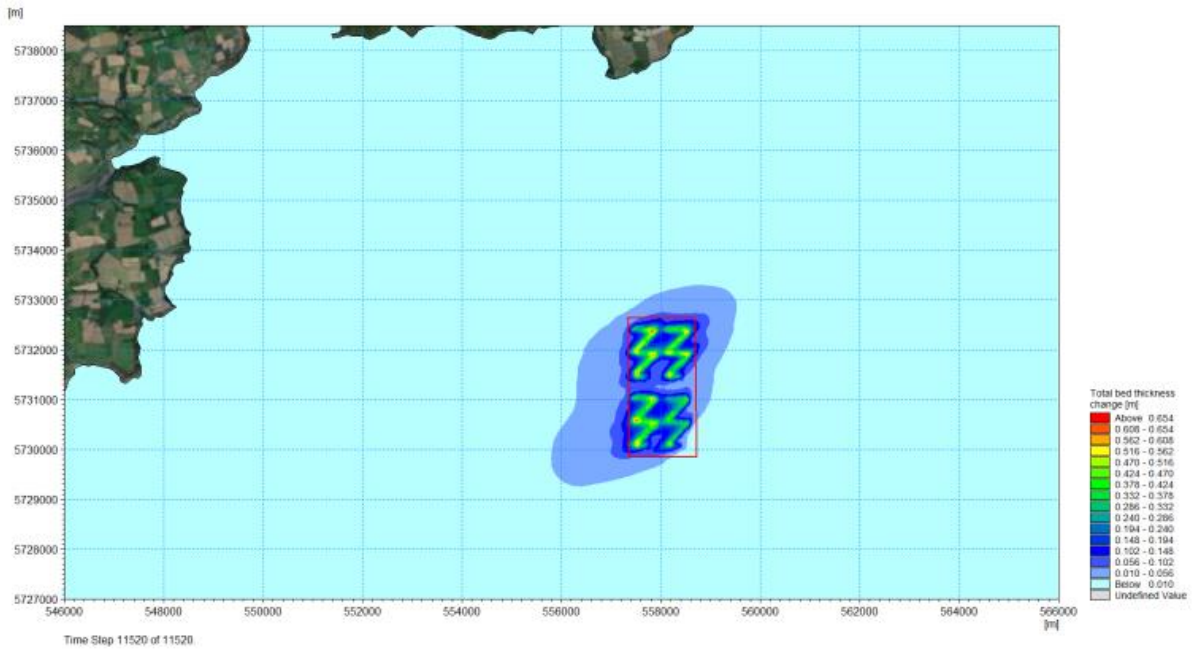


Figure 13-39: Total bed thickness (m) change at the licensed disposal site following the capital dredging operations (RPS 2024)

[13.8.2] Operation Phase

Figure 13-40 shows the residual current with the Cork Estuary after completion of the re-development. The 'imbalance' between ebb and flood tides drives sediment transport within the coastal estuary. The general trend for sediment transport is easterly along the stretch between Ringaskiddy and Paddy's Point.

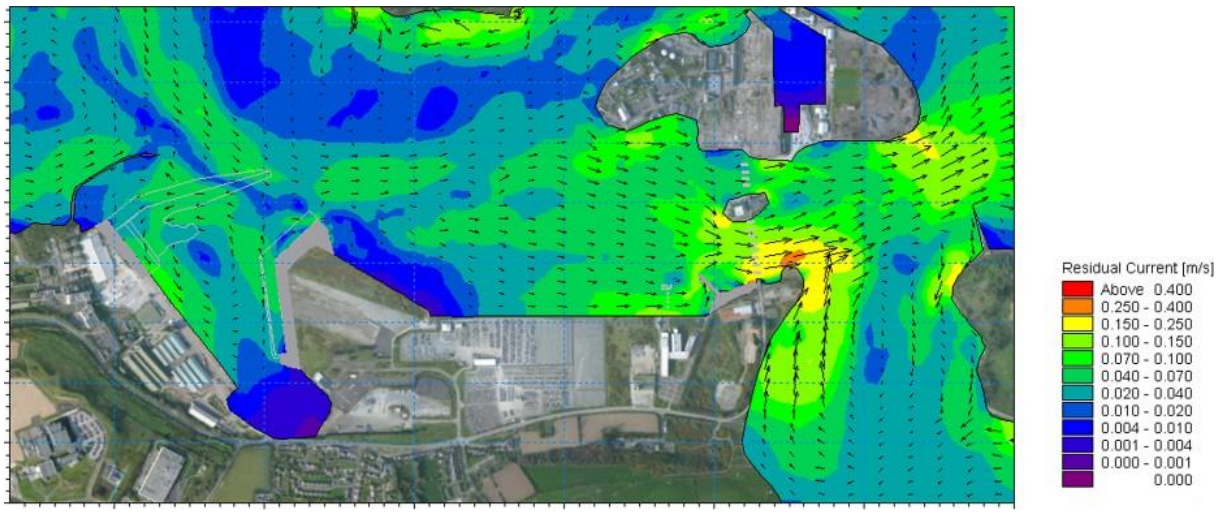


Figure 13-40: Proposed Re-development Residual Current (m/s) (RPS 2014)

[13.9] Potential Interactions & Cumulative Impacts

An examination of the local planning history shows that there are only two proposed activities which are not land based. The Monkstown Marina consists of floating berths and breakwaters located on the western shore at Monkstown. RPS modelling of the coastal processes has been undertaken for this development as part of a request for further information by the planning authority. The modelling showed that there would be no effect on the coastal processes with no change in tidal levels and the effect on the tidal currents restricted to the project area with changes of not greater than 0.04m/s. Thus, this development will not have a cumulative effect with the proposed Ringaskiddy Port Re-development. Similarly, the remedial work completed at the eastern end of Haulbowline Island will not have a cumulative effect as the work is now complete.

[13.10] Summary

Numerical modelling studies were carried out by RPS to evaluate the impacts of proposed re-development at Ringaskiddy; this included the impacts of proposed port re-development at Ringaskiddy for both the construction and operational phases, which provides hydrodynamic and sediment transport modelling. The impact of the proposed re-development was quantified in terms of the changes in the current regime for the proposed re-developments at Ringaskiddy. The proposed construction will not impact on tidal current regime beyond the immediate vicinity of the re-development. The general sediment transport regime will remain unchanged.

Sediment plume and deposition modelling were undertaken for dredging during the construction phase of the Ringaskiddy East and West sites, which showed minimum levels of deposition outside the immediate vicinity of the dredging envelope. Suspended sediment levels associated with the dredging programme showed that the turbidity levels would be increased within the local area, but peaks would only persist for short periods of the tide.

There are two completed marine projects adjacent to the Ringaskiddy re-development that have been considered in respect of cumulative impacts. There is a completed marina at Monkstown which has been shown to have no significant impact on the coastal processes and there is a remedial operation completed for the eastern end of Haulbowline Island. The impact from both projects was assessed in the original EIS, but they are now complete and accordingly is not anticipated to cause a cumulative effect in conjunction with the proposed re-development.

[14] Water Environment

[14.1] Introduction

This Chapter examines the likely significant effects associated with the construction, operation and maintenance of the Proposed Scheme on surface water quality and the existing hydrological regime. The elements of the water environment that are assessed in this Chapter with regard to the proposed Ringaskiddy Port Redevelopment include water quality, flood risk and sewage and storm water infrastructure. The information is based on the analysis and interpretation of data acquired during the baseline assessment as part of the previously prepared EIS (RPS 2014) , as well as more recently available information.

Potential impacts related to the construction and operational phases of the proposed Ringaskiddy Port Redevelopment are assessed and mitigation measures proposed to reduce significant adverse impacts on the receiving water environment. Chapter 3 of the EIAR sets out a full description of the elements of the proposal considered in the completion of this assessment.

The footprint of the proposed redevelopment is relatively large, and with construction works taking place both within and immediately adjacent to Cork Harbour there is an inherent risk of having a direct and indirect impact on water quality within the Harbour.

[14.2] Assessment Methodology

[14.2.1] Study Area

As illustrated in **Figure 14-1**, the location of the proposed redevelopment lies within Cork Harbour coastal water body (IE_SW_060_000) in the South-Western River Basin District (SWRBD). The harbour (IE_SW_060_0000) is fed by Lough Mahon (IE_SW_060_0750), Owenboy Estuary (IE_SW_060_0800) and North Channel Great Island (IE_SW_060_0300) transitional water bodies before feeding into the Outer Cork Harbour coastal water body (IE_SW_050_0000).

In terms of the impact assessment, Cork Harbour is considered to be a feature of extremely high importance based on the evaluation of significance set out in the National Roads Authority (NRA) publication "*Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*" (NRA, 2008). The significance of the water body is extremely high as sections of the water body are protected by EU legislation, i.e. Natura 2000 sites (European Sites) designated under the Habitats Directive (92/43/EEC) and Birds Directive (2009/147/EC) and shellfish areas designated under the Shellfish Waters Directive (2006/113/EC). This is relevant to the assessment of environmental impacts outlined further in this chapter. The designated sites in the vicinity of the proposed redevelopment are illustrated in Figure 14-2.

Figure 14-1 Location map showing Cork Harbour and nearby waterbodies

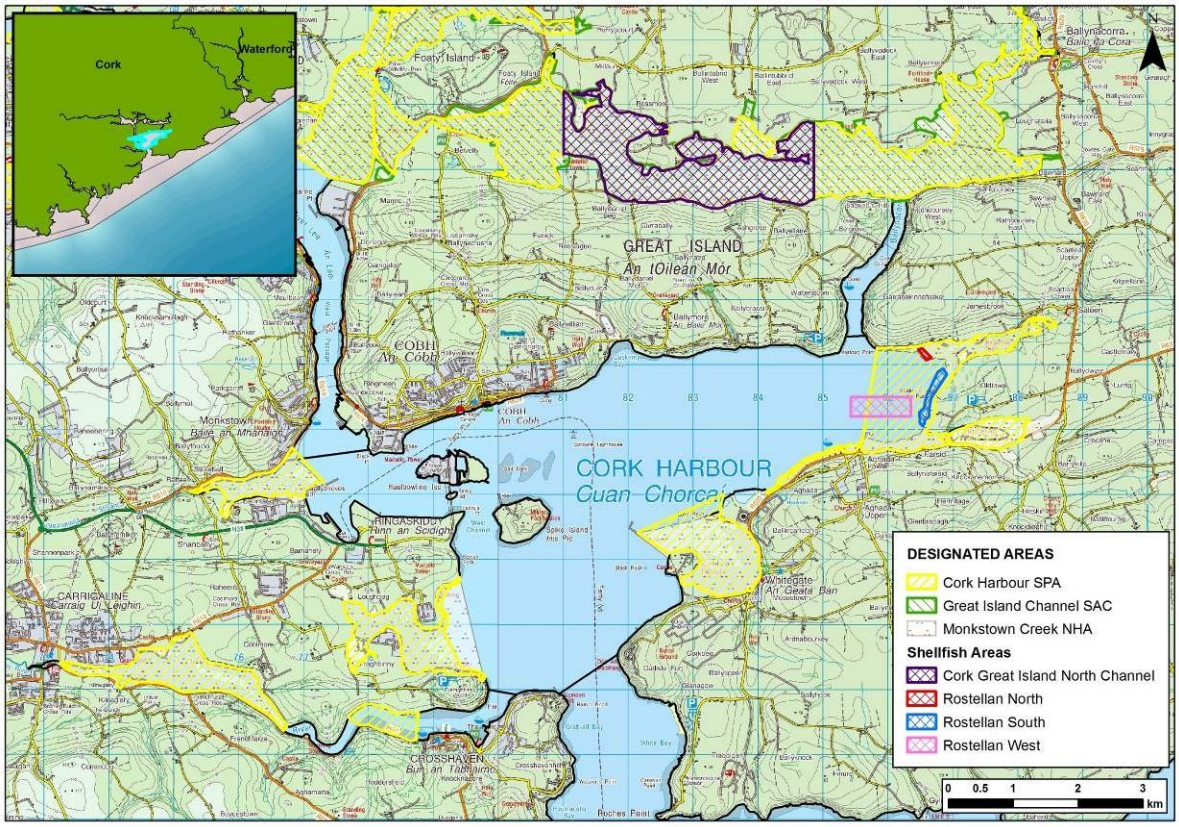


Figure 14-2 Map showing designated areas in proximity to Cork Harbour

[14.2.2] Assessment of Impacts

The assessment of the water environment considers the following:

- Water quality
- Flooding; and
- Sewage/Stormwater Infrastructure

The assessment considers the likely significant impacts of the proposed scheme on surface waterbodies and hydrological features within and in proximity to the proposed scheme during construction and operation.

The likely significant effects have been assessed by classifying the importance of water quality, flood risk and sewage/stormwater infrastructure, and quantifying magnitudes of any likely significant effects on these attributes. For the purpose of this assessment, the following guidance was used specifically in the assessment of impacts:

- NRA (2009) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.
- EPA (2022) Guidelines on the Information to be contained in Environmental Impact Assessment Reports.

The rating of potential environmental impacts on the surface water environment is based on the matrix presented in the table below, which takes account of the quality, significance, duration and type of impact characteristic identified (NRA, 2008).

[14.2.3] Legislation & Guidance

This assessment has been undertaken with due regard to the overarching EIA guidance (described in Chapter 1 'Introduction, Scoping and Consultation'). Other important EU and national legislation pertaining to the hydrological environment include:

- The Water Framework Directive (WFD) - The WFD has been transposed into Irish law by means of the following main Regulations.
    - European Communities (Water Policy) Regulations, 2014 (S.I. No. 350 of 2014)
    - European Communities (Drinking Water) Regulations 2014 (S.I. No. 122 of 2014).
    - European Communities Environmental Objectives (Surface Waters) (amendments) Regulations, 2019 (S.I. No. 77 of 2019).
    - European Communities Environmental Objectives (Groundwater) (Amendments) Regulations, 2016 (S.I. No. 366 of 2016).
    - European Communities (Good Agricultural Practice for Protection of Waters) (Amendments) Regulations, 2020 (S.I. No. 40 of 2020).
    - European Communities (Technical Specifications for the Chemical Analysis and Monitoring of Water Status) Regulations, 2011 (S.I. No. 489 of 2011).
- The European Union Environmental Objectives (Surface Water) (Amendment) Regulations, 2019 - *further detail is provided in the following sections.*
- European Communities (Quality of Salmonid Waters) Regulations, 1988 - *further detail is provided in the following sections.*
- S.I. 722 of 2003, European Communities (Water Policy) Regulations, as amended.
- The EU Floods Directive 2007/60/EC.
- S.I. 122 of 2010 European Communities (Assessment and Management of Flood Risks) Regulations.
- S.I. 81 of 1988, European Community Environmental (Quality of Surface Water Intended for Human Consumption) Regulations 1984 as amended.

Regard was also given to the following guidance documentation in this assessment:

- National Roads Authority (NRA)[1] 'Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Scheme' by the National Roads Authority (2008).
- Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters.
- The Planning System and Flood Risk Management; Guidelines for Planning Authorities (2009).

[14.2.3.1] Criteria for Rating Impact Significance

In order to estimate the magnitude of the impact on the water environment in the vicinity of the scheme the criteria for rating significance set out in the NRA Guidelines (NRA, 2008) has been used for the most part. However additional criteria in relation to hydromorphological impact in the context of the coastal process and alteration to any natural coastline have also been assessed.

This rating is based on a series of criteria which determines both negative and positive impacts associated with the proposed redevelopment. Table 13.1 provides a summary of the criteria for rating the significance of the impact as presented in the NRA Guidelines (NRA, 2008).

Table 14-1 Criteria for Rating Impact Significance (based on the NRA, 2008)

Magnitude Of Impact	Criteria	Typical Examples
Large Adverse	Results in loss of attribute and /or quality and integrity of attribute	Loss or extensive change to a water body or water dependent habitat.
		Increase in predicted peak flood level >100mm.
		Extensive loss of fishery
		Extensive reduction in amenity value
		Potential high risk of pollution to water body from routine run-off
Moderate Adverse	Results in impact on integrity of attribute or loss of part of attribute	Increase in predicted peak flood level >50mm
		Partial loss of fishery
		Potential medium risk of pollution to water body from routine run-off
		Partial reduction in amenity value
	Results in minor impact on integrity of attribute or loss of small part of attribute	Increase in predicted peak flood level >10mm

1 Transport Infrastructure Ireland (TII)

Small Adverse		Minor loss of fishery Potential low risk of pollution to water body from routine run-off Slight reduction in amenity value
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity	Negligible change in predicted peak flood level Negligible loss of amenity value Negligible loss of fishery

14.2.3.1.1 Rating of Significance of Environmental Impacts

Based on the importance of the receiving water body, which has been assessed to be of extremely high importance, and the impact significance an assessment of the potential environmental impact of the proposed redevelopment has been made based on the matrix presented in Table 1 of Chapter 1.

[14.2.4] Data Sources

Information from a number of sources was collated in preparation of this section and are outlined below:

- Environmental Protection Agency online mapping, including latest water quality monitoring data.
- Catchments.ie
- The Water Action Plan, 2024 (DHLGH, 2024).
- South-Western River Basin Management Plan: 2009-2015 (SWRBD, 2010).
- Port of Cork Interceptor Sampling and Testing (May and June 2023, and May 2024).
- Water quality information outlined in the EPA's most recent water quality report, "*Water Quality in Ireland 2016-2021"* (EPA, 2021).
- "Ireland's National Water Framework Directive Monitoring Programme 2019-2021" (EPA, 2021).
- Water body status information arising from the WFD monitoring programme and outlined in the "*South-Western River Basin Management Plan: 2009-2015"* (SWRBD, 2010).
- "An assessment of dangerous substances in Water Framework Directive Transitional and Coastal Waters: 2007 – 2009" (Marine Institute, 2011).

[14.2.5] Site Visits/Surveys

Regular compliance water quality sampling is undertaken at Ringaskiddy Port. This is reported annually in the Port's Annual Environmental Report.

[14.3] Baseline Environment

This section presents existing water environment information in the vicinity of Ringaskiddy where the works are proposed.

[14.3.1] Water Quality

[14.3.1.1] WFD Classification

The potential for the proposed Ringaskiddy Port Redevelopment to impact upon water quality is assessed in the context of the EU Water Framework Directive (WFD) (Directive 2000/60/EC).

As well as achieving good ecological and chemical status, a water body must achieve compliance with standards and objectives specified for protected areas, which include areas designated by the Bathing Water Directive; the Urban Wastewater Treatment Directive; the Shellfish Waters Directive; the Habitats Directive and the Birds Directive.

In order to establish the WFD status of water bodies, the EPA engages a WFD-compliant monitoring programme. It builds on previous monitoring programmes and provides a comprehensive assessment of water quality and quantity.

WFD status classifications apply at the water body scale and are based on several samples/surveys targeting the variety of parameters, including biological, physico-chemical, chemical and hydromorphological elements, required to establish WFD status. The current status classifications are based on the results of a complete monitoring cycle, i.e. 2019 to 2021, and have been reported by the EPA (EPA, 2024).

The most recent Water Action Plan 2024 (DHLGH, 2024) show Cork Harbour (IE_SW_060_0000) to be a Heavily Modified waterbody (HMWB), as outlined in Article 4(3) of the WFD. A HWMB is the phrase used to describe natural bodies of water which have been substantially changed in physical character as a result of alterations by human activity for the purposes of a specified use, such as a Harbour. In this context, physical alterations mean changes to the hydromorphology of the water body. In HMWB, the hydromorphological or physical character of the water body cannot be restored sufficiently to support Ecological Status, without impacting on the specified use. As a result, these water bodies are set an alternative environmental objective of 'Good Ecological Potential. However, heavily modified water bodies are still expected to meet the required standards for all the other water quality elements, such as physicochemical conditions, nutrients, specified pollutants and chemicals.

Cork Harbour has been deemed to be under pressure from Urban Run-off and Urban Wastewater Pressures (EPA, 2024) and has been classified as being at 'moderate ecological potential (Figure 14-3**Error! Reference source not found.**). The results in relation to the individual status elements are presented in Table 14-2.

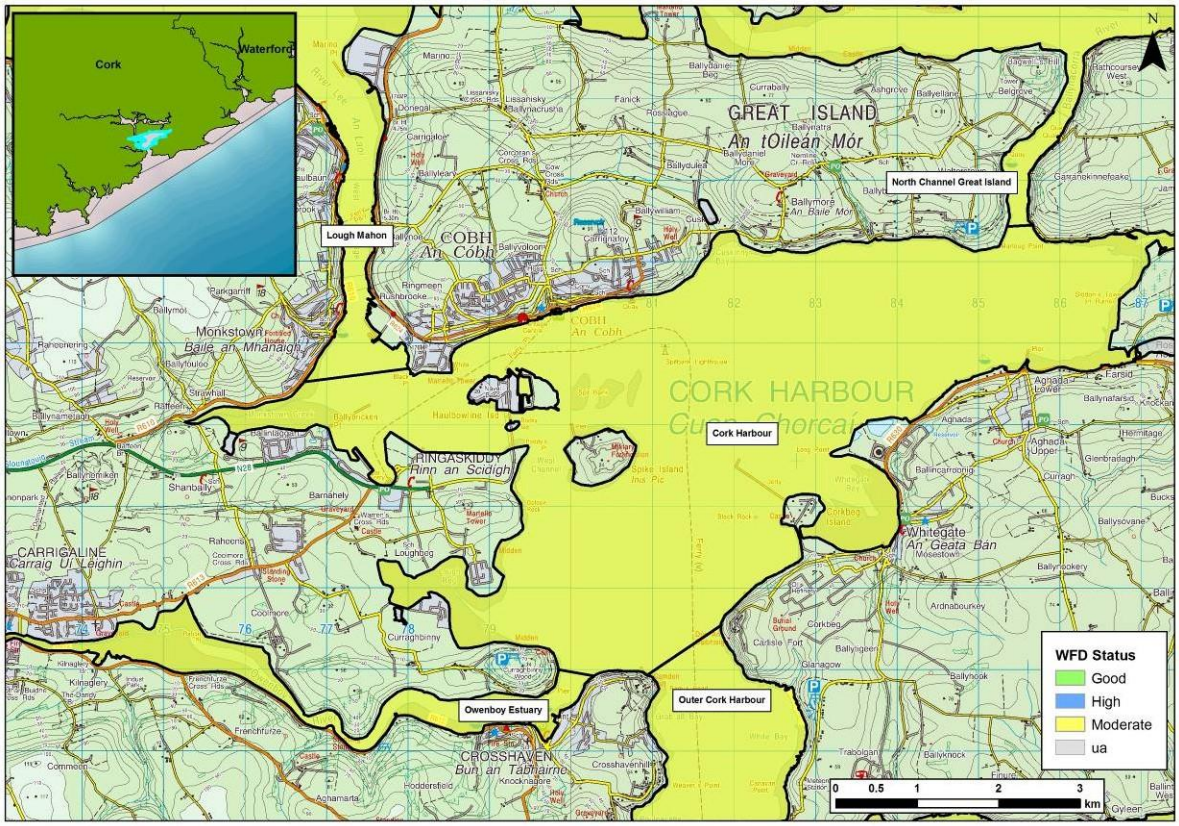


Figure 14-3 WFD Status 2016-2021 - Cork Harbour Study Area

Table 14-2 WFD Status Elements

Status Element	Cork Harbour
Ecological Status or Potential	Moderate
Biological Status or Potential	Good
Phytoplankton Status or Potential	Good
Invertebrate Status or Potential	Good
Hydromorphological Conditions	Moderate
Supporting Chemistry Conditions	Moderate
General Conditions	Moderate
Oxygenation Conditions	Moderate
Dissolved Oxygen (% Sat)	Moderate
Nutrient Conditions	Good
Nitrogen Conditions	Good

Specific Pollutant Conditions	Pass
Chemical Surface Water Status	Failing to achieve good
Confidence level in status	High

The Cork Harbour coastal water body is at moderate status, i.e. less than good ecological status, due to nutrient and organic conditions from the aforementioned pressures. Cork Harbour is 'at risk' of not achieving good status.

An analysis of change over time from 2012-2022 shows that there has been significant increase in winter median phosphate concentrations in Cork Harbour (EPA, 2023). Further, the EPA's report on Water Quality in Ireland (2016-2021) note that Cork Harbour failed the environmental quality standard for dissolved oxygen (EPA, 2021).

14.3.1.1.1 WFD Assessment

Assessment of the development proposals in terms of current status and the WFD objectives was also undertaken, including an assessment of potential impact. This assessment is based on the guidelines published by the Northern Ireland Environment Agency Water Manag*ement Unit: "Carrying out a Water Framework Directive (WFD) Assessment on EIA Development*" (NIEA, 2012) as well as '*Clearing the Waters for All'* Guidance from the UK Environment Agency (Environment Agency, 2024). Similar guidance for WFD assessment has not yet been prepared in Ireland. The mitigation strategies outlined in this chapter have been informed by the WFD assessment and the need to ensure that the development does not compromise the achievement of the Cork Harbour coastal water objectives, as defined in the "*South-Western River Basin Management Plan: 2009-2015*" (SWRBD, 2010).

14.3.1.1.2 Dangerous substances assessment

An assessment of hazardous substances (i.e. priority substances and other relevant pollutants) in Transitional and Coastal Waters (TCW) was prepared by the Marine Institute, on request of the EPA, as part of the monitoring programme required under the WFD to contribute to the status classification (Marine Institute, 2010). There is no more recently available data to show the current state.

From the Marine Institute report published in 2010 Cork Harbour was found to fail chemical status requirements due to Tributyltin (TBT), a priority hazardous substance, and lead compounds, a priority substance under Annex X of the WFD. However, monitoring undertaken in Ringaskiddy East in 2009 showed ecological quality objectives were met for TBT and the samples passed demonstrating a recovery situation. The results for other stations in Cork Harbour however failed which resulted in a failure across the whole water body (Marine Institute 2010).

The results of the baseline surveys of the sediment at the proposed Ringaskiddy Port site, undertaken as part of the original EIS, are presented in EIAR Volume IV – Appendix 7.3. The results show TBT levels in the sediment are compliant with guidance values for sediment quality guidelines from the "*Guidelines for the Assessment of Dredge Material for Disposal in Irish Waters"* (Marine Institute 2006). TBT has not been tested for in the most recent surface water sampling (see Section [14.3.1.2])

The main sources of lead to the environment are primary production processes such as ferrous and non-ferrous metal production and mining. Other relevant sources are transport, glass production and recycling processes, ceramics production, offshore industry, and waste

incineration and disposal. The main pathway of lead to the sea is via air and it can be carried long distances from its source.

TBTs were used from the 1960s onwards in the marine environment as a biocide in antifouling coatings on underwater structures, ships and other craft. Marketing of TBT for use on small vessels was banned in the mid-1980s, as unwanted effects on marine snails and bivalves emerged. Use of TBT as a marine antifouling agent is currently being phased out through the 2001 International Convention on the Control of Harmful Anti-fouling Systems on Ships (AFS Convention), which banned the application of TBT-based antifouling paints for use on ship hulls. The Convention entered into force in 2008 but has previously been implemented through EU Regulation (EC) No 782/2003 on the prohibition of organotin compounds on ships. With the phasing out TBT levels of organotin are likely to decline further in Irish coastal areas (Marine Institute, 2010).

14.3.1.1.3 Protected Areas

A significant proportion of waters connected with the Port of Cork are protected under existing EU legislation requiring special protection due to their sensitivity to pollution or their particular economic, social or environmental importance. The register of protected areas includes:

- Drinking Water Areas;
- Economically Significant Waters;
- Recreational Waters;
- Nutrient Sensitive Areas;
- SPAs; and
- SAC's.

A number of protected areas are located within the Cork Harbour water body. These protected areas have their own monitoring and assessment requirements to determine their condition. They are often assessed for additional pollutants or requirements relevant to their designation. For example, faecal coliform levels are assessed within shellfish and bathing waters. Therefore it is important that the standards required for these protected areas are also met, otherwise a water body which otherwise meets the requirements of the WFD, may have the status reduced to "less than good" as it is not meeting the protected area objectives. The register of protected areas for the Cork Harbour area includes designations for economically significant waters (Shellfish Waters) and Natura 2000 sites. Natura 2000 sites will be assessed in Chapter 16 (Terrestrial Ecology and Ornithology).

Economically Significant Waters

The Shellfish Directive (2006/113/EC) sets physical, chemical and microbiological requirements that designated shellfish waters must either comply with or endeavour to improve. There are three designated shellfish waters within the Cork Harbour coastal water body:

- Rostellan North
- Rostellan South
- Rostellan West

Pollution Reduction Programmes (PRPs) have been produced for each of the designated shellfish areas in order to protect and improve water quality in these shellfish growing areas and in particular, to ensure compliance with the standards and objectives for these waters established by the European Communities (Quality of Shellfish Waters) Regulations 2006.

The most recent water quality monitoring available for the shellfish areas indicates that there is no water quality issues in any of the Rostellan designations and therefore Cork Harbour water body is achieving its protected area objective for Shellfish waters (Department of Housing, Local Government and Heritage, 2012).

[14.3.1.2] Water Quality Interceptor Sampling and Testing

Port of Cork carries out regular interceptor sampling and testing, subcontracted by Enva Ireland. There are 14 sampling points within the Port of Cork Container Terminal. The table below shows the parameters that are tested during these sampling regimes.

Table 14-3 Parameters tested during interceptor sampling

Test	Test	Test
Arsenic (unfiltered)	GRO > C5-C10	BTEX
Benzene	Lead (unfiltered)	Total Suspended Solids
Cadmium (unfiltered)	MTBE	Toluene
Hexavalent Chromium	Nickel (unfiltered)	Total EPH (C6-C40)
EPH (C6-C10) and (C10-C40)	Total Organic Carbon	Zinc (unfiltered)
Ethylbenzene	o-Xylene	

The results of this testing in May 2023 (where 7 of 14 sampling points were suitable for sampling) showed all results to be below the limits of detection of testing with the exception of Suspended Solids which was elevated in a total of 5 sampling points. Moreover, there was elevated levels of unfiltered Zinc at 2 locations, and of TOC and TPH and additional sampling locations.

Testing in June 2023 found only 2 of the sampling points suitable for testing due to low water levels. These two sites showed all parameters below the limits of detection with the exception of unfiltered Zinc, Total Suspended Solids, TOC and TPH which were elevated. One sampling point also found trace levels of Zinc, Lead and Nickel.

Testing in May 2024 found 5 points to be suitable for testing. All results were in accordance with expectations and previous testing with the exception of a slight peak of Total EPH at one sampling point.

[14.3.2] Flood Risk

Flood Risk is a key consideration where projects occur proximal either within or beside a waterbody. The impact of flooding to the proposed redevelopment. Moreover, it will also assess the risk of flooding from the proposed development, i.e., whether the proposed development will impact upon the existing flood risk.

The CFRAM Coastal flood extents were examined and show the modelled extent of land that might be flooded by the sea in a very extreme flood event. Low Probability flood events have

an indicative 1-in-a-1000 chance of occurring or being exceeded in any given year. This is also referred to as an Annual Exceedance Probability (AEP) of 0.1%. This modelling shows no flood risk to the infrastructure at Ringaskiddy port (OPW, 2024).

MIKE 21 flexible mesh coastal model was used to generate a range of extreme tidal water levels. This was achieved through using a tidal and storm surge model, which covers the entire Irish coastline, the English Channel to Dover, the Western English and Welsh coastlines, as well as the Outer and Inner Hebrides and the West of mainland Scotland. The model extends into the Atlantic Ocean off the continental shelf and was developed in house by RPS based on the flexible mesh 2D hydrodynamic software package called DHI MIKE 21 FMHD. Figure 14-4 shows the extent of the numerical model used. The model uses 15 tidal harmonics from a global tidal model on its open boundaries and the wind and pressure field is defined using data from the ERA40 re-analysis model and the most current operational analysis and forecast model operated by the European Centre of Medium Range Weather Forecast.

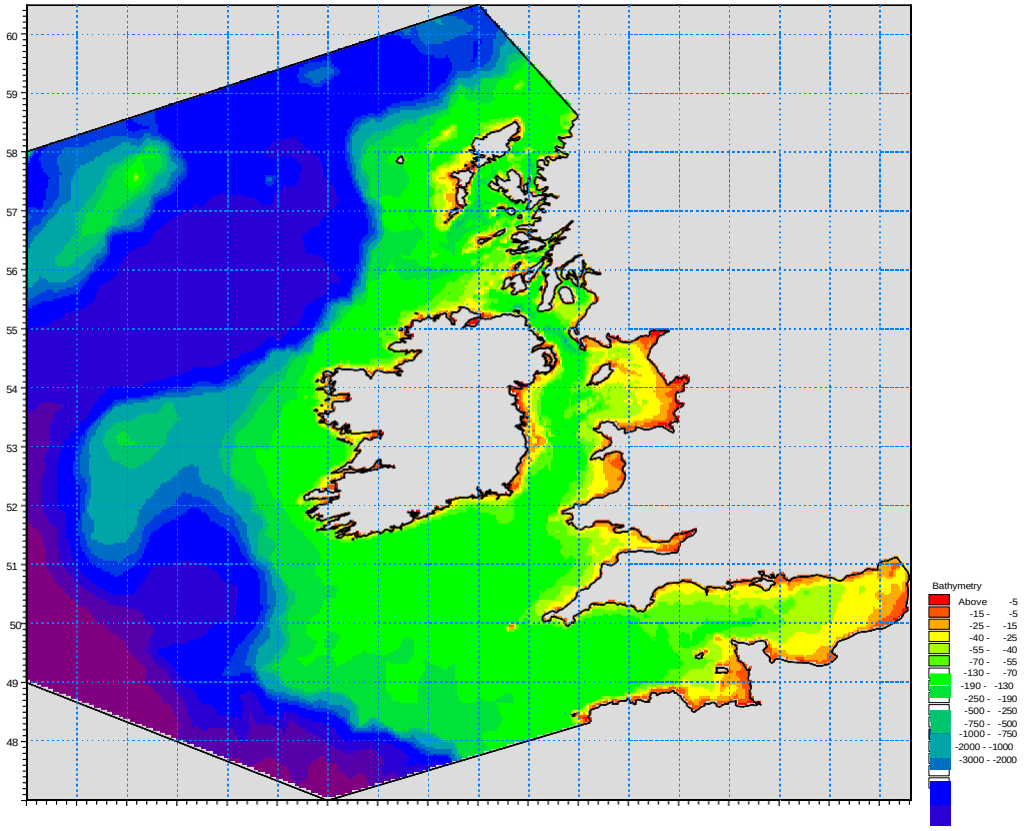


Figure 14-4 Extent of Irish Tidal and Storm Surge Model

The model was calibrated against a wide range of tidal measurements from various locations around Ireland and along the relevant UK coast. The model is utilised for both the Irish Coastal Protection Strategy commissioned by the Department of Communications, Marine and Natural Resources, and the OPW Storm Surge Forecasting Programme.

In the model extreme tidal water levels were estimated for a number of points. The point in the model located closest to Ringaskiddy Basin is C_2, and the location of this is shown in Figure 14-5. Table 14-4 shows the estimated extreme tidal water levels for a range of return period events at Point C_2.

Figure 14-5 Location of Water Level Prediction Points

Table 14-4 Extreme Tidal Water Levels

Annual Exceedance Probability (AEP)	Return Period (years)	Water Level to OD
0.5%	200	2.73
0.1%	1000	2.88

Flood zones as classified under the Planning System and Flood Risk Management Guidelines (2009) are as follows:

- **Flood Zone A:** areas where the probability of flooding from the sea is highest (0.5%). Based on the present day predicted tidal levels, this would equate to a level of 2.73m OD;
- **Flood Zone B:** area where the probability of flooding from the sea is moderate (between 0.1% and 0.5%), and this would equate to levels between 2.73 and 2.88m OD;
- **Flood Zone C:** areas where the probability of flooding from the sea is low (less than 0.1%), and this would equate to levels above 2.88m OD.

Topographical survey data of the area was used in order to map the extent of tidal flooding in the vicinity of the site. Figure 13.7 (EIAR Volume III) shows the extent of these flood zones. Based on the present day predicted tidal flood levels from Table 14-4 the entire land area of the site, with the exception of a small strip around the quay, is above the 0.1% AEP level and subsequently under the Planning System and Flood Risk Management Guidelines (2009) would be classified as Flood Zone C. This zone is considered to be at low probability of flooding. Given this flood zoning and the fact that the type of proposed development would be considered as water compatible, (as defined by Table 3.1 of the Planning and Flood Risk Management System Guidelines), a Justification Test would not be required and the application site would be considered suitable for all types of development (Table 3.2 of the guidelines).

The proposed redevelopment will not have any impact on the flood risk and is therefore compliant with the Planning System and Flood Risk Management Planning Guidelines (2009).

Flood risk in the context of Climate Change is considered in Chapter 11 (Climate).

[14.3.3] Sewage and Stormwater Infrastructure

The key infrastructure issues in relation to drainage and sewerage of the proposed redevelopment are fundamental to the planning and construction of the site as a whole. These key issues include:

- How the site may be serviced for water supply.
- How the site interacts with sewage infrastructure.
- Management of storm water runoff and discharge.

[14.3.3.1] Water Supply

Ringaskiddy is serviced by the Cork City and Harbour Water Supply Scheme which has a capacity of 30 million gallons of water a day.

The main requirements for water in the proposed redevelopment will be for the following:

- Water supply for the maintenance building and portacabin offices
- Water requirement for ships at CB/MPB and DWB for re-stocking their internal drinking water supplies
- Fire fighting.

[14.3.3.2] Sewage Infrastructure

A new Wastewater Treatment Plant (WwTP) has been constructed consisting of a collection system of new pipelines, pumping stations and a new central WwTP to serve the existing population/industrial centres of Cobh, Carrigaline (including Crosshaven), Passage West/Monkstown (including Glenbrook & Raffeen) and Ringaskiddy (including Shanbally & Coolmore). The discharge point is through a long sea outfall.

[14.3.3.3] Stormwater Infrastructure

As this is an existing working port with an established storm water management system, it is expected that facilitating the required additional drainage should not hinder development.

[14.4] Sensitive Receptors

Sensitive receptors in the case of the water environment include the receiving water environment in Cork Harbour, including the designated shellfish waters.

[14.5] Potential Impacts

The key issues identified with regard to water quality are associated with the physical disturbance in the marine environment and adjacent lands due to construction activities and the required dredging. The potential impact arising from the physical disturbance includes sediment, concrete or fuel/chemicals entering Cork Harbour. During the operational phase the potential for the proposed structures associated with the Ringaskiddy Port Redevelopment to impact on water quality at Cork Harbour when considering additional pressures associated with sewage, storm water drainage and accidental spillages.

Elevated DIN concentration and the unfavourable conservation status for the Cork Harbour SPA are the key issues currently preventing Cork Harbour from reaching 'good ecological potential'; whilst lead and TBT contamination are the reasons for chemical status failures within the Cork Harbour water body. However Ringaskiddy Basin monitoring data (Marine Institute, 2010), in addition to the sampling data obtained for the current assessment, demonstrate that TBT levels at the Ringaskiddy Port are compliant with the ecological quality objectives and therefore does not contribute to the failing chemical status. It will be important that the proposed redevelopment works and operational stage do not further contribute to the pressures causing the water body to fail its objectives under the WFD or introduce additional / cumulative pressures that may deteriorate the condition of the water body. Mitigation measures are presented for implementation in order to ensure that the residual impacts on water quality are minimised and avoided where possible.

The proposed redevelopment does not alter the existing levels of the application site. This means that the proposed redevelopment will not increase the existing flood risk, and therefore the flood zones will remain unchanged.

The predominant source of flooding to the application site emanates from extreme coastal water levels. Ideally, any development should include mitigation measures to ensure the risk from a design tidal level is minimised. For developments in Ringaskiddy Basin, this would equate to a 2100 0.5% AEP event of 3.23m OD.

[14.5.1] The 'do nothing' Scenario

[14.5.1.1] Water Quality

Cork Harbour has been designated as a heavily modified water body under Article 4(3) of the WFD. The reason for the designation is due to the Port Activities and the extensive port development. The designation means that the objective for this water body is 'good ecological potential' in recognition of the fact that it is significantly altered due to physical modifications. This objective allows the important function of this water body to be retained, while ensuring that the ecological features are protected or improved as far as possible. The water body is classified as at 'moderate hydromorphological status' (EPA, 2022). This indicates that the existing, ongoing physical modifications made to facilitate the port development (e.g. maintenance dredging, quay development) will not, in isolation, prevent the water body from achieving good ecological potential. In order for a water body to achieve good ecological potential the hydromorphological status must also be good.

Cork Harbour is currently failing to achieve its water quality objective of 'good ecological potential' due to dissolved inorganic nitrogen levels, chemical pollution and the conservation status of the Cork Harbour SPA. The dissolved inorganic nitrogen levels are a result of significant nutrient input, most likely from upstream sources but also waste water treatment plant discharges as outlined in the RBMP background document "Alternative Objectives: Approach to Extended Deadlines" (NS2 Project, 2010). The existing port activities are not identified in this report as a source of DIN pressures. The River Basin Management Plan has extended the timeline for the achievement of good ecological potential to allow natural recovery times from DIN once measures have been implemented in the upstream catchment. National Regulations to implement the EU Directives on urban waste water treatment and nitrates from agriculture sources are among the most important measures in place to combat eutrophication. As the Port activities do not represent a source of the nutrient levels there is no requirement for the existing Port operations to address the nutrient pressures in Cork Harbour.

The chemical pollution failure in Cork Harbour is due to lead pollution and TBT levels (Marine Institute, 2010). The main source of lead is from aerial deposition and existing port activities are unlikely to be a source of this pollution. TBT levels in Ringaskiddy Basin are within acceptable limit values and are recovering as reported by Marine Institute (Marine Institute, 2010) and confirmed in the baseline surveys undertaken previously as part of the 2014 EIS. Monitoring stations within the Cork Harbour water body have identified that the cause of the chemical status failure is not within the Ringaskiddy Basin (Marine Institute, 2010). Given the recovering status of the levels of TBT the existing Port activities in Ringaskiddy Basin are not a cause for the chemical status failures.

The existing port facilities in Ringaskiddy East will not have any significant impact on the achievement of this objective of the achievement of 'good ecological potential' and 'good chemical status', as the activities are not a source of the pressures causing a failure of the environmental quality objectives.

[14.5.2] Construction Phase

[14.5.2.1] Water Quality

14.5.2.1.1 Suspended Sediment

The construction works associated with the proposed redevelopment works, to include: new quay walls; and all the associated road improvement works; involve temporary working areas and access to the intertidal area by heavy plant and machinery. Impact piling, infilling and physical disturbance to an area within the intertidal area will result in a temporary increase in suspended sediment levels and the potential to damage the marine environment with reference to water quality impacts.

The works involved in the construction of the new CCT2 and the extension to the existing DWB will also require dredging works to varying levels in order to facilitate navigational access to the new facilities; which will result in a temporary increase in levels of suspended sediment. Whilst rock material recovered from the proposed dredging works at Ringaskiddy East CCT2 will be re-used as much as possible for the construction works, it is envisaged that there will be the need for imported fill material to be sourced locally to complete the infilling within the port redevelopment. Importation of fill material containing fine sediment has the potential to result in an increase in the suspended solids in the immediate vicinity of the works.

The impact of ongoing maintenance dredging activities associated with the existing Port is one of the reasons for the designation of Cork Harbour coastal water body as a 'heavily modified

water body'. Mitigation measures recommended in Appendix B of the HMWB overall summary report (EPA Catchments Unit, 2008) included the use of suction dredging measures where feasible.

The sediment sampling programme and analysis established that the baseline sediment quality within the Ringaskiddy Basin is largely in compliance with the lower-level guideline concentrations for all parameters with the exception of nickel which has been attributed to natural background concentrations. The dredging activities will not therefore result in the release of contaminated sediments into the water column.

Given the presence of designated Shellfish Areas in Cork Harbour and the guideline standards required for suspended solids in shellfish waters, it is evaluated that elevated suspended solids would have the potential for significant impacts. Chapter 13 of this EIAR has fully considered the mitigation measures proposed for the dredging (i.e. the use of a trailing hopper suction dredger where possible on the western dredge site and no barge overspill permitted). This has demonstrated that the dispersion of sediment in the vicinity of the works will not affect the shellfish designations in Cork Harbour, with concentrations in the vicinity of the shellfish areas at acceptable levels above background concentrations. Water quality monitoring will be undertaken in real time to ensure the concentrations of suspended sediment in the shellfish areas do not cause the suspended solid content of the waters to exceed the content in unaffected waters by more than 30% as required by schedules of the Quality of Shellfish Waters Regulations, 2006 (S.I. No. 268 of 2006).

The impact of suspended sediment on coastal processes, including sediment plumes and deposition can be found in Chapter 13 of this EIAR. The impact of suspended sediment on marine ecology, including on benthos or fisheries, is discussed in Chapter 15 of this EIAR.

14.5.2.1.2 Oil and Chemicals

The proposed construction works will involve the use of plant and machinery, as well as the associated temporary storage of construction materials, oils, fuels and chemicals in close proximity to Cork Harbour water body. During the construction phase there is the potential for accidental spillage or release of construction materials (e.g. diesel, oil, chemicals) directly into Cork Harbour. It is also possible that residual contaminants post-construction may be mobilised by surface run-off and washed into the harbour.

Given the scale of the proposal the magnitude of the impact is considered to be moderate adverse however the Cork Harbour coastal water body is considered to be of extremely high importance and based on the rating of the environmental impact presented in Table 1 of Chapter 1 the impact is assessed as potentially significant to profound in the absence of mitigation. However with the mitigation measures proposed in section [14.6] the risk of accidental spillage of oil and chemicals will be acceptable and the potential impact is considered to be imperceptible.

14.5.2.1.3 Cement and Concrete

For the construction of the new quay wall, a Combi-wall system is proposed which comprises tubular steel piles installed at intervals with traditional steel sheet piles filling the space in-between. The tubular piles will be drilled and driven or grouted into the bedrock. The sheet piles will be installed by driving with the connection to the tubular piles being affected by providing a clutch welded to the side of the pile. A reinforced concrete capping beam will also be required for the berthing face of the quay wall structures.

It is possible that concrete elements above mean low water spring tides will be cast *in situ,* in which case supporting formwork will be required. This temporary support may be trestles on

land or a temporary steel frame from the piles but its duration at any one location will be approximately 7-10 days before being removed and repositioned for the next pour.

It is envisaged that the concrete deck elements of the container terminal area will be installed as precast reinforced concrete slabs with *in-situ* stitching pours to tie them together at each pile head. Bituminous surfacing or block paving may also be used for trafficked areas, with a series of piled concrete runway beams installed along the edges of each container stack. Fresh concrete and cement is highly alkaline and therefore will affect water quality if washed into Cork Harbour. The extent of the impact will remain localised given the sheltered nature of the Ringaskiddy Basin where the residual current is circulatory in nature (as noted in Chapter 13 Coastal Processes of this EIAR).

The magnitude of the potential impacts arising from concrete / cement entering the aquatic environment are considered to be moderate adverse with regard to water quality. Based on the matrix of environmental impact as present in Table 1 of Chapter 1 the impact is considered to be potentially significant to profound in the absence of mitigation. However, with the mitigation measures proposed in section [14.6] in relation to the use of chemical admixtures and pre-cast concrete units for underwater elements of the construction the impact is considered to be moderate adverse over the short term.

14.5.2.1.4 Road Improvements

A programme of upgrade works to the local access routes for the terminal is proposed to improve traffic flow and, as a result, increase safety. An alternative access point will be incorporated to Ringaskiddy East, along with improvements of existing external access routes and internal road networks to also facilitate future access to the M28.

The extent of road improvement works is primarily focussed on the completion of the connection to M28. As a result, the magnitude of the impact can be considered imperceptible.

[14.5.2.2] Flood Risk

No impacts are expected to the flood risk during the construction phase.

[14.5.2.3] Sewage and Stormwater Infrastructure

No impacts are expected to the sewage and stormwater infrastructure during the construction phase.

[14.5.3] Operation Phase

[14.5.3.1] Road Drainage

Road drainage will be required from the sections of new road and upgrade works; it is proposed to discharge this to the harbour. The discharge has the potential to carry contaminants derived from either wear and tear of vehicles' mechanical parts, or from combustion of fuel or oil leaks. Generally, the concentration of contaminants in surface water run-off from a roads scheme increases with traffic density (NRA, 2008). The road design will include for the use of highway grade petrol/oil interceptors prior to any discharge to the harbour waters. This represents an improvement over the existing situation and therefore represents a positive impact in terms of water quality.

The N28 wider improvement scheme is not included as part of this application but the potential impacts from road construction and operational drainage will be similar to the impacts outlined in this EIAR and mitigation measures will be required to address road drainage, particularly where outfalls are proposed to Cork Harbour, but also the road construction and the potential for elevated suspended solids, oils and chemicals and concrete run-off generated from construction areas.

The extent of road improvement works is relatively minor and is primarily focussed on the completion of the connection to the M28.. The improved road drainage and treatment prior to discharge to Cork Harbour represents a positive impact from the proposed redevelopment.

[14.5.3.2] Maintenance

Upon completion of the construction of the new quay walls and associated revetments, little will be required in terms of maintenance, and so any impact from such maintenance works can be considered imperceptible.

Although maintenance dredging will continue to be required, the coastal process modelling demonstrates that maintenance dredging within Ringaskiddy would remain at the current scale and frequency and therefore the proposed redevelopment will not impact on the existing dredging regime. The Natura Impact Statement prepared for the latest maintenance dredging application has concluded that the current maintenance dredging regime will not have a significant impact on water quality, once mitigation measures are employed (RPS, 2021).

The impact associated with the maintenance during the operational phase is therefore considered to be imperceptible.

[14.5.3.3] Oil and Chemicals

Pollution from oils, diesels or chemicals is a potential impact during the operation of the CCT2 and DWB. This may arise from the vehicles operating in the terminal vicinity as well as directly from the ships. If vessels are being re-fuelled on site, any fuel spillages would potentially have adverse impacts on water quality in the area depending on the volumes released. Even small leaks and spills may have localised affects near the berths. Storage of chemicals or fuels and oils on-site for activities such as re-fuelling also has the potential to result in leaks or spillages which may enter directly into Cork Harbour.

The relocation of some of the Port activities to Ringaskiddy has the potential to increase the risk of pollution from oil and chemicals at this location within Cork Harbour. However in the context of the entire water body the improved handling facilities that will result from the proposed redevelopment to aid and improve port operations and the fact that a busy port is already in operation, the impact is considered to be negligible above the existing port activities that are undertaken. As a busy port there are environmental management procedures in place and the Port of Cork has in place an Oil Spill Contingency Plan, as outlined in section [14.6] which will ensure that the proposed redevelopment will not result in a significant impact to the Cork Harbour coastal water body from oil and chemicals and the rating of environmental impact is assessed as imperceptible.

[14.5.3.4] Surface Water and Foul Water Drainage

Surface water drainage could represent a potential impact on the water quality of Cork Harbour costal water body. Impacts are examined in section [14.5.3.6], 'Sewage and Stormwater Infrastructure'. Mitigation proposed is detailed in [14.6].

[14.5.3.5] WFD Assessment

A WFD Assessment has been carried out for the Cork Harbour coastal water body using guidelines which requires a development to comply with the four main objectives of the WFD, i.e.:

- To prevent deterioration in the ecological status/potential of the water body;
- To prevent the introduction of impediments to the attainment of good WFD status/potential for the water body:
- To ensure that the attainment of the WFD objectives for the water body are not compromised.
- To ensure the achievement of the WFD objectives in other water bodies within the same catchment are not permanently excluded or compromised.

In addition to the water quality impacts identified above the elements of the proposed port redevelopment that have the potential to impact on the achievement of the WFD objectives are summarised below.

14.5.3.5.1 Habitat Loss

One of the contributing elements to the WFD status classification of a water body is the protected area status supported by that water body. Where the conservation status of the habitats and species for which the protected area has been designated are considered to be unfavourable the ecological status/potential must be assessed as less than good on the basis that it is failing to achieve the protected area objectives. On this basis the habitat loss assessment has been included in the consideration of the status of Cork Harbour.

There will be a small area of habitat loss from the development via reclamation works associated with the new quay structures at Ringaskiddy East. There will be 0.5ha reclaimed lands behind the new 314m quay wall structure at the CB/MPB and 0.8ha reclaimed lands from the works at the 182m extension to the existing DWB.

The reclamation will not have a significant impact on any qualifying interests of nearby designations, and, as concluded in Chapter 15 of this EIAR, whilst the habitat loss is considered locally significant the impact is considered negligible given the extensive nature of the habitat in the immediate vicinity and throughout Cork Harbour. This coupled with the fact that the areas proposed for reclamation are already immediately adjacent to modified or reclaimed coastline mean that the impact in terms of habitat loss are considered imperceptible across the wider Cork Harbour water body.

14.5.3.5.2 Invasive Species

Invasive non-native plant and animal species are one of the greatest threats to biodiversity in Ireland, with the Leathery sea squirt (*Styela clava*) for example being abundant in Cork Harbour. Invasive alien species negatively impact biodiversity through competition, herbivory, predation, habitat alteration and introduction of parasites or pathogens and poses a risk to the genetic integrity of native species. Terrestrial and aquatic habitats can be negatively affected,

resulting in severe damage to conservation and economic interests, such as fisheries (Commercial and Recreational) and various other recreational activities.

Key vectors in assisting the distribution of such species include transport of dredged material, fouling on vessel hulls, and the release of bilge and ballast water from port regions.

Given that the potential impact would be largely dependent on the particular species introduced it is difficult to assess impact significance and importance on this issue. However, given the potential for invasive species to out-compete native species and completely alter localised ecosystems, the magnitude of the impact should be regarded as at least moderate adverse with the potential to result in significant to profound environmental impacts in the absence of mitigation. However, as the Port of Cork have strict controls of discharges and waste from vessels, in accordance with Ballast Water Management (BWM) Convention, with ballast water exchange only occurring mid ocean, the impact is considered to be negligible.

14.5.3.5.3 Achievement of WFD Objectives

The impacts outlined above and the mitigation measures proposed under the next section have informed this assessment and the relevant schedules from the guidelines are included in EIAR Volume IV Appendix 7.1. The conclusion of this assessment is that the proposed development will comply with the four WFD objectives; provided the mitigation measures outlined in the EIAR are implemented in full.

[14.5.3.6] Sewage and Stormwater Infrastructure

14.5.3.6.1 Water Supply

The proposed redevelopment will not result in a substantial increase in water demand, rather a requirement for a similar volume of water in a different location. It is predicted that the existing water supply to Ringaskiddy will be capable of servicing the redevelopment without causing any disruption to the village's water supply.

14.5.3.6.2 Sewage Infrastructure

Storm water runoff from the site will be collected in a dedicated storm water drainage system. The storm water drainage system will collect rainwater incident upon the site for discharge to Cork Harbour waters via a series of oil interceptors.

As the storm water systems will not be connected to the existing local public network, there will be no impact on the local wastewater infrastructure from the storm water drainage. The impact on water quality of the receiving waters is considered to be negligible given the discharge via oil interceptors.

Foul water from the proposed redevelopment has been connected to the updated sewage infrastructure of Lower Cork Harbour WwTP. Adequate capacity will be available to facilitate the construction of the scheme to accommodate the small amount of foul sewage generated. The impact on the sewage infrastructure and receiving water quality will be imperceptible.

14.5.3.6.3 Stormwater Infrastructure

Storm water runoff from the site will be collected in a dedicated storm water drainage system. The storm water drainage system will collect rainwater incident upon the site for discharge to Cork Harbour waters via a series of oil interceptors.

As the storm water systems will not be connected to the existing local public network, there will be no impact on the local wastewater infrastructure from the storm water drainage. The impact on water quality of the receiving waters is considered to be negligible given the discharge via oil interceptors.

[14.6] Mitigation Measures

Mitigation has already been undertaken during the design phase of the scheme to minimise the potential impact of the project on the water environment. Design of the new quay wall structures, the existing DWB extension and the construction of the new CCT2 have been undertaken to result in least possible loss of habitat.

The deck levels for the redevelopment have been designed to 6m CD, which is equivalent to 3.43m OD, and is therefore in excess of the 2100 0.5% AEP level of 3.23m OD. Mitigation measures have therefore been incorporated into the design of the proposed redevelopment.

[14.6.1] Construction Phase

[14.6.1.1] General

The following general water quality control measures shall be implemented during construction:

W_01 Water quality monitoring will be carried out by the main contractor- continuous in-situ monitoring will be carried out in advance of the works to establish a water quality baseline and during the dredging activities to ensure effective response to any incidents that may impact on water quality at sensitive sites. Water quality trigger levels and corresponding response or remedial actions will be determined after the establishment of a water quality baseline. The location of water quality monitoring stations and the monitoring programme will be agreed with the relevant agencies and based on the results of the coastal process modelling with regard to predicted dispersal of currents and location of sensitive receptors and protected areas;

W_02 A protocol for regular communication between the appointer contractor, the engineer's representatives, statutory agencies, such as NPWS and Cork County Council, and other third parties shall be established;

W_03 Management and auditing procedures, including tool-box talks to personnel, shall be put in place to ensure that any works which have the potential to impact on the aquatic environment are being carried out in accordance with required permits, licences, certificates and planning permissions.

W_04 Existing and proposed surface water drainage and discharge points shall be mapped on a site plan which should also include the location of existing and proposed measures such as monitoring points, sediment traps, settlement lagoon and oil interceptors.

W_05 *PPG 6 Working at demolition & construction sites* (Environment Agency, 2012) shall be adhered to particularly in relation to safe and secure on site storage and minimising storage time, wheel washing, placing of concrete and dealing with silty water.

[14.6.1.2] Sediment Control

[14.6.1.3] Concrete

W_06 The use of concrete in close proximity to water bodies requires a great deal of care. Fresh concrete and cement are very alkaline and corrosive and can cause serious pollution in water bodies. It is essential to ensure that the use of wet concrete and cement in or close to any water body is carefully controlled so as to minimise the risk of any material entering the water, particularly from shuttered structures or the washing of equipment.

W_07 Concrete use and production shall adhere to control measures outlined in *PPG 6 Working at demolition & construction sites* (Environment Agency, 2012) particularly if on-site concrete production is proposed and careful initial siting of concrete mixing facilities is required with no production within a minimum of 50 m from the aquatic zone.

W_08 For the sections of concrete that are under water, pre-cast units should be used for construction; however *in situ* stitching of these will be required. Where the use of pre-cast units is not possible or where *in situ* stitching is required or where concrete is to be placed under water or in tidal conditions, specific fast-setting mix is required to limit segregation and washout of fine material / cement. This will normally be achieved by having either a higher-than-normal fines content, a higher cement content or the use of chemical admixtures.

[14.6.1.4] Oils and Chemicals

The use of oils and chemicals on-site requires significant care and attention. It is important to ensure that the following procedures are followed to reduce the potential risk from oils and chemicals.

W_09 Fuel, oil and chemical storage must be sited on an impervious base within a bund and secured. The base and bund walls must be impermeable to the material stored and of adequate capacity. PPG 26 "*Safe storage – drums and intermediate bulk containers"* (Environment Agency, 2011a) shall be implemented to ensure safe storage of oils and chemicals.

W_10 The safe operation of refuelling activities shall be in accordance with PPG 7 *"Safe Storage – The safe operation of refuelling facilities"* (Environment Agency, 2011b).

W_11 With regard to potential oil spills during dredging operations, an emergency spill kit and oil spill containment equipment will be held on board by the dredging operator;

W_12 The Port of Cork has in place an Oil Spill Contingency Plan which is adhered to by all staff including those employed to carry out capital dredging on behalf of the Port. This plan is provided to assist the Harbour Master, or in his absence the Deputy Harbour Master of the Port of Cork Company in dealing with an accidental discharge of oil and/or Hazardous Noxious Substances (HNS). Its primary purpose is to set in motion the necessary actions to stop or minimise the discharge and to mitigate its effects. Effective planning ensures that the necessary actions are taken in a structured, logical and timely manner. This plan (Oil Spill/HNS Plan) guides Port of Cork staff (and other related organisations who hold a copy of the plan) through the various actions and decisions which will be required in an incident response.

[14.6.1.5] Contingency Planning

W_13 A contingency plan for the construction works shall be prepared in accordance with *PPG 21 Pollution Incident Response Planning* (Environment Agency, 2009). The Plan should also

detail the procedures to be followed if there is a breach in any licence conditions or a non-compliance.

W_14 It will be important to ensure that the Environmental Manager is notified of all incidents where there has been a breach in agreed environmental management procedures. Suitable training shall be provided to relevant personnel detailed within the Pollution Incident Response Plan to ensure that appropriate and timely actions will be taken.

[14.6.2] Operation Phase

[14.6.2.1] Water Quality

14.6.2.1.1 Oil and Chemicals

The key issues associated with the operation of the port facilities are associated with the risk of leaks or spillage of fuel, either during storage, quayside activities and vessel refuelling. In addition care will be required during maintenance works, in order to ensure that adequate protection is given to Cork Harbour coastal water body. As a result the key mitigation measures proposed include:

W_15 Compliance with the Port of Cork's Oil Spill Contingency Plan as outlined under the construction mitigation section;

W_16 Adequate bunding for any fuel, oils or chemicals stored on-land in accordance with relevant PPGs and following the same guidance outlined for storage and refuelling during the construction phase;

W_17 Regular inspection of the condition of chemical and fuel storage facilities along with routine maintenance to ensure the risk of leaks is minimised;

14.6.2.1.2 Control of discharges and waste from vessels

The following are required as part of the Port of Cork Environmental Management Plan and shall be adhered to with respect to vessels at berth or travelling through the Port of Cork:

W_18 Bilge water shall be treated in accordance with Marpol standards;

W_19 De-ballasting shall be undertaken offshore in accordance with International Maritime Organisation (IMO) guidelines;

W_20 Vessels shall be equipped with oil-water separation systems in accordance with Marpol requirements;

W_21 Spills on deck shall be contained and controlled using absorbing materials;

W_22 Vessels without sewage treatment systems shall have suitable holding tanks and will bring waste onshore for treatment by licensed contractors;

W_23 Chemicals shall be stored appropriately in suitably bunded areas and with material safety data sheets.

[14.6.2.2] Sewage and Storm Water

W_24 Site levels will be designed to guide water away from sensitive areas such as buildings. Storm water runoff from the site will be collected in a dedicated storm water drainage system for discharge to the harbour waters.

W_25 All surface drainage waters, including road drainage, will be presumed to be contaminated and will be routed through highway quality oil interceptors and sediment traps prior to discharge into the sea, therefore, there will be no adverse impact on water quality in the harbour and vessels will be strictly prohibited from discharging waste water into the harbour waters.

[14.7] Residual Effects

Based on the impact assessment the potential impact of the proposed redevelopment on the Cork Harbour coastal water body was considered to range from imperceptible to profound. However with the mitigation outlined in this section fully implemented then the magnitude of the residual impacts affecting water quality are evaluated as negligible and therefore the significance of the impact on the Cork Harbour water body is assessed as imperceptible. In addition, a WFD Assessment has been carried out (EIAR Volume IV – Appendix 7.2) and concluded that the proposed development will not compromise the achievement of the four main objectives of the WFD.

With any development adjacent to the sea there is always a residual flood risk. The required standard of protection can be exceeded, however with the freeboard afforded to the proposed redevelopment above the 0.5% AER levels this will reduce the likelihood of such an occurrence and any residual flood risk can be considered as minor.

If the mitigation outlined in section [14.6.2.2] is fully implemented then the residual impact on sewage and stormwater infrastructure is considered to be negligible

[14.8] Potential Interactions & Cumulative Impacts

Other developments in the Cork Harbour area have been considered in the context of cumulative impacts on Water Quality. A review of committed development through an examination of the Cork County Council Planning Register was undertaken and has established a number of projects that have the potential for cumulative impact on the water environment.

Other industrial development

There are other developments approved for Novartis and Pfizer which are essentially extensions to existing infrastructure at their current facilities. The potential for impact is low and therefore the cumulative impact is considered to be negligible.

Discharge Licences

A review of existing licensed discharges to Cork harbour was undertaken. There are eight Integrated Pollution Prevention Consents near Ringaskiddy, two licensed surface water discharges under the Water Pollution Acts into the harbour. All of these discharges are currently regulated under by the EPA or Cork County Council and have emission limit values specified in their consent license to ensure that there is no significant impact on the receiving water. It is

therefore anticipated that there will be no significant, cumulative adverse impacts on the water environment.

Nutrient Inputs

Upstream nutrient input mainly from diffuse sources but also waste water treatment discharges are the key sources of dissolved inorganic nitrogen (DIN). DIN levels in Cork Harbour are above EQS, preventing the water body from achieving good ecological potential. The proposed port redevelopment will be serviced by the proposed Cork Lower Harbour Main Drainage Scheme or, in the event that the scheme is not completed prior to the Port redevelopment, a dedicated waste water treatment plant prior to discharge to coastal waters. The proposed redevelopment will therefore not have any cumulative adverse impacts on nutrient conditions in the Harbour.

Port of Cork Maintenance Dredging

The coastal process modelling has concluded that the redevelopment of the Port will not change the existing maintenance dredging requirements in Cork Harbour. The habitats directive screening statement prepared for the latest maintenance dredging application has also concluded that the current maintenance dredging regime will not have a significant impact on water quality. Therefore based on the assessment of the capital dredging works proposed for the Port redevelopment and the maintenance dredging assessment no cumulative impacts are predicted.

[14.9] Summary

Description of Potential Impact	Significance Pre-Mitigation	Impact Duration	Suggested Mitigation and Monitoring	Residual Significance
Construction Phase Impacts				
Impact to water quality from suspended sediment	Not Significant	Temporary	Monitoring in advance of works to establish a water quality baseline and during the dredging activities. Erosion and sediment control measures. Suction dredging where feasible.	Imperceptible
Impact to water quality from oil and chemicals	Significant to profound	Long-term	Control measures in line with best practice. Fuel, oil and chemical storage sited on an impervious base within a secure and impermeable bund. Implementation of Oil Spill Contingency Plan.	Imperceptible

Description of Potential Impact	Significance Pre-Mitigation	Impact Duration	Suggested Mitigation and Monitoring	Residual Significance
Impact to water quality from cement and concrete	Significant to profound	Short-term	Control measures in line with best practice. No on-site concrete production within a minimum of 50m from the aquatic zone. Use of pre-cast units where feasible.	Moderate
Operation Phase Impacts				
Impact to water quality from road drainage	Positive	Long-term	Fitting of oil interceptors and sediment traps.	Imperceptible
Impacts to water quality from maintenance dredging	Imperceptible	Occasional Temporary	Monitoring in advance of works to establish a water quality baseline and during the dredging activities. Erosion and sediment control measures. Suction dredging where feasible.	Imperceptible
Impacts to water quality from oil and chemicals	Profound	Long-term	Implementation of Oil Spill Contingency Plan	Significant
Impacts to sewage and stormwater infrastructure	Imperceptible	Permanent	Following best practice in line with Marpol Standards. Control measures to be included in Port of Cork Environmental Management Plan.	Imperceptible
Impacts to WFD Status	Imperceptible	Temporary	Port redevelopment fully complaint with WFS therefore further assessment not required	Imperceptible

[15] Marine Ecology

[15.1] Introduction

AQUAFACT was commissioned to evaluate the potential impacts of the proposed Ringaskiddy developments on marine environmental quality, as well as protected marine species and habitats. An EIAR is defined in the Planning and Development Act 2000, as amended as: 'a report of the effects, if any, which proposed development, if carried out, would have on the environment and shall include the information specified in Annex IV of the Environmental Impact Assessment Directive'

This chapter outlines the likely significant effects of the Ringaskiddy developments on marine ecology and biodiversity, covering flora, fauna, and habitats. It provides an assessment of potential impact mechanisms associated with the Proposed Development, including construction impacts, underwater noise, seabed habitat loss, and discharges.

This Environmental Impact Assessment Report (EIAR) chapter is informed by desk studies and field surveys of marine habitats and species. The 2024 marine surveys provide an update on the information collected for an Environmental Impact Statement (EIS) produced by RPS in 2014, which was carried out prior to the start of construction, which formed part of the biological and environmental assessments. This current chapter follows the Environmental Protection Agency's Guidelines for Environmental Impact Assessment Reports (EPA, 2022).

Validity of Biological Survey information for an EIAR: Biological survey data should be recent and reflect current site conditions. Surveys typically remain valid for up to two years, but timelines may vary based on project specifics or the species studied. Outdated data may require supplementary surveys to ensure accurate and current ecological information. This is vital to meet the requirements of Directive 2014/52/EU, ensuring that decision-makers have reliable data when evaluating the environmental impact of projects.

Ringaskiddy Port is an operational ferry and cargo hub. Its perimeter consists of a number of built structures, with a 480m quay along the western side, CCT1/Multipurpose Berth on the eastern side and 1400m of rock armour along the rest. The inner basin features several mooring dolphins and Roll-on and Roll-off ramps. The port is separated from the tidal flats of Monkstown Creek by the 600m ADM Jetty and a 430m rock armour breakwater (the ADM Training Wall), much of which sits in the intertidal zone. The basin entrance, from the end of the ADM Jetty to the eastern rock armour, spans 320m. Most of the Ringaskiddy Basin consists of subtidal open water, with a soft sediment bottom extending between 7 and 13m in depth.

The main basin is subject to regular ship traffic, and sediments are dredged periodically along berths and access routes to maintain navigable depths. The basin's sheltered nature results in a predominance of subtidal soft sediments, and along the perimeter rock armour, intertidal and shallow subtidal communities are dominated by brown seaweed.

The Port of Cork Company (POCC) has completed major redevelopment at Ringaskiddy under the permitted Strategic Infrastructure Development (PA0035, with modifications). The main elements of these works are operational, but further permission is needed to complete remaining works.

The completed works include the following:

- Ringaskiddy East: 314m multipurpose berth, port area surfacing, link-span demolition, and terminal facilities.
- Road Improvements: Upgrades to Deepwater Terminal entrance and internal link roads.
- Paddy's Point: Public pier, slipway, landscaped area, and boat storage.

This Marine Ecology chapter considers the remaining construction, operation, and maintenance activities near the port.

[15.1.1] Summary of Remaining Proposed Development Works

The remaining redevelopment at Ringaskiddy involves several key construction elements across multiple sites and are summarised below (see redline boundaries Figure 15.1).

Ringaskiddy East (Container and Multi-purpose Berth (CB/MPB)):

- A Container Berth of approximately 200m in length (CCT 2)
- Dredging of the seabed to a level of -13.0 m Chart Datum (CD)
- Installation of link-span comprising a floating pontoon and access bridge
- Installation of container handling cranes
- Lighting and fencing

Ringaskiddy West (Deepwater Berth Extension):

- A new 182m extension to the existing Deepwater Berth (DWB) which will comprise a filled quay structure (of approximately 231m) extending no further seaward than the edge of the existing DWB
- Dredging works to varying levels to facilitate navigational access to the new facilities
- Lighting

Road Improvements:

- Improvements to internal road network at Ringaskiddy East to facilitate future access to the N28
- Lighting and fencing

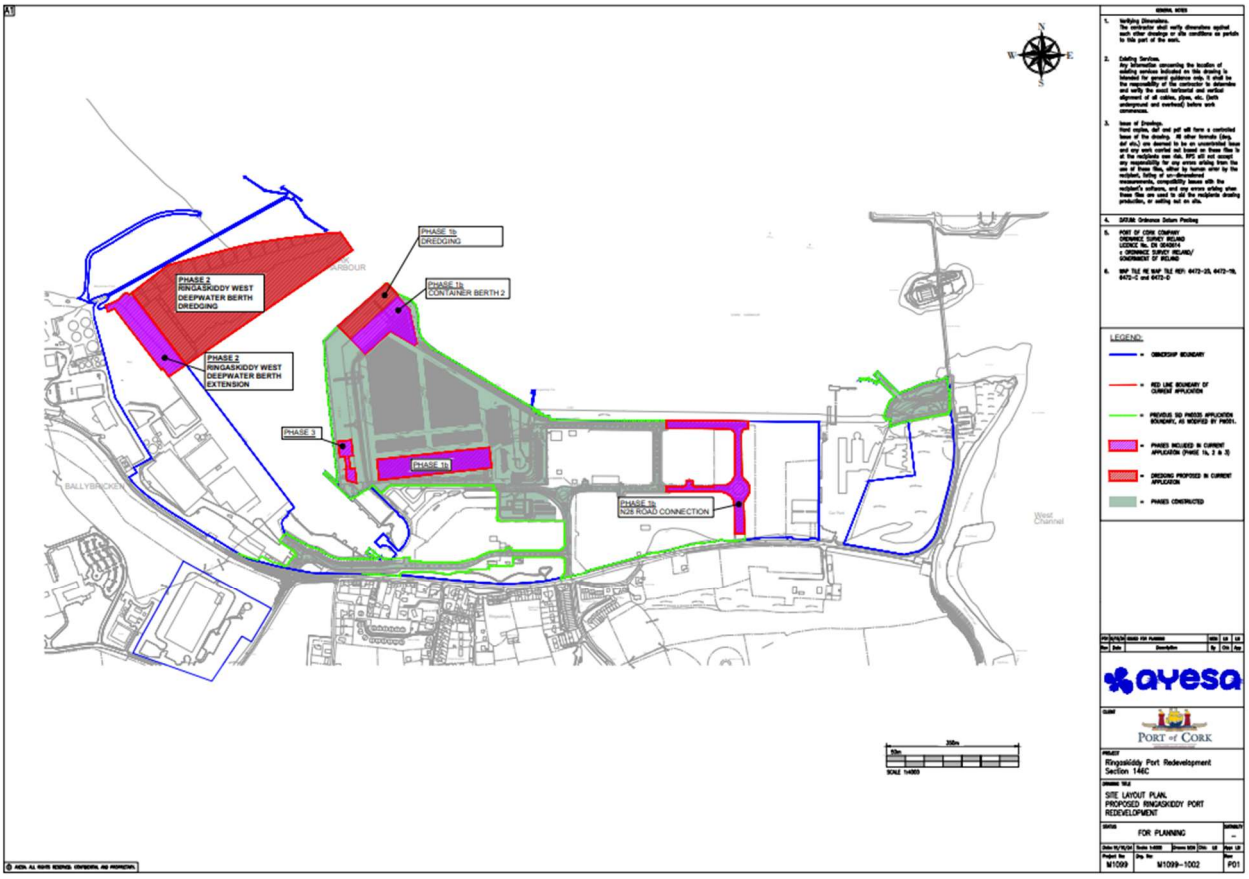


Figure 15.1: Ringaskiddy development site.

Construction phase

Proposed Berth 2: Container Berth 1 has been completed and features a concrete deck on steel piles. Proposed Berth 2 is to extend this structure using a combi-wall of steel piles. Each quay will support SSG cranes with reinforced concrete capping beams and include facilities for RoRo freight.
Reclamation, Surfacing, and Linkspan: There is limited new land reclamation to occur behind the quay walls. The container area will feature concrete surfaces and dedicated crane lanes, with bituminous surfacing for RoRo storage. A floating steel linkspan will provide access to the CCT2 facility, adapting to tides.
Dredging and Rock Removal: Dredging to -13.4m CD will ensure vessel access, requiring removal of approx 423,217 m³ of unsuitable silt and 10,000m³ of rock. This involves drilling, blasting, and mechanical excavation, with reusable material directed toward reclamation.
Services and Security: The terminal is to include storm drainage, high mast lighting, grid power, and fencing per ISPS code. Safety and navigation features, including mooring bollards, and fire hydrants.
Navigation and Ringaskiddy West: An extension to the Deepwater Berth at Ringaskiddy West is also planned.

Mitigation and Operational Management

Compliance with safety regulations and environmental protocols during both construction and operation phases.
Measures will be in place to manage waste and control pollution, minimising the environmental footprint.
Mitigation plans include appropriate drainage systems and safety equipment to ensure environmental standards are met during construction and operations.

[15.1.2] Summary of Operational Phase Activities

1) Lift-On Lift-Off (LOLO):

LOLO operations involve loading/unloading containers with Ship-to-Shore Gantry (SSG) cranes, transferring them to onsite stacks serviced by Rubber Tyred Gantry (RTG) cranes. Containers will be stacked up to five units high, with refrigerated and hazardous containers accommodated at designated areas. Mobile harbour cranes may also assist in early stages.

2) General Cargo Operations:

Break-bulk and project cargoes will be handled using mobile harbour cranes or SSG cranes and stored in open areas without dedicated buildings. Materials will be stacked up to 5.5m high, moved as needed by reach stackers.

3) Roll-On Roll-Off (RORO) Operations:

A RORO ramp will allow direct freight access to vessels. Unaccompanied freight will be moved by port tractors and stored until collected, while accompanied freight will drive directly onto public roads upon disembarkation.

4) Operational Management:

Periodic maintenance dredging in keeping with the Port of Cork's strategy and measures to manage waste and control pollution.

[15.1.3] Decommissioning Phase Activities

Harbours and ports have a long-term operational history and are designed for indefinite use, therefore there is currently no planned decommissioning phase for Ringaskiddy.

[15.2] Assessment Methodology

This chapter describes the likely significant effects of the Ringaskiddy development on marine ecology and biodiversity including flora, fauna, and habitats. It will provide a comprehensive assessment of the potential impact mechanisms associated with the Proposed Development. The impact mechanisms which are reviewed include the potential release of pollutants during

construction, such as the impact of underwater noise due to site works, seabed habitat loss due to construction and dredging.

[15.2.1] Assessment Structure

In line with the revised EIA Directive and EPA guidelines (2022) the structure of this Marine Ecology chapter is as follows:

- Assessment Methodology and Significance Criteria
- Description of baseline conditions at the Site
- Identification and assessment of significant effects to aquatic ecology associated with the Development during the Construction, Operational and Decommissioning phases of the Development
- Identification of cumulative significant effects if and where applicable
- Mitigation measures to avoid or reduce the significant effects identified
- Identification and assessment of residual significant effect of the Development considering mitigation measures.

[15.2.2] Desktop study

A desktop study review was carried out of existing data and records for fish, protected aquatic species and habitats (including Annex II species and aquatic Annex I habitats), and invasive species listed under the Third Schedule of S.I No. 477 of 2011, European Communities (Birds and Natural Habitats) Regulations 2011 (as amended)) on watercourses at or hydrologically connected (*i.e.,* downstream) to the development on the National Biodiversity Data Centre (NBDC) and National Parks and Wildlife Service (NPWS) websites.

The relevant receptors include Habitats; Marine Mammals; and Fish.

[15.2.3] Field Studies

During the summer of 2024 field studies were carried out across intertidal, subtidal, marine mammal, and fisheries components to assess biodiversity and ecosystem health. The purpose of these surveys in 2024 was to update the biological elements of the survey work undertaken in 2012 and assess the impacts of the proposed redevelopment on both the intertidal and subtidal benthic habitats at Ringaskiddy Port. The primary focus was on the Ringaskiddy Basin, and the area just outside the harbour area.

Surveys:

Subtidal Benthic Survey: A subtidal benthic grab survey took place on the 23rd of July 2024 using a 0.1m^2 Day Grab on board the Port of Cork vessel the *Denis Murphy*. Each station provided a faunal sample and a sediment sample for particle size and organic carbon analysis, following NMBAQC guidelines.

Intertidal Survey Campaign: The Phase I walkover survey of the two intertidal transect locations took place at low tide on the 24th of July 2024. Initially it was planned to carry out the Phase II

quantitative transect survey on foot to take core samples from the littoral zone. A dynamic risk assessment was carried out on site, and it was determined that the sediment type was not suitable to traverse across on foot and alternatively a decision was made to achieve the required grab samples from a vessel at high tide on the 12th of September 2024.

Drop-Down Video (DDV) Survey: On the 24th of July 2024, 27 drop-down video (DDV) recordings were carried out in the vicinity of the proposed development at Ringaskiddy. A high-resolution drop-down video system was deployed at 27 locations to characterise the flora and fauna in the area. AQUAFACT adhered to NMBAQC and JNCC guidelines for the best practice acquisition of video stills imaging of benthic substrata and epibenthic species.

Beam Trawl Survey: Beam trawl surveys were undertaken on the 27th of June and the 22nd of July 2024 in the vicinity of Ringaskiddy. The survey utilised a two-metre-wide beam trawl equipped with a tickler chain and an 11 mm, which was towed at a speed of 1.5 to 2.5 knots from the A-frame at the stern of a vessel. Seven trawls were undertaken near the project area to collect data on fish species and other marine organisms.

Marine Mammal Observations**:** Over five days days between the 22nd of July 2024 and the 1st of August 2024, qualified observers carried out marine mammal monitoring to assess activity and potential impacts on these species. The assessment of potential impacts is based on observations conducted during five surveys between July and August 2024 for the proposed development. Monitoring involved five land-based vantage point (VP) watches was used to describe the use of the site by marine mammals, as well as their distribution and relative abundance.

AQUAFACT key personnel:

This chapter has been written by Dr. Ronan Browne (MSc, PhD) and Dr. Eddie McCormack, (B.Sc, PhD). Ronan is Head of Consultancy at AQUAFACT. He has an extensive background in fisheries research and aquaculture, with a PhD on *Homarus gammarus*, an MSc in Shellfish Biology, Fisheries, and Culture from Bangor University. Dr McCormack has over 18 years in environmental consultancy specialising in freshwater and marine ecology.

AQUAFACT is an environmental consultancy based in Galway City. It has been in operation for almost 40 years, specialising in monitoring and managing resources in marine, freshwater and terrestrial environments. In February 2022 AQUAFACT joined the APEM group. APEM was founded more than 30 years ago and is one of Europe's largest specialist environmental consultancy companies. It offers high quality scientific expertise covering the investigation, monitoring and management of water and terrestrial environments with services including aquatic & ecological consultancy, field surveys, ornithological surveys, fisheries science, laboratory services, and aerial surveys. Furthermore, APEM has helped the environment industry to identify responses to issues such as invasive non-native species, recognised the importance of the natural capital approach and river restoration. Additionally, APEM has employed technological solutions including aerial surveys and digital data collection. In Ireland the APEM Group comprises AQUAFACT, Woodrow, APEM Ireland, and Macroworks.

[15.2.4] Study Area

The proposed development site ("the Site") is located at the Port of Cork, Ringaskiddy, Co. Cork. The Site is centred at approximate Irish Transverse Mercator (ITM) coordinates 706992, 735455 and is ca.0.4ha. Chapter 3 Project Description.

Ringaskiddy is 16 km from Cork City on the western side of Cork Harbour, with a green belt separating it from the city's suburbs. The Ringaskiddy Deepwater Berth (DWB) (West) spans a total of 485 meters, with minimum berth drafts of 13.4 meters, allowing it to accommodate fully laden Panamax vessels (up to 60,000 tonnes deadweight).

RoRo services to the Mediterranean, Northern Europe, and West Africa also operate out of Ringaskiddy. These services are supported by a 180-meter-long berth and a 42.1-meter linkspan at the RoRo terminal. Trade vehicles are discharged at both the DWB and the nearby Ringaskiddy Ferry Terminal, which accommodates the Brittany Ferries service to Roscoff.

The newly established Cork Container Terminal (CCT) in Ringaskiddy East can accommodate large Panamax vessels. The terminal is equipped with a 360-meter quay, along which two Ship-to-Shore (STS) gantry cranes have been installed.

[15.2.5] Legislation & Guidance

The core European directive is Directive 2011/92/EU, amended by Directive 2014/52/EU, which governs how EIAs are conducted across the EU, including Ireland. This directive outlines requirements for assessing the environmental impacts of major development projects, covering a wide range of factors.

European and Irish Legislation:

Wildlife Act 1976 (as amended)

European Communities (Birds and Natural Habitats) Regulations 2011 (as amended): Implements the Birds and Habitats Directives, ensuring impact assessments on protected species and habitats are included in Environmental Impact Assessment Reports (EIARs).

Directive 2011/92/EU (EIA Directive) (as amended by Directive 2014/52/EU): Establishes the framework for assessing the environmental effects of public and private projects.

Habitats Directive (92/43/EEC): Requires assessments for projects likely to affect Natura 2000 sites, including Special Areas of Conservation (SACs).

Birds Directive (2009/147/EC): Protects wild bird species and may require EIARs to consider impacts on Special Protection Areas (SPAs).

Planning and Development Act 2000 (as amended): Sets requirements for EIARs related to planning applications and development consent.

Planning and Development Regulations 2001 (as amended): Specifies procedures for conducting EIAs, including screening, scoping, and content requirements.

Environmental Protection Agency Act 1992 (as amended): Establishes the Environmental Protection Agency's role in overseeing environmental matters, including EIARs for projects requiring an IPC licence.

Foreshore Act 1933 (as amended): Applies to marine projects involving works on the foreshore that may require EIARs (Updated to 14 May 2024).

Maritime Area Planning Act 2021: Establishes procedures for marine-based projects, requiring EIARs for developments in Ireland's maritime areas.

International Conventions and Legislation:

Aarhus Convention (1998): Guarantees public rights to access information, participate in decision-making, and access justice in environmental matters, impacting the EIAR process.

Guidance Documents:

European Commission Guidance:

Updated Recommendation and guidance on speeding up permit-granting for renewable energy and related infrastructure projects (2024)

Commission notices on the application of the Environmental Impact Assessment Directive (2021)

Guidance on application of exemptions under the EIA Directive – Articles 1(3), 2(4), and 2(5) (2019)

Guidance on streamlining environmental assessments under Article 2(3) of the EIA Directive (2016)

EIA guidance series: Screening, Scoping, and EIA Report (2017)

Interpretation of project categories of Annex I and II of the EIA Directive (2015)

Streamlining environmental assessment procedures for energy infrastructure Projects of Common Interest (PCIs) (2013)

Guidance on integrating climate change and biodiversity into EIAs (2013)

Managing Natura 2000 sites (Article 6 of the Habitats Directive) (2001, 2002, 2018)

Application of EIA Directive to specific project types, such as landfills and hydrocarbon exploration (2010-2012)

Irish National Guidance:

EPA (2022): Guidelines on Information to be Contained in Environmental Impact Assessment Reports

Heritage Council (2011): Best Practice Guidance for Habitat Survey and Mapping

Marine Natura Impact Statements in Ireland - SAC Working Document (DAHG NPWS, 2012)

Guidance to manage the risk to marine mammals from man-made sound sources in Irish waters (NPWS, 2014)

Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DEHLG, 2009, Revised 2010)

Appropriate Assessment Screening for Development Management (OPR, 2021)

Other Notable Guidance:

CIEEM (2016): Guidelines for Ecological Impact Assessment in the UK and Ireland

IFI (2016): Guidelines on Protection of Fisheries during Construction Works

EU (2017): Guidance on preparing the EIA Report (Directive 2011/92/EU as amended by 2014/52/EU)

[15.3] Baseline Environment

The Port of Cork is classified as a "Core Port" under the Trans-European Transport Network and a Port of National Significance (Tier 1) in Ireland and is tasked with meeting future port capacity demands and driving regional economic growth. The "Port of Cork Masterplan 2050" provides the strategy to shift operations from the city docks to the lower harbour to accommodate increasing vessel sizes and meet global industry needs. The 2050 master plan includes facilitating the green energy sector and ensuring the port remains an efficient link in the global logistics chain. The €89 million Cork Container Terminal at Ringaskiddy was recently opened, addressing growing commercial cargo demands.

Designated sites in Ireland include Special Areas of Conservation (SACs) and Special Protection Areas (SPAs), designated under the Habitats and Birds Directives, respectively. SACs and SPAs are discussed further in the following section.

[15.3.1] European Sites

The assessment of potential impact to conservation sites considers sites that form part of the Natura 2000 network. These sites include Special Areas of Conservation (SACs) designated under the Habitats Directive (92/43/EEC) due to their significant ecological importance for species and habitats protected under Annexes I and II respectively of the Habitats Directive, and Special Protection Areas (SPAs), designated for the protection of populations and habitats of bird species protected under the EU Birds Directive (Council Directive 2009/409/EEC). Respectively the features for which SACs and SPAs are designated are called Qualifying Interests (QIs) and Special Conservation Interests (SCIs). QIs and SCIs are collectively referred to herein as Qualifying Features.

The Cork Harbour SPA (004030) and Great Island Channel SAC (001058) are both located within Cork Harbour, with Great Island Channel SAC largely overlapping Cork Harbour SPA (Figure 15.2), thus sharing similar conservation values. The proposed project is situated between Monkstown Creek, Lough Beg, and Whitegate Bay, which are all designated areas within Cork Harbour SPA (Figure 15.2).

The Cork Harbour SPA (site code: 004030) is a large site encompassing several protected pockets across Cork Harbour. It covers 27 km², of which 91% is marine, and protects 35 species under the Nature Directives. The SPA includes the main intertidal zones of Cork Harbour, including all of the North Channel (which overlaps with Great Island Channel SAC), the Douglas River Estuary, inner Lough Mahon, Monkstown Creek, Lough Beg, the Owenboy River Estuary, Whitegate Bay, Ringabella Creek, and the Rostellan and Poulnabibe inlets. Cork Harbour is a sheltered harbour with extensive intertidal mudflats, rich in macro-invertebrates that serve as an important food source for wintering birds. The salt marshes provide high tide roosts, making it an area of international and national significance for birdlife, supporting over 20,000 wintering waterbirds and 22 nationally important wintering populations of bird species.

Great Island Channel SAC (site code: 001058) protects 20 species under the Nature Directives and four habitat types under the Habitats Directive. It covers an area of 14 km², of which 87% is marine, and stretches from Little Island to Midleton, with Great Island forming its southern boundary. The estuaries of the Owennacurra and Dungourney rivers, which overlap this SAC, are the main sources of freshwater inflow into the North Channel. This part of Cork Harbour is relatively undisturbed compared to other areas and features extensive intertidal mudflats and salt marshes

that provide valuable estuarine habitat. Cork Harbour is recognised as a wetland of international importance, and the Great Island Channel SAC includes three key areas for wintering waterbirds. The predominant land use within this site is aquaculture, specifically oyster farming. Major threats to its conservation value have been identified as roadworks, land infilling, sewage discharges, and potential marina developments.

As a sheltered region of the harbour, the extensive intertidal flats are mostly comprised of soft muds and salt marshes are scattered throughout the site, and over the mud flats form estuarine salt marshes. Cork Harbour is a wetland of international importance and the Great Island Channel SAC contains three of the most important areas for wintering waterbirds in Cork Harbour. The main land use within the site is aquaculture (specifically oyster farming), and the most significant threats to its conservation have been concluded as resulting from road works, infilling, sewage outflows, and possible marina developments.

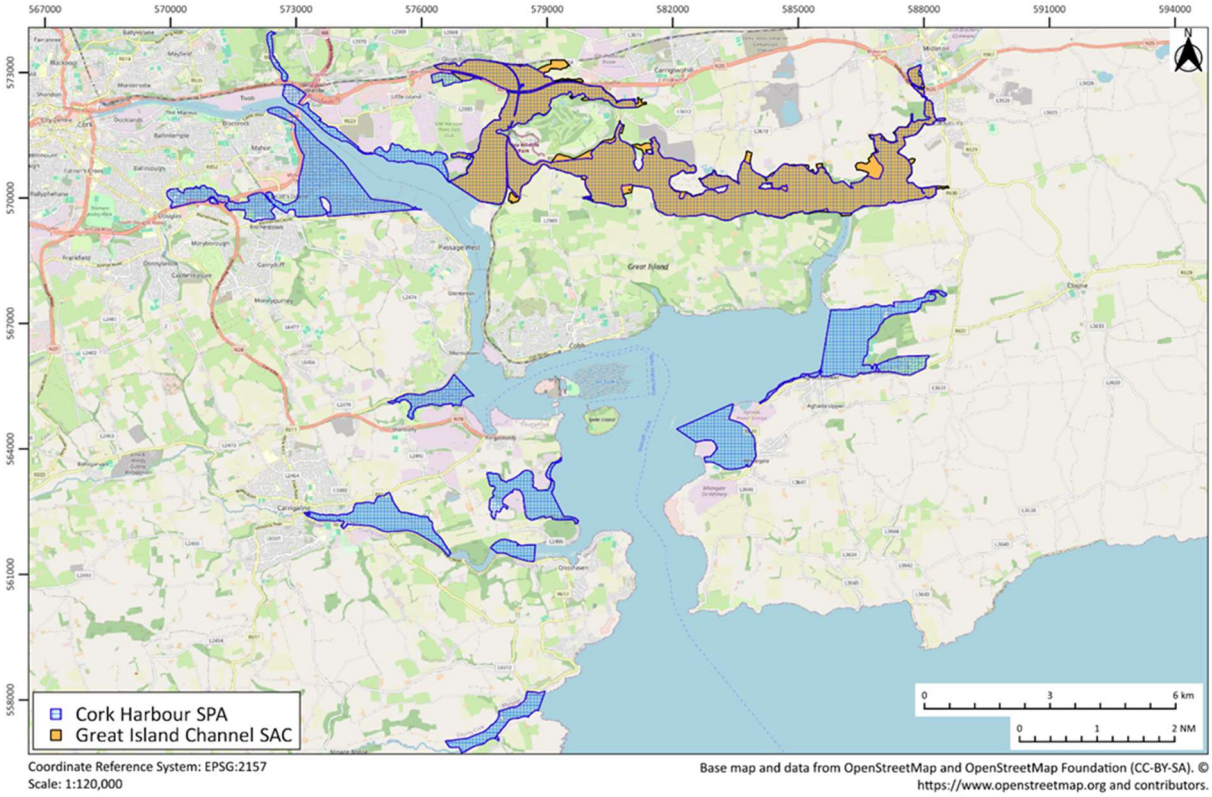


Figure 15.2: SACs and SPAs in the vicinity of Cork Harbour.

[15.3.2] Subtidal and intertidal surveys:

A series of intertidal and subtidal surveys were undertaken in the vicinity of the proposed development in 2024. The full details of these surveys are outlined in a separate accompanying report.

[15.3.2.1] Subtidal survey

The subtidal benthic grab survey took place on the 23rd of July 2024 using a 0.1m^2 Day Grab on board the Port of Cork vessel the *Denis Murphy.* Figure 2.1 shows the locations of the subtidal and intertidal sample stations at Ringaskiddy.

Figure 15.3: Ringaskiddy Subtidal and intertidal sampling locations.

Subtidal Sampling and Analysis

AQUAFACT followed in-house procedures and NMBAQC standards for benthic sampling, using a 0.1m² Day grab sampler at 14 stations. The location of each station was recorded, and care was taken during sample collection to avoid cross-contamination. Biological samples were sieved and washed on a 1mm mesh to retain fauna, which were then preserved. Additional grab samples were collected for sediment analysis, including organic carbon content and granulometry.

At the laboratory faunal samples were sorted into major groups such as Polychaeta, Mollusca, Crustacea, and others, with identification to species level where possible. Sediment samples were analysed for particle size using a combination of wet sieving and dry sieving techniques, with size fractions classified according to standard methods.

Sediment data were analysed to determine organic content and particle size distribution. Faunal data underwent univariate and multivariate statistical analyses using PRIMER software. Various diversity indices were calculated, including Margalef's richness index and Shannon-Wiener diversity index. Multivariate analysis included cluster analysis and ordination techniques like MDS, helping to identify patterns in species distribution and similarities between stations.

Subtidal Survey Benthic Fauna Results

The subtidal benthic infauna survey at 13 subtidal stations in Ringaskiddy recorded 99 taxa and 1,918 individuals across 8 phyla, with 64 taxa identified to species level. Station (St.)12 was not possible to sample due to the presence of large boulders. Four taxa accounted for over 55% of the faunal abundance: the bivalve Mytilidae juvenile (319 individuals, 16.63% abundance) and the polychaetes *Melinna palmata* (292 individuals, 15.22% abundance), *Nephtys* spp (damaged) (229 individuals, 11.94% abundance), and Ampharetidae (damaged) (222 individuals, 11.54% abundance).

Univariate statistical analyses were carried out on the station-by-station faunal data. The same data set used above for the univariate analyses was also used for the multivariate analyses. The full results of which are available in the accompanying Marine Benthic Ecology report.

Four distinct station groupings were identified through SIMPROF analysis (Figure 15.4). A clear divide (79.95% dissimilarity) can be seen between Group a within the inner Ringaskiddy harbour area and those outside (Groups b, c, and d).

Group a, included the stations within the inner harbour basin. This group contained 29 taxa comprising 670 individuals. Of the 29 taxa, 20 were present twice or less. Six taxa accounted for over 93% of the faunal abundance: the molluscs Mytilidae (juvenile) (282 individuals, 42.09% abundance), *Peringia ulvae* (65 individuals, 9.7% abundance), and *Abra nitida* (53 individuals, 7.91% abundance) and the polychaetes *Nephtys* spp. (damaged) (133 individuals, 19.85% abundance), Ampharetidae (damaged) (52 individuals, 7.76% abundance), and *Nephtys hombergii* (38 individuals, 5.67% abundance) These taxa were generally either tolerant or indifferent to organic enrichment and disturbance. Group a stations exhibit elements of the JNCC biotopes 'SS.SMu.IFIMu.CerAnit *Cerastoderma edule* with *Abra nitida* in infralittoral mud' (EUNIS code A5.341) (Tillin & Tyler-Walters, 2016) and 'SS.SSa.IMuSa.SsubNhom *Spisula subtruncata* and *Nephtys hombergii* in shallow muddy sand' (EUNIS code A5.244) (Tillin, 2016).

Group b included Station St.11 and contained 37 taxa comprising 141 individuals. Of the 37 taxa, 23 were present twice or less. Six taxa accounted for almost 57% of the faunal abundance: the polychaetes *Melinna palmata* (35 individuals, 24.82% abundance), *Galathowenia oculata* (10 individuals, 7.09% abundance) *Lumbrineris cingulata* aggregate (6 individuals, 4.26% abundance), the crustaceans *Bodotria scorpioides* (12 individuals, 8.51% abundance) and *Euphilomedes sinister* (10 individuals, 7.09% abundance) and the bivalves Mytilidae (juvenile) (7 individuals, 4.96% abundance. Group b can be classified as belonging to the JNCC biotope 'SS.SMu.ISaMu.MelMagThy *Melinna palmata* with *Magelona* spp. and *Thyasira* spp. in infralittoral sandy mud' (EUNIS code A5.334) (De-Bastos, 2016).

Group c included stations St. 13 and St 14 and contained 60 taxa comprising 668 individuals. Of the 60 taxa, 36 were present twice or less. Nine species accounted for over 74% of the faunal abundance: the polychaetes Ampharetidae (damaged) (157 individuals, 23.5% abundance), *Melinna palmata* (119 individuals, 17.81% abundance), *Nephtys* spp. (damaged) (57 individuals, 8.53% abundance), and *Ampharete lindstroemi* aggregate (25 individuals, 3.74% abundance), the amphipod *Ampelisca tenuicornis* (48 individuals, 7.19% abundance), the bivalves *Abra nitida* (29 individuals, 4.34% abundance) and Mytilidae (juvenile *Mytilus edulis*) (22 individuals, 3.29% abundance), and the gastropods *Tragula fenestrata* (21 individuals, 3.14% abundance) and *Odostomia unidentata* (20 individuals, 2.99% abundance). and d comprised stations outside the harbour, with high abundance of Ampharetidae and *Nephtys* spp., also indicative of varying tolerance to disturbance and enrichment. Group c can be classified as belonging to the JNCC biotope 'SS.SMu.ISaMu.MelMagThy *Melinna palmata* with *Magelona* spp. and *Thyasira* spp. in infralittoral sandy mud' (EUNIS code A5.334) (De-Bastos, 2016).

Group d included stations St. 1, St. 8, and St 10 and contained 59 taxa comprising 439 individuals. Of the 59 taxa, 33 were present twice or less. Seven species accounted for over 61% of the faunal abundance: the polychaetes *Melinna palmata* (137 individuals, 31.21% abundance), *Nephtys* spp. (damaged) (34 individuals, 7.74% abundance), *Notomastus* sp. (32 individuals, 7.29% abundance), and *Phyllodoce mucosa* (12 individuals, 2.73% abundance) the amphipod *Ampelisca* sp. (damaged) (26 individuals, 5.92% abundance), the cumacean *Bodotria scorpioides* (14 individuals, 3.19% abundance), and the gastropod *Peringia ulvae* (14 individuals, 3.19% abundance). Group d can also be classified as belonging to the JNCC biotope

SS.SMu.ISaMu.MelMagThy *Melinna palmata* with *Magelona* spp. and *Thyasira* spp. in infralittoral sandy mud (EUNIS code A5.334).

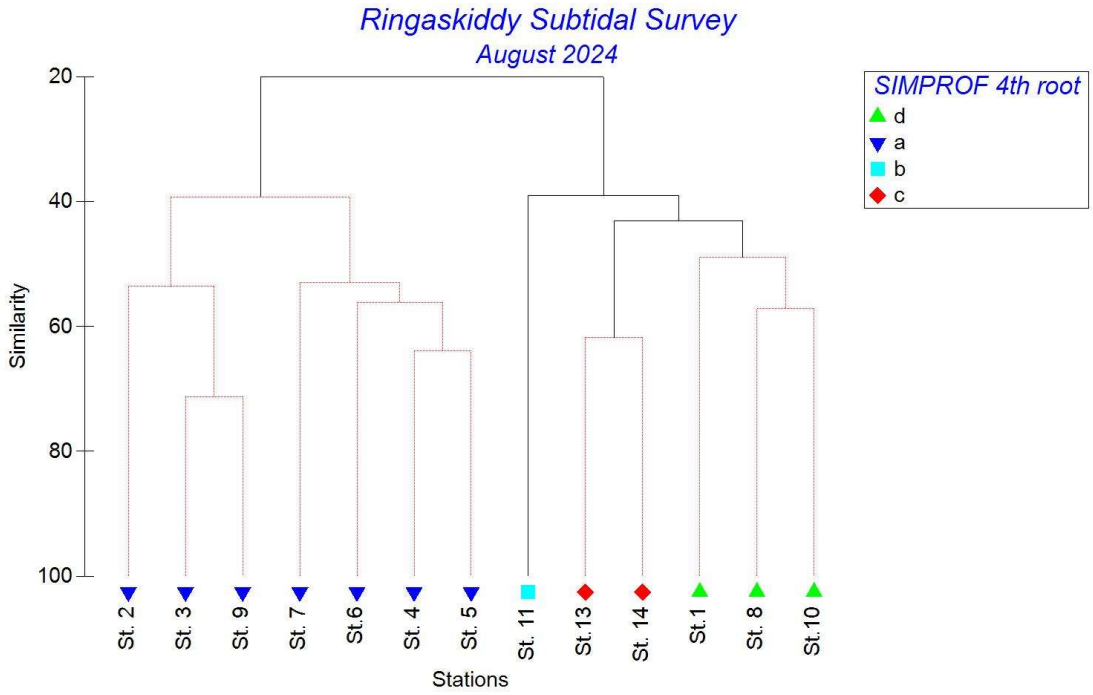


Figure 15.4: Dendrogram produced from Cluster analysis.

Subtidal Survey Sediment Results

The subtidal sediment types ranged from muddy sand to gravelly muddy sand, with the highest levels of medium sand at St.6, fine sand at St.1, and silt-clay at St.13. Organic content varied, with higher values typically associated with finer sediments. The sediment composition is shown in full in the accompanying Marine Benthic Ecology Report.

[15.3.2.2] Intertidal Survey

The preliminary walkover survey of the upper shore areas of Transect 1 (T1) and Transect 2 (T2) on the 24th of July 2024 revealed sloped rock armour boulders leading onto a shore of thick fine mud. Attempts to retrieve core samples by foot along the upper, middle, and lower shores proved a safety risk and an alternative method of sampling from a RIB at highwater was employed. Three stations were samples along each transect (upper, middle and lower shore) using a 0.025m^2 Van Veen grab were collected along each of two intertidal transects (T1 and T2). The locations of these subtidal sampling stations are illustrated in Figure 15.5 and Figure 15.6.

The grab sampling took place on the 12th of September 2024 on board a RIB called *Oisre*. A total of 6 stations were sampled along 2 transects, with 1 faunal sample and 1 sediment sample collected at each station. Footage of the sample area was also captured using a drop-down video at each transect. Additionally, images of the shoreline were captured by the survey team during the first intertidal survey attempt on the 24th of July 2024.

Intertidal Survey Benthic Fauna Results

Transect 1 had previously been surveyed in 2012. This location is situated to the south of the training wall and north of the ADM jetty. The upper shore rock armour along the training wall has a zonation typical of hard substrates in this sheltered muddy mid estuarine location. Sloping stable boulders in the supralittoral has a community of yellow and grey lichens including *Xanthoria parietina, Caloplaca marina*, and *Hydropunctaria maura* (formerly *Verrucaria maura*). This can be classified as the JNCC biotope 'LR.FLR.Lic.YG – Yellow and grey lichens on supralittoral rock' (EUNIS code B3.111) (Tyler-Walters, 2016). This band transitions into a narrow upper rocky shore biotope characterised by *Pelvetia canaliculata* and *Fucus spiralis* ('LR.LLR.F.Fspi – *Fucus spiralis* on sheltered upper eulittoral rock' (EUNIS code A1.312)(Perry, 2015)). This biotope then transitions into a band dominated by *Ascophylum nodosum* and *Vertebrata lanosa* with some *Ulva* spp. ('LR.LLR.F.Asc.FS – *Ascophyllum nodosum* on full salinity mid eulittoral rock' (EUNIS code A1.3141)(Perry & Hill, 2020)).

Beneath the ADM jetty there is an extensive area of mussel bed that was previously recorded in the 2008 and 2014 surveys and remains relatively unchanged since the last surveys. This mussel bed can be classified as 'LS.LBR.LMus.Myt.Mu - *Mytilus edulis* beds on littoral mud' (EUNIS code A2.7213)(Tillin & Mainwaring, 2018).

Figure 15.5: Intertidal Transect 1 station locations.

Transect 2 (Figure 15.6) was not surveyed in 2012 due to access issues. This transect is located along the quay wall to the east of the proposed 160m quay wall extension and to the west of the bridge at Paddy's Point. The location was chosen as a representative intertidal location downstream from the proposed extension and likely to be influenced by the proposed works. Figure 15-8 illustrates the locations of the intertidal faunal grab stations. The upper shore rock armour along the quay wall has a similar as Transect 1. Sloping stable boulders in the supralittoral has a community of yellow and grey lichens including *Xanthoria parietina, Caloplaca marina*, and *Hydropunctaria maura* (formerly *Verrucaria maura*). ('LR.FLR.Lic.YG – Yellow and grey lichens on supralittoral rock' (EUNIS code B3.111). This band transitions into a narrow upper rocky shore

biotope characterised by *Pelvetia canaliculata* and *Fucus spiralis* ('LR.LLR.F.Fspi – *Fucus spiralis* on sheltered upper eulittoral rock' (EUNIS code A1.312)). This biotope then transitions into a band dominated by *Ascophylum nodosum* and *Vertebrata lanosa* with some *Ulva* spp. ('LR.LLR.F.Asc.FS – *Ascophyllum nodosum* on full salinity mid eulittoral rock' (EUNIS code A1.3141)).

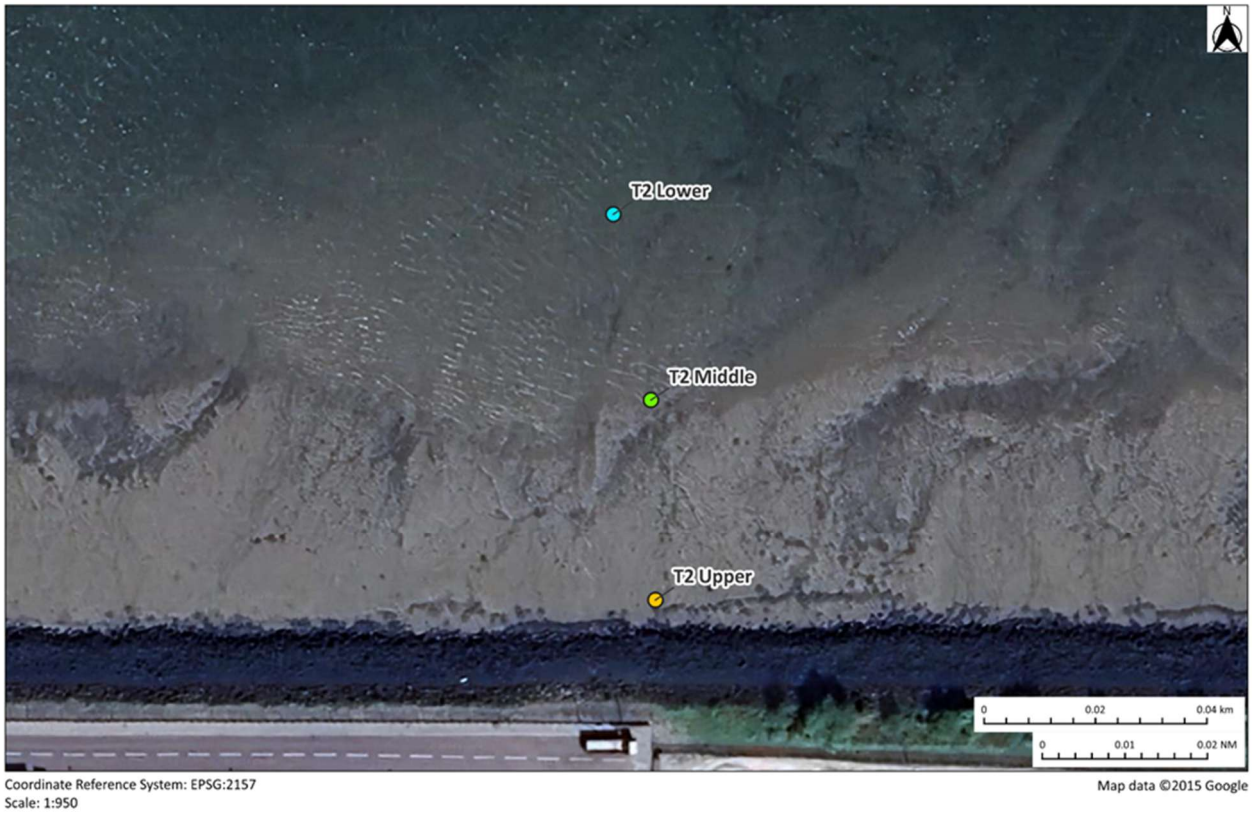


Figure 15.6: Intertidal Transect 2 station locations.

Univariate statistical analyses were carried out on the combined replicates of the station-by-station faunal data The same data set used above for the intertidal univariate analyses was also used for the multivariate analyses. The full results of which are available in the accompanying Marine Benthic Ecology report.

SIMPROF analysis revealed 2 statistically significant groupings between the 6 stations (Figure 15.7) (the samples connected by red lines cannot be significantly differentiated). A clear divide (57.87% dissimilarity) can be seen between **Group a** and **Group b**.

Group a consisted of stations T1 Lower, T2 Upper, T2 Mid, and T2 Lower. This group separated from Group b at a 57.87% dissimilarity level. Group a had a 54.02% within group similarity. This group contained 49 taxa comprising 1,129 individuals. Six taxa accounted for over 70% of the faunal abundance: the oligochaete *Tubificoides benedii* (433 individuals, 38.35% abundance), the polychaetes *Melinna palmata* (113 individuals, 10.01% abundance) and *Nephtys hombergii* (83 individuals, 7.35% abundance), the bivalve *Cerastodema edule* (69 individuals, 6.11% abundance), Nematoda (49 individuals, 4.34% abundance), and the amphipod *Microprotopus maculatus* (58 individuals, 3.49% abundance). Group a stations exhibit elements of the JNCC biotopes 'SS.SMu.SMuVS.AphTubi *Aphelochaeta marioni* and *Tubificoides* spp. in variable salinity infralittoral mud' (EUNIS code A5.322) (De-Bastos & Hiscock, 2016) and 'LS.LMx.Mx.CirCer Cirratulids and *Cerastoderma edule* in littoral mixed sediment' (EUNIS A2.421) (Tillin & Marshall, 2016).

Group b consisted of stations T1 Upper and T1 Mid, this group separated from Group a at a 57.87% dissimilarity level. Group b had a 48.05% within group similarity. This group contained 44 taxa comprising 535 individuals. Of the 44 taxa, 24 of the taxa were present twice or less. Six taxa accounted for over 76% of the faunal abundance: the oligochaetes *Tubificoides benedii* (183 individuals, 334.21% abundance) and *Tubificoides brownae* (25 individuals, 4.67% abundance), Nematoda (114 individuals, 21.31% abundance), the bivalve *Cerastoderma edule* (35 individuals, 6.54% abundance), the amphipod *Gammarus locusta* (34 individuals, 63.6% abundance), and the gastropod *Peringia ulvae* (18 individuals, 3.36% abundance). Group b stations also exhibit elements of the JNCC biotopes 'LS.LMx.Mx.CirCer Cirratulids and *Cerastoderma edule* in littoral mixed sediment (EUNIS A2.421) (Tillin & Marshall, 2016).

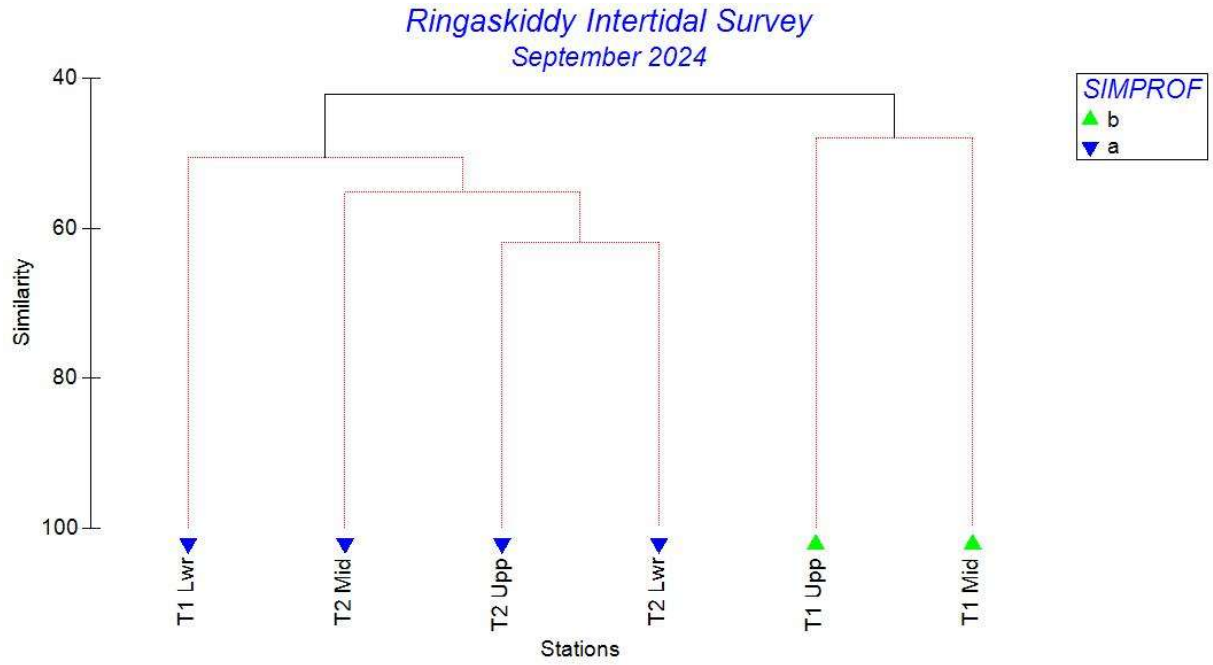


Figure 15.7: Dendrogram produced from Cluster analysis of the intertidal data.

Intertidal Survey Sediment Results

The intertidal sediment types ranged from muddy sand to gravelly muddy sand, with the highest levels of medium sand at T2 Lwr, fine sand at T2 Mid, and silt-clay at T1 Upp. Organic content varied, with higher values typically associated with finer sediments. The sediment composition is shown in full in the accompanying Marine Benthic Ecology Report.

Intertidal Biotopes

The initial intertidal walkover survey documented the biotopes present on the rock armour in the upper shore of the transect locations. These included 'LR.FLR.Lic.YG – Yellow and grey lichens on supralittoral rock', 'LR.LLR.F.Fspi – *Fucus spiralis* on sheltered upper eulittoral rock', and LR.LLR.F.Asc.FS – *Ascophyllum nodosum* on full salinity mid eulittoral rock'. In addition, an area of mussel beds that was identified in the previous surveys in the vicinity of the ADM jetty was again recorded in the present survey. This biotope can be classified as LS.LBR.LMus.Myt.Mu - *Mytilus edulis* beds on littoral mud'.

Multivariate analysis of the faunal samples revealed a clear divide between the stations within the inner Ringaskiddy harbour area and those outside. The stations within the inner harbour area can be classified as a mosaic of the JNCC biotopes SS.SMu.IFIMu.CerAnit *Cerastoderma edule* with *Abra nitida* in infralittoral mud' and 'SS.SSa.IMuSa.SsubNhom *Spisula subtruncata* and *Nephtys hombergii* in shallow muddy sand. The stations surveyed outside of the inner harbour area were classified as 'SS.SMu.ISaMu.MelMagThy *Melinna palmata* with *Magelona* spp. and *Thyasira* spp. in infralittoral sandy mud'.

There are full descriptions of the biotope types recoded on the Marine Biological Association MarLIN website. The sensitivities of these biotopes to various pressures (Physical, Chemical, Biological, and Hydrological) are well understood and each biotope is assessed on the Resistance, Resilience, and Sensitivity of a variety of activities that could impact on them. The proposed dredging activities have the most potential to impact on the biotopes identified. Dredging may result in light siltation (deposition of less than 5cm depth), heavy siltation (deposition of greater than 30cm depth) and/or removal of the substrate by extraction.

[15.3.2.3] Drop Down Video (DDV)

AQUAFACT staff conducted this beam DDV survey on the 27th of June 2024 in the vicinity of Ringaskiddy. The beam trawl was deployed from the Denis Murphy, a vessel kindly provided by the Port of Cork.

The drop-down camera used was the STR SeaSpyder Nano, an ultra-compact system offering high-resolution digital imaging and photographic-quality illumination. The system featured the latest generation STR SeaCam Mini IP camera and two ultra-efficient STR SeaLight LED lights, installed on a lightweight deployment frame with a 50m Kevlar-reinforced umbilical. Real-time HD video was captured using the supplied STR VidOverlay software. Laser scaling was integrated into the camera system, which was essential for conducting an assessment and for accurately measuring percentage cover.

At each station, short transect drifts were used to record the seabed conditions, and the depths ranged from about one to 16 metres. The footage captured sediment types, species, and key features seen in an area. At some locations there was significant amounts of suspended sediment due to water movement and the camera/ vessel interacting with the seabed. At Station 11 there was a technical issue and only still pictures were collected.

The locations for the drop-down video surveys (Figure 15.8) were selected to provide a visual assessment of the various biotopes within the Ringaskiddy basin, as well as the areas outside where proposed developments are planned.

Figure 15.8: Drop Down Video locations Ringaskiddy

Drop Down Video (DDV) observations:

The predominant habitat types (Table 15-1) across these locations consisted of relatively homogeneous, featureless muddy sands. Occasionally, fish and crabs were observed on the sediment surface. This habitat type was classified as the Infralittoral Sandy Mud habitat complex [SS.SMu.ISaMu], following the JNCC guidelines. The video evidence supported the conclusions drawn from faunal and granulometric assessments conducted during the grab survey at the time, which also identified the same habitat type within the Ringaskiddy Basin.

Table 15-1: Biotope classification in 2024.

Station	Biotope Classification 2024
ST01	Infralittoral Sandy Mud habitat complex [SS.SSa.IMuSa] Infralittoral sandy mud SS.SMu.ISaMu
ST02	Infralittoral Sandy Mud habitat complex [SS.SMu.ISaMu], Circalittoral mixed sediment [SS.SMx.CMx]
ST03	Infralittoral Sandy Mud habitat complex [SS.SMu.ISaMu]
ST04	*Mytilus edulis* beds on sublittoral sediment SS.SBR.SMus.MytSS - Infralittoral Sandy Mud habitat complex [SS.SMu.ISaMu]
ST05	Infralittoral Sandy Mud habitat complex [SS.SMu.ISaMu]
ST08	Infralittoral muddy sand [SS.SSa.IMuSa] *Saccharina latissima* and red seaweeds on infralittoral sediments [SS.SMp.KSwSS.SlatR]
ST09	Infralittoral fine mud [SS.SMu.IFiMu]
ST11	Infralittoral muddy sand [SS.SSa.IMuSa]
ST13	Infralittoral fine mud [SS.SMu.IFiMu]
ST15	Infralittoral muddy sand [SS.SSa.IMuSa]
ST16	Infralittoral fine mud [SS.SMu.IFiMu] Characterised by fine silt, low energy [SS.SMu.CSaMu]
ST17	Infralittoral fine mud [SS.SMu.IFiMu] *Saccharina latissima* (if attached) [SS.SMp.KSwSS.SlatR]
ST18	Infralittoral mixed sediment [SS.SMx.IMx]
ST19	Infralittoral mixed sediment [SS.SMx.IMx]
ST20	Shell/Mussel-bed habitat complex [SS.SMx.IMx]
ST21	Shell/Mussel-bed habitat complex [SS.SMx.IMx]

Station	Biotope Classification 2024
ST22	*Mytilus edulis* beds on sublittoral sediment [SS.SBR.SMus.MytSS]
ST24	*Mytilus edulis* beds on sublittoral sediment [SS.SBR.SMus.MytSS]
ST25	Faunal communities on variable salinity infralittoral rock [IR.LIR.IFaVS] Sublittoral biogenic reefs [SS.SBR]
ST26	Circalittoral sandy mud, characterised by fine mud and the presence of scattered shell and organic material [SS.SMu.CSaMu]
ST27	Circalittoral sandy mud, characterised by soft muddy sediment with occasional coarser materials [SS.SMu.CSaMu].
ST28	Circalittoral sandy mud, characterised by fine muddy sediments and strong current influences [SS.SMu.CSaMu].

Infralittoral Sandy Mud habitats (SS.SSa.IMuSa and SS.SMu.ISaMu) were common across many stations observed, particularly ST01, ST02, ST03, ST04, ST05, ST08, ST11, ST15, and ST20. These habitats are typical for low energy, infralittoral zones. *Mytilus edulis* (blue mussel) beds on sublittoral sediment were seen at ST04, ST22, and ST24, indicating biogenic reefs where mussels play a prominent role. Infralittoral Fine Mud habitats (SS.SMu.IFiMu) are present in stations such as ST09, ST13, ST16, and ST17, characterised by finer sediments and low energy environments. Some of these locations include specific features, such as low-energy environments with fine silt in ST16. *Saccharina latissima* occurred on infralittoral sediment at ST08 and at ST17. Shell/Mussel-bed complexes are reported at ST20 and ST21, representing areas with a dominance of shells or mussel beds. Circalittoral Sandy Mud (SS.SMu.CSaMu) habitats were seen at stations ST26, ST27, and ST28, characterized by fine muddy sediments, often with scattered shells, organic material, and, in some locations, influenced by strong currents.

[15.3.2.5] Beam Trawl Surveys

AQUAFACT conducted a beam trawl survey at Ringaskiddy in June and July 2024 as part of this Environmental Impact Assessment Report (EIAR) on Marine Ecology. Seven beam trawl transects (T) were carried out using a 2-metre beam trawl with an 11 mm mesh size, towed at a speed of 2 knots Figure 15.10. Each transect averaged 0.3 km in length. The contents of the trawl were photographed, and species were identified, counted, and measured. Fish and invertebrates were separated, with every effort made to return live specimens to the water after processing.

Figure 15.9: Beam trawl (2 m diameter with an 11 mm mesh).

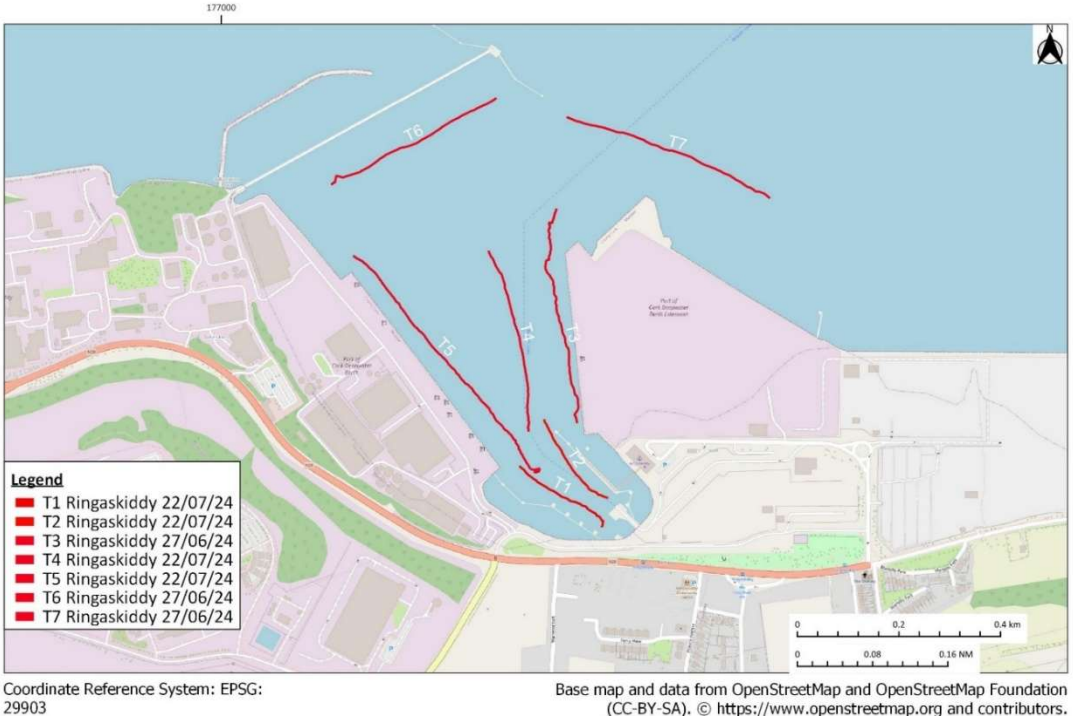


Figure 15.10: Location of trawl survey tracks (T1 to T7) for Ringaskiddy on the 27th of June and the 22nd of July 2024.

The survey focused on capturing and documenting the finfish and invertebrate species, including size distributions, with species like brown shrimp (*Crangon crangon*) and green crab (*Carcinus maenas*) identified and measured on board.

Beam trawl survey results:

The beam trawl survey revealed a diverse array of finfish, with Plaice (*Pleuronectes platessa*) recorded in many transects, particularly in T5. Sand Goby (*Pomatoschistus minutus*) was the most abundant species overall, especially in T1. Other notable species included Reticulated Dragonet (*Callionymus reticulatus*), most prevalent in T5, and Dover Sole (*Solea solea*), a commercially important species favouring soft, sandy substrates. Transects T1 and T5 showed high species diversity and abundance, demonstrating the ecological value of these areas.

Invertebrate Findings: A total of 965 individual invertebrates were recorded, representing over 20 species. Harbour Crab (*Polybius depurator*) was the most frequently captured, followed closely by Green Crab (*Carcinus maenas*). Brown Shrimp (*Crangon crangon*) was also abundant. Species diversity varied across transects, with T7 showing the highest diversity. The survey provided valuable insight into the invertebrate populations, with crabs and shrimp dominating the catches.

Key invertebrate species like Green Crab and Brown Shrimp were measured for size distribution. Green Crab carapace widths clustered around 20 mm, 40 mm, and 45 mm, while most Brown Shrimp measured between 30-45 mm, indicating a predominance of mid-sized individuals in the population. The full survey results can be seen in the accompanying Fisheries report.

[15.3.2.6] Fish, Fisheries and Aquaculture

A desk-based baseline study was undertaken to review aquaculture, fishing activities, and fish/shellfish species around Ringaskiddy. Using resources like Ireland's Marine Atlas, the Department of Agriculture, Food and the Marine (DAFM), and the National Biodiversity Data Centre (NBDC), the study identifies commercial fisheries, species of interest, and aquaculture considerations in the area.

Key data sources also included conservation status reports, NPWS site synopsis and mapping, and reports on protected habitats and species. While NPWS data highlights gaps in fish species records, especially for fish, bats, and birds, it supports field surveys. Ireland's Marine Atlas further provides insights into administrative boundaries, protected sites, fisheries, aquaculture, and oceanographic features relevant to Ringaskiddy.

There are over 563 marine fish found around Ireland. Some 245 species inshore (<200m depth) (130 exclusively inshore) and 435 species offshore (>200m depth) (321 exclusively offshore). Approximately 65 fish species in transitional waters are being monitored through the Water Framework Directive Fish Monitoring Programme (Inland Fisheries Ireland).

Migratory marine fish species designated under Annex II of the Habitats Directive which can occur around Ireland are:

1095 Sea lamprey [*Petromyzon marinus*]

1099 River lamprey [*Lampetra fluviatilis*]

1103 Twaite shad [*Alosa fallax*]

Sea Lamprey (*Petromyzon marinus*) and River Lamprey (*Lampetra fluviatilis*): Both the sea and river lamprey are anadromous, spending part of their lives in freshwater before migrating to the sea. Sea lamprey is listed as near threatened in Ireland but of least concern globally, while river lamprey is least concern on both lists (King *et al.,* 2011; IUCN, 2021). Population declines have been linked to overharvesting and habitat disruption, particularly due to man-made barriers (Igoe et al., 2004). Sea lampreys in the River Ulla, for instance, experience significant delays due to such obstacles (Silva *et al*., 2019). Both species spawn in fast-flowing rivers with gravel beds, and after a single spawning event, they die (Bracken *et al*., 2018). Key habitats in Ireland include the Shannon, Suir, Nore, Moy, and Corrib rivers, among others.

Twaite Shad (*Alosa fallax*): Twaite shad is an anadromous species of the herring family (Clupeidae) that inhabits the north-eastern Atlantic, ranging from Iceland in the north to Morocco in the south and as far east as the Baltic Sea (Aprahamian *et al*., 2003). Globally, it is listed as of least concern on the IUCN Red List (IUCN, 2021), but it is classified as vulnerable on Ireland's Red List (King *et al*., 2011). Adults migrate from the sea into freshwater rivers to spawn between February and June, depending on their geographical location (Davies *et al*., 2020). In Ireland, they spawn in rivers such as the Munster Blackwater and the Barrow-Nore-Suir system (Gallagher *et al*., 2020).

Atlantic Salmon (*Salmo salar*): Atlantic salmon are an anadromous species, migrating from the sea to spawn in freshwater rivers with clean, well-oxygenated gravel beds. They are listed as vulnerable in Europe and Ireland (IUCN, 2021; King *et a*l., 2011). River obstacles such as bridges and culverts hinder salmon migration, and their removal would enhance river connectivity (Atkinson *et al*., 2020). In Ireland, the Shannon River Basin supports healthy juvenile salmon populations, with monitoring showing strong numbers in rivers such as the Feale and Mulkear (Gargan *et a*l., 2020).

European Eel (*Anguilla anguilla*): The European eel, found throughout Ireland, is a critically endangered species on the IUCN Red List (IUCN, 2021) and is listed under CITES Appendix II due to concerns over trade. This catadromous species spends most of its life in freshwater or estuaries before migrating to the Sargasso Sea to spawn (Arai et al., 2006). In the River Shannon, eel populations have been affected by hydropower developments, with declines in both juvenile and adult numbers despite past stocking efforts (McCarthy *et al*., 2008).

The Southwest Regional Inshore Fisheries Forum (RIFF) covers the coastal zone from Youghal in East Cork to the Kerry-Limerick border, supporting approximately 32% of Ireland's national fishing fleet, with 647 vessels primarily operating in polyvalent general, specific, and potting sectors. Key fishing ports include Castletownbere, Cobh, Kinsale, Union Hall, and Dingle, with numerous smaller harbours and piers supporting both fishing and tourism activities. The fisheries in this area target a range of species, including lobster, brown crab, shrimp, spider crab, crayfish, scallops, Nephrops, and whelk, using various fishing methods such as pots, trawls, and nets.

According to Irelands Marine Atlas shrimp (Figure 15.11) potting appears to be the main documented fishing activity in Cork Harbour, though it is likely that other potting activities, such as for crab and lobster, are also conducted at lower intensities that may not be recorded.

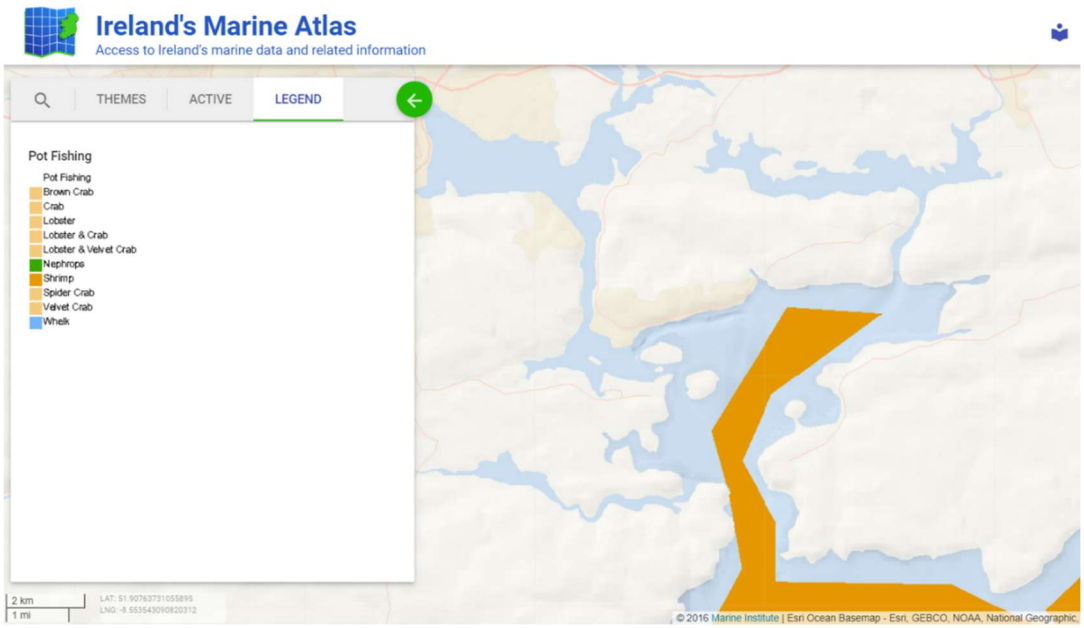


Figure 15.11: Pot fishing for brown crab, lobster, velvet crab, spider crab (light brown colour), shrimp (dark brown) and whelk fishing grounds (blue) (Source Irelands Marine Atlas).

Nursery and spawning grounds for commercial fish species in Cork Harbour, were identified using Ireland's Marine Atlas. Species such as cod, herring, horse mackerel, and whiting have nursery grounds in the area, with some species, like whiting, also having spawning grounds in the harbour. Wild Atlantic salmon, which have a broad range, were also noted Figure 15.12.

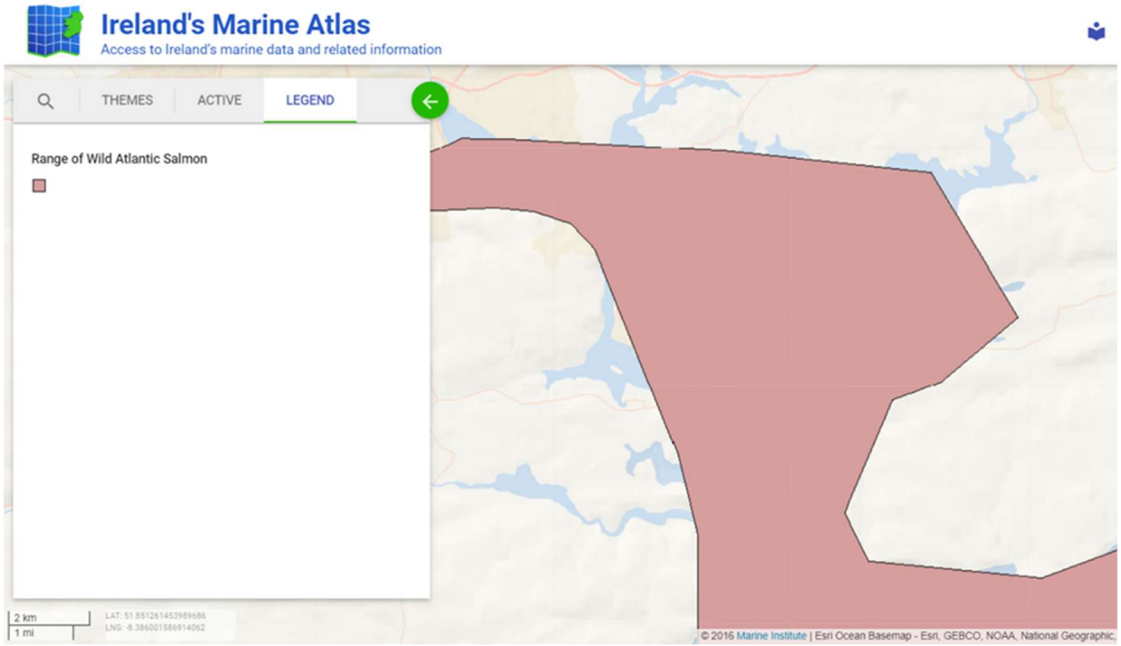


Figure 15.12: Range of Wild Atlantic Salmon (brown colour) in Cork Harbour (Source: Data from the fisheries theme accessed through Ireland's Marine Atlas at http://atlas.marine.ie/).

Atlantic salmon (*Salmo salar*) is a protected species in freshwater under Annex II of the Habitats Directive (92/43/EEC). Salmon are protected by conservation measures under the EU Freshwater Fish Directive (78/659/EEC), which was transposed into Irish law in 1988 through the European Communities Regulation on Quality of Salmonid Waters (S.I. No. 293/1988).

Under S.I. No. 293/1988 - European Communities (Quality of Salmonid Waters) Regulations 1988, Water Framework Directive (WFD) River Network Routes were designated as Designated Salmonid Waters. The Council Directive 78/659/EEC of 18 July 1978 on the quality of fresh waters needing protection or improvement to support fish life, and the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, were transposed into Irish law under the Fish Directive S.I. 293/1988 and Habitats Directive S.I. 477/2011. This legislation requires that salmonid waters must sustain their natural populations of Atlantic salmon, sea trout/brown trout (*Salmo trutta*), char (*Salvelinus*), and whitefish (*Coregonus*).

Inland Fisheries Ireland (IFI)

In 2010, Inland Fisheries Ireland undertook surveillance monitoring in transitional waters (WFD) within the greater Cork Harbour area. There were seven water bodies studied, and these included Glashaboy Estuary, Lee Estuary (Lower and Upper), Lough Mahon (and Harper's Island), North Channel Great Island, and Owenacurra Estuary (Table 15-2).

Table 15-2: Transitional water bodies surveyed for the WFD fish surveillance monitoring programme, October 2010 (TW=transitional).

Transitional water body	MS Code	Easting	Northing	Type	Area (km^2)
Glashaboy Estuary	SW_060_0800	172449	73470	TW	0.12
Lee (Cork) Estuary, Lower	SW_060_0900	172082	72051	TW	0.89
Lee (Cork) Estuary, Upper	SW_060_0950	165903	71693	TW	0.25
Mahon, Lough	SW_060_0750	177107	69092	TW	12.23
Mahon, Lough (Harper's Island)	SW_060_0700	180271	72382	TW	2.05
North Channel Great Island	SW_060_0300	183669	69611	TW	7.96
Owenacurra Estuary	SW_060_0400	188010	71718	TW	1.12

A total of 32 fish species were recorded (with sea trout counted as a separate variety of brown trout) across the seven transitional water bodies surveyed in the Greater Cork Harbour area during 2010. Flounder and sand goby were the most common species, present in all seven water bodies, followed by European eel, thick-lipped grey mullet, and plaice, each found in five water bodies. Cod, pollack, and scad were also recorded, with species richness ranging from 23 in the North Channel Great Island to only three in the Glashaboy Estuary. Species important to angling, such as cod, pollack, and sea trout, were also transitional in these water bodies. Salmon and sea trout were also recorded, but only in one water body each.

The seven transitional water bodies within the Greater Cork Harbour estuary system vary significantly in size and environmental characteristics, which was reflected in the fish species composition recorded. North Channel Great Island and Lough Mahon exhibited the highest species diversity, with their close proximity to the open sea and higher salinity levels favouring marine species. In the Greater Cork Harbour area, the salinity levels appeared too high for large populations of freshwater species. The most abundant species recorded were sand goby, flounder, and sprat, with species richness and distribution detailed in the 2010 WFD summary report (Kelly et al., 2011).

Marine Leisure (Fishing)

It is reported thar recreational sea angling in Cork Harbour offers a variety of hotspots, including Ballybranigan Beach, Inch Beach, Roches Point, and White Bay, where species such as bass, cod, flounder, and mackerel can be caught. Charter boats, provide deep-sea and shark fishing

trips, targeting blue sharks, ling, pollack, and conger eel. Popular pier and shore fishing locations include Aghada Pier and Lynch's Quay, known for catches of bass, dogfish, and thornback ray. Several slipways, including those at Gyleen, Rostellan, and Crosshaven, provide accessible launch sites for anglers.

Aquaculture

Within Cork Harbour, there are two licensed aquaculture sites: one for mussels (T05-522B) and another for Pacific oysters and brown seaweed (T05-294). Additionally, two Fishery Orders are in place, one for blue mussels (Rostellan T05-002OFO) and the other for European flat oysters (T05-017OFO) (Figure 15.13). There are also four protected sites, designated under the Shellfish Water Directive: Cork Great Island North Channel (T05-294A), and Rostellan West, South, and North (T05-522B, T05_522B, T05-522B) (Figure 15.14).

Figure 15.13: Aquaculture sites (T05-522B, T05-294) and Fishery orders in Cork Harbour (T05-002OFO and T05-017OFO) (source: https://dafm-maps.marine.ie/aquaculture-viewer/).

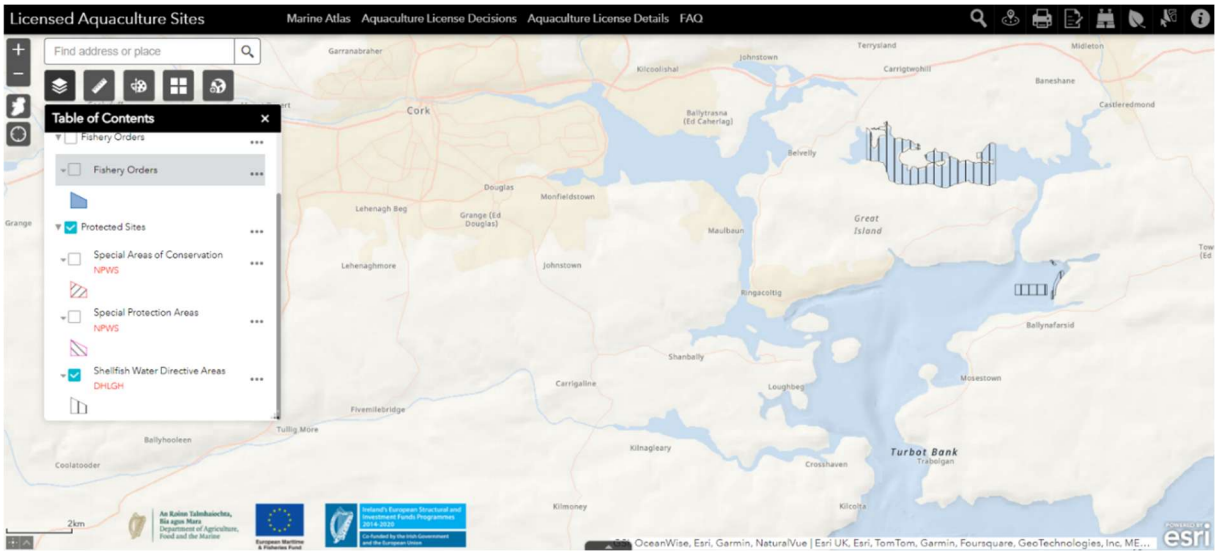


Figure 15.14: Protected sites, Shellfish Waters Directive areas (DHLG).

[15.3.2.7] Water Quality

Several sources that have the potential to effect water quality in the Project area will be examined. Chapter 14 Water Environment assesses this in full.

Discharges during both construction and operational phases have the potential to cause water pollution. Dredging, construction activities, and stormwater discharges could cause increased sedimentation and turbidity in the water column.

Storm drainage systems will be installed within the development site. Storm water runoff from the site will be collected in a dedicated storm water drainage system. The storm water drainage system will collect rainwater incident upon the site for discharge to the harbour waters via a series of silt traps and oil interceptors.

Regulatory compliance and monitoring must be adhered to throughout the Project. Compliance with the Water Framework Directive (WFD) must be ensured which includes assessments of chemical and dissolved oxygen. Compliance must also be ensured for the Dangerous Substances Directive (DSD) which sets specific discharge limits for toxic substances to protect aquatic ecosystems. Current modelling indicates that anticipated discharges are within these regulatory limits.

With adherence to regulatory standards and effective implementation of mitigation strategies, the proposed project is expected to have manageable impacts on water quality, if discharge levels remain within compliance limits.

[15.3.2.8] Marine Mammals

The Marine Mammal report details a desk study section and identified marine mammal records within the immediate vicinity of the site. For the purpose of this impact assessment, this range was extended, and records were searched on the National Biodiversity Data centre within hectads X and Y. This allowed a greater level of data to carry out the impact assessment, and on a precautionary basis, identify marine mammals which could be in the surrounding waters of the greater Ringaskiddy and Cork Harbour area. The results of the MMO survey are also outlined here but can be viewed in greater detail in the accompanying report.

Harbour Porpoise (*Phocoena phocoena*)

Harbour porpoises are listed under Annex IV of the Habitats Directive as a European protected Species, and under Annex II as a species of Community Interest. There are several Special Conservation Areas (SACs) designated for the protection of harbour porpoise. In Ireland, harbour porpoise have a ‘favourable’ conservation status and a ‘stable’ population trend. They are the most abundant cetacean species in Irish waters and have a wide distribution (Berrow *et. al*, 2010, Rogan *et al*., 2018a; Wall *et. al*, 2013).

The National Biodiversity Data Centre (NBDC) was accessed on the 01/10/2024 to check if there were any recent records (within the last 5 years) of harbour porpoise in the vicinity of the proposed development area. The 10km grid squares W86 & W76 were used for this search. A record of seven individuals of ‘*Dolphin species possibly harbour porpoise’* was recorded in W86 on 06/12/2020.

Harbour porpoise was not observed during the Marine Mammal Observer surveys carried out for this assessment.

Bottlenose dolphin (*Tursiops truncatus*)

Bottlenose dolphins are also listed under Annex IV of the Habitats Directive as a European Protected Species and under Annex II of the Habitats Directive as a species of Community Interest. Similar to harbour porpoise, there are a number of SACs designated for their conservation. In Ireland, bottlenose dolphin have a 'favourable' conservation status and a 'stable' population trend. They are widespread and abundant in Irish waters (Berrow *et al*., 2010; Wall *et al*., 2013).

The National Biodiversity Data Centre (NBDC) was accessed on the 01/10/2024 to check if there were any recent records (within the last 5 years) of bottlenose dolphin in the vicinity of the proposed development area. The 10km grid squares W86 & W76 were used for this search. A record of seventeen identified 'Bottlenose dolphin' individuals was recorded on the 02/05/2020 in W86. While a record of two 'Dolphin species' was recorded on 14/09/2020.

No bottlenose dolphin were observed during the Marine Mammal Observer surveys carried out for this assessment.

Common dolphin (*Delphinus delphis*)

Common dolphins are listed under Annex IV of the Habitats Directive and as a European Protected Species of Community Interest. In Ireland, common dolphins have a 'favourable' conservation status and a 'stable' population trend (NPWS, 2019). Common dolphins are the most frequently recorded dolphin species in Irish waters and have a broad distribution, occurring in both offshore and coastal waters (Berrow *et al*., 2010).

The National Biodiversity Data Centre (NBDC) was accessed on the 01/10/2024 to check if there were any recent records (within the last 5 years) of common dolphin in the vicinity of the proposed development area. The 10km grid squares W86 & W76 were used for this search. There were two separate recordings of '*Common dolphin*' documented. A count of twenty-two common dolphin was documented on 27/11/2020 in W86, while a record of 6 was documented on 10/10/2020 in W76.

No common dolphin were observed during the Marine Mammal Observer survey carried out for the purpose of this assessment.

Risso's dolphin (*Grampus griseus*)

Risso's dolphins are listed under Annex IV of the Habitats Directive as a European Protected Species of Community Interest. In Ireland, Risso's dolphin have a 'favourable' conservation status and a 'stable' population trend. Risso's dolphins are frequently recorded in Irish waters and have a wide distribution with sightings in both deep offshore shelf and slopes waters and in coastal areas (Berrow *et al*., 2010; Rogan *et a*l., 2018).

The National Biodiversity Data Centre (NBDC) was accessed on the 01/10/2024 to check if there were any recent records (within the last 5 years) of risso's dolphin in the vicinity of the proposed development area. The 10km grid squares W86 & W76 were used for this search. There were no records of '*Risso's dolphin'* documented on the NBDC in the vicinity of the proposed development within the last 5 years. There is a record of 'Dolphin species' which did not identify a specific species of dolphin, that had a count of two individuals on 14/09/2020 within W86.

No risso's dolphin were observed during the Marine Mammal Observer surveys carried out for the purpose of this assessment.

Minke whale (*Balaenoptera acutorostrata*)

Minke whales are listed under Annex IV of the Habitats Directive as a European Protected Species of Community Interest. In Ireland, minke whales have a 'favourable' conservation status and 'stable' population trend (NPWS, 2019). Minke whales are the most abundant species of baleen whale in Irish waters (Rogan *et a*l., 2018).

The National Biodiversity Data Centre (NBDC) was accessed on the 01/10/2024 to check if there were any recent records (within the last 5 years) of minke whale in the vicinity of the proposed development area. The 10km grid squares W86 & W76 were used for this search. The National Biodiversity Data Centre (NBDC) was accessed on the 01/10/2024 to check if there were any recent records (within the last 5 years) of minke whale in the vicinity of the proposed development area. The 10km grid squares W86 & W76 were used for this search. No record of '*Minke whale'* or any other whale species were recorded within the vicinity of the proposed development on the NBDC within the last five years.

No minke whale were observed during the Marine Mammal Observer survey carried out for the purpose of this assessment.

Harbour seal (*Phoca vitulina*)

Harbour seals are listed under Annex II of the Habitats Directive as a species of Community Interest; therefore SACs are designated for their conservation. In Ireland, harbour seals have a 'favourable' conservation status and 'stable' population trend (NPWS, 2019). Harbour seal occur throughout Irish waters in estuarine, coastal and marine environments (Cronin et al., 2004, Morris and Duck, 2019). Harbour seals favour bays and islands, and coves and estuaries to haul-out and are known to haul-out in the Ringaskiddy port area.

The National Biodiversity Data Centre (NBDC) was accessed on the 01/10/2024 to check if there were any recent records (within the last 5 years) of harbour seal in the vicinity of the proposed development area. The 10km grid squares W86 & W76 were used for this search. A record of four '*Common seal'* individuals were documented on 01/05/2023 in W86, additionally two separate recordings of '*Phocidae'* were documented. A record of thirteen individuals of '*Phocidae'* was recorded on 09/05/2024 within W86, while a record of one '*Phocidae'* individual was record on 10/10/2020 within W76.

The harbour seal was the most recorded marine mammal during the Marine Mammal Observer surveys carried out for the purpose of this assessment. Harbour seal were observed on 4 out of the 5 survey dates, with the largest count of the species being seventeen, recorded on 01/08/2024. The harbour seal has established a haul-out site on the eastern edge of the intertidal area, adjacent to the jetty. Figure 4-1, within the Marine Mammal Observer report, shows the location of the haul-out site.

Grey seal (*Halichoeros grypus*)

Grey seals are listed under Annex II of the Habitats Directive as a species of Community Interest; therefore, the designation of SACs is a required component of their conservation. There are several SACs where grey seal are listed as a Qualifying Interest. In Ireland, grey seals have a 'favourable' conservation status and an 'increasing' population trend.

The National Biodiversity Data Centre (NBDC) was accessed on the 01/10/2024 to check if there were any recent records (within the last 5 years) of grey seal in the vicinity of the proposed development area. The 10km grid squares W86 & W76 were used for this search. A record of

sixteen individuals of '*Grey seal'* was documented in the vicinity of the proposed development site on 05/12/2023 within W86. Additionally, two separate recordings of '*Phocidae'* were documented. A record of thirteen individuals of '*Phocidae'* was recorded on 09/05/2024 within W86, while a record of one '*Phocidae'* individual was record on 10/10/2020 within W76.

One grey seal was observed on the 23/07/2024 during the Marine Mammal Observer surveys carried out for the purpose of this assessment.

Otter (*Lutra lutra*)

In Ireland, otters are protected under the provisions of the Wildlife Act, the Habitats Directive (Annexes II and IV) and the Bern Convention (Appendix II). There are several SACs where otter is listed as a Qualifying Interest. In Ireland, otter have a 'favourable' conservation status and a 'favourable' population trend. seals have a 'favourable' conservation status and an 'increasing' population trend. The National Biodiversity Data Centre (NBDC) was accessed on the 01/10/2024 to check if there were any recent records (within the last 5 years) of grey seal in the vicinity of the proposed development area. The 10km grid squares W86 & W76 were used for this search. There are multiple records of otter within the last five years. During the surveys carried out in 2012 and 2024 for the proposed development, otter activity was widespread at the base of the ADM jetty.

During the Marine Mammal Observer surveys carried out in 2024, one otter was observed on the 22/07/2024.

MMO Survey Conclusion

The 2024 Marine Mammal Observer surveys provide a robust baseline for the assessment of marine mammals present within the proposed development area. Of note, there is a greater number of harbour seal (*Phoca vitulina*) recorded within the area than previously noted in the 2014 EIS, with the greatest number of species found in one haul-out location adjacent to the port jetty. Grey seal (*Halicheros grypus*) and otter (*Lutra lutra*) were also recorded during the 2024 surveys showing their presence in the proposed development area. Notably, a range of seabirds were recorded as incidental species, indicating the use of the area for foraging and commuting purposes for these species

[15.4] Sensitive Receptors

Sensitivity according to the Marine Life Information Network (MarLIN) is "the likelihood of change when a pressure is applied to a feature (receptor) and is a function of the ability of the feature to tolerate or resist change (resistance) and its ability to recover from impact (resilience) Tillin *et al*. (2010), Tillin & Hull (2012-13), Tillin & Tyler-Walters (2014)".

The Marine Evidence based Sensitivity Assessment (MarESA) framework, used by MarLIN, categorises biotope sensitivity by assessing the resistance and resilience of habitats to specific pressures like dredging, siltation, and substrate removal. In the terms of biotope sensitivity assessments, High, Medium, and Low refer to the degree of vulnerability a biotope has to various environmental pressures.

The relevant receptors include Habitats; Marine Mammals; and Fish.

[15.4.1.1] Subtidal and intertidal biotopes

The sensitivities of biotopes to various pressures (Physical, Chemical, Biological, and Hydrological) are well understood (Table 15-3), and each biotope that could be identified is assessed on the Resistance, Resilience, and Sensitivity of various planned activities that could impact them. The proposed dredging activities have the most potential to impact the biotopes identified. Dredging may result in light siltation (deposition of less than 5 cm depth), heavy siltation (deposition of greater than 30cm depth) and/or removal of the substrate by extraction. In the table below biotopes for the subtidal, identified though faunal analysis from grabs and DDV and intertidal biotopes.

Table 15-3: Subtidal and Intertidal Biotopes and sensitivities to physical pressures.

Biotope	**Sensitivity to Pressures**		
	Physical – Dredging Light siltation (<5cm)	**Physical – Dredging Heavy siltation (>30cm)**	**Physical Removal of substrate (extraction)**
Subtidal Grab			
SS.SMu.IFIMu.CerAnit *Cerastoderma edule* with *Abra nitida* in infralittoral mud	Low	Medium	Medium
SS.SSa.IMuSa.SsubNhom *Spisula subtruncata* and *Nephtys hombergii* in shallow muddy sand	Low	Medium	Medium
SS.SMu.ISaMu.MelMagThy *Melinna palmata* with *Magelona* spp. and *Thyasira* spp. in infralittoral sandy mud	Not Sensitive	Low	Medium
Subtidal DDV			
ST04 *Mytilus edulis* beds on sublittoral sediment [SS.SBR.SMus.MytSS]	Medium	Medium	High
ST08 *Saccharina latissima* and red seaweeds on infralittoral sediments [SS.SMp.KSwSS.SlatR]	Not Sensitive	Low	Medium
Intertidal			

Biotope	Sensitivity to Pressures		
	Physical – Dredging Light siltation (<5cm)	**Physical – Dredging Heavy siltation (>30cm)**	**Physical Removal of substrate (extraction)**
LR.FLR.Lic.YG – Yellow and grey lichens on supralittoral rock	N.A.	N.A.	N.A.
LR.LLR.F.Fspi – *Fucus spiralis* on sheltered upper eulittoral rock	Low	Medium	N.A.
LR.LLR.F.Asc.FS – *Ascophyllum nodosum* on full salinity mid eulittoral rock	Medium	High	N.A.
LS.LBR.LMus.Myt.Mu - *Mytilus edulis* beds on littoral mud	Medium	Medium	High
SS.SMu.SMuVS.AphTubi *Aphelochaeta marioni* and *Tubificoides* spp. in variable salinity infralittoral mud	Not Sensitive	Low	Medium
LS.LMx.Mx.CirCer - Cirratulids and *Cerastoderma edule* in littoral mixed sediment	Low	Medium	Medium

The sensitivity to pressures assessments in Table 15-3 for subtidal and intertidal biotopes shows a varied responses to dredging, siltation, and substrate removal. Subtidal biotopes like SS.SMu.IFIMu.CerAnit *Cerastoderma edule* with *Abra nitida* in infralittoral mud and SS.SSa.IMuSa.SsubNhom *Spisula subtruncata* and *Nephtys hombergii* in shallow muddy sand have low sensitivity to light siltation but medium sensitivity to heavy siltation and substrate removal. In contrast, SS.SMu.ISaMu.MelMagThy *Melinna palmata* with *Magelona* spp. and *Thyasira* spp. in infralittoral sandy mud is not sensitive to light siltation but shows medium sensitivity to substrate removal. The *Mytilus edulis* beds on sublittoral sediment [SS.SBR.SMus.MytSS] biotope shows a high sensitivity to dredging activities. The *Saccharina latissima* and red seaweeds on infralittoral sediments [SS.SMp.KSwSS.SlatR] biotope shows a low sensitivity to light siltation, indicating resilience to minor sediment deposition and a medium sensitivity to removal of substrate, indicating it can recover more easily from substrate removal than highly structured or species-specific habitats.

For intertidal habitats, LR.LLR.F.Fspi – *Fucus spiralis* on sheltered upper eulittoral rock has low sensitivity to light siltation, while LR.LLR.F.Asc.FS – *Ascophyllum nodosum* on full salinity mid eulittoral rock is more sensitive, with medium to high responses. LS.LBR.LMus.Myt.Mu - *Mytilus edulis* beds on littoral mud are highly sensitive to substrate removal, and LS.LMx.Mx.CirCer - Cirratulids and *Cerastoderma edule* in littoral mixed sediment show medium sensitivity across most of these pressures.

[15.4.1.2] Fish

Fish sensitivity to various environmental pressures can be assessed evaluating a combination of their stressors and their ability to recover from disturbances. This assessment involves a range of biological, ecological, and environmental factors: Some of the key elements to be considered are:

Biological Sensitivity:

Life History: Species with slow growth, long lifespans, and late maturity (e.g., sharks) are more sensitive to pressures like overfishing or habitat degradation.

Reproductive Strategies: Fish species with specific spawning grounds can be more vulnerable, while those with wide dispersal of eggs or larvae can often recover more quickly.

Habitat Dependency: Species that rely on specific habitats (e.g., seagrass beds, coral reefs) for breeding, feeding, or shelter are more sensitive to habitat changes or loss.

Environmental Pressures:

Physical Disturbance: Activities like dredging, trawling, and construction can alter or destroy key habitats, affecting the species dependent on those specific substrate types (e.g., demersal species). But pelagic species are less affected by physical habitat changes.

Water Quality: Pollution, changes in salinity, temperature, or dissolved oxygen levels can have direct impacts on fish physiology, behaviour, and survival. However, in the short-term fish do have an ability to move away from such changes.

Noise Pollution: Anthropogenic noise from shipping, construction, and sonar have been shown to disturb fish behaviour, particularly for species that use sound for communication, mating, or navigation.

Recovery Potential:

Reproductive Capacity: High fecundity fish species and those with faster life cycles (e.g., small pelagic fish) tend to have higher recovery potential, while those with lower reproductive rates and long lifespans recuperate more slowly.

Mobility: Mobile species can avoid localised pressures more effectively, although physical obstacles to migration or spawning routes may still pose significant risks.

Population Dynamics: The ability of a population to rebuild after depletion depends on factors such as fecundity, population structure, and the availability of suitable habitat for recruitment.

Sensitivity Indicators:

Fish sensitivity can be judged using a combination of pressure (e.g., fishing intensity, pollution), impact (the damage caused by the pressure), and recovery (how quickly fish populations). These can be rated as low, medium, or highly sensitive.

The Annex II marine fish species which is reported to occur in the area is the Atlantic salmon [*Salmo salar*]. Thornback Ray (*Raja clavata*) were found in the beam trawl survey undertaken for this investigation are reported by the National Biodiversity Centre to be a “rare marine fishes taken in Irish waters from 1786 to 2008”.

[15.4.1.3] Marine Mammals

All marine mammals that have been recorded in the proposed development area, through the desk study of field study component of this assessment, within the last five years are included as sensitive receptors. These are:

- Bottlenose dolphin (*Tursiops truncatus*)
- Common dolphin (*Delphinus delphis*)
- Harbour seal (*Phoca vitulina*)
- Grey seal (*Halichoerus grypus)*
- Harbour porpoise (*Phocoena phocoena*)

All sensitive receptors have been assigned as of '**International importance'** at risk of significant impact and are scoped into this marine ecology assessment. Otter (*Lutra lutra*) has been assessed in the accompanying chapter on Terrestrial Ecology.

[15.5] Potential Impacts

The Guidelines on the Information to be Contained in Environmental Impact Assessment Reports', (EPA, 2022) provides definitions which have been used to classify the effects in respect of ecology. This classification scheme is outlined below in **Table 15-4**.

Table 15-4: EPA Impact Classification.

Impact Characteristic	Term	Description
Quality	Positive	A change which improves the quality of the environment.
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative	A change which reduces the quality of the environment.
Significance	Imperceptible	An effect capable of measurement but without significant consequences.
	Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
	Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging trends.
	Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
	Profound	An effect which obliterates sensitive characteristics.
Duration and Frequency	Momentary Effects	Effects lasting from seconds to minutes.
	Brief Effects	Effects lasting less than a day.
	Temporary Effects	Effects lasting less than a year.
	Short-term	Effects lasting one to seven years.
	Medium-term	Effects lasting seven to fifteen years.
	Long-term	Effects lasting fifteen to sixty years.
	Permanent	Effects lasting over sixty years.
	Reversible Effects	Effects that can be undone.
	Frequency	Describe how often the effect will occur. (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)
	Irreversible	When the character, distinctiveness, diversity, or reproductive capacity of an environment is permanently lost.
	Residual	Degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic	Where the resultant effect is of greater significance than the sum of its constituents.
	'Worst Case'	The effects arising from a development in the case where mitigation measures substantially fail.

Limitations and assumptions: Some general assumptions that have been made during preparation of this EIAR are set out below:

- In undertaking cumulative assessments, consented, but as yet un-built, developments have been assumed to have been built in accordance with and within the duration permitted by the associated grant of permission;
- Information provided by third parties, including publicly available information and databases, is correct at the time of publication;
- Local Authority and An Bord Pleanála public planning registers reviewed as part of the assessment process are up-to-date; and
- Baseline conditions and assessments are accurate at the time of the surveys.

Some general limitations associated with the preparation of this chapter are set out below:

- The assessment of cumulative effects from built or consented developments is partially reliant on the availability of information provided by relevant third parties.

Table 15-5 outlines the potential impact mechanisms related to Proposed Development phases, specifically concerning the marine environment receptors. Descriptions of these impact mechanisms are provided, along with an assessment of the impacts and effects on the marine receptors (biotopes, fish and marine mammals). This includes proposed mitigation measures, monitoring, and a "do nothing" scenario for both the construction and operational phases.

Table 15-5: Potential Impact Mechanisms

No.	Potential Impact Mechanisms	Development Phase
1	Underwater noise	Construction Phase and Operation Phase
2	Seabed habitat loss	Construction Phase and Operation Phase
3	Release of pollutants during construction	Construction Phase
4	Wastewater discharge and Effluent	Construction and Operation Phase

[15.5.1] The ‘do nothing’ scenario

In the event that the permitted development does not proceed, an assessment of the future baseline conditions has been carried out and is described within this section.

A "Do Nothing” scenario, would mean that the existing environmental conditions would not be altered, as no construction or dredging activities would take place.

The "Do Nothing" scenario would maintain the current state of the marine environment. The existing biotopes, sediment profiles, noise levels, and water quality would not change. As a result, the local biodiversity (biotopes and fish species) would remain as it is, albeit changing over time with the various ecological and hydrographical pressures.

Without construction, any potential risks to water quality, such as pollutant spills, would be avoided. Correspondingly, the local hydrodynamic conditions would be stable, with no alterations to structures like piers, seawalls, or other coastal defences, which might have otherwise affected tidal flows and sediment transport.

In conclusion, while the "Do Nothing" scenario avoids environmental disturbance, it also leaves any benefits from the proposed development unrealised.

The potential impact mechanisms of the construction and operational phases of the Proposed Development on marine ecology are presented in the construction and operational phases later in this report.

Marine Mammals:

The future trajectories of marine mammal populations are challenging to predict because monitoring at the appropriate temporal and/or spatial scales does not exist at present (Martin et al., 2023). Therefore, it is challenging to fully understand the baseline dynamics of some marine mammal populations, including all cetacean and pinniped species within this assessment.

If the permitted development were not to occur, it is likely marine mammal levels within the area would remain at a similar rate as present. Currently, Ringaskiddy port experiences a high level of shipping traffic, and is the location of a busy container and ferry terminal. The high levels of activity, noise and disturbance at present in the area, make it an unlikely destination for significant numbers of cetaceans to reside, breed, or forage in over a significant period of time. There is a population of harbour seal (*Phoca vitulina*) hauled-out at present adjacent to the jetty wall, which would likely remain and potentially grow as the population are already accustomed to the disturbances within the port.

[15.5.2] Construction Phase

The construction phase of the permitted development has the potential to cause direct and indirect effects to biotopes, fish, cetaceans and pinnipeds within the area. The below sections identify potential impacts and the associated significance of the impact on marine mammals as a result.

[15.5.2.1] Noise Disturbance

Fish: Anthropogenic noise from shipping, construction, and sonar have been shown to disturb fish behaviour, particularly for species that use sound for communication, mating, or navigation. During the construction phase the following impacts are considered, pile driving, blasting, drilling and dredging.

All fish species, including elasmobranchs (such as sharks and rays), are sensitive sound (Table 15-6), especially at frequencies below several hundred hertz. Most fish are capable of hearing sounds from as low as 10-30 Hz up to around 300-500 Hz, with some species extending their hearing range to approximately 1000 Hz. A smaller group of fish have specialised adaptations allowing them to detect sounds between 3000 and 4000 Hz.

Table 15-6: Fish hearing, frequency range detected and references (adapted from Marine Institute 2021)

Hearing	Frequency Range Detected	Reference
Hearing abilities of all fish species studied	Majority detect sounds from less than 50 Hz to 300-500 Hz	Popper & Hawkins (2019)
Lower limit of fish hearing	As low as 10-30 Hz	Sand & Karlsen (2000)
Upper limit for most fish species	Up to approximately 1000 Hz	Popper & Hawkins (2019)
Specialised species with extended hearing range	Up to 3000-4000 Hz	Ladich & Fay (2013); Popper & Hawkins (2019)

Although there is potential for temporary behavioural changes in fish species due to the influence of underwater noise, such temporary changes in behaviour are considered highly unlikely to result in significant impacts on the composition of species in the area.

Marine Mammals: The construction period has the potential to result in elevated levels of noise that is detectable to marine mammals above background levels which could result in injurious or behavioural effects.

Auditory injury in marine mammals can occur as either a Permanent Threshold Shift (PTS), where there is no hearing recovery in the animal, or as a Temporary Threshold Shift (TTS), where an animal can recover from tissue damage. Irish guidance recommends that the risk of TTS is included as potential injury as this could have negative effects on the ability of the animal to use natural sounds, including communication, navigation and prey location and could leads to consequences for an animal's fitness (NPWS, 2014). The most likely response to an animal exposed to TTS however is to flee the noisy area. It is therefore considered that there is also a behavioural response (disturbance) that overlaps with potential injury ranges, and animals exposed to noise levels have the potential to induce TTS are likely to actively avoid hearing damage by moving away from the area.

For marine mammals, injury thresholds are based on both linear (i.e. unweighted) peak sound pressure levels (SPL_{pk}) and marine mammal hearing-weighted cumulative Sound Exposure Level (SEL_{cum}). The SEL_{cum} takes account of the cumulative sound received by an animal within an area of increased noise over the entire piling/dredging sequence and is weighted by marine mammal hearing groups based on similarities in known or expected hearing capabilities (Southall et al., 2007). Marine mammal hearing groups are described according to the latest guidance (Southall et. al., 2019) as follows:

- **Low frequency (LF) cetaceans**: marine mammal species such as baleen whales with an estimated functional hearing range between 7Hz and 35 kHz. There are no records of this cetacean type in the vicinity of the Proposed development area.
- **High frequency (HF) cetaceans**: marine mammal species such as dolphins, toothed whales, beaked whales and bottlenose whales with an estimated functional hearing range between 150 Hz and 160 kHz. Bottlenose dolphin and common dolphin have been recorded in the vicinity of the proposed development area during the desk study assessment.
- **Very high frequency (VHF) cetaceans**: marine mammal species such as true porpoises, river dolphins and cephalorhynchid with an estimated functional hearing range of between 275 Hz and 160 kHz. Harbour porpoise have been recorded in the vicinity of the proposed development area during the desk study assessment.

Phocid pinnipeds in water (PW): true seals with an estimated functional hearing range between 50Hz and 86kHz. Grey seal and harbour seal were recorded in the vicinity of the proposed development area.

Table 15-7 illustrate the TTS and PTS onset thresholds for non-impulsive noise (e.g. dredging) and Table 15-8 shows the onset thresholds for impulsive noise (e.g. pile driving and blasting). While there has been no measurement of the underwater sound of this site due to the proposed development, on a precautionary basis, it has been concluded that the proposed activities may exceed the below thresholds. Therefore, all marine mammals noted above are fully assessed in terms of the potential for adverse impact on the species.

Table 15-7-TTS and PTS onset thresholds for marine mammals exposed to non-impulsive noise:
SEL thresholds for dB re 1µPa^{2}s under water and dB re (20 µPa)^{2}s in air (groups PCA and OCA only) (Southall et. al, 2019).

Marine mammal hearing group	TTS onset: SEL (weighted)	PTS onset: SEL (weighted)
LF	179	199
HF	178	198
VHF	153	173
SI	186	206
PCW	181	201
OCW	199	219
PCA	134	154
OCA	157	177

Table 15-8-TTS and PTS-onset thresholds for marine mammals exposed to impulsive noise:
SEL thresholds in dB re 1μPa²s under water and dB re (20 μPa)²s in air (groups PCA and OCA only): and peak SPL thresholds in dB 1 μPa under water and dB re 20 μPa in air (groups PCA and OCA only). (Southall et. al, 2019).

Marine mammal hearing group	TTS onset: SEL (weighted)	TTS onset: Peak SPL (unweighted)	PTS onset: SEL (weighted)	PTS onset: Peak SPL (unweighted)
LF	168	213	183	219
HF	170	224	185	230
VHF	140	196	155	202
SI	175	220	190	226
PCW	170	212	185	218
OCW	188	226	203	232
PCA	123	138	138	144
OCA	146	161	161	167

Conclusion:

The significant sources of noise with the potential to impact during the construction phase of the project are dredging, blasting and pile driving. These sound levels will be localised and of relatively short duration. Consequently, any effects from these activities are expected to be **minor, temporary,** and confined to the immediate area surrounding the proposed development, with **no long-term** impacts on marine mammal or fish populations.

15.5.2.1.1 Pile Driving

Pile driving is a conventional technique employed in many coastal and offshore constructions, such as wind farms, offshore platforms and harbour extensions. There are several key impact mechanisms to consider, underwater noise and physical disturbance/ loss of habitat.

Biotope: Pile driving is a relatively localised activity, and it is not anticipated to cause a significant loss of biotope (but the total area of the activity will impact on specific biotope areas). However, the localised impact can be further minimised through the application of best practices and careful consideration in selecting the methodologies for pile placement. By doing so, any potential adverse effects on the surrounding environment can be effectively mitigated.

Fish: There are several impact mechanisms associated with pile driving that could affect fish species, including noise (discussed earlier), loss of habitat and the risk of physical injury. However, since pile driving activities are typically highly localised, it is unlikely that any significant injury or habitat loss will occur as a result. It is also probable that fish species will move away from the area due to the noise, reducing the likelihood of direct harm.

Marine Mammals: The sound directionality of pile driving is omnidirectional, with a bandwidth of 20Hz-20kHz (ACCOBAMS, 2021).

As reported by JNCC (2010), the installation of driven piles in the marine environment without mitigation is likely to produce noise levels capable of causing injury and disturbance to marine mammals. Pile driving associated with the proposed development, is considered to be a potentially detrimental activity to marine mammals because it produces a very high source level and broad bandwidth sound. Low frequency sounds dominate pile driving. Sound produced during pile driving propagates through the air into water, through the water column, and to a lesser degree, through the sediment and from there back into the water column (Thomspon et. al, 2006). Sound pressure levels in impact pile-driving are dependent on the length and diameter of the pile and the impact energy (Nedwell et. al, 2003). As well as the seabed conditions and substrate hardness. The response thresholds of cetaceans are usually the lowest for pulsed sounds and pile driving is one of the loudest sources of this type of noise (Richardson & Wursig, 1996).

Conclusion:

Pile driving will create short-term noise and cause some loss of biotope area, but the effects are expected to be **minor, temporary,** and localised to the area around the proposed development, with no **long-term** effects on marine mammals or fish, and no significant reduction in the overall biotope area.

15.5.2.1.2 Blasting

Blasting is a technique used in certain coastal and offshore construction activities, such as harbour deepening or subsea infrastructure installation. This process involves several potential impact mechanisms, primarily underwater noise and physical disturbance to the marine environment.

As cited in the Department of Arts, Heritage and the Gaeltacht (2014) guidance to manage risks to marine mammals pulsed sounds generated by coastal or underwater explosions are known to exhibit extremely high sound pressure levels (SPLs), sound exposure levels (SELs), and rapid rise times (Southall et al., 2019). Such sounds are considered among the most intense man-made noises introduced into marine environments. While the duration and extent of underwater sound propagation from an individual explosion vary depending on project type, blast location, and charge size, source sound pressure levels often exceed those of other anthropogenic sources (Appendix 1), typically ranging between 250–300 dB re: 1 µPa (Southall et al., 2019; Richardson & Würsig, 1996; Nedwell et al., 2003). Explosive activities can thus pose one of the highest risks to marine mammals from human-made sound sources, with energy levels sufficient to cause immediate permanent threshold shift (PTS) in exposed individuals. Additionally, explosions produce a physical shock wave at close range, which propagates differently through the environment than acoustic energy and can result in traumatic or even lethal injury to marine mammals (Richardson & Würsig, 1996).

Due to the significant potential for pulsed sound from blasting to impact marine mammals, stringent mitigation measures are generally required to safeguard individuals and populations.

Biotope/ habitat: Blasting, similar to pile driving, has a localised impact area. While the total area of activity could temporarily impact specific biotope areas, significant biotope loss is not anticipated due to the controlled, targeted nature of blasting. Applying best practices and selecting optimal blasting methodologies can help to further minimise localised impacts, thereby mitigating adverse effects on the surrounding environment.

Fish: Blasting produces impulsive noise and pressure waves that may affect fish species through potential mortality, acoustic and physical injury, behavioural disruption, and localised habitat disturbance. However, as with pile driving, blasting activities are confined to a defined area, and fish species are likely to vacate the vicinity in response to the disturbance.

Marine Mammals: The directionality of blasting noise is multidirectional, producing high-intensity sound with a broad bandwidth that may exceed marine mammal hearing thresholds (JNCC, 2010). Without mitigation, the pressure waves generated by blasting may cause injury or disturbance to marine mammals, as the high-intensity noise propagates through water and sediment. This can lead to both auditory damage and behavioural disturbance for cetaceans and pinnipeds, which are sensitive to pulsed sound sources, such as those produced during blasting activities (Richardson & Würsig, 1996). Additionally, sound pressure levels from blasting vary according to the charge size, depth, and substrate hardness (Nedwell et al., 2003). As such, blasting is considered a potentially detrimental activity, necessitating strict mitigation to reduce the risk of harm to marine mammals.

Conclusion: Blasting, like pile driving, generates short-term noise and may cause minor localised disturbance to biotope areas. However, with proper mitigation measures in place, such as seasonal restrictions, exclusion zones, and acoustic deterrents, the effects are expected to be temporary and localised around the blasting area. No long-term impacts on marine mammals or fish are anticipated, and no significant reduction in overall biotope area is expected.

15.5.2.1.3 Drilling

Seabed-related activities such as dredging, drilling or small-scale coastal pile driving (e.g., for the fixing of floating pontoons or temporary structures), while generally of less concern, may nevertheless produce underwater sound at sound pressure levels up to 190 d.

Drilling operations comprise a static activity that tends to take place in a fixed area for a prolonged or intermittent period of days, weeks or several months depending on the required operation. This activity therefore has the potential in most circumstances to introduce continuous sounds at levels that may impact upon marine mammal individuals and/or populations, the degree of which will also depend on operational features such as the location, water depth, time-scale, etc.

While sound exposure levels from such operations are thought to be below that expected to cause injury to a marine mammal, they have the potential to cause lower level disturbance.

15.5.2.1.4 Dredging

Dredging is an excavation activity that involves removing substrate from the seabed and depositing it at a new location.

Biotope/ habitat: Subtidal biotopes like SS.SMu.IFIMu.CerAnit (*Cerastoderma edule* with *Abra nitida* in infralittoral mud) and SS.SSa.IMuSa.SsubNhom (*Spisula subtruncata* and *Nephtys hombergii* in shallow muddy sand) exhibit low sensitivity to light siltation but have medium sensitivity to both heavy siltation and substrate removal. SS.SMu.ISaMu.MelMagThy (*Melinna palmata* with *Magelona* and Thyasira species in infralittoral sandy mud) is not sensitive to light siltation but shows medium sensitivity to substrate removal.

For intertidal biotopes, LR.LLR.F.Fspi (*Fucus spiralis* on sheltered upper eulittoral rock) has low sensitivity to light siltation, while LR.LLR.F.Asc.FS (*Ascophyllum nodosum* on full salinity mid eulittoral rock) demonstrates medium to high sensitivity. LS.LBR.LMus.Myt.Mu (*Mytilus edulis* beds on littoral mud) are highly sensitive to substrate removal, and LS.LMx.Mx.CirCer (cirratulids and *Cerastoderma edule* in littoral mixed sediment) shows medium sensitivity to most pressures.

The subtidal DDV-identified biotopes, including those with *Mytilus edulis* beds (e.g., ST04, ST22, ST24), exhibit high sensitivity to dredging activities. In contrast, infralittoral and circalittoral mixed sediment biotopes (e.g., ST18, ST19) have lower sensitivity compared to those dominated by specific species or complex structures. However, certain habitats with mixed sediments or specific seaweed types (e.g., ST08, ST26, though possibly detrital) demonstrate medium sensitivity.

Nearly all biotopes show high sensitivity to heavy siltation (smothering), as thick sediment layers can smother benthic organisms and significantly alter the biotope. While habitats will generally show high sensitivity to the loss of physical habitat, mixed sediments and some muddy habitats exhibit medium sensitivity, as they can recover more easily from substrate removal than the more structured or species-specific biotopes.

Fish: Dredging involves removing the surface sediment layers, disrupting the seabed and its associated fauna and infauna. This also affects mobile species associated with the seabed, such as shrimp (*Crangon* species) and harbour/ green crabs, which may be caught in during dredging activities. Also, as the sediment is disturbed, it can become suspended in the water column, causing a temporary increase in turbidity. This plume of sediment disperses over time and can be diluted by tidal mixing, thereby reducing the impact away from the dredging area.

Entrainment, where fish and invertebrates are sucked up along with the sediment, is another impact for consideration. Dredgers will inadvertently entrain fish that live near the bottom, such as flat fish (flounder, plaice, dab, and sole) which are found around Ringaskiddy. Other species that may be affected include sand gobies, black gobies, dragonets, and pogge. Gadoid fish such as whiting and cod would be less affected, as they are not as closely associated with the seabed, while pelagic species which swim higher in the water column, are at lower risk of being caught up. Despite the potential for entrainment, the overall impact on fish populations is expected to be minor to moderate. This is because the species involved appear to be abundant and widespread, and much of the intertidal areas of Ringaskiddy will not be affected by the dredging. Also, many of these smaller species have short life cycles and high reproductive rates, allowing for rapid recovery.

The risk to salmon if present, is very low due to their rapid movement, low numbers and the nature of dredging operations.

Suspended solids concentrations may reach high levels near a dredging location, particularly around the Ringaskiddy basin, but these concentrations typically decline with distance due to tidal mixing. The levels predicted are not high enough to cause significant harm to fish, especially since many species are adapted to turbid environments. For example, flatfish and gobies are naturally tolerant of high suspended solids levels, as they often live in areas with fine silts and muds. Migratory species like salmon if they were to encounter high levels would pass through such an area quickly.

While the dredging may result in some entrainment of species such as juvenile flatfish, gobies, crabs, and other species, the overall impact is expected to be moderate and have short term consequences. The risk to more valuable species, like salmon, is considered minimal due to

their migration routes and the location of dredging activity. The temporary increase in suspended solids is not expected to have a significant adverse effect on fish populations, and the localised nature of the activities means they are unlikely to affect the broader ecosystem of the Ringaskiddy.

Marine Mammals: Dredging produces continuous, broadband, low frequency sound, below 1kHz, with sound pressure levels between 168dB and 186dB re 1µPa at 1m (Todd et al. 2015).

The most likely impact of the proposed dredging activities in the port will be through sound disturbance and local habitat modification. Benthic dredging activity can result in significant modification to the biological environment. Destruction of benthic communities will displace many species of invertebrates and fish and subsequently affect the food chain and impact on marine predators. The potential effects on dredging on marine mammals are:

- Physical injury or death of individuals resulting from collisions with operator vessels.
- Displacement/disturbance through noise disturbance.

Conclusion: Biotope: The subtidal *Mytilus edulis* biotopes identified by DDV (e.g., at stations, ST04, ST22, ST24) show high sensitivity to dredging activities, while infralittoral and circalittoral mixed sediments (e.g., ST18, ST19) have lower sensitivity. Biotopes with mixed sediments or certain seaweed types (e.g., ST08, ST26) show medium sensitivity. Heavy siltation (smothering) poses a significant threat to nearly all biotopes, as thick sediment layers can smother benthic organisms. While many habitats are highly sensitive to substrate removal, mixed sediments and muddy habitats can recover more easily, showing medium sensitivity.

Fish: The impact on fish populations is expected to be low to moderate, as they can move away from dredging activities, species like flatfish and gobies are adapted to turbid environments and will recover quickly due to their short life cycles and high reproductive rates. Migratory species, such as salmon, are thought to be at a very low risk due to their recorded absence at the site and their rapid movement in water.

Marine Mammals**:** Prior to mitigation, noise disturbance from the above sources has the potential to cause an adverse significant effect to species of International and National Importance through a temporary, or worst-case scenario, permanent threshold shift in marine mammal hearing. As there is no information specific to the underwater noise of the site due to the proposed construction activities to inform the mitigation process (e.g. specific sound propagation underwater of piling) all mitigation measures will be subject to DAHG (2014) guidelines which are thoroughly stated in the below mitigation sections. These mitigation measures have been supplemented by recent papers published regarding further ‘best practice’ mitigation measures for marine mammals in relation to underwater noise mitigation.

Overall, the effects are expected to be minor, temporary, and localised to the area around the proposed development, with no long-term effects on marine mammals or fish, and no significant reduction in the overall biotope area.

[15.5.2.2] Release of Pollutants

Potential effects associated with the construction activity include the accidental release of sediment, concrete and chemical pollutants to the Ringaskiddy basin waters. This may be in the form of chemical pollutants such as hydrocarbons released accidentally from machinery during the construction phase, and/or increased sedimentation in the water due to the proposed dredging and piling within the site.

Biotope: Heavy metals, hydrocarbons, and chemical runoff: Sediment biotopes can be highly sensitive to contaminants like heavy metals, oils, and other chemicals. These pollutants may also accumulate in the sediment, impacting filter feeders like *Mytilus edulis* and *Cerastoderma edule,* reducing their feeding efficiency, growth, and survival. Toxic substances can also kill or stunt the growth of seaweed.

pH: Concrete releases highly alkaline substances (such as calcium hydroxide) as it cures, which can increase the pH of surrounding waters and negatively impact on the local intertidal and subtidal biotopes.

Oxygen depletion: The release of organic pollutants (such as from sewage) could lead to increased biological oxygen demand (BOD), reducing oxygen levels in the sediment.

Sedimentation: Pollutants in fine sediments can smother kelp holdfasts and reduce light availability, critical for photosynthesis.

Habitat degradation: Increased levels of turbidity and sedimentation from construction activities can smother reef surfaces and reduce the abundance of encrusting organisms like hydroids, sponges, and bryozoans that contribute to reef complexity.

Salinity: Increased or decreased levels of freshwater will impact on local biotopes.

Nutrient enrichment: Runoff with high nutrient loads can lead to eutrophication, causing harmful algal blooms. Reducing light penetration can negatively affect photosynthetic species and alter food availability for filter and deposit feeders.

Increased turbidity: Pollutants and sediments entering these biotopes may increase turbidity reducing the feeding activity of filter feeding organisms.

Fish: Pollutants affect water quality, habitat conditions, and the health of aquatic species, leading to a range of potential adverse effects.

pH: Elevated pH levels from concrete curing can be harmful to fish, particularly at the larval and juvenile stages, as it affects their gill function, osmoregulation, and metabolic processes.

Heavy Metals: Are toxic to fish at low concentrations. They can also bioaccumulate in fish tissues, particularly in species like flatfish and demersal species that live near or in the sediment, where heavy metals tend to settle. Chronic exposure impairs reproductive success, disrupt endocrine functions, and cause neurological damage. Also, predatory fish that feed on contaminated prey can experience even greater accumulation of heavy metals, affecting higher trophic levels.

Hydrocarbons: Can enter the marine environment through spills, leaks from equipment/ machinery, or runoff from the construction sites. These compounds are harmful to fish larvae, which are highly sensitive to contaminants. Additionally, exposure to polycyclic aromatic hydrocarbons (PAHs) can cause health problems in fish, including liver damage, impaired reproduction, and developmental abnormalities.

The cumulative impact of pollutants can combine to degrade water quality and disrupt the habitat that indigenous fish populations rely on.

Marine Mammals: Prior to mitigation, this has the potential to have a minor, temporary adverse significant impact on marine mammals of International and National importance through

disturbance and displacement. The proposed mitigation ensures there is no residual adverse effect of this potential impact.

Conclusion:

The accidental release of sediment, concrete, and chemical pollutants such as hydrocarbons, which could affect water quality, biotopes, fish, and marine mammals. Impacts might include oxygen depletion, habitat degradation, and pH changes. However, with proper mitigation measures in place, these effects are expected to not occur and will therefore have no long-term impacts.

[15.5.3] Operation Phase

Ringaskiddy East operates in three primary modes: Lift-On Lift-Off (LOLO) operations, involving the use of gantry cranes to load and unload containers, which are then stacked up to five units high (CCT 1 is already operational). General Cargo Operations, where break-bulk and project cargoes are handled using mobile cranes and stored in open areas, with materials stacked up to 5.5m high; and Roll-On Roll-Off (RORO) operations, utilising a ramp for direct freight access to vessels, with unaccompanied freight stored and accompanied freight driving directly onto public roads. Paddy's Point Amenity Area has been completed, providing a public pier, slipway, and landscaped areas.

Minimal maintenance is expected for quays and revetments, with any siltation addressed by the Port of Cork's regular dredging programme. Pollution control measures include a drainage system with interceptors and managed sewage disposal, while waste from berthed vessels will be handled through the Port's Environmental Management System. Operational management will ensure periodic maintenance dredging and pollution control in line with Port of Cork's strategy.

[15.5.3.1] Disturbance

Marine Mammals: The operational phase of the proposed development will include an increase in vessels within the Ringaskiddy basin, an increase in the traffic and personnel on the surrounding coastal roads, and an overall increase in the container terminal in terms of personnel and cargo. However, due to the present high activity levels of the port and container terminal, and the large volume of vessel traffic within the Ringaskiddy basin, it is unlikely to have any significant effect on marine mammals in the area as the species are likely habituated to this high level of activity. As a result, this impact is assessed as not significant and does not require further mitigation.

[15.5.3.2] Maintenance dredging

Marine Mammals: Maintenance dredging is undertaken at present in the Ringaskiddy basin as part of the Port of Corks ongoing maintenance dredging licence. Prior to mitigation, this has the potential to cause a minor, local, adverse significant effect to marine mammals of International and National Importance through temporary displacement, and noise disturbance at the site. A full suite of mitigation measures following best practice guidelines is recommended below.

Cork Harbour is a bustling area for maritime activities, including commercial cargo, tourist cruise ships, commercial and recreational fisheries, pleasure vessels, and Ireland's national naval base. Therefore, the operational impacts of Ringaskiddy are expected to be minor and

temporary for marine mammals and fish. Similarly, maintenance dredging will have very localised, short-term effects on the surrounding biotopes.

Conclusion:

Greater Cork Harbour is a active area for maritime activities, including commercial cargo, tourist cruise ships, commercial and recreational fisheries, pleasure vessels, and Ireland's national naval base. Therefore, the operational impacts of Ringaskiddy are expected to be minor and temporary for marine mammals and fish. Similarly, maintenance dredging will have very localised, short-term effects on the surrounding biotopes.

[15.6] Mitigation Measures

[15.6.1] Construction Phase

The following measures will be used to ensure to no significant residual effects on fish and any marine mammal species previously identified in this section as utilising the waters surrounding the proposed development:

[15.6.1.1] Underwater Noise Mitigation

Fish: Mitigation following a series of equipment soft starts as followed for marine mammals will help allow fish to react and move away from the sound source before it is on at full power.

Marine Mammals: Underwater noise mitigation has been provided following current legislation and best practice guidelines from:

- DAHG (2014)- Guidance to Manage the Risk of Marine Mammals from Man-made Sources in Irish Waters.
- ACCOBAMS (2022)- Guidance on Underwater Noise Mitigation Measures.

15.6.1.1.1 Pile Driving

Marine Mammals:

- **ME_01** Two Marine Mammal Observers (MMO's) will be appointed to monitor for marine mammals and to log all relevant events using a standardised data form (Locations 1&2 on Figure 15.15). Two Marine Mammal Observers is recommended instead of the mandatory one (as per DAHG 2014 guidelines), to ensure a complete 180-degree arc view of the study area, and to ensure any marine mammal which may enter the 1000m-radius exclusion zone are spotted.

Pre-Start monitoring

- **ME_02** Pile driving activities shall only commence in daylight hours where effective visual monitoring can be achieved. Where effective visual monitoring, as determined by the MMO, is not possible the sound-producing activities shall be postponed until effective visual monitoring is possible.
- **ME 03** An agreed and clear on-site communication signal must be used between the MMO and the Works Superintendent as to whether the relevant activity may or may not

proceed, or resume following a break (see below). It shall only proceed on positive confirmation from the MMO.

- **ME_04** Due to the proximity of a harbour seal haul-out site to the proposed works area, an Acoustic Mitigation Device (AMD) will be used prior to the soft-start procedure. This device will be an Acoustic Deterrent Device (ADD), which will transmit loud (170-200dB), mid-frequency sound from the site to the surrounding waters. This will deter the seals of the area away from the vicinity of the works area, as the seals will find the frequency and volume of the sound aversive. The ADD will be activated for 30 minutes prior to the Soft-start procedure.

- **ME_05** The MMO shall conduct a pre-start-up constant effort monitoring at least 30 minutes before the sound producing activity is due to commence until at least 30 minutes have elapsed with no marine mammals detected within the Monitored Zone by an MMO.

- **ME_06** This prescribed Pre-Start Monitoring shall subsequently be followed by an appropriate Ramp-Up Procedure which should include continued monitoring by the MMO's.

Ramp Up Procedure

- **ME_07** As the potential noise levels underwater from the proposed piling activity at this site is unknown, on a precautionary basis, an appropriate Ramp-Up procedure (soft-start) must be used.

- **ME_08** Where it is possible according to the operational parameters of the equipment and materials concerned, the underwater acoustic energy output shall commence from a lower energy start-up (i.e., a peak sound pressure level not exceeding 170 dB re: 1µPa @1m) and thereafter be allowed to gradually build up to the necessary maximum output over a period of 20-40 minutes.

- **ME_09** This controlled build-up of acoustic energy output shall occur in consistent stages to provide a steady and gradual increase over the ramp-up period.

- **ME_10** In all cases where a Ramp-Up procedure is employed the delay between the end of ramp-up and the necessary full output must be minimised to prevent unnecessary high-level sound introduction into the environment.

- **ME_11** As recommended by ACCOBAMS (2022), a suitable qualified Passive Acoustic Monitoring (PAM) technician should be employed for the duration of the pile driving works, if the work is to be carried out during a time of year where weather conditions are likely unfavourable for MMO visibility (i.e. November to January) or if the pile driving work is to occur at nighttime. This is in addition to the two recommended Marine Mammal Observers, to serve as an additional form of mitigation. While PAM will not detect pinnipeds, as cetaceans have been recorded in the project area (as noted during the desk study carried out for this assessment), it is highly recommended.

- **ME_12** If there is a break in pile driving sound output for a period greater than 30 minutes (e.g. due to equipment failure, shut down or location change) then all Pre-Start Monitoring and a subsequent Ramp-up procedure (where appropriate following Pre-start Monitoring) must be undertaken.

15.6.1.1.2 Blasting

Marine Mammals:

- **ME_13** Only the minimum quantities of explosives to achieve the desired result must be used. While the duration of individual blasting events must also be minimised, a series of smaller explosions should be undertaken rather than fewer larger explosions.

- **ME_14** Two Marine Mammal Observers (MMO's) will be appointed to monitor for marine mammals and to log all relevant events using a standardised data form (Locations 1&2 on Figure 15.15). Two Marine Mammal Observers is recommended instead of the mandatory one (as per DAHG 2014 guidelines), to ensure a complete 180-degree arc view of the study area, and to ensure any marine mammal which may enter the 1000m-radius exclusion zone are spotted.

- **ME_15** Where possible, blasting events must be scheduled to occur early in the daytime to allow a buffer for delays caused by marine mammal presence within the immediate area of operations.

- **ME_16** Where possible, individual explosive charges should be placed within a borehole drilled into the substratum or an excavated depression and covered or packed with stemming material (e.g., loose gravels, clean angular crushed rock and/or overburden).

- **ME_17** Blasting activity shall not commence if marine mammals are detected within a 1,000m radial distance of the sound source, i.e., within the Monitored Zone. Pre-Start Monitoring

Pre-Start Monitoring

- **ME_18** Blasting activities shall only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, has been achieved. Where effective visual monitoring, as determined by the MMO, is not possible the sound-producing activities shall be postponed until effective visual monitoring is possible.

- **ME_19** An agreed and clear on-site communication signal must be used between the MMO and the Works Superintendent as to whether the relevant activity may or may not proceed. It shall only proceed on positive confirmation with the MMO.

- **ME_20** The MMO shall conduct pre-start-up constant effort monitoring at least 30 minutes before the sound-producing activity is due to commence. Sound-producing activity shall not commence until at least 30 minutes have elapsed with no marine mammals detected within the Monitored Zone by the MMO.

- **ME_21** The prescribed Pre-Start Monitoring shall subsequently be followed by a pre-arranged RampUp Procedure wherever possible. There should include continued monitoring by the MMO.

Ramp-Up Procedure

- **ME_22** The use of a clear Ramp-Up Procedure must be considered; for example, whereby charges of smaller mass are detonated first in a progressive series of blasts aimed at reducing the acoustic/environmental impact caused by individual high energy pulse sounds, and allowing animal avoidance, surfacing or other potential safeguarding behaviour of marine mammals to occur.

- **ME_23** Sequential detonations within an overall blast cycle should employ a short inter-charge time delay (of milliseconds in duration) in order to minimise the cumulative effect of separate individual blast pulses.

- **ME_24** In all cases where a Ramp-Up Procedure is employed the delay between the end of ramp-up and the necessary full output must be minimised.

- **ME_25** Any proposed Ramp-Up Procedure should be informed by the risk assessment undertaken giving due consideration to all technical and operational specifications, the size/weight and scale of the intended detonation(s), the receiving substrate, the duration of the blasting activity, the receiving environment and species therein, and other information (see section 3).

- **ME_26** Full reporting on MMO operations and mitigation undertaken must be provided to the Regulatory Authority as outlined in Appendix 7.

15.6.1.1.3 Drilling

Marine Mammals:

The measures outlined below should be considered applicable in relation to (i) conventional coastal and marine drilling operations

ME_27 A qualified and experienced marine mammal observer (MMO) shall be appointed to monitor for marine mammals and to log all relevant events using standardised data forms.

- **ME_28** Unless information specific to the location and/or plan/project is otherwise available to inform the mitigation process (e.g., specific sound propagation and/or attenuation data) and a distance modification has been agreed with the Regulatory Authority, drilling activity shall not commence if marine mammals are detected within a 500m radial distance of the drilling sound source, i.e., within the Monitored Zone.

Pre-Start Monitoring

- **ME_29** Drilling activities shall only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, has been achieved. Where effective visual monitoring, as determined by the MMO, is not possible the sound-producing activities shall be postponed until effective visual monitoring is possible.

- **ME_30** An agreed and clear on-site communication signal must be used between the MMO and the Works Superintendent as to whether the relevant activity may or may not proceed, or resume following a break (see below). It shall only proceed on positive confirmation with the MMO.

- **ME_31** In waters up to 200m deep, the MMO shall conduct pre-start-up constant effort monitoring at least 30 minutes before the sound-producing activity is due to commence.

Sound-producing activity shall not commence until at least 30 minutes have elapsed with no marine mammals detected within the Monitored Zone by the MMO.

- **ME_32** Where operations occur in waters greater than 200m depth (i.e., >200m), pre-start-up monitoring shall be conducted at least 60 minutes before the sound-producing activity is due to commence. Sound-producing activity shall not commence until at least 60 minutes have elapsed with no marine mammals detected within the Monitored Zone by the MMO.

- **ME_33** This prescribed Pre-Start Monitoring shall subsequently be followed immediately by normal drilling operations. The delay between the end of Pre-Start Monitoring and the necessary full drilling output must be minimised.

Drilling operations

- **ME_34** Once normal drilling operations commence, there is no requirement to halt or discontinue the activity at night-time, nor if weather or visibility conditions deteriorate nor if marine mammals occur within a 500m radial distance of the sound source, i.e., within the Monitored Zone.

- **ME_35** If there is a break in drilling sound output for a period greater than 30 minutes (e.g., due to equipment failure, shut-down or location change) then all Pre-Start Monitoring must be undertaken in accordance with the above conditions prior to the recommencement of drilling activity.

15.6.1.1.4 Dredging

To minimise impacts of dredging, techniques for selective dredging should be adopted. The techniques used should also minimise turbidity generated by dredging.

Biotopes and Fish: To minimise the impacts of dredging on sensitive biotopes, the following mitigation measures should be adopted particularly for the *Mytilus edulis* biotopes identified by DDV (e.g., stations, ST04, ST22, ST24) show high sensitivity to dredging activities:

ME_36 Siltation Control/ dredger type: Use methodologies of dredging that reduce the spread of sediment. Silt curtains or other barriers to limit the drift of suspended sediments during dredging.

ME_37 Minimised Dredging Footprint: Employ techniques that limit the footprint of dredging operations, such as progressive or targeted dredging, to avoid habitat loss.

ME_38 Habitat Restoration: Where feasible, restore affected habitats post-dredging by reintroducing species, such as reseeding mussel beds or transplanting seaweed species.

Marine Mammals: Dredging works will be carried out to -13.0m CD adjacent to the new quay structures to provide sufficient water depths for vessels at all stages of the tide.

- **ME_39** Two Marine Mammal Observers (MMO's) will be appointed to monitor for marine mammals and to log all relevant events using a standardised data form (Locations 3&4 on Figure 15.15). Two Marine Mammal Observers is recommended instead of the mandatory one (as per DAHG 2014 guidelines), to ensure a complete

180-degree arc view of the study area, and to ensure any marine mammal which may enter the 500m-radius exclusion zone are spotted.

Pre-Start Monitoring

- **ME_40** Dredging activities shall only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO's, has been achieved. Where effective visual monitoring, as determined by the MMO's, is not possible the sound-producing activities shall be postponed until effective visual monitoring is possible.

- **ME_41** An agreed and clear on-site communication signal must be used between the MMO's and the Works Superintendent as to whether the relevant activity may or may not proceed, or resume following a break. It shall only proceed on positive confirmation with the MMO's.

- **ME_42** Due to the proximity of a harbour seal haul-out site to the proposed works area, an Acoustic Mitigation Device (AMD) will be used prior to the soft-start procedure. This device will be an Acoustic Deterrent Device (ADD), which will transmit loud (170-200dB), mid-frequency sound from the site to the surrounding waters. This will deter the seals of the area away from the vicinity of the works area, as the seals will find the frequency and volume of the sound aversive. The ADD will be activated for 30 minutes prior to the Soft-start procedure.

- **ME_43** The MMO's shall conduct pre-start-up constant effort monitoring at least 30 minutes before the sound-producing activity is due to commence. Sound-producing activity shall not commence until at least 30 minutes have elapsed with no marine mammals detected within the monitored zone by the MMO's.

- **ME_44** This prescribed pre-start monitoring shall subsequently be followed immediately by normal dredging operations. The delay between the end of Pre-Start monitoring and the necessary dredging output must be minimised.

- **ME_45** If there is a break in dredging sound output for a period greater than 30 minutes (e.g. due to equipment failure, shut-down or location change) then all pre-Start Monitoring must be undertaken in accordance with the above conditions prior to the recommencement of dredging activity.

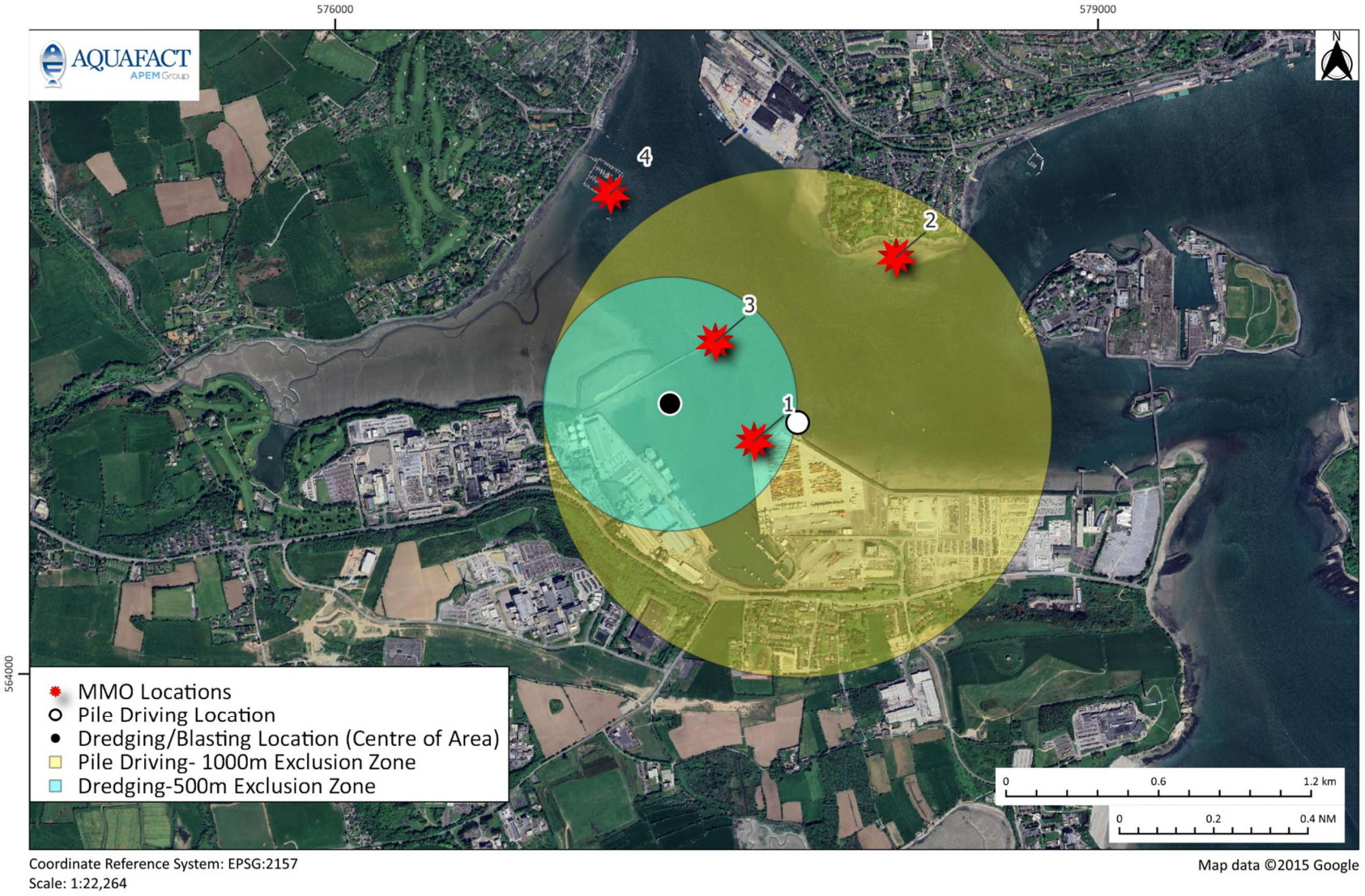


Figure 15.15- Marine Mammal Observer (MMO) locations and associated exclusion zones per noise producing activity.

[15.6.1.2] Mitigation for the Potential Release of Pollutants

The construction phase of the proposed development has the potential to release pollutants into the waters of Ringaskiddy basin through potential runoff of contaminants. Pollutants released during pier construction can have a wide range of negative effects on marine biotopes, fish and marine mammals. These impacts include habitat degradation, oxygen depletion, bioaccumulation of toxins, and disruption of ecological processes, with certain biotopes showing varying degrees of sensitivity. Mitigating measures such as silt screens, pollutant containment, and careful monitoring can reduce these risks to marine ecosystems.

The following best practice measures will be incorporated into the proposed development to ensure that the waters in Ringaskiddy basin are not polluted and as a result, there is no adverse effect on marine mammals within the area.

Site set up

- **ME_46** Prior to the beginning of works, all works areas will be clearly marked out using marking tape or temporary fencing and no works will be undertaken outside of these areas.

- **ME_47** The site compound will be located within a set works area and will be clearly fenced off.

Pollution Prevention

- **ME_48** All hazardous materials will be stored and handled in bunded areas located at least 50m from the water.

- **ME_49** To avoid site runoff of contaminated materials and/or debris, site clearance will not be undertaken during wet conditions, when rainfall of more than 0.5mm/hour is forecast within the next 24 hours.

- **ME_50** Refuelling of construction equipment will not be undertaken within 50m of the water.

- **ME_51** No overflow of the dredger will be permitted during dredging.

[15.6.2] Operation Phase

Ringaskiddy East operates in three primary modes (CCT1`is already operational): Lift-On Lift-Off (LOLO) operations, involving the use of gantry cranes to load and unload containers, which are then stacked up to five units high; General Cargo Operations, where break-bulk and project cargoes are handled using mobile cranes and stored in open areas, with materials stacked up to 5.5m high; and Roll-On Roll-Off (RORO) operations, utilising a ramp for direct freight access to vessels, with unaccompanied freight stored and accompanied freight driving directly onto public roads. Paddy’s Point Amenity Area has been completed, providing a public pier, slipway, and landscaped areas.

Minimal maintenance is expected for quays and revetments, with any siltation addressed by the Port of Cork's regular dredging programme. Pollution control measures include a drainage system with interceptors and managed sewage disposal, while waste from berthed vessels will be handled through the Port’s Environmental Management System. Operational management

will ensure periodic maintenance dredging and pollution control in line with Port of Cork's strategy.

[15.6.2.1] Maintenance Dredging

Biotopes and Fish: To minimise the impacts of dredging on sensitive biotopes, the following mitigation measures should be considered for maintenance dredging:

ME_52 Scheduling: Conduct dredging operations during periods when biotopes are less sensitive, such as outside of breeding or spawning seasons.

ME_53 Siltation Control/ dredger type: Use methodologies of dredging that reduce the spread of sediment. Silt curtains or other barriers to limit the drift of suspended sediments during dredging.

ME_54 Minimised Dredging Footprint: Employ techniques that limit the footprint of dredging operations, such as progressive or targeted dredging, in order to avoid habitat loss.

ME_55 Habitat Restoration: Where feasible, restore affected habitats post-dredging by reintroducing species, such as reseeding mussel beds or transplanting seaweed species.

Marine Mammals: All maintenance dredging which may be required will be carried out as part of the Port of Cork's regular maintenance dredging programme. The material generated will likely be disposed of at sea at a licensed disposal site as agreed in accordance with Port of Cork's maintenance dredging licence.

ME_56 The conditions of the maintenance dredging licence will be adhered to with regard to marine mammals during the operational phase. Additionally, all mitigation prescribed for dredging during the construction period of this development, should be replicated for the maintenance dredging of the site.

[15.7] Monitoring

[15.7.1] Construction Phase

Biotopes and Fish: Physicochemical monitoring using multiparameter sondes inside and outside of the Ringaskiddy basin at strategic locations would be helpful to assess potential impacts on water quality. Key parameters to monitor include temperature, conductivity (salinity), pH, turbidity, and dissolved oxygen levels, as these factors can be affected by construction activities such as dredging or pollutant release.

Regular measurements of turbidity can detect increased sediment suspension, while monitoring oxygen levels helps assess the health of the aquatic environment for species sensitive to hypoxia.

Salinity and pH levels should also be tracked to identify any deviations from natural freshwater inputs. Additionally, using a chlorophyll sensor could provide valuable data on changes in nutrient inputs by detecting algal blooms, which may indicate nutrient enrichment from runoff or construction activities.

Continuous monitoring of these indicators will help ensure early detection of environmental changes and guide mitigation measures.

Marine Mammals: No additional monitoring.

[15.7.2] Operation Phase

Biotopes and Fish: No additional monitoring.

Marine Mammals: No additional monitoring.

[15.8] Residual Effects

After the construction phase is complete, some habitat loss will occur where new structures have been built or areas impacted by other activities. But over time, the areas directly impacted by the activities will undergo a natural recolonisation through a succession process.

[15.8.1] Construction Phase

Biotopes: Some loss of biotope area due to new construction area.

Fish: There will probably be a temporary adverse effect due to the displacement of fish from the site during construction activities, such dredging and piling. However, the fish are expected to return once the activities cease, given their high level of habituation to the existing high levels of activity in the area.

Marine Mammals: Following the incorporation of the above mitigation, there will be no long term significant adverse residual effect on marine mammals from the construction phase of the development. There will be a temporary, slight residual adverse effect in terms of temporary displacement from the site during construction activities (e.g. piling) however, the marine mammals are expected to return to the site following cessation of the activities due to the high degree of habituation to the present levels of high activity at the site. As such, there is no lasting significant adverse residual effect on marine mammals at this site.

[15.8.2] Operation Phase

Fish: There will be a temporary, minor adverse effect due to the displacement of fish from the site during maintenance dredging. However, fish are expected to return once the activities cease, given their high level of habituation to the existing area.

Marine Mammals: Following the incorporation of the above mitigation, there will be no significant adverse residual effect on marine mammals within the proposed development area. The marine mammals present in the vicinity of the proposed development site are habituated top the high levels of activity within the site, and there it is not predicted the operational phase of this development will be significant on individual or population level for marine mammal species.

[15.9] Potential Interactions & Cumulative Impacts

The cumulative impacts of the Proposed Development and other nearby approved projects are discussed below. A planning search covering granted and pending applications within the vicinity of the Proposed Development site is provided below. Smaller applications, such as those for extensions or alterations to existing dwellings, have been excluded from the cumulative assessment due to their limited scale. Consequently, only projects of sufficient size and scale with the potential for cumulative effects alongside the Proposed Development are included in this assessment.

Summary of Schemes Considered in Cumulative Impact Assessment

Proposed Developments:

- FS007126 Port of Cork - Maintenance Dredging- Maintenance dredging to facilitate the maintenance of the port berth, basins and approach channels into Port of Cork 320459: Monkstown Marina Company Limited (Applicant) - 10 year permission to construct rock armour and reclamation of foreshore. Construction of marina building, gym, bird hide, electrical vessel recharging facility and associated site works. A Natura Impact Statement will be submitted to the planning authority with the application (decision 12/2024).
- 315058 Whitegate Plant Hire Limited (Applicant) - Construction of 31 dwellings and associated site works.
- Permission for the construction of a grain storage and distribution facility and all ancillary site works. The proposed development consists of a grain storage building and grain handling storage building with associated headhouse structure. The proposed development also includes the provision of 2 no. weighbridges and ancillary weighbridge office building, ESB substation, the provision of rooftop PV panels, perimeter fencing and the additional port operational use of the existing jetty to facilitate cargo vessels. A Natura Impact Statement (NIS) has been prepared and will be submitted to the planning authority with the application (Awaiting FI Response).
- 315622- Passage Railway Greenway Improvement Scheme, Phase II Mahon to Passage West, and all associated works. Phase II of the Greenway route commences on the northern side of the N40 near Bessborough, crosses the N40 Cork South Ring Road and the Douglas Estuary via bridges, traverses Harty's Quay and the R610 Rochestown Road, passes Hop Island and terminates at the Cork City boundary to the west of Passage West. The proposed development also includes improvement works to pedestrian / cycle tracks that extend from the northern section of the Greenway towards Mahon Industrial Estate and Mahon Interchange.
- Planning Application: 236365 Type: Permission
  Status: Application Finalised
  Decision Due Date: 29/01/2024
  Development Description: Relocation and erection of a small micro generation wind turbine at the Beaufort Building (University College Cork), including construction of a concrete foundation and metal lattice tower with a turbine height of 19.1m. The turbine will provide power for educational purposes and associated site works such as fencing and utility connections.
  Address: Beaufort Building - Environmental Research, UCC, Haulbowline Road, Ringaskiddy, Co. Cork
  Decision: Conditional
- Planning Application: 235147
  Type: Permission
  Status: Appealed
  Decision Due Date: 08/07/2024
  Development Description: 10-year planning for the construction of rock armour revetment protection and foreshore reclamation at Cork Harbour Marina, Monkstown. It includes a two-storey marina building (with public restaurant/café, offices, convenience store, etc.), a single-storey gym and rowing facility, a bird hide, floating electrical and refuelling facilities, associated works such as demolishing parts of the

seawall, car and bike parking, and landscaping. A Natura Impact Statement will accompany the application.
Address: Lands adjacent to Cork Harbour Marina, Strand Road, Monkstown, Co. Cork
Decision: Refused

- Planning Application: 195607
  Type: Extension of Duration
  Status: Application Finalised
  Decision Due Date: 14/08/2019
  Development Description: Extension of permission for two waste facilities: a metal recycling facility (processing 45,000 tonnes per year) and a recovered waste storage facility (accepting up to 45,000 tonnes per year of recyclable materials). Ancillary works include a weighbridge, hardstand resurfacing, and installation of a hydrocarbon interceptor. An Environmental Impact Statement has been prepared.
  Address: Cork Dockyard, Rushbrooke, Ringacoltig, Cobh, Co. Cork
  Decision: Extension granted under An Bord Pleanála Ref PL53.240794
- Planning Application: 225173
  Type: Permission
  Status: Application Finalised
  Decision Due Date: 20/01/2023
  Development Description: Construction of a containment basin and pipework with associated platforms at Whitegate Refinery, Midleton. The proposal includes modifications to an establishment regulated by the Major Accident Directive and will require an Integrated Pollution Control Licence.
  Address: Whitegate Refinery, Corkbeg, Whitegate, Midleton, Co. Cork
  Decision: Conditional

The above projects have been proposed, or granted, within the last 5 years and were identified as having potential to have an adverse, significant impact in combination with the proposed project due to their potential to increase sedimentation and/or noise disturbance in the waters of Ringaskiddy. However, following a review, where available, of the associated documentation of the above projects, and the proposed mitigation involved in each, it can be concluded there will be no adverse, significant effect on marine ecology within the Ringaskiddy area, in combination with the proposed project.

[15.9.1] Construction Phase

No adverse cumulative impacts at Ringaskiddy.

[15.9.2] Operation Phase

No adverse cumulative impacts at Ringaskiddy.

[15.10] Summary

Under the EU's Environmental Impact Assessment (EIA) Directive (2011/92/EU as amended by 2014/52/EU), major building or development projects in the EU must first be assessed for their impact on the environment.

This Environmental Impact Assessment Report (EIAR) chapter is informed by desk studies and field surveys of marine habitats and species. The 2024 marine surveys provide an update on the information collected for an Environmental Impact Statement (EIS) produced by RPS in 2014, which was carried out prior to the start of construction, which formed part of the biological and environmental assessments. This current chapter follows the Environmental Protection Agency's Guidelines for Environmental Impact Assessment Reports (EPA, 2022).

Environmental and waste control systems will be in place during both construction and operations. Minimal maintenance is expected, with dredging integrated into the Port's regular schedule. Pollution control includes drainage systems and waste management through the Port's Environmental Management System. No decommissioning phase is planned, as the Port is designed for long-term use.

The assessment of potential impacts on marine ecology and biodiversity for the Ringaskiddy development was carried out in three stages. 1) a desk study reviewed ecological data from various sources, including the National Parks & Wildlife Service (NPWS) and the Irish Whale and Dolphin Group (IWDG). 2) site visits and field surveys by ecologists, involving intertidal and subtidal habitat surveys, benthic grab sampling, drop-down video (DDV) footage, and beam trawl surveys for fish. Marine mammal observations were also conducted over five days. 3) The gathered data was assessed to establish the existing ecological conditions and potential pressures of the planned development on biotopes, fish and marine mammals. The report then provided recommendations for mitigation measures, ongoing environmental monitoring to track changes in benthic community structures, and management of sediment disturbance from dredging to maintain ecological balance. These efforts align with the EU's Environmental Impact Assessment (EIA) Directive to ensure the sustainability of marine habitats throughout the project.

The area of habitat loss is negligible (construction phase) and will not have any significant effects on the structure, ecological functioning. These minor effects are with a gradual recovery after construction is completed.

The potential for noise pollution is short term (construction and operational) and manageable with no long-term impact.

The risk of pollutants being discharged during the construction and operational phase is low, and the implementation of best practice measures outlined in the OCEMP will further minimise this risk. With mitigation in place, there will be no adverse impacts on designated sites overlapping the project area.

Table 15-9 provides a summary of the construction and development phase stages, aspects of the impact assessed, receptors, consideration of mitigation and significance.

Table 15-9: Summary of development stage, aspect impact assessed, receptor, mitigation and significance.

Proposed Development Stage	Aspect/ Impact Assessed	Receptor (greatest importance)	Impact Quality	Impact Significance (Prior to Mitigation)	Impact Duration and Frequency	Mitigation and Monitoring Measures (the Proposed Development design Embedded environmental controls and all mitigation and monitoring measures detailed herein are included in the OCEMP)	Significance rating (Following Mitigation)
Construction Phase **and** Operation Phase	Impact Mechanism 1 Underwater noise	Marine Mammals	Negative	**Significant**	Medium- term	Standard mitigation required to minimise the risk potential impact to marine mammal species	Not significant
Construction Phase **and** Operation Phase	Impact Mechanism 1 Underwater noise	Fish	Negative	Not Significant	Short-term	Standard mitigation required to minimise the risk potential impact to marine mammal species	Not significant
Construction Phase **and** Operation Phase	Habitat loss 2	Marine habitats	Negative	Not significant (area)	Short - Long term	Standard mitigation required to reduce the extent of the impact	Not significant
Construction Phase **and** Operation Phase	Habitat loss 2	Fish	Negative	Not significant	Short term	Standard mitigation to reduce the extent of the impact	Not significant
Construction Phase	Impact Mechanism 3 Release of pollutants during construction	Marine habitats	Negative	Significant	Short-term	Standard construction best practice mitigation measures to prevent release of sediments, chemical and pollutants during construction	Not significant
Construction Phase	Impact Mechanism 3 Release of pollutants during construction	Fish	Negative	Significant	Short-term	Standard construction best practice mitigation measures to prevent release of sediments, chemical and pollutants during construction	Not significant
Construction Phase	Impact Mechanism 3 Release of pollutants during construction	Marine Mammals	Negative	Significant	Short-term	Standard construction best practice mitigation measures to prevent release of sediments, chemical and pollutants during construction	Not significant
Operation Phase	Impact Mechanism 4 Discharge of Wastewater	Marine Mammals	Negative	Not Significant	Long-term	None	-
Operation Phase	Impact Mechanism 4 Discharge of Wastewater	Fish populations	Negative	Not Significant	Long-term	None	-

[16] Terrestrial Ecology & Ornithology

[16.1] Introduction

This chapter examines the terrestrial flora and fauna, including terrestrial habitats, higher plants, mammals, birds and the environmental protection of the receiving environment within and surrounding the proposed Ringaskiddy Port Redevelopment. Full details of the proposed redevelopment are included in Chapter 3 Project Description of the EIAR and are not repeated in this Chapter. Marine Ecology is dealt with separately in Chapter 15 of this EIAR.

The aim of this chapter is to identify the key ecological receptors within the study area, determine their ecological value, assess the potential impacts of the scheme upon them and propose mitigation to offset any identified impacts. The methods employed to establish the ecological baseline within and around the proposed development are described, together with the process followed to determine the nature conservation importance of the ecological features present.

[16.2] Legislation, Policy, and Guidance

[16.2.1] Legislation

The main legislation which provides for biodiversity and nature conservation in Ireland are the European Communities (Birds and Natural Habitats) Regulations 2011 (as amended), SI No.477 of 2011 as amended, ("the Habitats Regulations" or "the Habitats Regulations 2011 to 2021" and the Wildlife Acts 1976 (as amended) (which includes inter alia the Wildlife Act 1976, the Wildlife (Amendment) Act 2000, the Wildlife (Amendment) Act 2010, the Wildlife (Amendment) Act 2012, the Heritage Act 2018, including Part 3 thereof, the Planning, Heritage and Broadcasting (Amendment) Act 2021, including Chapter 3 thereof).

The Habitats Regulations were inter alia amended by S.I. No. 290 of 2013; S.I. No. 499 of 2013; S.I. No. 355 of 2015; Planning, Heritage and Broadcasting (Amendment) Act 2021 (no.11 of 2021), Chapter 4; S.I. No. 293 of 2021. The National Parks & Wildlife Service (the NPWS') has issued the following circulars as guidance on the implementation of the Habitats Regulations: Circular Letter NPWS 1/10; Circular Letter L8/08; Circular Letter NPWS 2/08; Circular Letter SEA 1/08 & NPWS 1/08; Circular Letter PD 2/07 & NPWS 1/07; Circular Letter NPWS 2-07 - Guidance on Compliance with Regulation 23.

The European Communities (Birds and Natural Habitats) Regulations, 2011, as amended ('the Habitats Regulations'), transpose into Irish law Directive 2009/147/EC (the 'Birds Directive') and Council Directive 92/43/EEC (the 'Habitats Directive'), which list priority habitats and species of international (European Union) conservation importance, which require protection. This protection is afforded in part through the designation of European sites – areas that represent significant occurrences of listed habitat types and populations of listed species within a European context. Areas designated for bird species are classed as Special Protection Areas (SPAs), while those designated for other protected species and/or habitats are classed as Special Areas of Conservation (SACs). Wild bird species in SPAs, and habitats and species listed on Annexes I and II (respectively) to the Habitats Directive that are contained in SACs, are legally protected. Additionally, species listed on Annex IV to the Habitats Directive are strictly protected wherever they occur – whether inside or outside the Natura 2000 network. This protection is afforded to animal and plant species by Sections 51 and 52, respectively, of the Habitats Regulations. Annex I habitats outside of SACs are still considered to be of national

and international importance and, under Section 27(4)(b) of the Habitats Regulations, public authorities have a duty to strive to avoid the pollution or deterioration of Annex I habitats and all habitats integral to the functioning of SPAs.

The Wildlife Act, 1976 (as amended) ('the Wildlife Acts'), is the principle legislative mechanism for the protection of wildlife in Ireland. A network of nationally protected Nature Reserves, which public bodies have a duty to protect, is established under the Wildlife Acts. Sites of national importance for nature conservation are afforded protection under planning policy and the Wildlife Acts. Natural Heritage Areas (NHAs) are sites that are designated under the Wildlife Acts for the protection of flora, fauna, habitats and geological features of interest. Proposed Natural Heritage Areas (pNHAs) are published sites identified as of similar conservation interest, but which have not been statutorily proposed or designated – but are nonetheless afforded some protection under planning policies and objectives.

The Wildlife Acts also protect species of conservation value from injury, disturbance and damage to individual entities or to their breeding and resting places. All species listed on the relevant Schedules to the Wildlife Acts must, therefore, constitute a material consideration in the planning process.

An additional, important piece of national legislation for the protection of wild flora, i.e. vascular plants, mosses, liverworts, lichens and stoneworts, is the Flora (Protection) Order 2015, which makes it illegal to cut, uproot or damage listed species in any way or to alter, damage or interfere in any way with their habitats.

[16.2.2] Policy

This section summaries National policy relevant to this Chapter, including national policy documents and policies and objectives in the relevant county development plans.

Ireland's National Biodiversity Action Plan (2023-2030) (Department of Culture, Heritage and the Gaeltacht, 2023), in accordance with the Convention on Biological Diversity, is a framework for the conservation and protection of Ireland's biodiversity, with an overall objective to secure the conservation, including, where possible, the enhancement and sustainable use of biological diversity in Ireland and to contribute to collective efforts for conservation of biodiversity globally. Action 1.1.3 of the National Biodiversity Strategy aspires that "all Public Authorities and private sector bodies move towards no net loss of biodiversity through strategies, planning, mitigation measures, appropriate offsetting and/or investment in Blue-Green infrastructure". This is particularly relevant to developments. The plan is implemented through legislation and statutory instruments concerned with nature conservation.

All-Ireland Pollinator Plan (2021 – 2025) (NBDC, 2021) seeks to halt the decline in pollinators through a range of objectives. This plan is supplemented by the guidance document, Pollinator Friendly Management of Transport Corridors (NBDC, 2019) and Councils: Actions to Help Pollinators (NBDC, 2016).

Cork County Development Plan (**2022 – 2028)** sets out the development strategy (policies and objectives) for the sustainable future growth of the county. The current County Development Plan 2022 was adopted in June 2022 and will remain in place until 2028.

Port of Cork Masterplan 2050 (Port of Cork, 2023) aims to move the port operations from the Cork City Docks and the Tivoli Docks in the upper harbour downstream to modern and environmentally sustainable facilities in the lower harbour. The aim of the plan is to facilitate increasing global vessel sizes; provide consolidated, efficient, and sustainable operations for our customers; and ensure the global connectivity.

Policy Statement on the facilitation of Offshore Renewable Energy by Commercial Ports in Ireland (Department of Transport 2021) recognises that Irish Ports will have an important role to play in delivering Offshore Renewable Energy targets to meet the EU's goal of climate neutrality by 2050.

[16.2.3] Guidance

The process of identifying, quantifying and evaluating potential impacts of the proposed development on habitats, species and ecosystems was undertaken in accordance with the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2019). In addition, reference to the following recognised guidance defined the scope and evaluation process:

- EPA (2022) Guidelines on the Information to be Contained in Environmental Impact Statements;
- EPA (2015) Draft Advice Notes for preparing Environmental Impact Statements;
- Marnell, F. Kelleher, C & Mullen, E. (2022). Bat Mitigation Guidelines for Ireland v2. Irish Wildlife Manuals, No. 134;
- NBDC (2019) Pollinator-friendly management of: Transport Corridors. All-Ireland Pollinator Plan, Guidelines 9. National Biodiversity Data Centre Series No. 20;
- NBDC (2021) All Ireland Pollinator Plan 2021-2025;
- TII (2006a) Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes;
- TII (2006b) Guidelines for the Treatment of Bats during the Construction of National Road Schemes;
- TII (2006c) Guidelines for the protection and preservation of trees, hedgerows and scrub prior to, during and post Construction of National Road Schemes;
- TII (2008a) Environmental Impact Assessment of National Road Schemes – A Practical Guide (Revision 1);
- TII (2008b) Ecological Survey Techniques for Protected Flora and Fauna during the Planning of National Road Schemes;
- TII (2008c) Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes;
- TII (2008d) Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes;
- TII (2009) Guidelines for Assessment of Ecological Impacts of National Road Schemes;
- TII (2020a) The Management of Invasive Alien Plant Species on National Roads – Standard; and
- TII (2020b) The Management of Invasive Alien Plant Species on National Roads – Technical Guidance.

[16.3] Methodology

[16.3.1] Desktop Study

The desk study included review of the following sources of information:

- Article 17 Reports (NPWS, 2019)
    - GIS spatial data for Article 17 Reports
- National Biodiversity Data Centre (NBDC) – 1km- and 2km-square species reports (accessed online on 20/08/2024)
- Botanical Society of the British Isles - www.bsbi.org.uk;
- Invasive Species Ireland - www.invasivespeciesireland.com;
- Bat Conservation Ireland - http://www.batconservationireland.org/;
- Chartered Institute of Ecology & Environmental Management (CIEEM) - www.cieem.net; and
- BirdWatch Ireland (BWI) - http://www.birdwatchireland.ie/.

[16.3.2] Establishing a Zone of Influence

"The 'zone of influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries." (CIEEM, 2019)

A distance of 15 km is currently recommended in the case of plans, as a potential zone of influence, however for projects, the distance could be much less than 15km, and in some cases less than 100m (DEHLG, 2009). National Parks and Wildlife Service (NPWS) guidance (NPWS, 2009) advises that this must 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. Where there is hydrological links beyond the site boundaries, particularly in the marine environment, zones of influence can be extensive and lead to effects well beyond the construction site (CIEEM, 2018). This is particularly relevant in the case of sediment and nutrient transport in marine habitats.

The key activities to be undertaken as part of the construction of the proposed development site include the following; dredging works with trailing hopper suction dredger/backhoe dredging to facilitate navigational access to Ringaskiddy West and Ringaskiddy East Berth 2, importation of fill material, piling of combi quay wall with tubular steel piles, casting of concrete *in-situ,* and stormwater management. Operational activities such as maintenance dreging of navigational area, road drainage (management of stormwater), discharge of waste and bilge from vessels, and the movement of vehicles and gantry cranes.

Given the nature and location of the proposed development and works listed above, the Zone of Influence is defined as 15km.

[16.3.3] Establishing a Study Area

A study area was established to include a 100-metre buffer zone around the proposed redevelopment area. The study would consist of both Terrestrial and Ornithological surveys (full descriptions of which are provided in the following paragraphs), with particular attention to be paid to the areas where the redevelopment works are proposed.

[16.3.4] Terrestrial Ecology Surveys

[16.3.4.1] Flora & Habitat Survey

16.3.4.1.1 Previous Surveys

The proposed redevelopment site was visited in May 2012, September 2013 and January 2014, in order to carry out a Flora and Habitat Survey. The survey methodology followed that outlined by the Heritage Council's Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2011). All terrestrial habitats i.e. above the mean high-water mark (MHWM) encountered within the survey area were mapped and an intensive search was undertaken for protected and invasive flora species. Habitat assessment categories used were consistent with those outlined in A Guide to Habitats in Ireland (Fossitt, 2000). Reference was also made to CIEEM Technical Guidance Series Guidelines for Preliminary Ecological Appraisal (CIEEM, 2013).

16.3.4.1.2 2024 Terrestrial Ecology Survey

On the 6th of August 2024 an Ayesa Ecologist conducted a general assessment of the site. The site assessment aligned with the Heritage Council's Best Practice Guidance for Habitat Survey and Mapping (Smith et al., 2011) and habitats were classified to level 3 of the Fossitt (2000) classification system. To illustrate the general habitat quality, photographs were taken using a digital camera. Grid references were recorded using a GPS handset. Site evaluation is based on the guidelines of the Chartered Institute of Ecology and Environmental Management (CIEEM 2018).

The site and immediate surroundings were inspected for invasive species, as listed in the Third Schedule of the Birds and Natural Habitats Regulations (S.I. No. 477/2011). Regulation 49 (2) states that "*any person who plants, disperses, allows or causes to disperse, spreads or otherwise causes to grow in any place any plant listed in the Third Schedule, shall be guilty of an offence*". The determination of the presence or absence of Annex I habitats was carried out in consultation with the habitat descriptions provided in the most recent Article 17 Reports (NPWS, The Status of EU Protected Habitats and Species In Ireland. Volume 1: Summary Overview., 2019). The Interpretation Manual of European Union Habitats (EUR 28, April 2013) was also consulted. In addition, the spatial GIS data for the Article 17 Reports were examined to determine the distribution of these habitats (as known to the NPWS) within the study area1. Additionally, the existing watercourse was investigated for evidence of the presence of amphibians and otters.

All surveys were completed by qualified specialists and in accordance with relevant legislation, particularly the "Guidelines for Ecological Impact Assessment in the UK and Ireland" (CIEEM, 2018) through the additional recording of specific features indicating the presence, or likely presence, of protected species or other species of nature conservation significance.

[16.3.4.2] Mammal Survey

16.3.4.2.1 Previous Surveys

A mammal fauna study was undertaken within the proposed redevelopment site in 2012 and updated in late winter 2014. The surveys aimed primarily to identify the presence and importance of the proposed development footprint to Bats, Otter (*Lutra lutra*), and Badger (*Meles meles*). In addition, the survey also gathered general observation of all other terrestrial mammal species. Marine mammals were dealt with separately in Chapter 15 – Marine Ecology (APEM) of this EIAR.

16.3.4.2.2 2024 Surveys

On the 06th of August 2024 an Ayesa Ecologist conducted a walkover mammal survey of the site. The ecologist noted features of interest during the field survey. In practice, the approach to this type of survey is one whereby certain features of interest are searched for and recorded as part of the mammal survey. Any features of interest were photographed, and their GPS location were recorded.

For non-volant Mammals – particularly otters, deer, badgers, pine martens, hedgehogs, Irish stoat, and pygmy shrews, the ecologist searched and took note of the following evidence (if observed):

- Direct sightings of mammals (live or dead);
- Burrows, setts, dens, holts, otter couches and slides;
- Prints;
- Prey/food remains;
- Faeces;
- Scratching posts at the base of tree trunks;
- Snuffle holes (small scrapes where badgers have searched for insects, earthworms, and plant tubers); and
- Trails, paths, runs.

The following guidance documents were consulted when carrying the survey:

- Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes (NRA, 2008)
- Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes (NRA, 2005)
- A Guide to Identifying Evidence of Pine Martens in Wales (Vincent Wildlife Trust, 2017)

[16.3.5] Bats

APEM Ireland were commissioned by AYESA to provide support for updated bat surveys and report for the Ringaskiddy Port Development in Ringaskiddy, Co. Cork. This report along with

the associated results can be seen in Appendix 9.7of this report. The methodology of these bat surveys carried out by APEM is outlined below.

[16.3.5.1] Desk Study

A desk-based review of habitat availability in the environs of the proposed development, and the available bat data was used to inform the scope of the bat surveys required. Collins, (2023) recommends a minimum of a 2 km radius background data search for small-scale projects, including any temporary works. For this desk study, a pre-cautionary 10 km radius was taken to cover core sustenance zones of different bat species, and any potential zone of influences exceeding the 2 km range. The desk-based study included:

- Reviewing distances from closest Natura 2000 sites designated for bats (the only bat SACs in Ireland are for lesser horseshoe bat *Rhinolophus hipposideros*).
- Examining aerial imagery and 6-inch maps to identify potential bat foraging and roosting habitats, including old buildings and caves.
- Reviewing Lundy *et al*. (2011), as display on Biodiversity Maps, which provides a high-level assessment of potential habitat suitability for Irish bat species.
- Review of Biodiversity Maps reports for the 10-km squares covering the Site [W76 and W86], including species recorded and known roosting sites (https://maps.biodiversityireland.ie/Map).

[16.3.5.2] Field Surveys

16.3.5.2.1 Potential Roost Features

An external daylight potential roost features (PRF) survey and endoscope inspection (under license) where applicable were undertaken on the 08 August 2024 to establish potential roost sites and to look for signs of roost activity such as bat presence, bat droppings and staining.

Surveyors utilised the assessment criteria described in Collins (2023), which provides guidelines for assessing potential suitability of habitat features as bat roosts and for foraging bats.

16.3.5.2.2 Emergence Survey

On 08 August 2024, one emergence survey was conducted at the Ringaskiddy Ferry Terminal (51.832355, -8.322169) which surveyed for bats with full spectrum bat detectors.

16.3.5.2.3 Transect Activity Survey

An activity survey, comprising a driven transect was conducted to provide valuable information on the usage of bats within the Site and to identify key features or areas within the Site that may be used as foraging / commuting corridors, or to locate potential roost sites if present.

On 08 August 2024, one driven transect was conducted which followed a set transect route and surveyed for bats with full spectrum bat detectors.

16.3.5.2.4 Static Detector Surveys

One static bat detector was deployed to record the types of bat species present and to provide an overview of how bat activity is broadly distributed over the site.

On 08 August 2024, one Wildlife Acoustics Song meter 4 (SM4) static detector was deployed for 12 days within the Site.

[16.3.6] Ornithological Surveys

[16.3.6.1] Breeding Bird Survey

16.3.6.1.1 Previous Surveys

A breeding bird survey was undertaken within the redevelopment footprint in 2012 and 2013. The field survey methodology employed was largely a scaled down version of the British Trust for Ornithology's (BTO) Common Bird Census (CBC) technique (Bibby et al., 2000 & Gilbert et al., 1998). A full copy of the survey report, which contains detailed survey methodologies and survey areas, is provided in Appendix 9.2 and 9.4.

All bird species encountered during survey were mapped and coded using standard BTO 'Species Codes' and 'Categories of Breeding Evidence' e.g. singing male, agitated behaviour, carrying food, recently fledged downy young. No attempts were made to locate nests as such behaviours are generally sufficient to determine probable or confirmed breeding. Survey visits commenced shortly after dawn and were completed before mid-day to coincide with the peak bird activity period. Visits were not made during adverse weather conditions, and a route was chosen to ensure all parts of the survey area were passed within c.100m

[16.3.6.2] Wintering Wetland Bird Survey

16.3.6.2.1 Previous Surveys

The intertidal and marine areas, adjacent to the proposed redevelopment footprint, were subject to a wintering wetland bird survey in 2011/12 and 2013/14. A full copy of the survey report, which contains detailed survey methodologies, survey dates and survey areas, is provided in Appendix 9.3.

The Wintering Wetland Bird Survey comprised a series of waterbird counts between the overwintering months of September to April, based on the British Trust for Ornithology's (BTO) Wetland Bird Survey (WeBS) and Irish Wetland Bird Survey (I-WeBS) methodologies (Gilbert et al., 1998).

16.3.6.2.2 2023/2024 Surveys

Flynn Furney Environmental Consultants produced the Wintering Bird Survey Report for 2023/2024 on behalf of Ayesa. The survey methodology was based on that used by the British Trust for Ornithology's (BTO) Wetland Bird Survey (WeBS) and the Irish Wetland Bird Survey (I-WeBS).

These surveys were conducted from three vantage points: Monkstown, Ringaskiddy and Rocky Island. The Wintering Bird Survey was conducted monthly from October 2023 to March 2024.

All surveys were performed by Ronan O'Driscoll.

1. High Tide Waterbird Counts were undertaken within two hours either side of high tide, to record the distribution, numbers and behaviours of waterbirds the survey area during high tide conditions; and

2. Low Tide Waterbird Counts were undertaken within two hours either side of low tide, to record the distribution, numbers and behaviours of waterbirds within the survey area during low tide conditions.

3. In May 2024, a further count area (Count Area 4) was added at Rocky Island, facing east towards Spike Island.

4. Within each count area, all waterbirds seen were recorded and dominant behaviours noted as either feeding (F) or engaged in other activity such as roosting, resting, washing or preening (R). Birds moving through the area only are indicated with (M). Note, gulls were not recorded in the Breeding Bird Survey (May-August).

5. Birds flying over were ignored unless they subsequently went onto land within the survey area.

6. Equipment used: 20-60 zoom scope, 7X42 binoculars, tripod.

A full copy of the survey report, which contains detailed survey methodologies and survey areas, is provided in Appendix 9.6.

[16.3.6.3] Breeding Season Wetland Bird Survey

16.3.6.3.1 Previous Surveys

A breeding summer season wetland bird survey was undertaken within the intertidal and marine areas adjacent to the proposed redevelopment footprint in 2011, 2012 and 2013. A full copy of the survey report, which contains detailed survey methodologies and survey areas, is provided in Appendix 9.4.

The breeding season wetland bird survey primarily aimed to identify key foraging areas for Common Terns during the respective breeding seasons. Effort was made to visually track the origin and destination of terns using count areas to ascertain their association with the Deepwater Berth (DWB) sub-colony.

The survey area was divided into a number of sub-sites to enable a fine scale assessment of bird usage. Details on the survey areas used for each survey are detailed in Appendix X. All wetland bird species were recorded during the survey, with the overall objective to establish the usage of the survey area by wetland birds during the breeding season.

16.3.6.3.2 2024 Surveys

Flynn Furney Environmental Consultants produced the Breeding Wetland Bird Survey Report for 2023/2024 on behalf of Ayesa. The survey methodology was based on that used by the British Trust for Ornithology's (BTO) Wetland Bird Survey (WeBS) and the Irish Wetland Bird Survey (I-WeBS).

These surveys were conducted from three vantage points: Monkstown, Ringaskiddy and Rocky Island. The Breeding Bird Surveys were conducted monthly May 2024 to August 2024.

All surveys were performed by Ronan O'Driscoll.

1. High Tide Waterbird Counts were undertaken within two hours either side of high tide, to record the distribution, numbers and behaviours of waterbirds the

survey area during high tide conditions; and

2. Low Tide Waterbird Counts were undertaken within two hours either side of low tide, to record the distribution, numbers and behaviours of waterbirds within the survey area during low tide conditions.

3. In May 2024, a further count area (Count Area 4) was added at Rocky Island, facing east towards Spike Island.

4. Within each count area, all waterbirds seen were recorded and dominant behaviours noted as either feeding (F) or engaged in other activity such as roosting, resting, washing or preening (R). Birds moving through the area only are indicated with (M). Note, gulls were not recorded in the Breeding Bird Survey (May-August).

5. Birds flying over were ignored unless they subsequently went onto land within the survey area.

6. Equipment used: 20-60 zoom scope, 7X42 binoculars, tripod.

[16.3.7] Assessment Methodology

The ecological evaluation and impact assessment methodology within this Chapter follows the methodology that is set out in Chapter 3 of Guidelines for Assessment of Ecological Impacts of National Roads Schemes (TII, 2009) and also using experience of 'best practice' in the ecological assessment of similar developments.

[16.3.7.1] Evaluation of Ecological Resources

The criteria used for ecological evaluation follow those set out in Section 3.3 of TII (2009). These guidelines set out the context for the determination of value on a geographic basis, with a hierarchy assigned in relation to the importance of any receptor based on the following scale:

- International Importance
- National Importance
- County Importance
- Local Importance (Higher Value)
- Local Importance (Lower Value)

The Guidelines clearly set out the criteria by which each geographic level of importance can be assigned. For example, Locally Important (Lower Value) receptors contain habitats and species that are widespread and of low ecological significance and only of importance in the local area. Conversely, Internationally Important sites are either designated for conservation as part of the Natura 2000 network (SACs or SPAs) or provide the best examples of habitats or internationally important populations of protected species.

All terrestrial flora and fauna within the Zone of Influence and Study area were assigned a level of significance on the above basis, and Key Ecological Receptors were established and classified on this basis.

[16.3.7.2] Characterisation of Ecological Impacts

The impact assessment herein uses the EPA (2002) and EPA (2003) guidelines, but also has regard to the EPA (2015) and Draft EPA (2017) Guidelines in relation to characterising the impact of the proposed development on the receiving environment. The parameters used to characterise ecological impacts are:

- Magnitude –the quantum of impact, for example the number of individuals affected by an activity;
- Extent –the area over which the impact occurs;
- Duration – the length of time for which the impact is predicted to continue, until recovery or re-instatement;
- Reversibility – whether an impact is ecologically reversible, either spontaneously or through specific action; and,
- Timing – timing and/or frequency of impacts in relation to important seasonal and/or life-cycle constraints should be evaluated. Similarly, the frequency with which activities (and associated impacts) would take place can be an important determinant of the impact on receptors.

Definitions of terms used when quantifying duration of impacts are defined below, as per EPA (2017):

- Momentary – seconds to minutes
- Brief – less than a day
- Temporary – up to 1 year
- Short-term – 1 to 7 years
- Medium-term – 7 to 15 years
- Long-term – 15 to 60 years
- Permanent – over 60 years

It is necessary to ensure that any assessment of impacts takes account of the construction and operational phases; direct, indirect and cumulative impacts; and impacts that are temporary, reversible and irreversible.

[16.3.7.3] Assessing the Significance of Effects

The significance of effects was determined following guidelines set out in Section 6.2.20 of TII (2009), whereby effects are assigned significance based on the characterization of impacts, irrespective of the value of the receptor. Significance is determined by effects on conservation status or integrity, regardless of geographical level at which these would be relevant.

Quality and Significance are the most relevant criteria for the assessment of effects on biodiversity. These criteria are defined in EPA (2017) and reproduced in Table 16.1 and Table 16.2 respectively.

Table 16-1. Criteria for assessing quality (EPA, 2017)

Quality	Criteria
Positive	A change which improves the quality of the environment (for example, by increasing species diversity; or the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).

Table 16-2. Criteria for assessing significance (EPA, 2017)

Significance	Criteria
No change	No discernible change in the ecology of the affected feature.
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences.
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.

[16.3.7.4] Mitigation, Compensation and Enhancement

The proposed development has been designed to specifically avoid, reduce and/or minimise impacts on all Key Ecological Receptors. The potential impacts of the proposed development have been considered and assessed to ensure that all impacts on Key Ecological Receptors are adequately addressed. Where potential significant impacts on Key Ecological Receptors are predicted, mitigation has been prescribed to ameliorate such impacts. Proposed best practice and mitigation measures are specifically set out in this chapter and are realistic in terms of cost and practicality. Mitigation measures follow best practice and have a high probability of success in terms of addressing the impacts on the identified Key Ecological Receptors.

The need for compensation and/or enhancement measures has also been considered. Compensatory measures are those which 'offset' significant residual (post-mitigation) impacts. Enhancement measures are those which "seek to provide net benefits for biodiversity over and above requirements for avoidance, mitigation or compensation" (CIEEM, 2019 p. 12).

[16.3.8] Difficulties Encountered/Limitations

The flora and fauna surveys detailed above in Section 16.3.5, does not aim to produce a full botanical species list or provide a full protected flora species survey, but to provide an understanding of the ecology of a site in order to:

- broadly identify the nature conservation value of a site and preliminary assess the significance of any potential impacts on habitats/flora species recorded; and/or
- confirm the need and extent of any additional specific ecological surveys that are required to identify the true nature conservation value of a site.

Seasonality is also a key issue in ecological surveys as the timing of survey may dictate whether certain flora groups are under-recorded or missed together. It is impossible to survey for all flora species in one survey visit due to the staggered nature of the life histories of different species.

[16.4] Desktop Results

[16.4.1] Designated Sites

[16.4.1.1] European

Within 15 km of the proposed development site (Table 16.3 and Figure 16.1) there is one Special Protection Areas (SPAs) and one Special Area of Conservation (SACs).

Table 16-3. Natura 2000 Sites within 15 km of the Ringaskiddy Port Redevelopment.

Type	Site Code	Site Name	County
SPA	004030	Cork Harbour SPA	Cork
SAC	001058	Great Island Channel	Cork

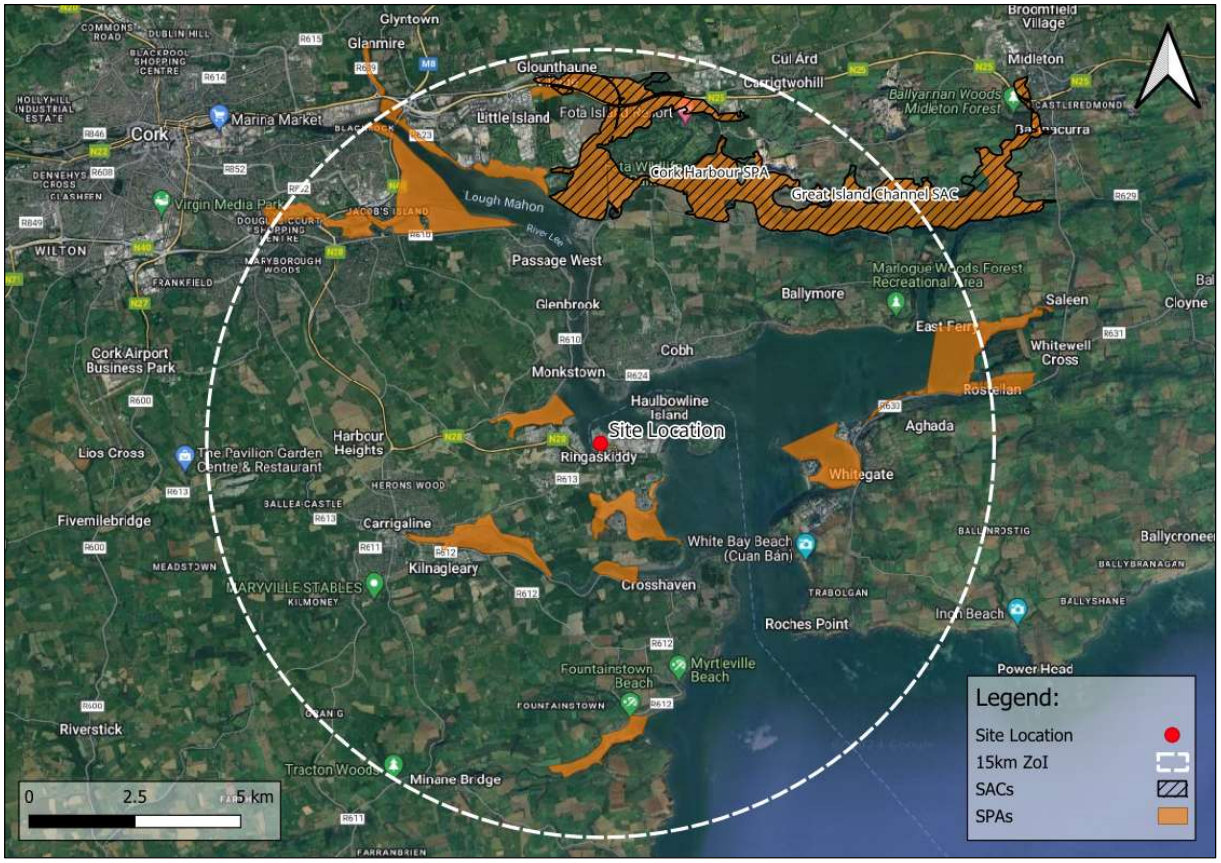


Figure 16-1. Natura 2000 Sites within 15 km of the Ringaskiddy Port Redevelopment.

Of the Natura 2000 sites within 15 km, connectivity via an aqueous pathways exist between the project scheme area and the Cork Harbour SPA and the Great Island Channel SAC

Given the above aqueous pathway between the project scheme area and the above-mentioned European sites, it has been determined that there is a possibility of significant negative effects to these SACs and SPAs via hydrocarbon and sediment transportation. These sites are considered in detail in the Natura Impact Statement that accompanies this EIAR (M1099-AY-ENV-R-00).

[16.4.1.2] National

The basic national designation for ecology is the Natural Heritage Area (NHA). This is an area considered nationally important for the habitats present or that holds species of plants and animals whose habitat needs protection. NHAs are designated under the Wildlife Act (1976) and its amendments.

There are no Natural Heritage Areas (NHA) within the proposed scheme area, nor anywhere within the 15km ZoI.

16.4.1.2.1 Non-Statutory Nature Conservation Designations

A list of proposed NHAs (pNHAs) was published on a non-statutory basis in 1995, but these sites have not since been statutorily proposed or designated. These sites are of significance for wildlife and habitats.

There are ten pNHAs, listed below (see Table 16.4 and Figure 16.2), which are within 15km of the scheme area and some of which have hydrological connection. However, the proposed works do not fall within any pNHA.

The NPWS provides a PDF portfolio document containing site synopses of pNHAs in Ireland. However, not all of the sites have information available. Site synopses were available for 001074, 001987, and0 00371 only (see Table 16.5).

Table 16-4. Proposed Natural Heritage Areas within 15 km of the Ringaskiddy Port Redevelopment.

Type	Site Code	Site Name	SAC/SPA within which the pNHA is located	County
pNHA	001082	Dunkettle Shore	Cork Harbour SPA	Cork
pNHA	001074	Rockfarm Quarry, Little Island	N/a	Cork
pNHA	001058	Great Island Channel	Cork Harbour SPA and Great Island SAC	Cork
pNHA	001987	Cuskinny Marsh	N/a	Cork
pNHA	001076	Rostellan Lough, Aghada Shore And Poulnabibe Inlet	Cork Harbour SPA	Cork
pNHA	001084	Whitegate Bay	Cork Harbour SPA	Cork
pNHA	001979	Monkstown Creek	Cork Harbour SPA	Cork
pNHA	001990	Owenboy River	Cork Harbour SPA	Cork
pNHA	000371	Fountainstown Swamp	N/a	Cork
pNHA	001966	Minane Bridge Marsh	N/a	Cork

Table 16-5. Proposed Natural Heritage Areas – Notes on their Ecological Significance

Site Code	Site Name	Notes from Site Synopsis
001074	Rockfarm Quarry, Little Island	Formerly quarried for its limestone but now consists of unimproved lowland dry grassland, amenity grassland (a golf course), scrub woodland and the exposed rock and spoil of the quarries. A considerable diversity of flora has developed with the presence of 'rarities' for the region, such as Dense-flowered Orchid and Portland Spurge.
001987	Cuskinny Marsh	Brackish lake is the dominant habitat which is of local importance as it supports considerable numbers of wildfowl. Species include Dabbling Ducks and Mute Swans.
000371	Fountainstown Swamp	Former lake or inlet of the sea has been grown over by a mixture of marsh plants and woodland, giving rise to a quaking swamp of unusual character. The site supports high numbers of birds including Mallard, Heron, Reed Bunting and Sedge Warbler.

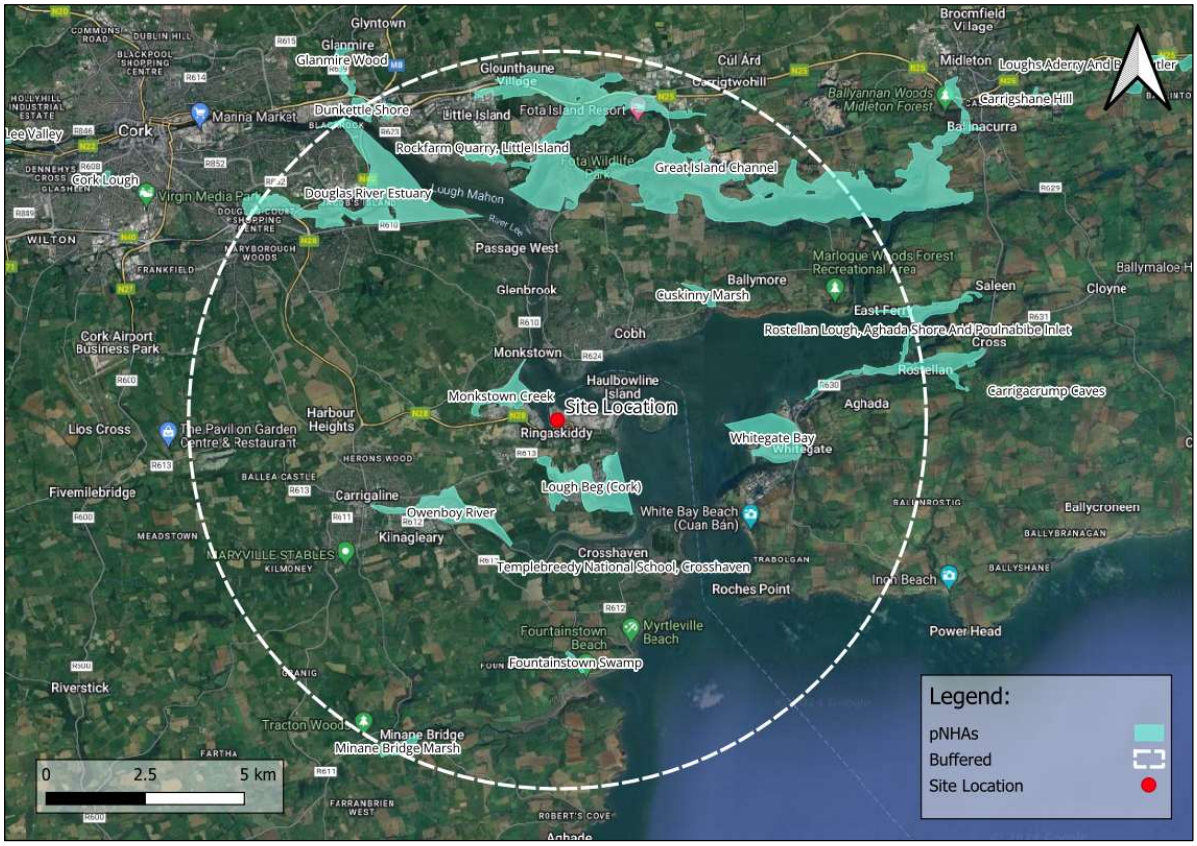


Figure 16-2. Proposed Natural Heritage Areas within 15 km of the Ringaskiddy Port Redevelopment.

16.4.1.2.2 Wildfowl Sanctuaries

Sanctuaries are areas that have been excluded from the 'Open Season Order' so that game birds can rest and feed undisturbed. Shooting of game birds is not allowed in these sanctuaries. Wildfowl sanctuaries in County Cork are listed below in Table 16.6.

Table 16-6. Wildfowl Sanctuaries in County Cork

Site Code	Location	Notes
WFS-08	Ballynamona – Shannagarry	Coastal East Cork
WFS-09	Kilcolman Bog	Ballyhoura Mountains, North Cork
WFS-10	Lough Aderry	East Cork
WFS-11	The Lee Reservoir	River Lee, Cork
WFS-12	The Lough, Cork	Cork City

[16.5] Survey Results

[16.5.1] Baseline Environment

It is noted that the proposed redevelopment works are located in and adjacent to an operational Port. The ecological baseline currently co-exists alongside the Port's operations including daily

human and shipping presence on the quayside, periodic maintenance dredging, and the amenity and commercial use of the shoreline, basin and channel.

[16.5.2] Habitats

Habitats recorded in the study area are listed in Table 16.7 below. They are listed in the order that they appear in 'A Guide to Habitats in Ireland' (Fossitt, 2000) rather than in order of abundance.

Table 16-7. Habitats recorded within the study area.

Habitat Name	Habitat Code (as per Fossitt, 2000)
Spoil and bare ground	ED2
Recolonising bare ground	ED3
Buildings and artificial surfaces	BL3
Sea walls, piers, and jetties	CC1
Scrub	WS1
Treelines	WL2

[16.5.3] Fossitt, 2000 Habitats

[16.5.3.1] Spoil and bare ground (ED2)

Numerous areas of this habitat were identified along the boundary of the port. Areas of unpaved ground containing spoil/rubble that have not yet been colonised by plants fall into this category. The areas on which they were observed within the scheme area appeared to be heavily trampled on or driven over regularly.

Figure 16-3. Spoil and bare ground (ED2) recorded onsite - 06/08/2024.

[16.5.3.2] Recolonising bare ground (ED3)

This classification was applied to any areas of bare ground; artificial surfaces of tarmac, concrete or hard core, that have been invaded or recolonised by herbaceous plants. The species assemblage comprised of the following; Gorse (*Ulex europaeus*), Spear thistle (*Cirsium vulgare*), Chamomile (*Chamaemelum nobile*), Pennyroyal (*Mentha pulegium*), Scarlet pimpernel (*Anagallis arvensis*), Broad-leaved dock (Rumex obtusifolius), Annual Meadow-grass (*Poa annua*), Yorkshire-fog (*Holcus lanatus*), Pineappleweed (*Matricaria discoidea*), and Horseweed (*Erigeron Canadensis*).

Figure 16-4. Recolonising bare ground (ED3) recorded onsite - 06/08/2024.

[16.5.3.3] Buildings and artificial surfaces (BL3)

Given the largely urban nature of the development area, this habitat dominates the landscape. All roads, terminals, buildings, shipment containers, footpaths etc. fall into this category.

Figure 16-5. Buildings and artificial surfaces (BL3) recorded onsite - 06/08/2024.

[16.5.3.4] Sea walls, piers, and jetties (CCT1)

This category is used for all coastal constructions that are partially or totally inundated by sea water at high tide, or subject to wetting by sea spray or wave splash. It includes sea walls, piers, jetties, slipways, causeways and other structures associated with ports and docks in urban or rural areas. Any other artificial structures that are exposed along the coast at low tide should also be included: coastal defences or groynes, wrecks, and pipes or pipelines (Fossitt, 2000). This classification was applied to areas of rock armour in the intertidal zone of the site boundary.

Figure 16-6. Sea walls, piers, and jetties (CC1) recorded onsite - 06/08/2024.

[16.5.3.5] Scrub (WS1)

This broad category includes areas that are dominated by at least 50% cover of shrubs, stunted trees or brambles. The canopy height is generally less than 5 m, or 4 m in the case of wetland areas. Scrub frequently develops as a precursor to woodland and is often found in inaccessible locations, or on abandoned or marginal farmland (Fossitt, 2000). A limited area of Scrub habitat was recorded running adjacent to the rock armour on the boundary of the site. Species identified included but were not limited to Gorse (*Ulex europaeus*), Broom (*Cytisus scoparius*), Alder (*Alnus glutinosa*), Butterfly-bush (*Buddleja davidii*), Sycamore (*Acer pseudoplatanus*), and Grey willow (*Salix cinerea* subsp. *cinerea*).

Figure 16-7. Scrub (WS1) recorded onsite - 06/08/2024.

[16.5.3.6] Treelines (WL1)

Considerable stretches of the development boundary fall under this habitat. The species assemblage of the Treelines on site comprised of Alder (*Alnus glutinosa*), Sycamore (*Acer pseudoplatanus*), Butterfly-bush (*Buddleja davidii*) and Grey willow (*Salix cinerea* subsp. *cinerea*).

Figure 16-8. Treelines (WL1) recorded onsite - 06/08/2024.

[16.5.4] Annex I Habitat

There were no listed Annex I habitats identified in the Ringaskiddy Port Redevelopment area.

[16.6] Flora

[16.6.1] Species of Conservation Interest

No flora species of conservation interest were observed. This includes all species listed in Schedules A and B of the Flora (Protection) Order 2015 (S.I. No. 356/2015).

[16.6.2] Invasive Species

There were no alien invasive plant species listed in the Third Schedule of the Birds and Natural Habitats Regulations 2011 (S.I. No. 477/2011) recorded in the vicinity of the project works.

Other problematic invasive and non-native native species were observed within the boundary of the proposed development works. The following plant species is not listed as Third Schedule Species but is worth noting due to their highly invasive nature. Small to moderate stands of Butterfly Bush (*Buddleja davidii*) were observed throughout the survey area, shown below in Figure 16.9.

Figure 16-9. Butterfly-Bush (Buddleja davidii) individuals recorded on site - 06/08/2024.

[16.6.3] Trees

As can be seen in the previous images above of scrub and treeline habitat, only immature trees (<20 years old) were found to be growing onsite. These trees mainly consisted of Alder (*Alnus glutinosa*) and Grey Willow (*Salix cinerea*).

[16.7] Fauna

[16.7.1] National Biodiversity Data Centre (NBDC) Records

The National Biodiversity Data Centre (NBDC) maintains a database of wildlife records across the entire country. The land area is divided into 10-km squares, which are further divided into 2-km and 1-km squares. The NBDC database was searched for records within the 1km square (W7765, W7764, W7864, and W7964) encompassing the study area (see Figure 16.10).

Figure 16-10. 1km squares (W7765, W7764, W7864, and W7964) encompassing the study area.

[16.7.2] Mammals

This section of the report provides a summary of the desk study and surveys for the following mammal species:

- Otter (*Lutra lutra*)
- Badger (*Meles meles*)
- Bats
- Other terrestrial mammals

[16.7.2.1] Otter (*Lutra lutra)*

16.7.2.1.1 National Biodiversity Data Centre (NBDC) Records

There are no records of Otter available from the NBDC for the 1km squares W7765, W7764, W7864, and W7964. Otter distribution measure based on standard otter survey technique. Current range is estimated at 93.6% (Reid et al. 2013). Otters will regularly commute across stretches of open water up to 500m e.g., between the mainland and an island; between two

islands; across an estuary (De Jongh and O'Neill, 2010). It is important that such commuting routes are not obstructed (NPWS, 2019).

16.7.2.1.2 Article 17 Spatial Dataset

Records available from the Article 17 Spatial Dataset within the 15km ZoI are shown below in Figure 16.11.

Figure 16-11. Article 17 Spatial Dataset – Otter.

16.7.2.1.3 Walkover Survey

The Ayesa ecologists did not observe any live sighting. No prints, holts, couches, or slides were recorded on site either. However, as shown below in Figure 16.12, potential otter spraint was recorded adjacent to the rock armour on the boundary of the works site.

Figure 16-12. Potential Otter Spraint pictured on site - 06/08/2024.

[16.7.2.2] Badger (*Meles meles*)

16.7.2.2.1 National Biodiversity Data Centre (NBDC) Records

There are no records of Badger available from the NBDC for the 1km squares W7765, W7764, W7864, and W7964.

16.7.2.2.2 Walkover Survey

There were no signs of badger activity or setts found on site during the walkover surveys. This is likely as many areas within and surrounding the site is not optimal for badger as the landscape connectivity is impeded. Badger habitats are generally found in areas of deciduous or mixed woodlands which are near farmland or open grounds, making good use of hedgerow systems to travel between habitats.

[16.7.2.3] Bats

16.7.2.3.1 Desk Study (NBDC Records)

A review of aerial photography and mapping of the Site found that there is limited potential for roosting and hibernating bats within a 10 km radius. High quality foraging and commuting habitat is recorded within the Site such as hedgerows, treelines, open grassland and waterbodies.

A total of 5 species of bats have been recorded within 10 km grid squares which include the following:

- Common pipistrelle (Pipistrellus pipistrellus)
- Soprano pipistrelle (*Pipistrellus pygmaeus*)
- Leisler's bat **(**Nyctalus leisleri)
- Brown long-eared bat (*Plecotus auritus*)
- Daubenton's bat (Myotis daubentoniid)

The landscape suitability index, as generated by Lundy *et al* (2011) for bat species at the Site, is detailed in the report. The highest index ratings are for soprano pipistrelles and Leisler's bats. Nathusius' pipistrelle and Lesser horseshoe bat have the lowest rating. The overall rating for all bats was 29.33 (high) out of a maximum 100.

16.7.2.3.2 Habitat and Roost Availability Assessment

The port itself is a built-up area, with small areas of green within the port. Within these green areas, it is mainly immature trees which are not suitable for roosting bats. However, south of the port there are some agricultural fields, treelines and small mixed broadleaf woodland. This particular mixed broadleaf woodland is outside the red-line boundary. The buildings present on site are of industrialised warehouses and portacabins. There were no PRFs located within these buildings. The use of strong lit floodlights at night makes for unfavourable conditions and would deter any light-sensitive bats away from these areas. There were no suitable features identified within the red-line boundary. The only tree with suitable PRF's was identified outside the redline boundary

16.7.2.3.3 Emergence Survey

An emergence survey was conducted on the 08 August 2024 at the ferry terminal. This terminal was originally classed as having "low" potential for roosting bats but changed to "negligible" once it was observed that the floodlights lit up the entire Site.

The survey started at 20:55 and ended at 22:40. Once the survey has started, the floodlights lit up the entire Site causing considerable light spill into the area. Weather conditions were favourable for bat species. There were three records of Leisler's bat passes recorded during the survey. One Leisler's bat was recorded foraging. There was one record of a Leisler's bat commuting west at approximately 30 m high. Another record was of a Leisler's bat commuting easterly at approximately 30 m in height. There were no records of bats relating to the features being targeted for the emergence survey. There were no emergences observed.

16.7.2.3.4 Transect Activity Survey

A transect activity survey was conducted after the emergence survey on the 08 August 2024. There were Leisler's bats, common pipistrelles and soprano pipistrelles recorded during the survey. Common pipistrelles were the more common species recorded, with 32 bat passes. Leisler's bat passes were identified 16 times, while there were only four bat passes from soprano pipistrelles.

16.7.2.3.5 Static Bat Detector Surveys

A song meter SM4BAT-FS bat detector was deployed on the 08 August 2024 for 12 nights.

Weather data for the deployment period has been extracted from Roches Point public weather station (met.ie, 2024). Collins (2023) recommends surveys to be carried out during optimum weather conditions (sunset temperature of 10°C or above, without heavy rain or strong winds). Weather conditions should be checked regularly, including temperature, rainfall and windspeed.

Leisler's bats, soprano pipistrelles and common pipistrelles were recorded. There was a total of 2,122 bat passes identified during the 12-night deployment. Soprano pipistrelles had the majority of passes accounting for 1,141 of the bat passes recorded. Leisler's bats accounted for 756 of these passes, while common pipistrelles had 223 passes recorded by this detector. There were also two *Pipistrellus* passes recorded.

[16.7.2.1] Other Terrestrial Mammals

There are no records of the following mammal species within the 1 km square W7765, W7764, W7864, and W7964: West European Hedgehog (*Erinaceus europaeus*), Pine Marten (*Martes martes*), Pygmy Shrew (*Sorex minutus*), Red Squirrel (*Sciurus vulgaris*), Red Fox (*Vulpes vulpes*).

There is one record of Irish Stoat (*Mustela erminea* subsp. *hibernica*) available from the NBDC for the 1km square W7964. Seen below in Table

Table 16-8. Terrestrial Mammal Species recorded in the 1 km square W7964.

Species Name	Record Count	Date of Last Record	Designation
Irish Stoat (*Mustela erminea* subsp. *hibernica*)	1	02/03/2011	Protected Species: Wildlife Acts

[16.7.3] Birds

[16.7.3.1] Desk Study (NBDC Data)

Records available from the NBDC within the 1km squares W7764, W7864, and W7964 are shown in the Tables below. There were no bird records available within the 1km grid square W7765.

Table 16-9. Bird Species recorded in the 1 km square W7764.

Species Name	Record Count	Date of Last Record	Designation
Common Starling (*Sturnus vulgaris*)	1	05/05/2012	Protected Species: Wildlife Acts Birds of Conservation Concern - Amber List
Common Tern (*Sterna hirundo*)	1	05/05/2012	Protected Species: Wildlife Acts EU Birds Directive: Annex I Birds of Conservation Concern - Amber List
Northern Gannet (*Morus bassanus*)	1	05/08/1994	Protected Species: Wildlife Acts

			Birds of Conservation Concern - Amber List
Rook (*Corvus frugilegus*)	1	05/08/1994	Protected Species: Wildlife Acts
Sandwich Tern (*Sterna sandvicensis*)	1	05/05/2012	Protected Species: Wildlife Acts EU Birds Directive: Annex I Birds of Conservation Concern - Amber List

Table 16-10. Bird Species recorded in the 1 km square W7864.

Species Name	Record Count	Date of Last Record	Designation
Glossy Ibis (*Plegadis falcinellus*)	1	07/03/1981	Protected Species: Wildlife Acts
Great Spotted Cuckoo (*Clamator glandarius*)	1	15/02/2009	Protected Species: Wildlife Acts
Lesser Yellowlegs (*Tringa flavipes*)	1	01/10/2006	Protected Species: Wildlife Acts
Long-billed Dowitcher (*Limnodromus scolopaceus*)	1	01/10/2006	Protected Species: Wildlife Acts
Pied Avocet (*Recurvirostra avosetta*)	1	15/02/1895	Protected Species: Wildlife Acts

Table 16-11. Bird Species recorded in the 1 km square W7964.

Species Name	Record Count	Date of Last Record	Designation
Common Tern (*Sterna hirundo*)	1	15/08/2010	Protected Species: Wildlife Acts EU Birds Directive: Annex I Birds of Conservation Concern - Amber List
Little Egret (*Egretta garzetta*)	1	15/08/2010	Protected Species: Wildlife Acts EU Birds Directive: Annex I
Mediterranean Gull (*Larus melanocephalus*)	1	15/08/2010	Protected Species: Wildlife Acts EU Birds Directive: Annex I Birds of Conservation Concern - Amber List
Sandwich Tern (*Sterna sandvicensis*)	2	29/03/2020	Protected Species: Wildlife Acts EU Birds Directive: Annex I Birds of Conservation Concern - Amber List

Birds of Conservation Concern in Ireland (BoCCI):

Based on qualitative data on species populations and distributions, Birds of Conservation Concern in Ireland (BoCCI) comprises lists of priority birds so that resources can be effectively allocated for their conservation. The system follows a traffic light system (i.e. red, amber, and green), with red being the highest conservation priority. Some of the criteria, which may trigger a species to be Red or Amber-listed, reflect global or European status regardless of how the species is faring in Ireland. It is important to have this wider context in status assessments to ensure protection of populations which are declining elsewhere in their range.

Of the available species records, there are five amber-listed species (see Tables 16.8, 16.9, and 16.10 above).

EU Birds Directive:

Of the available species records, there are four EU Birds Directive Annex listed species (see Tables 16.8, 16.9, and 16.10 above).

[16.7.3.2] Wintering and Breeding Bird Survey Results 2023/2024

Various different species of bird were recorded during the wintering and breeding season between October 2023 – August 2024. These results are shown in full in the Ringaskiddy Wintering & Breeding Wetland Bird Survey Report 2023/2024 prepared by Flynn Furney Environmental Consultants (See Appendix 9.6).

The following tables show the bird counts recorded from the Flynn Furney wintering and breeding bird surveys in 2023/2024. Counts are shown in both High and Low tide times. 'R' refers to roosting birds and 'F' refers to foraging birds:

16.7.3.2.1 Wintering Birds Results

Table 16-12. Wintering Bird Survey Results – October 2023

Species	October 2023 - Wintering					
	1. Ringskiddy Port		2. Rocky Island		3. Monkstown Creek	
	HIGH	LOW	HIGH	LOW	HIGH	LOW
Bar tailed Godwit						
Black Guillemot						
Black-headed Gull	72 R	39 R	37 R	16 R		46 R
Black-tailed Godwit					41 R	
Brent Goose						
Common Gull	4 R	5 R	5 R	2 R		3 R
Common Tern						
Cormorant	43 R	29 R	12 R	7 R	334 R	65 R
Curlew		2 F		4 R	1 F	31 F
Dunlin				25 F		
Great Black-backed Gull	8 R	4 R	1 R	5 R	1 R	1 R
Great Crested Grebe					1R	
Greenshank	1 R	1 F		3 F	9 R	3 F
Grey Heron	2 R	7 F	2 R	5 F	17 R	30 R
Herring Gull	13 R	28 R	3 R	11 R	5 R	3 R
Lapwing						

Lesser Black-backed Gull	1 R	8 R			5 R	3 R
Little Egret	1 F	2 F	1 F	1 F	6 R	4 F
Mallard	4 R	28 R			17 R	5 R
Mediterranean Gull						1 R
Mute Swan	1 R	7 R		1 R	1 R	
Oystercatcher		8 F	1 F	19 F	7R	7 F
Red-breasted Merganser						
Redshank	2 F	2 F		3 F	5 F	68 F
Sandwich Tern						
Shag	2 R	2 R	6 R	8 R		
Shelduck						
Snipe						
Teal					23 R	53 R
Turnstone	3 F			4 F	2 F	
Whimbrel						
Other						
Common Sandpiper	1 R	1 F	1 F			
Ringed Plover				20 F		

Table 16-13. Wintering Bird Survey Results – November 2023

Species	November 2023 - Wintering					
	1. Ringaskiddy Port		2. Rocky Island		3. Monkstown Creek	
	HIGH	LOW	HIGH	LOW	HIGH	LOW
Bar tailed Godwit						
Black Guillemot			1 F			
Black-headed Gull	92 R	126 R	8 R	19 F	28 R	41 F
Black-tailed Godwit					5 R	33 F
Brent Goose						
Common Gull		2 R		3 F	2 R	
Common Tern						
Cormorant	85 R	19 R	1 F	6 F	91 R	15 R
Curlew	1 R	2 F		3 F	12 R	21 F
Dunlin	9 R					97 F
Great Black-backed Gull	5 R	1 R	2 R	3 F	2 R	
Great Crested Grebe					1 F	1 F
Greenshank	2 R	1 R		2 F	2 F	4 F
Grey Heron	2 F	7 R	1 R	6 F	5 R	9 F
Herring Gull	1 R	8 F		9 F	3 R	
Lapwing						5 R
Lesser Black-backed Gull	1 R	2 R			2 R	1 R
Little Egret	1 R					3 F
Mallard	8 R	46 R			67 R	5 R
Mediterranean Gull						
Mute Swan	7 R	6 R	2 R			

Oystercatcher		7 F		29 F	14 R	12 F
Red-breasted Merganser				2 R		
Redshank	17 R	4 F		5 F	3 F	57 F
Sandwich Tern						
Shag		1 R	6 R	2 R	2 R	
Shelduck	1 R				7 R	15 F
Snipe	8 R			2 F		5 F
Teal					56 R	78 R
Turnstone					11 F	
Whimbrel						
Common Sandpiper	1 R	1 R	1 R	2 F		
Ringed Plover				1 F		
Great Northern Diver					1 F	

Table 16-14. Wintering Bird Survey Results – December 2023

Species	December 2023 - Wintering					
	1. Ringaskiddy Port		2. Rocky Island		3. Monkstown Creek	
	HIGH	LOW	HIGH	LOW	HIGH	LOW
Bar tailed Godwit						2 F
Black Guillemot						
Black-headed Gull	193 R	258 F	1 R	2 R	17 R	119 F
Black-tailed Godwit		20 F			58 R	38 F
Brent Goose		19 F		9 F	5 F	
Common Gull					1 R	3 F
Common Tern						
Cormorant	2 R	62 R	2 F	3 F	169 R	31 R
Curlew		2 F		1 F	8 F	13 F
Dunlin						56 F
Great Black-backed Gull	5 R	2 R	2 R	2 R	1 R	3 R
Great Crested Grebe						
Greenshank		1 F	1 F	1 R	4 F	2 F
Grey Heron		5 F	1 R	4 R	21 R	7 F
Herring Gull	36 R	26 F		15 R	4 R	6 F
Lapwing						
Lesser Black-backed Gull	2 R	2 R		1 R	2 R	3 F
Little Egret			1 R	1 F	1 F	
Mallard	3 R	67 R			79 R	23 R
Mediterranean Gull						
Mute Swan	6 R	5 R	2 F	2 R		
Oystercatcher		7 F	1 F	3 F	2 F	8 R
Red-breasted Merganser					3 F	1 R
Redshank		2 F			2 F	64 F
Sandwich Tern						

Shag	1 F	1 R	1 F	5 R	6 R	
Shelduck	3 R	3 F			17 R	15 F
Snipe						
Teal		1 R			91 R	63 F
Turnstone					7 F	
Whimbrel						
Other						

Table 16-15. Wintering Bird Survey Results – January 2024

Species	January 2024 - Wintering					
	1. Ringaskiddy Port		2. Rocky Island		3. Monkstown Creek	
	HIGH	LOW	HIGH	LOW	HIGH	LOW
Bar tailed Godwit						
Black Guillemot			3 F		2 F	
Black-headed Gull	197 R	322 R	1 R	36 R	67 R	24 F
Black-tailed Godwit		35 F				112 F
Brent Goose						
Common Gull		28 R	1 R	67 F		26 R
Common Tern						
Cormorant	5 F	29 F	2 F	2 F	426 R	37 R
Curlew		3 F		4 F	6 F	13 F
Dunlin						23 F
Great Black-backed Gull	3 R	5 R	2 R	4 R	2 R	2 R
Great Crested Grebe						
Greenshank	3 R	2 F	1 F	2 F	3 F	2 F
Grey Heron	2 R	5 F		5 F	11 R	17 R
Herring Gull	41 R	53 R	4 R	24 F	2 R	9 F
Lapwing						
Lesser Black-backed Gull	4 R	6 R		2 R	3 F	4 R
Little Egret		2 F			1 F	1 F
Mallard	2 R	87 R			29 F	6 F
Mediterranean Gull		2 R				
Mute Swan		4 R				
Oystercatcher		7 F		29 F		3 F
Red-breasted Merganser						
Redshank	1 R	3 F		2 F	7 F	62 F
Sandwich Tern						
Shag			2 F	2 F		
Shelduck		10 F			26 F	27 F
Snipe						
Teal					53 F	109 F
Turnstone					6 F	5 F
Whimbrel						
Other						

Great Northern Diver			1 F			
Common Sandpiper				1 F		

Table 16-16. Wintering Bird Survey Results – February 2024

Species	February 2024 - Wintering					
	1. Ringaskiddy Port		2. Rocky Island		3. Monkstown Creek	
	HIGH	LOW	HIGH	LOW	HIGH	LOW
Bar tailed Godwit						4 F
Black Guillemot						
Black-headed Gull	243 R	82 R	9 R	5 R	49 R	139 R
Black-tailed Godwit					27 R	127 F
Brent Goose		34 F				
Common Gull	61 R	29 R	2 R	13 R	1 R	102 R
Common Tern						
Cormorant	109 R	86 R	4 F	3 F	407 R	11 R
Curlew		4 F		2 F	8 R	16 F
Dunlin						
Great Black-backed Gull	4 R	3 R	3 R	1 R	5 R	
Great Crested Grebe						
Greenshank		1 F	1 F		3 F	5 F
Grey Heron	2 R	4 R			23 R	8 R
Herring Gull	51 R	23 R	3 R	11 R	39 R	9 R
Lapwing				12 R		
Lesser Black-backed Gull	18 R	5 R	1 R		2 R	5 F
Little Egret						
Mallard	3 R	19 R			38 R	6 F
Mediterranean Gull	1 R				1 R	
Mute Swan	2 F	3 F				1 F
Oystercatcher		2 F	3 R	3 F		2 F
Red-breasted Merganser						
Redshank		1 F	5 F		3 F	64 F
Sandwich Tern						
Shag	1 R		1 R	4 R		
Shelduck					12 R	12 F
Snipe						
Teal					98 R	144 F
Turnstone						2 F
Whimbrel	1 F					
Other						
Common Sandpiper	1 R			1 R		
Ringed Plover						

Table 16-17. Wintering Bird Survey Results – February 2024

Species	March 2024 - Wintering					
	1. Ringaskiddy Port		2. Rocky Island		3. Monkstown Creek	
	HIGH	LOW	HIGH	LOW	HIGH	LOW
Bar tailed Godwit						
Black Guillemot						
Black-headed Gull	1 R	1 F				7 F
Black-tailed Godwit		26 F			97 R	550+ F
Brent Goose	2 R				2 F	
Common Gull	41 R	7 F				19 F
Common Tern						
Cormorant	2 F	3 F	1 F		69 R	13 R
Curlew		2 F				8 F
Dunlin						
Great Black-backed Gull	3 R		2 R			2 R
Great Crested Grebe						
Greenshank					1 R	5 F
Grey Heron	2 R	3 F	1 R		6 R	8 R
Herring Gull	5 R	12 F			2 R	
Lapwing						
Lesser Black-backed Gull		1 F				1 R
Little Egret					2 R	
Mallard	19 R	13 R			7 R	
Mediterranean Gull						
Mute Swan						
Oystercatcher		5 F				6 F
Red-breasted Merganser						
Redshank						31 F
Sandwich Tern						
Shag	2 R		1 R			
Shelduck		1 F			5 R	2 R
Snipe						
Teal					13 R	9 R
Turnstone						
Whimbrel						
Other						
Common Sandpiper	1 R	1 R				
Sandwich Tern	1 R					

16.7.3.2.2 Breeding Bird Results

Table 16-18. Breeding Bird Survey Results – May 2024

Species	May 2024 - Breeding							
	1. Ringskiddy Port		2. Rocky Island		3. Monkstown Creek		4. Spike Island	
	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW
Bar tailed Godwit								
Black Guillemot							2 F	
Black-headed Gull								
Black-tailed Godwit								
Brent Goose								
Common Gull								
Common Tern	16 R	19 R	4 F	5 F	5 F	12 F	5 F	3 F
Cormorant	10 R	3 R	2 F	1 F	2 F	9 R	2 F	
Curlew								
Dunlin								
Great Black-backed Gull								
Great Crested Grebe								
Greenshank								
Grey Heron	1 R	5 F	1 R	2 F	1 R	3 F	1 R	1 R
Herring Gull								
Lapwing								
Lesser Black-backed Gull								
Little Egret						1 F		
Mallard	4 R	29 R	2 F	2 F	11 R	2 R		3 F
Mediterranean Gull								
Mute Swan		1 R						
Oystercatcher		2 F	4 M			8 F	4 R	4 R
Red-breasted Merganser								
Redshank								
Sandwich Tern								
Shag				1 R	1 R	2 R	1 F	
Shelduck					2 R	5 F		
Snipe								
Teal								
Turnstone								
Whimbrel								
Other								
Ringed Plover				2 F			3 F	

Table 16-19. Breeding Bird Survey Results – June 2024

Species	June 2024 - Breeding							
	1. Ringskiddy Port		2. Rocky Island		3. Monkstown Creek		4. Spike Island	
	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW
Bar tailed Godwit								
Black Guillemot								
Black-headed Gull								
Black-tailed Godwit								
Brent Goose								
Common Gull								
Common Tern	15 F	13 F	3 F	8 F	6 F	11 F	2 F	5 F
Cormorant	5 R	9 R	1 F	2 F	7 R	13 R	10 R	6 R
Curlew					5 F	12 F	2 M	1 F
Dunlin								
Great Black-backed Gull								
Great Crested Grebe								
Greenshank						4 F	1 R	
Grey Heron	2 R	2 F	1 R	2 F	11 R	9 F		2 F
Herring Gull								
Lapwing								
Lesser Black-backed Gull								
Little Egret					1 F	1 F		
Mallard		1 R			9 R			
Mediterranean Gull								
Mute Swan	3 F	1 R	6 R		2 F			
Oystercatcher		3 F		4 F		7 F	7 R	2 F
Red-breasted Merganser								
Redshank								
Sandwich Tern								
Shag			2 R	3 R			1 R	
Shelduck					7 R	7 F	2 R	
Snipe								
Teal								
Turnstone				2 F				
Whimbrel								
Other								
Ringed Plover				2 F				
Sandwich Tern						1 R		

Table 16-20. Breeding Bird Survey Results – July 2024

Species	July 2024 - Breeding							
	1. Ringskiddy Port		2. Rocky Island		3. Monkstown Creek		4. Spike Island	
	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW
Bar tailed Godwit								

Black Guillemot								
Black-headed Gull								
Black-tailed Godwit						1 F		
Brent Goose								
Common Gull								
Common Tern	26 R	21 R	4 F	12	6 F	8 F		2 M
Cormorant	23 R	15 R	1 R		36 R	12 R	1 F	7 R
Curlew		1 F		2		8 F		2 F
Dunlin								
Great Black-backed Gull								
Great Crested Grebe								
Greenshank		1 F				1 F		
Grey Heron	2 R	6 F		3	11 R	11 R		1 F
Herring Gull								
Lapwing								
Lesser Black-backed Gull								
Little Egret		1 F			5 R	3 R		1 F
Mallard	28 R	11 F			2 F	1 F		
Mediterranean Gull								
Mute Swan		2 R				1 F		
Oystercatcher		9 F		3	17 R	9 F	2 R	6 F
Red-breasted Merganser								
Redshank					1 F			
Sandwich Tern								
Shag	1 R			1	2 R			
Shelduck								
Snipe								
Teal								
Turnstone								
Whimbrel								
Other								
Common Sandpiper		2 R		1				
Ringed Plover				2				

Table 16-21. Breeding Bird Survey Results – August 2024

Species	August 2024 - Breeding							
	1. Ringskiddy Port		2. Rocky Island		3. Monkstown Creek		4. Spike Island	
	HIGH	LOW	HIGH	LOW	HIGH	LOW	HIGH	LOW
Bar tailed Godwit								
Black Guillemot								
Black-headed Gull								
Black-tailed Godwit				8 F		4 F		
Brent Goose								
Common Gull								
Common Tern						6 F	1 F	

Cormorant	2 F	16 R	3 F	3 F	148 R	43 R	2 R	17 R
Curlew	1 R	1 F		6 F		7 F		5 F
Dunlin								
Great Black-backed Gull								
Great Crested Grebe								
Greenshank	4 R					7 F	1 F	
Grey Heron	1 R	6 F	1 R	5 F	2 R	5 R		3 F
Herring Gull								
Lapwing								
Lesser Black-backed Gull								
Little Egret	1 R			1 F	7 R			
Mallard	14 R	2 F			19 R	4 F		
Mediterranean Gull								
Mute Swan								
Oystercatcher	25 R	29 F		42 F	2 R	4 F	1 M	27 F
Red-breasted Merganser								
Redshank						51 F		
Sandwich Tern		1 M				2 F	3 F	
Shag	1 F	2 F		2 R		3 R	4 R	3 F
Shelduck								
Snipe								
Teal								
Turnstone								
Whimbrel							1 F	
Other								
Gannet			1 M					
Ringed Plover				33 F				

[16.7.4] Evaluation

The evaluation of ecological features (habitats and species) which could be affected by the Project includes:

Any statutory designated areas, with the exception of Natura 2000 sites, which are situated within 10km of the Project Site that have potential ecological connection (s) with the Site;

- Any surface or groundwater bodies that have hydrological connectivity with the Site;
- Any habitat type recorded within the Site; and
- Any species of conservation importance which has been confirmed as occurring within the Site.

The value of the feature is defined with reference to the geographical context of the scheme i.e. the specific importance of the scheme to each of the habitats or protected species populations identified as being present within it or making use of it. This assessment of value is based on the condition of the site during the survey period, although, where information is available, reference is made to these. The evaluation takes into account any statutory or non-statutory conservation status, its extent (or population size) within the site compared to the

resource elsewhere and whether it has characteristics which either elevate or depress its importance in comparison with a 'typical' example (for example, whether a habitat is particularly species rich, or depleted in species). Common and widespread species or habitats, therefore, only have a level of importance in respect to the biodiversity of their immediate area (taken in this case to be represented by the boundary of the Site).

Some protected species may, under certain circumstances (such as a single example occurring within the Site, as part of a much larger local population) be considered to only be of importance within the Site itself. Such species, on the basis of legal and planning regulation compliance, are included within the Impact Assessment and, (if necessary) dedicated impact mitigation measures are provided.

Table 16-22. Evaluation of Ecological Receptors from the Proposed Development

Ecological Receptor	Importance	Rationale
Designated Sites		
Cork Harbour SPA	International Importance	As this site is designated under the European Communities (Birds and Natural Habitats) Regulations 2011, made under European Habitats Directive, it is considered to be of international importance. This feature (SPA) is thus carried forward into the design mitigation and impact assessment sections.
Great Island Channel SAC	International Importance	As this site is designated under the European Communities (Birds and Natural Habitats) Regulations 2011, made under European Habitats Directive, it is considered to be of international importance. This feature (SAC) is thus carried forward into the design mitigation and impact assessment sections.

Ecological Receptor	Importance	Rationale
Designated Sites		
Dunkettle Shore pNHA	National Importance	Within 15km of the scheme area and appear to have a hydrological connection. National importance on the basis that these sites are designated as proposed Natural Heritage Areas (pNHA).
Douglas River Estuary pNHA	National Importance	Within 15km of the scheme area and appear to have a hydrological connection. National importance on the basis that these sites are designated as proposed Natural Heritage Areas (pNHA).
Monkstown Creek pNHA	National Importance	Within 15km of the scheme area and appear to have a hydrological connection. National importance on the basis that these sites are designated as proposed Natural Heritage Areas (pNHA).

Rock Farm Quarry Litle Island pNHA	National Importance	Within 15km of the scheme area and appear to have a hydrological connection. National importance on the basis that these sites are designated as proposed Natural Heritage Areas (pNHA).
Great Island Channel pNHA	National Importance	Within 15km of the scheme area and appear to have a hydrological connection. National importance on the basis that these sites are designated as proposed Natural Heritage Areas (pNHA).
Cuskinny Marsh pNHA	National Importance	Within 15km of the scheme area and appear to have a hydrological connection. National importance on the basis that these sites are designated as proposed Natural Heritage Areas (pNHA).
Rostellan Lough, Aghada Shore and Poulnabibe Inlet pNHA	National Importance	Within 15km of the scheme area and appear to have a hydrological connection. National importance on the basis that these sites are designated as proposed Natural Heritage Areas (pNHA).
Whitegate Bay pNHA	National Importance	Within 15km of the scheme area and appear to have a hydrological connection. National importance on the basis that these sites are designated as proposed Natural Heritage Areas (pNHA).
Lough Beg (Cork) pNHA	National Importance	Within 15km of the scheme area and appear to have a hydrological connection. National importance on the basis that these sites are designated as proposed Natural Heritage Areas (pNHA).
Fountainstown Swamp pNHA	National Importance	Within 15km of the scheme area and appear to have a hydrological connection. National importance on the basis that these sites are designated as proposed Natural Heritage Areas (pNHA).
Minane Bridge Marsh pNHA	National Importance	Within 15km of the scheme area and appear to have a hydrological connection. National importance on the basis that these sites are designated as proposed Natural Heritage Areas (pNHA).

Ecological Receptor	Importance	Rationale
Habitats and Flora		
Recolonising Barte Ground	Local (Lower) Importance	The grassland types within the proposed scheme include Amenity Grassland and Dry meadows and grassy verges habitat along the riverbank. Recolonising Bare Ground is of little ecological importance. These areas have yet to become established with substantial amount of vegetation and mainly consist of bare ground. This habitat is not considered further in this assessment.
Linear habitats	Local Importance (Higher)	Immature Treelines were recorded in some areas of the proposed works area. These habitats act as ecological corridors connecting many different forms of wildlife from one habitat to another, whilst providing shelter and protection from predators. Hedgerows and treelines are recognised as valuable due to low woodland coverage nationally. Hedgerows and treelines are recognised as important ecological corridors in the Cork County Development Plan 2022 - 2028 These habitats are carried forward into the design mitigation and impact assessment sections.
Wooded Areas	Local Importance (Higher)	Scrub habitat was recorded in some areas of the proposed works area. These habitats don't contain as high an ecological significance as semi-natural woodland; however, they are nonetheless recognised as ecologically valuable due to the low woodland coverage nationally. These habitats are carried forward into the design mitigation and impact assessment sections.

Urban Environment	Local Importance (Lower)	The heavily developed nature of some areas within the scheme area results in its assessment of being of less than local ecological value and is not considered further in this assessment. This includes built up areas of the port consisting entirely of hardstand (concrete, tarmac).
Mammals		
Otter	Regional/County Importance	Otters are listed on Annex IV of the Habitats Directive and also on the Wildlife Acts. Otters are known to be abundant around Cork Harbour (NPWS Article 17 data). Furthermore, a potential otter spraint was recorded during the ecology survey of the area. This species is thus carried forward into the design mitigation and impact sections.
Bats	Regional/County Importance	There were no roosts found during the PRF survey and little activity for foraging or commuting (as per 2024 Bat Survey Report (Appendix 9.7)) It is not anticipated that bat will be significantly impacted on by the proposed works. Bat species will not be carried forward into the design mitigation and impact assessment sections.
Ecological Receptor	**Importance**	**Rationale**
Birds		
Overwintering birds	Local (Higher) Importance	Vartious different bird species of bird were recorded during the wintering bird survey. These bird species are either/or protected under the Wildlife Acts and under the EU Birds Directive- Annex II; Annex III.

		Wintering bird species are carried forward into the design mitigation and impact assessment sections.
Birds present during the breeding season	Local (Higher) Importance	The project area provides some habitats to a range of common bird species and so the valuation of local importance is applied. This includes treelines and scrub habitat which may be suitable for nesting. All bird species are carried forward into the design mitigation and impact assessment sections.

[16.8] Identification of Potential Sources of Impact

This section examines the potential sources of impact that could potentially result in adverse effects on the biodiversity and protected habitats and species that occur within the zone of influence of the proposed scheme. These potential sources of impact could arise during both the construction and operational phases but require complete source > pathway > receptor changes for adverse impacts to arise.

[16.8.1] Physical Damage

Physical damage includes degradation to, and modification of, protected habitats. It can occur in working areas and along access routes where construction works are undertaken, and it may be temporary or permanent. The construction works have the potential to encroach on several different habitats such as areas of scrub and treelines and well as embankments which could facilitate otter activity.

[16.8.2] Disturbance (noise/visual)

A number of activities can result in disturbance, including visual and noise. This is more frequently associated with construction activities but could also be associated with some aspects of the operational phase (e.g. structure maintenance, public access). Disturbance can cause sensitive species, such as birds, to deviate from their normal, preferred behaviour, resulting in stress, increased energy expenditure and, in some cases, species mortality.

[16.8.3] Changes in Water Quality

A number of activities can impact upon water quality, in particular nutrient status and turbidity levels. For example, inundation of contaminated/nutrient enriched land and sediment mobilisation can all impact on water quality. This can adversely impact on habitats and also species, for example by impacting upon macroinvertebrate communities.

[16.8.4] Pollution

Certain activities, in particular construction works, may lead to the release of pollutants into water, air or the ground. This can impact upon habitats directly and also the species they support.

[16.8.5] Invasive Species

Invasive species have legal implications if left untreated. They can spread rapidly over suitable habitat, including riverbanks, wetlands or disused waste land.

[16.9] Predicted/Potential Impacts

[16.9.1] Construction Phase Impacts

The key construction phase impacts assessed are:

- Habitat loss/disturbance;

- Species loss (Flora);
- Disturbance to faunal species; and
- Reduction in water quality.

Potential direct and indirect impacts are discussed in detail below. Where potentially significant adverse impacts are identified, avoidance and mitigation measures are proposed to offset these impacts.

[16.10] Description of Potential Impacts (Unmitigated)

[16.10.1] Effects on Natura 2000 Sites

The proposed development is hydrologically connected to two European sites. As likely significant effects could not be excluded at the screening stage, a Natura Impact Statement (NIS) has been prepared. The NIS presents all of the predicted effects on these sites and their Qualifying Interests and also provides a detailed analysis and evaluation of these effects in the context of the relevant Conservation Objectives. The NIS also prescribes mitigation measures to address any adverse effects identified. As such, there is some overlap between this chapter of the EIAR and the NIS for the proposed development. However, both the EIAR and NIS for the proposed development are standalone documents which do not rely on each other. Impacts on the relevant European sites are dealt with under 'Designated Sites' Section.

[16.10.2] General Impacts on Key Ecological, Receptors

[16.10.2.1] Habitat Loss

The proposed development will inevitably lead to some habitat loss in order to facilitate the construction of quay wall. However, it should be noted that most of this habitat consists of bare ground/recolonising bare ground. Although there is some risk to surrounding areas of scrub and treelines, these are small in scale and the majority of these woody habitats are not located in the direct footprint for proposed development.

[16.10.2.2] Habitat Fragmentation

Any loss of linear woodland (areas of treelines and/or scrub) will result in habitat fragmentation which could lead to the displacement of wildlife from the area and the fracture of an ecological corridor which will inhibit the movement of species through the area and into more natural refuges along the corridor.

[16.10.2.3] Habitat Degradation

The construction and operation of the proposed development could lead to habitat degradation. The potential impacts include the pollution of Cork Harbour, and the conversion of wooded habitat (treelines & scrub) to built land.

Water quality impacts arising from both the construction and the operation of the proposed development have the potential to affect habitats and species directly and indirectly. Accidental pollution events could result in sediment and pollutants entering Cork Harbour. Increased storm water overflow incidences could also result in increased pollutants entering Cork Harbour.

[16.10.2.4] Disturbance

Construction of the proposed development will result in temporary noise, vibration, lighting and visual disturbance and will affect species both within and outside the construction footprint.

[16.10.2.5] Direct Mortality

Direct mortality is possible as a result of site clearance, tree felling and vegetation removal. Birds are particularly vulnerable during the nesting season (March-August inclusive) when works could lead to the loss of nests.

[16.10.2.6] Indirect Mortality

The physiological effects of exposure to, and ingestion of significant concentrations of hydrocarbons on fish has been well-documented; these include delayed maturation, embryo malformation and suppressed gene expression (Holth, 2009). Many bird species that are SCIs of Cork Harbour have diets consisting of fish. Consumption of contaminated prey can represent a risk of ill-health and could potentially result in mortality. Fish is also the staple diet of the otter.

Table 16-23. Characterisation and evaluation of likely impacts on Key Ecological Receptors, following EPA (2017) and TII (2009)

Key Ecological Receptor	Construction Phase Impacts	Operational Phase Impacts	Ecological Significance if Unmitigated
Linear Woodland (Treelines & Scrub)	• Habitat Loss	• Habitat degradation	**Construction Phase** The permanent loss of linear woodland would constitute a **Permanent Slight Negative Impact at the Local Level.** **Operational Phase** Habitat degradation as a result of increased artificial structures and hardstand during the operational phase of the proposed development constitutes **Permanent Slight Negative Impacts at the Local Level.**
Birds	• Habitat Loss • Habitat degradation	• Habitat degradation • Disturbance • Direct mortality	**Construction Phase** The permanent loss and degradation of habitat would constitute a **Permanent Moderate Negative Impact at the Local Level.** Disturbance during the construction phase would constitute a **Short-term Moderate Negative Impact at the County Level.** **Operational Phase** Habitat degradation as a result of increased artificial structures and hardstand during the operational phase of the proposed development would constitute a **Permanent Moderate Negative Impact at the Local Level.**
Mammals (Non-Volant)	• Habitat Loss • Habitat disturbance • Habitat degradation		**Construction Phase** Site activity may deter terrestrial mammals from the proposed site during daylight hours when activity is at its highest. otters are largely nocturnal. This disturbance represents a **Short-term Significant Negative Impact at the local level.** **Operational Phase** Habitat degradation as a result of increased artificial structures and hardstand during the operational phase of the proposed development would constitute a **Permanent Moderate Negative Impact at the Local Level.**

Nationally Designated Sites	•	Habitat degradation	N/A	**Construction Phase** Pollutants entering Cork Harbour have the potential to lead to **Short-term and Permanent Moderate Impacts at the National Level** on Nationally Designated Sites downstream of the proposed development.
European designated sites	•	Habitat degradation	N/A	**Construction Phase** Pollutants entering Cork Harbour have the potential to lead to **Short-term and Permanent Moderate Impacts at the National Level** on European Designated Sites downstream of the proposed development.

[16.11] Mitigation Measures

[16.11.1] Construction Phase

[16.11.1.1] Design Mitigation

This section describes the mitigation measures that have been incorporated at the design stage. A number of measures which follow generic best practice are proposed to mitigate the impacts of the proposed works on the ecological environment at the Site:

16.11.1.1.1 General

- **TEO_01** All Site construction will be undertaken in accordance with the CIRIA (2015) Environmental Good Practice on Site (Charles and Edwards 2015);
- **TEO_02** Mitigation described in this report will be followed during site construction and operation phases;
- **TEO_03** There shall be no water abstraction from or discharges to Cork Harbour from the construction activities on the site;
- **TEO_04** A site-specific CEMP) will be written by the contractor prior to site works commencing. This CEMP will incorporate the mitigation measures listed here.

16.11.1.1.2 Site Compound

TEO_05 The site compound shall be located within the site boundary.

- The compound will be sited as far from any water course (>50m) as possible in order to minimise any potential impacts.
- Only plant and materials necessary for the construction of the works will be permitted to be stored at the compound location.

[16.11.1.2] Specific Mitigation

16.11.1.2.1 Surface Water Protection

Temporal impacts due to increased levels of turbidity/sedimentation and accidental spillages cannot be ruled out. Mitigation measures will be required to manage the potential impacts:

- **TEO_06** Monitoring of the water quality during the operational phases must take place.
    - The monitoring must be in accordance with any issued authorisation needed to undertake the proposed works.
    - The monitoring must include sampling and testing of the waters to show compliance with the authorisation.
- **TEO_07** To minimise exacerbated adverse effects, the prevailing weather conditions and time of year is to be taken into account when the site development manager is planning the removal of vegetation, soil, existing concrete, and/or general construction works.

- **TEO_08** Fuels, lubricants and hydraulic fluids for equipment used on the construction site, as well as any solvents and oils, will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, provided with spill containment and stored >10m from watercourses;

- **TEO_09** Fuelling and lubrication of equipment will not be carried out within 10m of watercourses where this is possible, and shall only be undertaken in designated bunded areas;

- **TEO_10** Any spillage of fuels, lubricants or hydraulic oils must be immediately contained, and the contaminated soil removed from the site and dispatched to a suitably authorised waste facility.

- **TEO_11** Refuelling must be carried out using 110% capacity double bunded mobile bowsers. The refuelling bowser must be operated by trained personnel. The bowser must have spill containment equipment which the operators must be fully trained in using.

- **TEO_12** Plant nappies or absorbent mats to be place under refuelling point during all refuelling to absorb drips.

- **TEO_13** Mobile bowsers, tanks and drums should be stored in secure, impermeable storage area, away from drains and open water.

- **TEO_14** To reduce the potential for oil leaks, only vehicles and machinery will be allowed onto the site that are mechanically sound. An up-to-date service record must be required from the main contractor.

- **TEO_15** Should there be an oil leak or spill, the leak or spill must be contained immediately using oil spill kits; the nearby dirty water drain outlet must be blocked with an oil absorbent boom until the fuel/oil spill has been cleaned up and all oil and any contaminated material removed from the area. This contaminated material must be properly disposed of in a licensed facility.

- **TEO_16** The site Environmental representative must be immediately informed of the oil leak/spill and must assess the cause and the management of the clean-up of the leak or spill. They must inspect nearby drains for the presence of oil and initiate the cleanup if necessary.

- **TEO_17** Immediate action must be facilitated by easy access to oil spill kits. An oil spill kit that includes absorbing pads and socks must be kept at the site compound and also in site vehicles and machinery.

- **TEO_18** Correct action in the event of a leak or spill must be facilitated by training all vehicle/machinery operators in the use of the spill kits and the correct containment.

It is considered that, with the implementation of the proposed mitigation measures outlined above, there will be no significant risk to any nearby SACs or SPAs. With appropriate measures in place to address the risks arising from silt/turbidity or accidental spills, potential impacts to nearby European Sites can be avoided entirely.

16.11.1.2.2 Noise and Vibration

The following mitigation measures are recommended as standard practice and should be adhered to for the duration of the construction works:

- **TEO_19** During the works, best practice noise reduction measures described in British Standard 5228-12009+A1:2009, Code of Practice for Noise and Vibration Control on Construction and Open Sites must be incorporated into the Construction and Environmental Management Plan.
- **TEO_20** For mobile plant items such as cranes, HGV's, excavators and loaders, maintaining enclosure panels closed during operation can reduce noise levels over normal operation.
- **TEO_21** Mobile plant will be switched off when not in use and not left idling.
- **TEO_22** For steady continuous noise, such as that generated by diesel engines, noise reduction can be achieved by fitting a more effective exhaust silencer system.
- **TEO_23** Acoustic screens are required to be erected in certain locations for the duration of the redevelopment works. These screens shall be carefully positioned to be as effective as possible. In general, the barrier shall have no gaps or openings in the joins of the barrier material. The barrier material shall have a minimum mass per unit area of 7 kg/m^2 and minimum recommended height of 2.4m.
- **TEO_24** No machinery should be left running outside of the agreed operation hours, which must limit any noise emissions from the site in the late evenings and early mornings when mammal (i.e., otter) activity is at a higher level.

16.11.1.2.3 Terrestrial Mammals (otter)

As evidence of otter activity is confirmed to be present in the area, mitigation will be required including:

1) Surface Water Protective Measures

TEO_25 Surface water protective measures outlined in Section 16.11.1.2.1 of the specific mitigation measures will be adhered to for the protection of watercourses used by otters. This will help avoid the contamination of prey that otters feed on as well as maintaining the water quality of the river in which the otters forage.

2) Noise Control

Noise emission measures outlined in Section 16.11.1.2.2 of the specific mitigation measures will be adhered to for the protection of mammals including otters. This will help avoid significant negative impacts to surrounding mammal species from potential noise emissions from the site.

TEO_26 No machinery should be left running outside of the agreed operation hours, which must limit any noise emissions from the site in the late evenings and early mornings when mammal (i.e., otter) activity is at a higher level.

3) Careful Storage of Machinery

TEO_27 Mitigation measures such as cordoning off of hazardous machinery with temporary fencing at the end of the working day and the restriction of works to daylight hours (otters are largely nocturnal) should be implemented by the contractor on site. These mitigation works will necessarily be implemented throughout the entire construction period.

16.11.1.2.4 Trees (Treelines)

Pre-Construction

1) Barriers

TEO_28 Vertical barriers and/or ground protection must protect all trees that are being retained on site. It is essential that these provisions be put in place prior to any development work or soil excavations are carried out.

The purpose of protective barriers is to exclude any harmful construction activity that may damage the Root Protection Area. A root protection area is calculated as using the diameter of the tree trunk at 1.5 meters height x12 (Woodland Trust, 2021).

These barriers help protect the main stem of the tree. Tree protection barriers should be fit for the purposes of excluding construction activities and be durable to withstand an impact. The barrier should consist of a vertical and horizontal frame and should be at least 2.3m in height. To ensure the protection barriers are respected, clear concise signage must be affixed to the barrier in an unrestricted easily viewed location. The signage must specify that no construction activity is to take place within the RPA. This should remain the case until completion of all works unless certain works are deemed acceptable following consultation with an arborist. The signage must also state that no materials of any description are to be stored or the “spilling out” of materials should not occur within the RPA. Site personnel must be made aware of the importance of the protective barrier.

During Construction

1) Tree Protection

TEO_29 Any excavation works carried out within the RPA should be undertaken with extreme care and should be carried out with due diligence, avoiding damage to the protective bark covering larger roots. This may involve excavation by mini-digger and/or hand as deemed appropriate. Exposed roots should be wrapped in a hessian sacking to avoid desiccation and roots less than 2.5cm in diameter can be pruned back to a side root. The advice of a qualified arborist should be sought if larger roots that influence anchorage need to be severed.

Trunk protection should also be put in place using hessian sacking and timber strips clad around the tree, in order to mitigate any potential damage that may occur.

2) Altering Ground Levels

TEO_30 Alteration of ground levels within the RPA should only be carried out following a considered assessment of the likely impact on the tree. In general, a ground alteration in excess of 75mm should be avoided. Changes in ground levels in the vicinity of a tree may alter the existing soil hydrology and necessitate the incorporation of adequate drainage around the tree. New impermeable surfaces should not cover more than 20% of the RPA. An increase in ground level up to a maximum of 1m is tolerable for certain species using specific techniques (beech and oak are not amenable to such a level of disturbance). This involves the construction of a dry well around the tree trunk allowing for future growth and the incorporation of coarse aggregates to provide sufficient drainage and allow for gaseous diffusion in the raised ground.

16.11.1.2.5 Birds

1) Avoidance of the Bird Breeding Season

TEO_31 To limit the potential impact of construction on breeding birds, removal of woody vegetation should be restricted to the non-breeding season (September to February, inclusive). Where the construction programme does not allow this, an ecologist should undertake a breeding bird check immediately prior to vegetation clearance. Where no breeding birds are present, clearance may proceed without requiring a derogation licence from the NPWS. However, given that breeding birds and the nests of all bird species are protected under the Wildlife Acts, a licence would be required from the NPWS to permit the destruction of nest sites and disturbance to breeding birds during the breeding season (1st of March to the 31st of August).

If the applicant intends to carry out clearance works during the bird breeding season, guidance should be sought from the NPWS with regard to compliance with Section 40 (1) and Section 40 (2) (e) of the Wildlife Acts (see below):

40. *(1) (a) It shall be an offence for a person to cut, grub, burn or otherwise destroy, during the period beginning on the 1st day of March and ending on the 31st day of August in any year, any vegetation growing on any land not then cultivated.*

(1) (b) It shall be an offence for a person to cut, grub, burn or otherwise destroy any vegetation growing in any hedge or ditch during the period mentioned in paragraph (a) of this subsection.

40. *(2) Subsection (1) of this section shall not apply in relation to—*

(e) the clearance of vegetation in the course of road or other construction works or in the development or preparation of sites on which any building or other structure is intended to be provided.

2) General Site Management During Construction to Avoid Contamination of Receiving Waters

TEO_32 Surface water protective measures outlined in Section 16.11.1.2.1 of the specific mitigation measures will be adhered to for the protection of watercourses used by waterbirds. This will help avoid the contamination of mudflats, sandflats and water bodies where birds forage in the harbour.

3) Noise Control

TEO_33 Sudden loud noises (or impulsive noises) should be avoided when construction activity is underway. This will help limit the potential for nearby birds to become startled and displaced from their habitat, especially species of birds that are resident to Ireland and are located in the country all year round, not just during the breeding season.

Noise emission measures outlined in Section 16.11.1.2.2 of the specific mitigation measures will be adhered to for the protection of surrounding waterbirds. This will help avoid significant negative impacts to surrounding bird species from potential noise emissions from the site.

4) Minimising Impacts on Potential Bird Nesting Habitat

TEO_34 Treelines and areas of scrub offer birds suitable nesting habitat locations. These areas should be protected and remain untouched during construction. The proposed works will be carried out with the aim of avoiding as much damage to this potential bird nesting habitat as possible.

Any trees or scrub in the way of the development layout are to be removed in such a manner not to cause damage to those trees to be retained. Root protection areas will be marked out around the trees to be retained. No machinery will enter these areas.

16.11.1.2.6 Alien Invasive Species

TEO_35 To avoid the spread of Invasive Plant Species to and from the redevelopment the following mitigations must be implemented:

- Construction machinery is to be visually inspected and power-washed prior to arrival at the site in order to avoid importation of invasive species;
- All excavation/access areas are to be pre-checked for invasive species and no machinery is to enter these fenced-off locations, unless instructed by the Client or its Representatives and appropriate management measures are put in place.

Throughout the period of the works, in order to comply with national legislation that prohibits any 'polluting matter' to enter 'waters', *e.g.* Fisheries (Consolidation) Act 1959, Environmental Protection Agency Acts 1992 and 2003, and Local Government (Water Pollution) Acts 1977 and 1990, standard operational procedures, both published and unpublished, will be implemented and adhered to. The adherence to these environmental protection measures would be implemented on-site irrespective of the presence of a designated European Site.

[16.11.2] Operation Phase

TEO_36 The project site will be typical of ongoing Port operations during the operational phase. As part of the Port of Cork Environmental Management System (EMS), they are required to monitor surface water, ground water, noise and dust emissions from the site to ensure that they meet EPA (Environmental Protection Agency) standards. This will continue during the operational phase and will ensure that surrounding receptors will not be negatively impacted on.

[16.12] Monitoring

[16.12.1] Construction and pre-construction Phase

[16.12.1.1] Ecological Clerks of Work (ECoW)

A species protection plan should be designed by a professional ecologist to ensure that works related to this proposal take into account any protected bird species present on site and the nearby surroundings. An Ecological Clerk of Works (ECoW) should be employed to monitor the works under license, and to inform the team through Ecological Toolbox Talks during the proposed works and tree felling activities.

A pre-construction survey of the scheme will be undertaken by an experienced Ecological Clerk of Works (ECoW), who shall walk the entire length of the scheme alongside the Site Manager / Site Engineer in order to highlight locations where environmental mitigation (as described below) is required prior to construction works commencing on the site. A minimum of 1 no.

ECoW visit shall be conducted per week during the course of the construction works at this site during the construction phase. The ECoW shall be present on-site during commencement of works. As such the following points must be adhered to for this scheme:

- An Ecological Clerk of Works (ECoW) will be involved as required during the construction period for this scheme, in order to ensure that the required mitigation is implemented.
- Once planning permission has been secured, pre-construction ecology surveys will be carried out within the proposed scheme area well in advance (ideally 3-4 months prior to construction works) in order to ensure that sufficient updated information is available to inform derogation licence applications as required.
- The ECoW and the Appointed Contractor will walk the proposed scheme together prior to work commencing on the site, in order to discuss the ecological constraints, to highlight all required mitigation and to demarcate exclusion zones appropriately.

[16.12.2] Operation Phase

[16.12.2.1] Post-Construction Monitoring

Depending on the type of contract, post-construction monitoring requirements should be stipulated in the Employer's Requirements or Maintenance Requirements for the local authorities.

Upon completion of construction, monitoring should be carried out to determine the success of the measures employed. Monitoring should be continued for at least one year after construction work ceases.

Any remedial works that need to be carried out must be undertaken by qualified Ecologist.

[16.13] Residual Effects

With the implementation of the mitigation measures outlined above, residual effects on sensitive ecological receptors are assessed as not significant during the construction and operational phase.

[16.14] Conclusion

It is considered that, with the implementation of the mitigation measures set out in this Chapter, the construction and operation of the proposed development will not have a significant negative impact on biodiversity in the Zone of Influence.

[17] Material Assets

[17.1] Introduction

This Chapter describes and assesses the potential effects of the proposed development on material assets. The existing environment is also described. Mitigation measures are proposed, where required and the predicted residual effects are described.

The proposed development will consist principally of two quay wall extensions – one at Ringaskiddy East (CCT2) and the other at Ringaskiddy West (DWB extension) as well as Phase3 (RoRo Ramp). These extensions will provide for additional container handling and bulk cargoes provisioning.

[17.2] Assessment Methodology

[17.2.1] Scope of Study

Material assets are now defined in the EPA Advice notes on current practice in the preparation of Environmental Impact Assessment Reports (EPA 2022) as 'built services and infrastructure'.

According to the EPA guidelines, the three main areas to focus on under the heading of material assets are:

- Built Services and infrastructure (including roads, electricity, telecommunications, gas, water supply infrastructure and sewerage);
- Roads and Traffic
- Waste Management.

Built services and infrastructure and waste management are addressed in this Chapter. Where relevant, effects on particular material assets such as the road network and construction waste disposal facilities are considered in detail elsewhere in this EIAR.

Refer to Chapter 8 Traffic and Transport for further assessment of the impact of the proposed development on these assets.

Refer also to Chapter 3 Description of the Proposed Development of this EIAR for a detailed description of the proposed design in relation to material assets.

The use of natural resources in the context of material assets (water supply, energy and materials) is addressed in this Chapter. Projections of resource use were made, for both the construction and operational phases of the development, and the impact assessed. The use of natural resources in the context of other environmental factors such as soil (Chapter 12) and biodiversity (Chapter 15 and 16) are addressed elsewhere in this EIAR. There are no quarries or mineral resources on or adjacent to the site (Refer to Chapter 12 Soils, Geology, Hydrogeology, Hydrology of this EIAR for further details).

The effects of the proposed development on land in the context of "landscape and visual" are addressed in Chapter 7 Landscape and Visual.

The use of natural resources in the context of land use and land take is also addressed in this chapter.

The assessment of cultural heritage is presented in Chapter 6 Cultural Heritage

A desk study was carried out on the existing material assets associated with the site of the proposed development.

[17.2.2] Legislation & Guidance

This chapter has been prepared having regard to the following guidelines:

- European Commission (2017) Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report;
- Government of Ireland (2018) Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018);
- Department of Housing, Planning, Community and Local Government (2017) Key Issues Consultation Paper on the Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems;
- Department of Housing, Planning, Community and Local Government (2017) Circular PL 1/2017 - Implementation of Directive 2014/52/EU on the effects of certain public and private projects on the environment (EIA Directive): Advice on the Administrative Provisions in Advance of Transposition;
- Department of Housing, Planning and Local Government (2018) Circular PL 05/2018 -Transposition into Planning Law of Directive 2014/52/EU amending Directive 2011/92/EU on the effects of certain public and private projects on the environment (the EIA Directive) And Revised Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment;
- Environmental Protection Agency (2022) Guidelines on the Information to be contained in Environmental Impact Assessment Reports (Final August 2022);
- European Commission (2012) Interpretation suggested by the Commission as regards the application of the EIA Directive to ancillary/associated works;

[17.2.3] Data Sources

The primary source of data for this assessment is the Port of Cork Masterplan 2050, which outlines the key port infrastructure, both existing and proposed.

As built drawings, services and utilities plans have been reviewed to prepare the baseline environment section.

[17.3] Baseline Environment

[17.3.1] Built Assets / Utilities

Roads:

There is an existing road network within the Port lands at Ringaskiddy and the proposed development includes a proposal for a road alignment to enhance connectivity to the M28.

The site is served by the L2545 road which is a continuation through Ringaskiddy village of the N28. The N28 is a National Primary Route which links Cork City to Ringaskiddy. Transport Infrastructure Ireland (TII), plans to construct a new road, the "M28 Cork to Ringaskiddy Project" which will run from the Bloomfield Interchange, near Douglas, to a new roundabout on the eastern side of Ringaskiddy. Permission for the proposed scheme1 was granted by ABP in July 2018. This new road will serve the future traffic needs of the area while removing traffic from Shanbally and Ringaskiddy villages.

The proposed M28 road will run in a north-south alignment to the south of the proposed development.

Utilities

Utility providers that are known to have services within, or adjacent to the footprint of the proposed project includes the stormwater sewer – Irish Water and Cork County Council; and

Built Assets

The existing Cork Container Terminal (CCT) was officially opened in September 2022. Large Panamax vessels can be accommodated along its 360m-long quay, where two Ship-to-Shore (STS) gantry cranes are installed. Trade vehicles are discharged at the linkspan in Ringaskiddy East, which also houses the Ferry Terminal. Ferry services are provided by Brittany Ferries to Roscoff.

With a total berth length of 485m and minimum berth drafts of 13.4m, the Ringaskiddy Deepwater Berth (DWB) (West) currently handles fully laden Panamax-size vessels (60,000 tonnes deadweight). Most of the animal feed trade is discharged through here, utilising specialist private-sector facilities. In addition, the DWB handles other bulk cargoes, such as molasses, cement, steel scrap, timber, and other project cargoes.

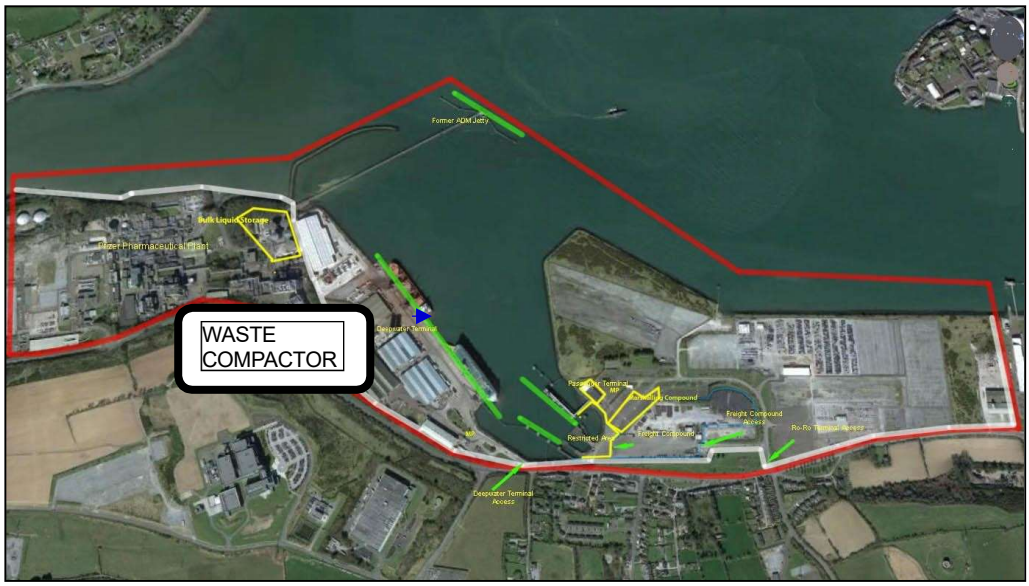
The current infrastructure gives the port sufficient operational capacity up to 2029. However, a planning condition limits throughput at the Ringaskiddy Port facility to 322,846 TEU until such time as the M28 and Dunkettle road schemes are complete. The current application will consider the further traffic scenario for Port upgrades.

It is envisaged that, by 2036, the terminal will need major infrastructure upgrades to accommodate future container-related demand. A land reclamation project is proposed herein, covering around 6.4ha, to allow the construction of a second berth.

The current total storage area (land occupied) for Ringaskiddy East (land occupied) is 18ha. For Ringaskiddy West the total current storage area is 9.6ha

[17.3.2] Resource & Waste Management

The Waste facilities within the jurisdiction of the Port Company are both Port owned and operated. The Port Company operates a large 23 m^3 garbage compactor at Ringaskiddy.



All other facilities, private and public are equipped with mobile bins and skips that are either removed to landfill sites when filled or are transferred to the port compactors which are emptied as required.

All skips and wheelie bins are clearly marked and labelled.

The system has been publicised through the agents and all parts of the waste management chain will have copies of this plan and an accompanying Contact Directory (with an amendment and update procedure).

Waste per ship will not automatically become one skip load but will be held until a skip is ready for disposal but this is to form part of the contractor's remit, not the port.

All vessels MUST discharge ship-generated waste before leaving The Port of Cork unless it can be demonstrated that storage space for such waste is sufficient. If retaining waste on board, a legitimate reason for not using the port reception facilities must be given. Failure to do so will result in detention in port until waste has been discharged.

It will be the responsibility of both the ship and the stevedore/cargo receiver to collect and dispose of all waste accumulated from the loading/discharge of cargo.

The stevedore/receiver will, as soon as possible after completion of cargo loading/discharge, dispose of any cargo residues remaining on the berth, and any spillages between the berth and the warehouses. They shall leave the berth in the same condition as prior to discharge/loading.

Ships which wish to discharge oily and hazardous wastes are required to make arrangements though their agents for such transfer and disposal of oily waste with specialist companies. Hazardous and Oily waste will be organised and charged separately directly to ship via ships agent.

There will be no port administration charge on this waste. The Port of Cork is to receive notification of such discharges.

[17.4]Potential Impacts

[17.4.1] The 'do nothing' scenario

In the Do Nothing Scenario, it is likely that the site would continue in its current use, in the short term. In the longer term, it is likely that site would be developed at some point in the future for an industrial port related use based on the value of the site within the 2050 Port of Cork Masterplan Framework and the proposed M28 construction.

Existing services would remain the same as current baseline in the do-nothing scenario.

[17.4.2] Construction Phase

[17.4.2.1] Built Assets / Utilities

The following construction work will take place to upgrade the built assets at Ringaskiddy CCT1 and DWB extension at Ringaskiddy West.

CCT2 Quay Structures Construction

The Berth 2 wall will likely comprise a combi-wall form of construction which involves the installation of intermittent tubular steel piles with traditional steel piles infilling between the main piles although other forms of construction such as open piled, or a combination of open piled and closed structures could be used.

The container terminal area will be surfaced using concrete slabs. A series of piled concrete runway beams will be installed along the edges of each southern container stack in order to provide lanes along which the RTG cranes can operate.

The additional general cargo / RoRo storage area will generally be surfaced using bituminous surfacing.

There will be a temporary negative impact during construction of the quay structure as a result of:

- Piling works which will generate noise
- Dredging of the dredge pocket adjacent to the quay structure which is likely to impact benthic communities on a temporary basis.
- Disposal of dredge material will be undertaken using a Dumping at Sea Permit at an established offshore dump site.

DWB Ringaskiddy West Quay Structures Construction

The existing Deepwater Berth (DWB) comprises a filled quay structure.

Approximately 0.8ha of new land will be created as part of the proposed works. The vast majority of the material arising from the proposed dredging works will be unsuitable for use in the reclamation works and as such it is anticipated that suitable fill material will need to be imported from local quarried sources.

It is anticipated that suitable fill material will need to be imported from local quarried sources for the required reclamation works.

Storm Water Drainage

Storm drainage systems will be installed within the development areas of CCT2, DWB and associated road network.

Storm water runoff from the site will be collected in a dedicated storm water drainage system. The storm water drainage system will collect rainwater incident upon the site for discharge to the harbour waters via a series of silt traps and oil interceptors.

Mechanical and Electrical Services

The proposed lighting for the general working areas will comprise high mast lighting, details of which will be subject to detailed design. Roadway lighting will comprise standard road lighting columns and lights. Lighting will be designed to provide an average lighting level of 20 Lux for roadways, 50-100 Lux for quayside areas and 30-50 Lux for storage and circulation areas.

The lighting is designed to prevent direct glare into surrounding properties and illumination of the night sky.

Power supply will be by connection to the local electricity grid system. Water supply will be by connection to the local mains system.

Fencing and Security

Palisade fencing is provided around the entire landward perimeter of the Container Terminal to comply with the requirements of the International Ship and Port facility Security Code (ISPS). Security gates will be positioned at the entrance and exit of the main CB/MPB terminal.

CCTV cameras will be installed

Safety Equipment

All quayside areas will be provided with mooring bollards, ladders and safety chains in accordance with the requirements of BS6349 Code of Practice for Maritime Structures.

Fire hydrants will be provided at regular intervals in all working and storage areas.

Navigation

Navigation simulations have been carried out by Port of Cork pilots and personnel from the Harbour Masters department to confirm the proposed quay can be accessed in a safe and efficient manner.

Construction (and operational) traffic entering and leaving the CCT2 and DWB Extension site will use the N28 and L2545 (and ultimately M28). Restrictions will be applied to arrival and departure times during both the construction phase. There will be sufficient capacity on the existing N28 for the proposed development during the construction of the proposed development. Refer to Chapter 8 Traffic and Transportation of this EIAR for further details.

The proposed changes to infrastructure are anticipated to have a slight negative impact to material assets during construction.

Temporary Site Compound

An area will be required for the establishment of the Contractor's site compound. The site compound will be used for the Contractor's site office accommodation and facilities and will include an area for temporary storage of construction materials.

At Ringaskiddy East the extent of the site is such that the contractor will be able to establish facilities within the immediate site area.

At Ringaskiddy West an area for a site compound will be made available in the area immediately behind the proposed works / existing DWB as indicated in Figure 3.6 which is contained within EIAR Volume III.

Site Access

Existing port operations will continue as normal during the construction period.

Suitable traffic management and other systems will be put in place as required to minimise disruption to existing activities during the construction period. These will include:

- Segregation of entrances
- Suitable restrictions on timing of deliveries to avoid peak traffic periods
- Preparation of a detailed traffic management plan for the construction phase

Potential Impacts

The following impacts to material assets are anticipated due to the construction works:

- Disposal/recovery of surplus waste (if any) generated by dredging and rock dredging. (These arisings will be limited in quantity and consist of existing overburden/rock which will be incorporated into the closed quay wall).
- Disposal/recovery of pile arisings from pile bores. (These arisings will be limited in quantity and consist of existing overburden/rock which will be incorporated into the closed quay wall).
- Minor disruption due to stockpile/temporary waste storage (bituminous mixes etc).
- Increased vehicular traffic within CCT1 and DWB due to construction/dredging and quay wall construction works.
- Minor percussive impact due to piling activities. This is not anticipated to have a significant impact on the surrounding infrastructure
- Minor, temporary and transient impacts to air, dust and noise.
- Potential for minor oil spills during refuelling of construction vehicles.
- Increased water consumption during construction.

Table 3.3 Below gives an indication of the proposed arrangements for construction waste recycling and disposal for CCT2 and DWB extension construction project.

Table 3.3 Typical Wastes Generated by the Construction Works

Activity	Waste Generated	Disposal/Treatment Recommendations
General Construction Waste	Waste oils	Collected by waste recycling contractor.
	Other waste	Collected in skips for disposal by licensed waste contractor.
General Office/Messing	Paper, packaging, canteen etc.	Collected in covered skips/large bins for disposal by a licensed waste contractor.
Temporary Site Toilets	Sewage	Emptied under contract for disposal at an appropriate facility.

Overall, the construction works for the CCT2 and DWB extension construction works proposed are considered to have a negligible long-term impact on the built assets/utilities of the port and significant long-term positive impact on the built environment of the port post-construction.

[17.4.2.2] Resource & Waste Management

The import and export of material is described in Chapter 3 and in Chapter 12 Soils, Geology, Hydrogeology of this EIAR.

As discussed in Chapter it is estimated that almost 423,217m^3 of surplus material will be removed from the site (including material from the road upgrade works and dredging).

Off-site disposal options for surplus clean and inert excavated material include:

- Dumping at Sea Permit for surplus dredge materials.
- reuse as a by-product on other sites if appropriate subject to Article 27, under the Waste Directive Regulations 2011
- recovery at suitable waste permit facilities or licensed soil recovery facilities in accordance with relevant waste legislation; or
- disposal at suitable authorised waste facilities.

Therefore, the effect of exporting of surplus material off-site will depend on the disposal option or combination of options available to the contractor at the time. The reuse of surplus material on other sites (subject to Article 27) will likely have a slight, positive effect on material assets (waste resources) as it diverts surplus clean material from permitted waste facilities. Recovery and disposal of surplus material will likely have a slight negative effect on waste resources.

The environmental effects on these facilities in accepting material will have been addressed during the application process as discussed below. This will ensure that any material proposed to be re-used or accepted at a waste facility will not have a negative effect on the receiving environment of that site or waste facility.

The potential construction traffic effects associated with offsite disposal have been addressed in Chapter 8 Traffic and Transport.

17.4.2.2.1 Re-use as a By-Product (Article 27)

Under Article 5 of the Waste Framework Directive, transposed into Irish legislation under Article 27 of the European Communities (Waste Directive) Regulations 2011, uncontaminated excavated soil and other naturally occurring materials, may be used on sites other than the one from which they were excavated provided the soil and stone material meets the criteria to be considered a by-product. The EPA guidance document, Guidance on Soil and Stone By-products (June, 2019). There are four by-product conditions that must be met in order for the material to regarded as a by-product:

a) further use of the soil and stone is certain;

b) the soil and stone can be used directly without any further processing other than normal industrial practice;

c) the soil and stone is produced as an integral part of a production process; and

d) further use is lawful in that the soil and stone fulfils all relevant product, environmental and health protection requirements for the specific use and will not lead to overall adverse environmental or human health impacts.

In practice, the EPA has outlined that:

"Prior to works (i.e. prior to commencement of the development), an economic operator (being either the material producer, or with the express written consent of the material producer) notifies the EPA of the by-product decision. A register of by-product notifications will be maintained and will be available for public inspection online to include details of origin and destination sites for soil and stone by-product.

Notifications should be accompanied by the full complement of necessary documentation to demonstrate compliance with the four by-product conditions."

At the construction stage of the proposed development, should further use of soil and stone be certain and all other criteria can be fulfilled, the appointed contractor will be responsible for notifying the EPA of the by-product decision.

17.4.2.2.2 Recovery

The Licensed soil recovery facilities are often worked out quarries that are undergoing restoration. They may also be sites where relatively large volumes of soil are being imported to raise natural ground levels. In both cases the soil recovery facilities are licensed to accept only uncontaminated natural soil and stone.

Unlike landfills, soil recovery facilities are not required to have an engineered basal liner, nor are they required to install an engineered cap following completion of restoration or land raising. As such there are no engineering controls to protect groundwater from contamination that may be present in soil used as backfill at these facilities.

Soil recovery facilities, depending on the volumes of material accepted, are permitted under the Third Schedule of the Waste Management (Facility and Registration) Regulations 2001 (SI No. 821 of 2007) as amended, or are required to operate under a Waste Licence granted by the EPA under Part V of the Waste Management Act 1996, as amended.

Depending on the volumes of material recovered, the facility will operate under one of three permits:

- Certificate of Registration (<25,000 tonnes total waste accepted annually);
- Waste Permit (>25,000 to <100,000t total waste accepted annually); or a
- Waste Licence (>100,000t 000 tonnes total waste accepted annually).

For a waste facility (not operated by the local authority) to obtain a Certificate of Registration or a Waste Permit, the application must be made directly to the local authority for which that facility sits. For facilities that apply to operate under a Waste Licence, applications are made to the EPA.

All waste facilities are required to prepare an EIA under Annex II of the EIA Directive 2011 (2011/92/EU) as amended by the 2014 Directive (2014/52/EU):

“11 (b) Installations for the disposal of waste (projects not included in Annex I)”

The EIAR must accompany the waste permit application to the local authority for Certificate of Registration or a Waste Permit, or the EPA for a Waste Licence application.

Therefore, the environmental effects of accepting uncontaminated natural soil and stone will have been assessed at any proposed licenced/permitted disposal site.

17.4.2.2.3 Disposal

Under the scenario where rock material exported from site is unsuitable for re-use (under Article 27) or recovery, the disposal of material at a landfill may be a disposal option, subject to the material fulfilling certain criteria.

Landfills in Ireland operate under Waste Licences issued by the EPA and must be constructed in accordance with strict technical requirements set out in the Council Directive 1999/31/EC on the landfill of waste.

Under the Waste Licence, the EPA will set the type of waste that the landfill facility will be licensed to accept. The landfill will be licensed to accept either Inert, Non-hazardous or Hazardous waste. The criteria of these wastes are set out in Council Decision 2003/33/EC which establishes the criteria and procedures for the acceptance of waste at landfills (with regard to Article 16 of and Annex II to Directive 1999/31/EC). There are no operating landfills in Ireland licensed to accept hazardous waste material.

[17.4.3] Operation Phase

[17.4.3.1] Built Assets / Utilities

The project will bring about additional long-term activities including an intensification of activity at CCT as well as the requirement for on-going maintenance dredging. Any maintenance dredging which may be required in the longer term will be carried out as part of the Port of Cork’s regular maintenance dredging programme. The material generated would likely be disposed of at sea at a licensed disposal site agreed in accordance with Port of Cork’s maintenance dredging licence.

Overall, the CCT2 and DWB extension are considered to have a negligible impact on the built assets/utilities of the port and a significant positive impact on the built environment of the port post-construction.

[17.4.3.2] Resource & Waste Management

During operational phase the addition of berths and the increase in container traffic is likely to result in additional waste ship waste arisings to port.

All waste associated with the proposed Ringaskiddy Redevelopment must take cognisance of the policies and actions outlined in the Southern Region Waste Management Plan 2015-2021.

The Southern Region Waste Management Plan 2015-2021 sets a target of 70% reuse, recycling and materials recovery rate of non-soil and stone construction and demolition waste to be achieved by 2020. It will be a requirement of the Contractor to achieve this target during the construction stage and the PoCC Waste Management Plan for operation phase.

[17.5] Mitigation Measures

[17.5.1] Construction Phase

[17.5.1.1] Built Assets / Utilities

- **MA_01** Stockpile in the temporary storage area (e.g. bituminous mixes) shall be minimised both spatially and temporally.
- **MA_02** Increased vehicular traffic within CCT1 and DWB due to construction/dredging and quay wall construction works will be managed by implementation of a Traffic Management Plan for the construction project.
- **MA_03** Impacts to air from construction dust will be mitigated by dampening during construction as required.
- **MA_04** Spill kits will be made available by the Contractor during the works and shall be stocked regularly.
- **MA_05** Material imported onto the site will be assessed to ensure that contamination is not introduced to the site. Any topsoil which is imported onto the site will be chemically analysed and screened against generic screening values for a commercial end use to ensure that it does not pose a risk to human health.
- **MA_06** Further investigations into services will be necessary during the detailed design stage. Methods such as ground penetrating radar (GPR) and test trenching can be used to verify or locate existing services.
- **MA_07** Services drawings shall be reviewed in detail prior to project inception and potential conflicts with construction works shall be noted and monitored.

[17.5.1.2] Resource & Waste Management

Waste management will incorporate the principles of the Waste Hierarchy.

MA_08 Excavated material on site will be managed in accordance with the requirements of the Waste Management Act 1996 (as amended). The Contractor will be required to ensure that the facility, to which any excavated material which requires transfer off-site is brought to/

is authorised in accordance with Waste Management Legislation. The Contractor, as holder of the waste, will be responsible under the Waste Management Act for ensuring that all statutory obligations are met. All waste activities at the site will be subject to best practice waste handling procedures (i.e. source segregation, storage and collection). Material will be re-used where possible.

MA_09 At a minimum the Contractor shall ensure:

- That any waste haulier employed by the contactor is authorised by a waste collection permit or is exempt from such a requirement; Waste Management Acts or any other legislation, as necessary;
- That the terms and conditions of the authorisations of the waste haulier and next destination waste facility allow for acceptance of the waste in question (i.e. allow the facility to accept the specific EWC/LoW type of waste); and
- That these authorisations will not expire within the lifetime of the project.

MA_10 Waste arisings generated will only be treated at facilities that are authorised to carry out the appropriate waste treatment activity for the specific waste stream. Records of all waste movements and associated documentation shall be maintained on-site such as waste facility authorisation number, expiry date, class of waste accepted, weighbridge records, treatment methods for each waste stream accepted i.e., backfilling, crushing, screening, etc.

MA_11 Where waste generated is not reusable on-site or deemed suitable for dumping at sea, samples will be taken and waste acceptance criteria (WAC) laboratory testing will be undertaken on the excavated material. The results of the laboratory testing will be used to determine whether a waste as inert, non-hazardous or hazardous. Authorised waste facilities will be contacted to establish what their waste acceptance criteria are. The waste from the proposed development will be compared with the facility waste acceptance criteria, and sent to the waste facilities which are authorised to accept the material in line with the waste acceptance criteria. Where practical, the closest suitable facilities to the proposed development will be selected to reduce impacts associated with vehicle movement such as air emissions.

MA_12 The Contractor(s) will store, handle and transport waste material arising in accordance with best practice guidelines and the Waste Management Act 1996 (as amended). Waste arisings that cannot be re-used or disposed of at sea will be sampled, tested and disposed of, to a licensed waste management facility.

[17.5.2] Operation Phase

[17.5.2.1] Built Assets / Utilities

MA_13 A survey/condition assessment of PoCC assets shall be undertaken periodically to assist in the management of such assets during port operations and maintenance.

[17.5.2.2] Resource & Waste Management

MA_14 The POCC operates an Oil/HNS Spill Contingency Plan (Port of Cork Company, July 2009) which outlines the measures to be undertaken in the event of an oil spill or spillage of Hazardous Noxious Substances. This contingency plan will be effective in dealing with any operational incidents with the potential to generate waste associated with the development.

MA_15 POCC Waste Management Plan outlines the measures required to manage the waste arisings from shipping and these measures will be reviewed on an ongoing basis to ensure that the waste facilities accepting waste from the port can meet the additional demand.

[17.6] Monitoring

[17.6.1] Construction Phase

[17.6.1.1] Built Assets / Utilities

MA_16 The Contractor shall develop a system of record keeping which records any damage or dereliction observed/encountered to existing POCC assets as a result of construction.

MA_17 A survey/condition assessment of existing POCC assets shall be undertaken at the inception of the project to assist in the management of such assets during construction and maintained throughout the duration of the programme.

[17.6.1.2] Resource & Waste Management

MA_18 The Contractor shall develop a record keeping system that will ensure that details of all arisings, movement and treatment of C&D waste are recorded. All materials being transferred from the site, whether for recycling, recovery or disposal, shall be subject to a documented tracking system which can be verified and validated.

[17.6.2] Operation Phase

[17.6.2.1] Built Assets / Utilities

MA_19 A survey/condition assessment of POCC assets shall be undertaken periodically to assist in the management of such assets during port operations and maintenance.

[17.6.2.2] Resource & Waste Management

MA_20 The Port of Cork Company shall adhere on an ongoing basis to the requirements of the Ringaskiddy Port Waste Management Plan.

[17.7] Residual Effects

[17.7.1] Construction Phase

[17.7.1.1] Built Assets / Utilities

The residual impacts associated with built assets and utilities following mitigation measures are considered to be imperceptible during construction phase.

[17.7.1.2] Resource & Waste Management

The residual impacts associated with waste following mitigation measures are considered to be imperceptible to slight.

[17.7.2] Operation Phase

[17.7.2.1] Built Assets / Utilities

The residual impacts associated with built assets and utilities following mitigation measures are considered to be imperceptible during operation phase.

[17.7.2.2] Resource & Waste Management

The residual impacts associated with built assets and utilities following mitigation measures are considered to be imperceptible during operation phase.

[17.8]Potential Interactions & Cumulative Impacts

[17.8.1] Construction Phase

[17.8.1.1] Built Assets / Utilities

There are no cumulative impacts to built assets or utilities anticipated for the construction phase.

[17.8.1.2] Resource & Waste Management

There is some potential for a cumulative impact as a result of dredging material to be placed at the DaS site to conflict with DaS for the Ballycotton Harbour Dredging DaS permit.

The dredging campaign for Ringaskiddy will be carefully managed and monitored to ensure the potential for cumulative impacts is minimised in accordance with the DaS permit.

[17.8.2] Operation Phase

[17.8.2.1] Built Assets / Utilities

There are no cumulative impacts to built assets or utilities anticipated for the operation phase.

[17.8.2.2] Resource & Waste Management

There are no cumulative impacts to resource and waste management anticipated for the operation phase.

[18] Interactions & Cumulative Effects

[18.1]Interaction between Environmental Aspects

The EIA Directive (2014/52/EU) requires a description of *'the interaction between any of the foregoing aspects'.* Interactions can occur when a predicted impact causes interaction or dependency with other environmental aspects.

This chapter discusses the interactions between aspects and assesses them as positive, negative or neutral (as having no interaction or interdependency). The interactions of environmental effects were considered throughout the design development for the proposed flood relief scheme and adjustment were made to the design of the layout to mitigate impacts arising from these interactions.

In Table 18-1, interactions between certain environmental aspects are marked with a 'Y' and discussed in the text below.

Table 18-1 Interactions between Environmental Topics

	Population and Human Health	Cultural Heritage	Landscape and Visual	Traffic & Transportation	Noise and Vibration	Air Quality	Climate	Soils, Geology and Hydrogeology	Coastal Processes	Water Environment	Marine Ecology	Terrestrial Ecology & Ornithology	Material Assets
Population & Human Health													
Cultural Heritage													
Landscape & Visual	Y	Y											
Traffic & Transportation	Y		Y										
Noise & Vibration	Y		Y	Y									
Air Quality	Y			Y									
Climate													
Soils, Geology & Hydrogeology			Y			Y							
Coastal Processes		Y					Y						
Water Environment								Y	Y				

Marine Ecology					Y	Y	Y		
Terrestrial Ecology & Ornithology	Y		Y			Y	Y	Y	
Material Assets		Y							

[18.1.1] Population & Human Health and Landscape & Visual

The proposed works have the potential to impact upon the landscape that will be most notable locally. With the inclusion of landscape design as outlined in Chapter 7 of this EIAR, these impacts can be minimised.

[18.1.2] Population & Human Health and Traffic & Transportation

The increase in network traffic will be most noticed amongst the local population. However, it is considered that the predicted increases in network traffic as a result of construction and operational development will be neutral and imperceptible with the probability of effects unlikely.

[18.1.3] Population & Human Health and Noise & Vibration

It is anticipated that noise and vibration impacts have the potential to affect the local population in both construction and operational phases. However, given the urban/industrial nature of the scheme area, and the addition of mitigation measures, the impacts will be similar to the current baseline scenario.

[18.1.4] Population & Human Health and Air Quality

It is considered that the predicted increases in network traffic as a result of construction and operational development will be neutral and imperceptible with the probability of effects unlikely. This is also addressed in Chapters 10 and 8.

[18.1.5] Cultural Heritage and Coastal Processes

While there are no recorded wrecking events within the dredge pockets, there is still potential for any of the wrecking events generally recorded as being in ‘Cork Harbour’ to have occurred there. As such, there is a potential for the alteration of coastal processes to impact upon marine archaeology. However, assessment has concluded that there will be no impacts as a result of the proposed works.

[18.1.6] Traffic & Transportation and Noise & Vibration

Traffic generation has the potential to result in noise related impacts. However, it is considered that the predicted increases in network traffic as a result of construction and operational development will be neutral and imperceptible with the probability of effects unlikely.

[18.1.7] Traffic & Transportation and Air Quality

It is considered that the predicted increases in network traffic as a result of construction and operational development will be neutral and imperceptible with the probability of effects unlikely.

[18.1.8] Traffic & Transportation and Material Assets

The road improvements will connect with the proposed redevelopment of the M28 which will serve future traffic needs in the area. Moreover. the increase in container traffic will likely result in additional waste arising from ships in the port. However, with the incorporation of suitable mitigation measures during construction, and operation, no significant impacts will occur.

[18.1.9] Noise & Vibration and Terrestrial Ecology & Ornithology

The increase in noise and vibration during the construction phase has the potential to impact upon the fauna, and in particular birds, in the vicinity of the proposed works. However, with the incorporation of suitable mitigation measures during construction, and operation, no significant impacts will occur. See Chapter 16 for more detail.

[18.1.10] Air Quality and Soils, Geology & Contamination

Excavation works and exposure of soil during the construction phase can influence the microclimate in an area. The movement of soils during the construction phase may result in the spread of dust and mud onto surrounding land uses and public roads. The air quality assessment indicates that there is no significant impact associated with these matters.

[18.1.11] Climate and Coastal Processes

There is potential for interaction between climate impacts and surface water. There is possibility for increased water levels as a result of increased frequency of 1:1000 AEP events. The likelihood of climatic changes being attributable to the activities at the site is considered low.

[18.1.12] Soils, Geology & Hydrogeology and Water Environment

Significant earthworks have the potential to impact on nearby watercourse. However, with the implementation of appropriate mitigation measures, no significant impacts are predicted.

[18.1.13] Soils, Geology & Hydrogeology and Marine Environment

Significant earthworks have the potential to impact on the marine environment and its habitats and species. However, with the implementation of appropriate mitigation measures, no significant impacts are predicted.

[18.1.14] Coastal Processes and Water Environment

There is a potential for interactions between water quality and coastal processes. These impacts can happen due to the alteration of the coastline. However, it is noted in the coastal processes chapter that there will be no significant impacts. See Chapter 13 for more information.

The water environment chapter also identifies potential impacts upon the coastal processes which may occur due to the potential for flooding. Assessments have concluded however that the proposed works will have no significant impact, as the predicted flood levels have been incorporated into the design.

[18.1.15] Coastal Processes and Marine Ecology

There are interactions between coastal processes and marine ecology impacts. There has been close cooperation between the ecological and Coastal Modelling consultants. With the implementation of appropriate mitigation measures, no significant impacts on marine ecology has been predicted.

[18.1.16] Water Environment and Marine Ecology

Marine ecology is dependent on water quality. Disruption in water chemistry or sediment levels has potential to impact on local flora and fauna. With the implementation of appropriate mitigation measures, the marine ecology chapter has shown that no significant impacts will occur. See Chapters 14 and 15.

[18.1.17] Water Environment and Terrestrial Ecology & Ornithology

Many terrestrial species rely on the water environment and can be negatively impacted by changes/reductions in water quality. However, with the implementation of appropriate mitigation measures, no significant impacts are predicted.

[18.2] Cumulative Effects

Cumulative impacts are effects that result from incremental changes caused by other past, present or reasonably foreseeable developments together with the proposed development. Cumulative effects were assessed by looking at all current developments for which planning has been approved within 1km of the proposed site location. A consideration of development objectives in the current development plans in the area was also carried out. This cumulative assessment has considered cumulative impacts that are:

a) Likely;

b) Significant; and

c) Relating to an event which has either occurred or is reasonably foreseeable together with the impacts from this development.

A search in relation to plans and projects that may have the potential to result in cumulative impacts was carried out. Data sources included the following:

- Cork County Council ePlan Online Enquiry
- Cork County Development Plan 2022-2028

The below Table 18-2 outlines the potential cumulative effects of all known plans/projects within 1km of the Project site location that have been granted planning permission in the past 5 years.

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Table 18-2 Cumulative effects of known plans/projects

Applicant [Application number]	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
Cork County Council Planning Applications with 1 km from the past 5 years (Decision due date from 2020 to 15/11/2024)				
Kiron Investments Limited [196785]	The construction of 4 no. two-storey townhouses and all ancillary site development works. The proposed development makes provision for the demolition of existing agricultural sheds and comprises 2 no. 2 bedroom houses and 2 no. 3 bedroom houses. Vehicular and pedestrian access to the proposed development will be via Warren's Court, which will be upgraded, with provision for a public footpath and public lighting, as part of the proposed development.	Application Approved (Conditional; 27/01/2020)	Minor Traffic Impacts anticipated	Considering the location of the proposed works and the extent of the works, the likelihood of significant environmental effects is low. It is therefore determined that there is **no potential for cumulative effects.**
Pfizer Ireland Pharmaceuticals [196818]	The construction of a one storey extension to the north-east corner of the existing Drum Pad warehouse, minor elevation changes and all associated site works at the production facility. The site currently operates under an Industrial Emissions (IE) license (P0013-04) under part IV of the Environmental Protection Agency Act 1992 (as amended for the Protection of the Environment Act, 2003). The new development is on a site to which the Chemical Act (control of major accident hazards involving dangerous substances) regulations 2015 (S.I. 209 of 2015) applies.	Application Approved (Conditional; 29/01/2020)	Minor construction dust impacts anticipated	Considering the location of the proposed works and the extent of the works, the likelihood of significant environmental effects is low. It is therefore determined that there is **no potential for cumulative effects**.
Pfizer Ireland Pharmaceuticals [205207]	The construction of a 1 storey water treatment & electrical building and a 2-storey electrical room extension to the existing finished goods building at the production facility. The site currently operates under an Industrial Emissions (IE) license (P0013-04) under part IV of the Environmental Protection Agency Act 1992 (as amended for the Protection of the Environment Act, 2003). The new development is on a site to which the Chemical Act (Control of Major Accident Hazards Involving Dangerous Substances) regulations 2015 (S.I. 209 of 2015) applies.	Application Approved (Conditional; 31/07/2020)	Minor construction dust impacts anticipated	Considering the location of the proposed works and the extent of the works, the likelihood of significant environmental effects is low. It is therefore determined that there is **no potential for cumulative effects**.

Applicant [Application number]	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
Pfizer Ireland Pharmaceuticals [205533]	A 10-year planning permission for the construction of a contractor's compound, welfare facilities, an internal access road and associated works. The proposed compound will be built in the area previously occupied by the ADM wastewater treatment plant, which is currently being demolished, Planning Ref. 18/6631 relates to this demolition. Part of the aeration basin tank walls which were to be demolished under Planning Ref. 18/6631 will now be retained as part of this proposed development. Enabling works will include the demolition of the former ADM workshop and stores (total floor area = 820m^2 with an overall height of 8.12m): Demolition of this building was previously permitted as part of the expired planning application 12/5768, the relocation and grading of site – won material, the removal of 91 trees, protective fencing around trees that are to remain, and some other minor demolitions and alterations. The proposed development will include: A two-storey canteen and meeting rooms building (total floor area = 337m^2 with an overall height of 6.45m); a toilet and shower building (total floor area = 202m^2 with an overall height of 3.15m); an electrical sub-station (total floor area = 56m^2 with an overall height of 3.15m); a pickling shed (total floor area = 92m^2 with an overall height of 4.74m); double-stacked temporary portable contractor cabin (total floor area = 808m^2 with an overall height of 4.95m); steel gantry walkways and stairs: a workshop and storage containers area (total floor area = 1290m^2 with an overall height of 2.45m); a waste and recycling area for accommodating skips; a laydown area; a new security building (total floor area = 66m^2 with an overall height of 3.15m); new internal roads, footpaths and set-down area, relocation of existing car parking spaces and provision of an additional 20 parking spaces, new car park information sign board at the site entrance. The development will include all associated on-site	Application Approved (Conditional; 04/12/2020)	Minor construction dust and traffic impacts anticipated	Considering the location of the proposed works and the extent of the works, the likelihood of significant environmental effects is low. It is therefore determined that there is **no potential for cumulative effects.**

Applicant [Application number]	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
	infrastructure. The proposed development is covered by an existing Industrial Emissions Directive Licence No. P0013-04. As the development refers to a modification to an establishment to which the Major Accident Directive applies information as specified in the third schedule of the Major Accident Regulations will be submitted with the application.			
Ringaskiddy Community Association [205840]	Renovations and alterations to existing community centre building, including installation of 22no. 275W 60 cell roof mounted P.V. panels and ancillary site works.	Application Approved (Conditional; 05/10/2020)	Minor construction dust impacts anticipated	Considering the location of the proposed works and the extent of the works, the likelihood of significant environmental effects is low. It is therefore determined that there is **no potential for cumulative effects**.
RNB Retail Ltd [214439]	Construction of a two-storey mixed-use development, namely; ground floor retail premises, and first floor residential (2no. apartments), along with associated site works.	Application Approved (Conditional; 16/04/2021)		Considering the location of the proposed works and the extent of the works, the likelihood of significant environmental effects is low. It is therefore determined that there is **no potential for cumulative effects**.
Pfizer Ireland Pharmaceuticals [214631]	A 10-year planning permission to amend the recently permitted development for the construction of a contractor's compound, welfare facilities, an internal access road and associated works, Ref: 20/5533. The amendments include adjusting internal access roads and associated works. The proposed amendments include relocating a section of road accessing the permitted contractor's compound, construction of associated earth reinforced retaining walls, the working and grading of site-won material, the removal of 88 trees, replacement planting of 90 trees, the erection of protective fencing around trees that are to remain, and some other minor	Application Approved (Conditional; 31/05/2021)	Minor construction dust impacts anticipated	Considering the location of the proposed works and the extent of the works, the likelihood of significant environmental effects is low. It is therefore determined that there is **no potential for cumulative effects**.

Applicant [Application number]	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
	demolitions and alterations. The proposal includes the removal of 3 No. double-stacked temporary portable contractor cabins (total floor area removed = 192m^2, overall height of 4.95m) and removal of a section of steel gantry walkways from the previously permitted contractor's compound. The development will include all adjustments required to associated on-site infrastructure. The proposed development is covered by an existing Industrial Emissions Directive Licence No. P0013-04. As the development refers to a modification to an establishment to which the Major Accident Directive applies information as specified in the third schedule of the Major Accident Regulations will be submitted with the application.			
Pfizer Ireland Pharmaceuticals [215132]	A 10-year permission for the construction of a new Clinical Manufacturing Facility (referred to as RCMF) at the existing Pfizer site. The proposed RCMF facility will include (i) a new five storey clinical manufacturing building (c.11,468sqm and maximum height 29.425m) which will include production areas, laboratories, ancillary office space, warehouse, and plant and utility space. The building will be constructed in two sequential phases, Phase 1 comprising c.9,465 sqm and Phase 2 comprising c.2,003sqm; (ii) a single storey warehouse drum store building (c.420sqm and maximum height 13.00m); (iii) an external utility yard comprising; a two storey electrical building (c.94sqm and maximum height 11.70m), an emergency generator with flue stack, 1No. liquid nitrogen tank, 2No. evaporators, 3No. bunded chillers, 2No. bunded receiver tanks, 2No. bunded glycol tanks, a three storey steel frame structure (to a maximum height of 12.91m) to accommodate; dry coolers, heat exchangers and other miscellaneous utility plant and machinery above the utility yard; (iv) an elevated structural steel piperack	Application Approved (Conditional; 22/06/2021)	Minor construction dust impacts anticipated. Proposed air quality emissions are in line with existing licence limits	Considering the location of the proposed works and the extent of the works, the likelihood of significant environmental effects is low. It is therefore determined that there is **no potential for cumulative effects**.

Applicant [Application number]	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
	(c.210m in length and maximum height 9.19m) to provide piped utility services to the new facility, and; (v) all associated site development works, including roads, paths, yards, underground services and landscaping. This application relates to development which comprises an activity which holds an Industrial Emissions Directive Licence (P0013-04). As the development refers to a modification to an establishment to which the Major Accident Directive applies, information as specified in the third schedule of the Major Accident Regulations will be submitted with the application. An Environmental Impact Assessment Report (EIAR) and a Natura Impact Statement (NIS) have been prepared and will be submitted to the Planning Authority with the application.			
Pfizer Ireland Pharmaceuticals [215379]	To construct a replacement end-of-line abatement unit, associated vent stack and ancillary works. The replacement end-of-line abatement unit will have a footprint of approximately 650m2 and a maximum height of 12.5m, whilst the associated vent stack will be approximately 32m in height above ground. Ancillary works include interconnecting pipework and the installation of three storage tanks. The proposed development is covered by an existing Industrial Emissions Directive License No. P0013. As the development refers to a modification to an establishment to which the Major Accident Directive applies, information as specified in the Third Schedule of the Major Accident Regulations will be submitted with the application.	Application Approved (Conditional; 13/07/2021)	Proposed air quality emissions are in line with existing licence limits	Considering the location of the proposed works and the extent of the works, the likelihood of significant environmental effects is low. It is therefore determined that there is **no potential for cumulative effects**.
Pfizer Ireland Pharmaceuticals [215402]	1) The construction of an electrical building, 2) i) amendments to the footprint and elevations of the recently permitted water treatment and electrical building which was granted planning under Planning Ref. 20/05207, ii) the construction of a first-floor electrical room extension to	Application Approved (Conditional; 12/07/2021)	Limited impacts anticipated	Considering the location of the proposed works and the extent of the works, the likelihood of significant environmental effects is low. It is therefore determined

Applicant [Application number]	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
	this permitted water treatment and electrical building. The proposed development is covered by an existing Industrial Pollution Control License No. P0013-04. As the development refers to a modification to an establishment to which the Major Accident Directive applies, information as specified in the Third Schedule of the Major Accident Regulations will be submitted with the application.			that there is **no potential for cumulative effects**.
Pfizer Ireland Pharmaceuticals [216026]	i) Modifications to the north, south and east elevations of the existing Organic Synthesis Production Building No. 4 (referred to as OSP4), ii) the demolition of the cantilevered window on the eastern elevation at second floor level of the existing OSP4 Production Building, iii) the construction of a single storey electrical room and control room extension at second floor level to the east of the existing OSP4 Production Building and iv) all ancillary site development works, at their production facility. The proposed development is covered by an existing Integrated Pollution Control Licence No. P0013-04. The development refers to a modification to an establishment to which the Major Accident Regulations applies.	Application Approved (Conditional; 14/09/2021)	Minor construction impacts, traffic noise and dust emissions should be temporary and transient	Considering the location of the proposed works and the extent of the works, the likelihood of significant environmental effects is low. It is therefore determined that there is **no potential for cumulative effects**.
University College Cork [217291]	The removal of 8 no. car parking spaces permitted under Cork County Council planning application 11/5487, and their replacement with the construction of an open-air outdoor enclosure comprising of a concrete base, timber panel security fence and access gateways, fixed to the existing in-situ concrete wall, and all associated development. The enclosure will house a test rig, consisting of pipe work,3 no. water tanks, and electronic equipment, mounted on a steel framed platform (a skid) to facilitate transport by road and ease of installation and allow for the removal of the rig once testing is complete after approximately 3 years.	Application Approved (Conditional; 24/03/2022)	Given the nature of the proposed works, several cumulative impacts and/or in-combination impacts may occur including: • Noise and vibration emissions	The development works encompass are relatively small in nature and duration so construction impacts are not expected. The operation of the rig is expected to emit noise emissions lower than established 60dB L_{AEQ} criterion. It is therefore determined that there is **no potential for cumulative effects**.

Applicant [Application number]	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
Pfizer Ireland Pharmaceuticals [224295]	Permission for (i) The retention of 2 no. one storey modular buildings for office use adjacent to the existing finished goods building, (ii) the construction of a two storey modular building for welfare use at ground floor level and office use at first floor level, to the north west of the existing warehouse building with enclosed stairway access to the first floor level, and (iii) all ancillary site development works at their production facility. The proposed development is covered by an existing Industrial Emissions Directive License No. P0013. As the development refers to a modification to an establishment to which the Major Accident Directive applies, information as specified in the Third Schedule of the Major Accident Regulations will be submitted with the application.	Application Approved (Conditional; 12/05/2022)	Given the nature of the proposed works, several cumulative impacts and/or in-combination impacts may occur including: • Noise and vibration emissions • Impacts from increased traffic	The increase of office space and therefore workers, means an increase in traffic on the N28. However, these impacts may only be short term until upgrade works on the M28 take place. Given the extent of existing offices and the modular nature of the construction, it is determined that there is **no potential for cumulative effects**.
Port of Cork Company [224356]	A new vehicular entrance off the L2545, the temporary use of lands (for a period of 10 years) for open storage of port related cargo, and all ancillary works including road / kerbside re-alignment and security fencing	Application Approved (Conditional; 22/07/2022)	Given the nature of the proposed works, several cumulative impacts and/or in-combination impacts may occur including: • Noise and vibration emissions • Impacts from increased traffic	Considering the location of the proposed works and the extent of the works, the likelihood of significant environmental effects is low. It is therefore determined that there is **no potential for cumulative effects**.
R & H Hall [224577]	Removal of external inclined conveyer system to warehouse as permitted under Cork County planning Ref. 06/13900 and replacement with vertical elevator and associated pit and a horizontal enclosed conveyor with supporting bridge structure and all associated site works	Application Approved (Conditional; 19/08/2022)	Given the nature of the proposed works, several cumulative impacts and/or in-combination impacts may occur including: • Noise and air emissions	Conditions of planning approval require mitigation measures to be put in place to ensure noise and air emissions don't exceed acceptable limits. It is therefore determined that there is **no**

Applicant [Application number]	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
				potential for cumulative effects.
Janssen Sciences Ireland UC [224608]	(i) 1 no. 3-storey office extension to the existing administration building with a floor area of approximately 2,721 square meters, an overall parapet height of 16.3 meters and connected by overhead passageway to the southern elevation of the administration building; (ii) temporary continuation for a further 2 years of use of the existing 4 no. single-storey, 360 square meter pre-fabricated temporary modular office units permitted under planning reference 16/07150; (iii) permanent continuation of use for the existing 95 no. car spaces temporarily permitted under reference 16/07150. The development will include associated works for local site roads, footpaths, connection to underground services, landscaping and site works. The proposed development is located on lands approximately 1.32 hectares within the existing permitted manufacturing campus. This application relates to development which comprises an activity which holds an industrial emissions directive licence (Reg. No. P0778-02)	Application Approved (Conditional; 19/08/2022)	Given most of the works are complete and the small nature of construction works, no significant effects are expected.	There is **no potential for cumulative effects**.
Port of Cork Company [234358]	Construction of a grass mound and erection of a commemorative sculpture and all associated works.	Application Approved (Conditional; 02/06/2023)	Given the small nature of the works, no significant effects are expected.	There is **no potential for cumulative effects**.
Pfizer Ireland Pharmaceuticals [225541]	(1) permission for retention of the following, (a) modifications to the elevations, (b) the extension of the goods lift to roof level including an external canopy at roof level, (c) the relocation of the firefighting stairs to the west of the existing building including signage on the western elevation, (d) an external access stairs from low level roof to high level roof, (e) additional production floor area of 139.5sq.m at ground floor mezzanine level, (f) additional production floor area of 621sq.m and 2 no. access	Application Approved (Conditional; 11/10/2022)	Given most of the works are complete and the small nature of construction works, no significant effects are expected.	There is **no potential for cumulative effects**.

Applicant [Application number]	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
	platforms at second floor mezzanine level, (g) additional production floor area of 46.8 square metres at third floor level and (h) modifications to the location and size of the production stairs on the west & east side of the south side extension. This retention permission relates to the previously permitted New Product Technology Laboratory extension, planning ref. 18/7382. (2) Permission for the following, (a) the construction of a 4-storey production extension at ground floor level to the north & west with a ground floor and second floor mezzanine including a fire escape stairwell at the north-west corner of this proposed extension. The proposed extension has a total floor area of 1,736 square metres. (b) additional plant room floor area of 166 square metres at third floor level and (c) the provision of roof mounted plant on the low-level roof area of the New Product Technology Laboratory building. The proposed development is covered by an existing Industrial Emissions Directive Licence no. P0013. As the development refers to a modification to an establishment to which the Major Accident Directives applies, information as specified in the third schedule of the major accident regulations will be submitted with the application.			
Dwellings Developments Ringaskiddy Ltd. [225633]	Construction of 18 no. dwelling houses (reconfiguration and change of layout of part of the permitted residential layout granted under Pl. Reg. No. 18/5545 at site no's 13 - 30, to re-orientate and rearrange the layout of 12 no. 3 bed semi-detached houses and 6 no. 3 bed terrace houses), re-location of site entrance, landscaping, public lighting, soakways and all associated development.	Application Approved (Conditional; 03/03/2023)	Given the nature of the proposed works, several cumulative impacts and/or in-combination impacts may occur including: • Noise and vibration emissions • Impacts from increased traffic	Considering the location of the proposed works and the extent of the works, the likelihood of significant environmental effects is low. It is therefore determined that there is **no potential for cumulative effects**.

Applicant [Application number]	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
Pfizer Ireland Pharmaceuticals [226239]	Permission for the construction of an electrical building and all ancillary site development works at their production facility at Ballintaggart and Ballybricken townlands, Ringaskiddy, Co.Cork. The proposed development is covered by an existing Industrial Emissions Licence No. P0013. As the development refers to a modification to an establishment to which the Major Accident Directive applies, information as specified in the Third Schedule of the Major Accidents Regulations will be submitted along side the application.	Application Approved (Conditional; 09/01/2023)	Given the small nature of the works, no significant effects are expected.	There is **no potential for cumulative effects**.
Janssen Sciences Ireland UC [226653]	Permission for development at Barnahely, Ringaskiddy, Co. Cork. The development will consist of; 1 no. 2-storey extension, with a floor area of approximately 48.0 square meters and height to parapet of 8.2 meters, to the existing warehouse locker room previously permitted under Cork Council Reg. Ref. 06/7499. The development will include associated ancillary site works, connection to existing underground services and landscaping. This application relates to development which comprises an activity which holds an Industrial Emissions Directive Licence (Reg. No. P0778-02).	Application Approved (Conditional; 10/03/2023)	Given the small nature of the works, no significant effects are expected.	There is **no potential for cumulative effects**.
Dwellings Developments Ringaskiddy Ltd. [226675]	Permission for retention and completion of 12 no. dwelling houses originally granted planning permission under Planning Reg. No. 18/5545.	Application Approved (Conditional; 14/03/2023)	Given most of the works are complete and the small nature of construction works, no significant effects are expected.	There is **no potential for cumulative effects**.
Pfizer Ireland Pharmaceuticals [235195]	Installation of a Solar Photovoltaic (PV) Array (Proposed Area = 2403m2) on the upper level of an existing ground and first floor carpark building, construction of an extension to an existing electrical switch room located under the access ramp to the upper level of the carpark and all ancillary site development works at their production	Application Approved (Conditional; 22/09/2023)	Given the small nature of the works, no significant effects are expected.	There is **no potential for cumulative effects**.

Applicant [Application number]	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
	facility. The proposed development is covered by an existing Industrial Emissions Licence No. P0013. As the development refers to a modification to an establishment to which the Major Accident Directive applies, information as specified in the Third Schedule of the Major Accident Regulations will be submitted with the application.			
Pfizer Ireland Pharmaceuticals [235371]	Permission to remove an existing biocycle wastewater treatment unit and replace with a new wastewater treatment unit and associated site works on their land at Raffeen Sports and Social Club, Ballintaggart & Shanbally Townlands, Ringaskiddy	Application Approved (Conditional; 29/09/2023)	Given the nature of the proposed works, several cumulative impacts and/or in-combination impacts may occur including: • Ground and surface water quality.	The proposed works will see the upgraded system moved further from the existing watercourse and there will be some localised and minor groundwater. However, the small nature of these works, there is **no potential for cumulative effects**.
University College Cork (UCC) [235531]	Removal of three car parking spaces and the erection of a research container unit.	Application Approved (Conditional; 19/10/2023)	Given the small nature of the works, no significant effects are expected.	There is **no potential for cumulative effects**.
Pfizer Ireland Pharmaceuticals [235834]	Permission for construction of Bld. 124 - Site Lab Building. This will comprise a new five-storey building (circa 10,881 square metres with a maximum height of circa 30.2m above ground) which will include laboratories, a canteen, ancillary office space and plant and utility space, and associated site development works, including; roads, paths, yards, underground services and landscaping. The proposed development is covered by an existing Industrial Emissions Directive Licence No. P0013-05. As the development refers to a modification to an establishment to which the Major Accident Directive applies, information as specified in the Third Schedule of the Major Accident Regulations will be submitted with the application.	Application Approved (Conditional; 08/12/2023)	Given the nature of the proposed works, several cumulative impacts and/or in-combination impacts may occur including: • Traffic increases • Noise and Vibration	The newly constructed building is to replace existing laboratory facilities and thus would not result in a large increase of workers travelling to the Pfizer estate. Construction noise and vibration is unlikely to cause significant effects due to the existing industrial environment. There is **no potential for cumulative effects**.

Applicant [Application number]	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
Pfizer Ireland Pharmaceuticals [235875]	Permission for the construction of an extension to the existing roof level platform for 1 no. air handling unit and associated ductwork over the existing organic synthesis plant 1. The construction of a roof level platform for 5 no. air handling units and associated plant and ductwork over the existing organic synthesis plant 3 including 2 no. cladded screens at penthouse level, 2 no. cladded screens with louvres at roof level and all ancillary site development works at their production facility. The proposed development is covered by an existing Industrial Emissions Licence No. P0013. As the development refers to a modification to an establishment to which the Major Accident Directive applies, information as specified in the Third Schedule of the Major Accident Regulations will be submitted with the application.	Application Approved (Conditional; 15/12/2023)	Given the small nature of the works, no significant effects are expected.	There is **no potential for cumulative effects**.
Pfizer Ireland Pharmaceuticals [235875]	Construction of 2 no. one storey modular buildings for office use and 2 no. storage containers to the north of the existing Operation Support Group Building including all ancillary site development works at their production facility. The proposed development is covered by an existing Industrial Emissions Licence No. P0013. As the development refers to a modification to an establishment to which the Major Accident Directive applies, information as specified in the Third Schedule of the Major Accident Regulations will be submitted with the application.	Application Approved (Conditional; 09/02/2024)	Given the nature of the proposed works several cumulative impacts and/or in-combination impacts may occur including: • Noise and vibration emissions • Impacts from increased traffic	There is potential for **minor cumulative traffic impacts**
University College Cork (UCC) [236365]	Permission for the relocation and erection of a small micro generation research wind turbine at the north-eastern corner of the site. The wind turbine will be used to provide power to the Beaufort Building and for the educational purposes. The project involves: 1) construction of a	Application Approved (Conditional; 07/03/2024)	Given the small nature of the works and the minor visual impact of the wind turbine, no significant effects are expected.	There is **no potential for cumulative effects**.

Applicant [Application number]	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
	concrete foundation for the turbine (measuring 12.25m2), 2) erection of the tower and turbine (metal lattice tower and turbine with tip height of 19.1m) and 3) associated site works, fencing and utility connections.			
Premier Molasses Company Limited [244445]	Permission is sought for the installation of three liquid storage tanks within an existing bunded area and all associated pipe works and site works at an existing tank farm.	Application Approved (Conditional; 12/06/2024)	Given the nature of the works, no significant effects are expected. Works are immediately adjacent to Port of Cork so there could be some construction overlap.	There is **no potential for cumulative effects**.
Pfizer Ireland Pharmaceuticals [244786]	Permission for the construction of a single storey electrical building and all ancillary site development works at their production facility. The proposed development is covered by an existing Industrial Emissions Directive Licence No. P0013-06. As the development refers to a modification to an establishment to which the Major Accident Directive applies, information as specified in the Third Schedule of the Major Accident Regulations will be submitted with the application.	Application Approved (Conditional; 23/07/2024)	Given the small nature of the works, no significant effects are expected.	There is **no potential for cumulative effects**.
Janssen Sciences Ireland UC [244822]	Permission for construction of a new bulk caustic tank and tanker loading area at existing bio-pharmaceutical manufacturing facility. The development will comprise: 1) construction of bulk caustic tank to a height of approximately 6.4m above the established ground level, a diameter of approximately 3m and capacity of approximately 30,000 litres to be positioned within a concrete bund providing 110% capacity of the tank and to include steel maintenance gentry stairs, control unit and associated equipment concrete plinths, 2) construction of a tanker loading area of approximately 180 sqm, 3) extension by approximately 12m of the adjacent existing high level pipe rack (approximate height of 7.4m) and 4)	Application Approved (Conditional; 09/08/2024)	Given the already industrial environment, there are unlikely to be significant in-combination or cumulative impacts during construction and operation.	There is **no potential for cumulative effects**.

Applicant [Application number]	Overview	Status (date)	Potential significant effects from plan/project	Potential in-combination effects
	associated drainage works, pipe connections and internal road reinstatement. This application relates to development which comprises an activity which holds an Industrial Emissions Directive licence (Reg. No. P0778-02).			
Janssen Sciences Ireland UC [244910]	Permission for the construction of extensions to the canteen facilities at our existing bio-pharmaceuticals manufacturing facility. The proposed development will comprise: i) a c.93sqm single storey extension to the northern side of the existing canteen to facilitate additional seating, and ii) a c.90 sqm extension to the southern side of the canteen to facilitate additional kitchen space. This application relates to development which comprises an activity which holds an industrial emissions directive licence (reg. no. P0779-02).	Decision made (Conditional; 13/07/2024)	Given the small nature of the works, no significant effects are expected.	There is **no potential for cumulative effects**.
Hovione Ltd	Permission for the construction of a single 4.3MW wind turbine, inclusive of underground connection to new on-site electrical building and associated infrastructure. The application relates to an establishment operating under an Industrial Emissions Licence. Hovione is notified as a Lower Tier Establishment under the Major Accidents Directive (as enacted by S.I. 209 of 2015).	Decision due: 11/12/2024	Given the relatively small and localised nature of the works, no significant effects are expected.	There is **no potential for cumulative effects**.

Discharge Licences

There are eight Integrated Pollution Prevention Consents near Ringaskiddy, two licensed surface water discharges under the Water Pollution Acts into the harbour. All of these discharges are currently regulated under by the EPA or Cork County Council and have emission limit values specified in their consent license to ensure that there is no significant impact on the receiving water. It is therefore anticipated that there will be no significant, cumulative adverse impacts on the water environment.

Nutrient Inputs

Upstream nutrient input mainly from diffuse sources but also waste water treatment discharges are the key sources of dissolved inorganic nitrogen (DIN). DIN levels in Cork Harbour are above EQS, preventing the water body from achieving good ecological potential. The proposed port redevelopment will be serviced by the Cork Lower Harbour Main Drainage Scheme or, in the event that the scheme is not completed prior to the Port redevelopment, a dedicated wastewater treatment plant prior to discharge to coastal waters. The proposed redevelopment will therefore not have any cumulative adverse impacts on nutrient conditions in the Harbour.

Road Drainage

Road drainage will be required from the sections of new road and upgrade works; it is proposed to discharge this to the harbour. The discharge has the potential to carry contaminants derived from either wear and tear of vehicles' mechanical parts, or from combustion of fuel or oil leaks. Generally the concentration of contaminants in surface water run-off from a roads scheme increases with traffic density (NRA, 2008). The road design will include for the use of highway grade petrol/oil interceptors prior to any discharge to the harbour waters. This represents an improvement over the existing situation and therefore represents a positive impact in terms of water quality.

Port of Cork Maintenance Dredging

The coastal process modelling has concluded that the redevelopment of the Port will not change the existing maintenance dredging requirements in Cork Harbour. The habitats directive screening statement prepared for the latest maintenance dredging application has also concluded that the current maintenance dredging regime will not have a significant impact on water quality. Therefore, based on the assessment of the capital dredging works proposed for the Port redevelopment and the maintenance dredging assessment no cumulative impacts are predicted.

[18.3] Potential Construction Overlap

The preliminary construction schedule for the development is as follows:

- Phase 1: CCT2- 2024-2027
- Phase 2: Ringaskiddy West DWB Extension- 2026-2027
- M28 Upgrade: 2027-2028

It is anticipated that there will be some construction overlap for the following project cited below and in Table 18-2.

- Premier Molasses – tank farm construction on neighbouring property
- Ballycotton Harbour Dredging – dredging and disposal at the off-shore dump site

[18.4] Interactions with Known Plans

[18.4.1] M28 Cork to Ringaskiddy Project

The M28 Cork to Ringaskiddy Project is the upgrade of approximately 12.5km of the N28 National Primary Route from the N40 South Ring Road, at Bloomfield Interchange, to Ringaskiddy, Co. Cork. The planning application for the M28 Cork to Ringaskiddy project was approved by An Bord Pleanála in June 2018. The proposed upgrade of the N28 (to become the M28) is a long-term strategic objective for both Cork City and County Councils. The interaction of these projects is likely to have **slight, short-term negative** impacts. However, the implementation of both projects will have **significant, long-term positive** impacts locally and nationally.

[18.4.2] Ringaskiddy Urban Realm & Active Travel Scheme

The scheme will enhance the village of Ringaskiddy and also provide an active travel route along the existing N28, from the existing Port of Cork entrance to the car park at Gobby Beach. The construction on this scheme is expected to last for 12 months. Both projects have Traffic Management Plans in place. The interaction of these projects is likely to have **slight, short-term impacts**.

[19] Major Accidents & Disasters

[19.1] Introduction

This Chapter describes likely significant negative effects on the environment arising from the vulnerability of the proposed development to risks of major accidents and/or natural disasters, and the potential for the proposed scheme to cause major accidents and/or disasters. The underlying objective of this assessment is to ensure that appropriate precautionary actions are taken for those projects where their vulnerability to major accidents and/or natural disasters may result in significant adverse effects on the environment.

The assessment of the vulnerability of the proposed scheme to major accidents and natural disasters is carried out in compliance with the EIA Directive whereby the chapter will seek to:

- Identify potential major accidents and/or disasters, if any, that the proposed scheme could be vulnerable to,
- Determine whether these major accidents and/or disasters are likely to result in significant adverse environmental impacts, and
- Define the measures in place, or need to be in place, to prevent or mitigate the possible significant adverse effects of such events on the environment.

The scope and methodology of this assessment is centred on the understanding that the proposed scheme will be designed, built and operated in line with best international current practice. As such, major accidents resulting from the proposed scheme will be very unlikely.

[19.2] Assessment Methodology

[19.2.1] Legislation

The scope and methodology presented in the following sections is based on the provisions of the EIA Directive, the EPA Guidelines 2022 and other published risk assessment methodologies as described in the following sections.

Article 3 of the EIA Directive requires that the EIAR shall identify, describe and assess in the appropriate manner, the direct and indirect significant effects on population and human health, biodiversity, land, soil, water, air and climate, material assets, cultural heritage and landscape deriving from (amongst other things) the “vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned”.

The information relevant to major accidents and/or disasters to be included in the EIAR is set out in Section 8 of Annex IV of the EIA Directive as follows:

“(8) A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on

the environment and details of the preparedness for and proposed response to such emergencies".

[19.2.2] Local Policy & Guidelines

Cork Major Emergency Management and Major Emergency Plan - https://www.corkcoco.ie/en/resident/fire-and-building-control/major-emergency-management-and-major-emergency-plan

The objective of this Major Emergency Plan is to protect life and property, to minimise disruption to the community and to provide immediate support for those affected. To achieve this objective the Plan sets out the basis for a co-ordinated response to a Major Emergency and the different roles and functions to be performed by the various agencies.

The priorities of Cork County Council's response in an emergency are;

- Protection and care of the public at times of vulnerability.
- Clear leadership in times of crisis.
- Early and appropriate response.
- Efficient, coordinated operations.
- Realistic and rational approach, capable of being delivered.
- Transparent systems, with accountability.
- Harnessing community spirit.
- The ethos of self-protection.
- Maintenance of essential services.
- Safe working.

This Major Emergency Plan provides for a co-ordinated response to Major Emergencies that may arise, for example, from fires, explosions, gas releases, and transportation accidents, spillages of dangerous substances and from severe weather. The types of emergency normally resulting from oil supply crises, electrical power blackouts, industrial disputes etc. are of a different nature and are not catered for in this Plan. It is recognised, however, that such emergencies could result in a situation, such as a major gas explosion, requiring activation of the Major Emergency Plan.

In certain circumstances, the local response to a Major Emergency may be scaled up to a Regional Level Response, requiring the activation of the Plan for Regional Level Coordination The Major Emergency Plan also contains specific sub-plans such as the Severe Weather Plan, Flood Emergency Response Plan, Drinking Water Incident Response Plan and External Emergency Plans for Upper Tier Establishments coming under the Seveso Regulations.

A Major Emergency will be declared by an Authorised Officer of whichever Principal Response Agency (PRA) considers that the criteria in the definition of a 'Major Emergency' below have been satisfied.

A Major Emergency is any event, usually with little or no warning, causes or threatens death or injury, serious disruption of essential services or damage to property, the environment of infrastructure beyond the normal capabilities of the Principal Emergency Services in the area in which the event occurs, and requires the activation of specific additional procedures and the mobilisation of additional resources to ensure an effective, co-ordinated response.

The Major Emergency Plan will immediately be activated when a Major Emergency is declared. The Plan will be activated by whichever of the following agencies first becomes aware of the declaration: -

- Health Service Executive
- Local Authority
- An Garda Síochána

The Major Emergency Plan will also be activated in other specific circumstances as follows:

- On request from a national body acting under the provisions of one of the following National Emergency Plans:
    - National Emergency Plan for Nuclear Accidents,
    - Public Health (Infectious Diseases) Emergency Plan,
    - Animal Health Plan;
- In response to a request from the Irish Coast Guard following a threatened or actual emergency in the Irish Maritime Search and Rescue Region
- In response to a request from a Minister of Government in light of an emergency/crisis situation.

There are both legislative and procedural arrangements, which require that Emergency Plans be prepared for specific sites or events (e.g. SEVESO sites, airports, ports, major sports events, etc.). Arising from the risk assessment process described in Section 3, Cork County Council's Major Emergency Plan has identified sites/events where specific plans/arrangements exist for responding to emergencies. These include the following:

- Inter-Agency Emergency Plan for Cork Airport.
- Inter-Agency Emergency Plan for the Jack Lynch Tunnel.
- Port of Cork Company Emergency Plan.
- Bantry Bay Port Emergency plan.

The generic response arrangements set out in the Section 7 or the Emergency Plan, will govern the Principal Response Agencies response to such sites/events and whether a Major Emergency is declared or not.

The contents of the Port of Cork Emergency Plan are presented in Section 19.2.3 below.

[19.2.3] Port Emergency Plans

The Port of Cork Company has in place an Emergency Plan (EP) to deal with both marine and land-based emergencies.

Marine emergencies may include (but are not limited to):

- Major incident on board a vessel such as fire, flooding or cargo related
- Collision between vessels or between a vessel and a fixed object
- Grounding of a vessel.
- A major oil spillage requiring the implementation of the oil spill response plan.
- A major incident involving small craft within the ports jurisdiction.

Land based emergencies within the port may include (but are not limited to):

- Major fire within a port facility.
- Major spill of hazardous material e.g. a hazardous material transportation vehicle accident within the port area.
- Emergency in a Seveso site within or adjacent to the Port.

The EP is also compatible with the structures and arrangement outlined in the 'Framework for Major Emergency Management of 2006 which is used by the Principal Response Agencies (PRA's) and the Principal Emergency Services (PES) in Ireland.

The plan contains Action Checklist for both Marine and Land-based Emergencies to respond effectively to any serious incident occurring in the POCC operations within the port estate in order to

- Prevent or minimise loss of life.
- Prevent the release of harmful materials into the environment.
- Minimise the damage to buildings and other assets.
- Minimise the effects on port operations.

The terminal operations manager or terminal supervisor will be the incident site coordinator until the arrival of the Duty Harbourmaster. Ultimately, emergency services are in control of the incident once they arrive on site.

The senior fire officer will be briefed on his/her arrival to the incident site. Other stakeholders will be alerted at the direction of the duty Harbourmaster to the incident.

[19.2.4] Guidance

The assessment of the risk of major accidents and/or disaster considers all factors defined in the EIA Directive that have been considered in this EIAR, i.e. population and human health, biodiversity, land, soil, water, air and climate and material assets, cultural heritage and the landscape.

The EIAR already includes an assessment of some potential accidents and disaster scenarios that might arise from the Proposed Development, such as potential contamination to soils, groundwater and surface water, as well as flooding events. These are described in detail in the relevant EIAR assessment chapters (refer to Chapter 14 'Water', Chapter 12 'Soils, Geology and Hydrogeology' and Chapter 15 and 16 'Biodiversity').

A risk analysis-based methodology that covers the identification, likelihood and consequence of major accidents and/or disasters has been used for this assessment. The Department of Environment, Heritage and Local Government (DoEHLG) published 'A Framework for Major Emergency Management Guidance Document 1-A Guide to Risk Assessment in Major Emergency Management' in 2010. The document provides guidance on the various stages of the risk assessment process and how it should be employed to inform mitigation and detailed planning during major emergency situations.

[19.2.5] Risk Assessment Methodology

As defined in the DoEHLG Guidance, the risk assessment process is guided by four stages, including:

Stage 1: Establish context and describe the area.
Stage 2: Identify potential hazards.
Stage 3: Assess each hazard for potential consequences and likelihood.
Stage 4: Plot each hazard on a risk matrix (evaluating risk).

These are described in greater detail in the following sections.

[19.2.5.1] Stage 1 Establish context and describe the area.

The purpose of this stage is to describe the characteristics of the area for which the risk assessment is being completed, as this will influence both the likelihood and the impact of a major emergency. Establishing the Local/Regional context enables a better understanding of the vulnerability and resilience of the area to emergencies.

This has been achieved through (i) reviewing the baseline conditions identified during the preparation of this EIAR (chapters 6 to 15), and (ii) reviewing the local policy with regards to major accidents and disasters.

[19.2.5.2] Stage 2 Identify potential hazards

Risks have been reviewed through the identification of plausible risks in consultation with relevant specialists. The identification of risks has focused on non-standard but plausible incidents that could occur at the proposed scheme during construction and operation.

Risks have been identified as such, in respect of the proposed scheme:

1. Potential vulnerability to disaster risks; and
2. Potential to cause accidents and/or disasters.

[19.2.5.3] Stage 3: Assess each hazard for potential consequences and likelihood.

In accordance with the DoEHLG Guidelines, risks are assessed through an examination of the potential impact (severity of consequences to life and health, property and infrastructure, and

the environment) of the hazards identified. The likelihood (probability) of the hazard occurring also has to be considered and the resulting judgement recorded on a risk matrix in the next stage. The impact and likelihood criteria as outlined in Table 19-1 and Table 19-2 below are used to position all the identified hazards on the risk matrix.

Table 19-1: Risk Classification Table - Likelihood (DoEHLG, 2010)

Ranking	Likelihood	Description
1	Extremely Unlikely	May occur only in exceptional circumstances; once every 500 or more years
2	Very Unlikely	Is not expected to occur; and/or no recorded incidents or anecdotal evidence; and/or very few incidents in associated organisations, facilities or communities; and / or little opportunity, reason or means to occur; may occur once every 100-500 years.
3	Unlikely	May occur at some time; and/or few, infrequent, random recorded incidents or little anecdotal evidence; some incidents in associated or comparable organisation's worldwide; some opportunity, reason or means to occur; may occur once per 10-100 years.
4	Likely	Likely to or may occur; regular recorded incidents and strong anecdotal evidence and will probably occur once per 1-10 years
5	Very Likely	Very likely to occur; high level of recorded incidents and/or strong anecdotal evidence. Will probably occur more than once a year.

Table 19-2: Risk Classification Table – Consequence (DoEHLG, 2010)

Rank	Consequence	Impact	Description
1	Minor	Life, Health & Welfare	Small number of people affected; no fatalities and small number of minor injuries with first aid treatment.
		Environment	No contamination, localised effects
		Infrastructure	<€0.5M
		Social	Minor localised disruption to community services or infrastructure (<6 hours).
2	Limited	Life, Health & Welfare	Single fatality; limited number of people affected; a few serious injuries with hospitalisation and medical treatment required. Localised displacement of a small number of people for 6-24 hours. Personal support satisfied through local arrangements.
		Environment	Simple contamination, localised effects of short duration.
		Infrastructure	€0.5-3M.
		Social	Normal community functioning with some inconvenience.

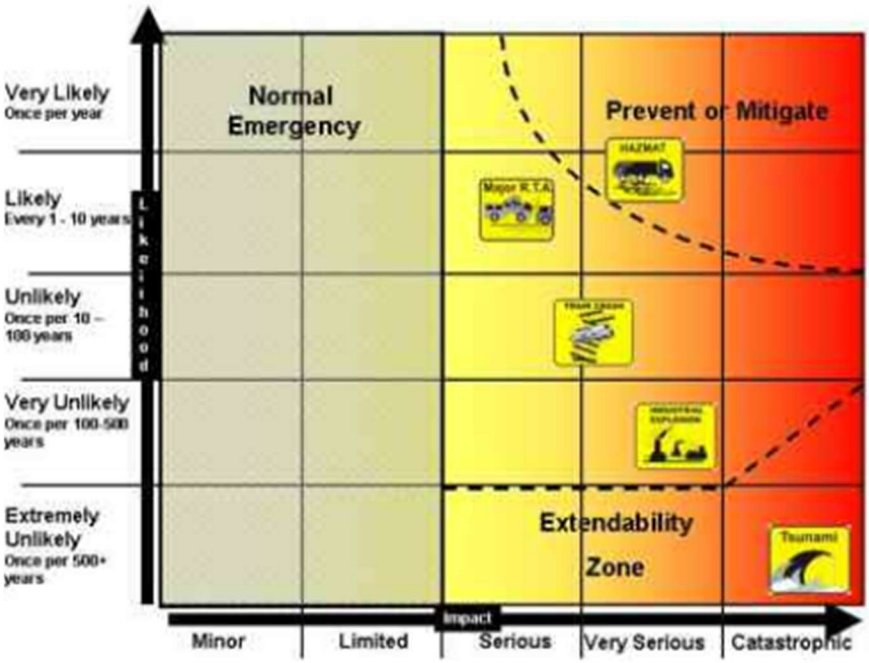
3	Serious	Life, Health & Welfare	Significant number of people in affected area impacted with multiple fatalities (<5), multiple serious or extensive injuries (20), significant hospitalisation. Large number of people displaced for 6-24 hours or possibly beyond; up to 500 evacuated. External resources required for personal support.
		Environment	Simple contamination, widespread effects or extended duration
		Infrastructure	€3-10M
		Social	Community only partially functioning, some services available.
4	Very Serious	Life, Health & Welfare	5 to 50 fatalities, up to 100 serious injuries, up to 2000 evacuated
		Environment	Heavy contamination, localised effects or extended duration
		Infrastructure	€10-25M
		Social	Community functioning poorly, minimal services available
5	Catastrophic	Life, Health & Welfare	Large numbers of people impacted with significant numbers of fatalities (>50), injuries in the hundreds, more than 2000 evacuated.
		Environment	Very heavy contamination, widespread effects of extended duration.
		Infrastructure	>€25M
		Social	Serious damage to infrastructure causing significant disruption to, or loss of, key services for prolonged period. Community unable to function without significant support.

[19.2.5.4] Stage 4: Plot each hazard on a risk matrix (evaluating risk).

Once classified, the likelihood and consequence ratings have been multiplied to establish a 'risk score' to support the evaluation of risks by means of a risk matrix, sourced from the DoEHLG (2010) (Figure 19-1). The risk matrix is colour coded to provide a broad indication of the critical nature of each risk:

- The red zone represents 'high risk scenarios'.
- The amber zone represents 'medium risk scenarios'.
- The green zone represents 'low risk scenarios'.

Figure 19-1: Risk Matrix (DoEHLG, 2010)



[19.3] Baseline Environment

The pre-development scenario involves normal port operations at CCT and DWB.

The Cork Container Terminal (CCT) was officially opened in September 2022. Large Panamax vessels can be accommodated along its 360m-long quay, where two Ship-to-Shore (STS) gantry cranes are installed. Trade vehicles are discharged at the linkspan in Ringaskiddy East, which also houses the Ferry Terminal. Ferry services are provided by Brittany Ferries to Roscoff. The current infrastructure gives the port sufficient operational capacity up to 2029.

The deepwater berth (DWB) at Ringaskiddy West currently facilitates the import of wind turbine components and other project cargoes associated with the land-based wind energy sector. Some of the longest blades in Ireland have been imported at the deepwater berth. The ADM jetty is currently used for the import of green liquid bulks, such as HVO.

The DWB is currently able to facilitate many of the vessels associated with the ORE industry, and the ADM jetty at Ringaskiddy West could be widened and an additional hammerhead berth added to allow for ORE project cargoes.

[19.4]Risk Assessment

The risk register/risk assessment for the construction and operation scenarios is set out in Table 19.3 and 19.4 below.

Table 19-3: Risk Register – Construction

Risk ID	Potential Risk	Possible Cause	Possible Impacts	Mitigation
	Potential vulnerability to accidents and/or disasters			
R1	Flooding of site	Periods of extended rainfall/storms coinciding with high tide	Impacts to properties, utilities, facilities, human health, transportation networks, surface water, flora and fauna	ERP_01 Existing flood defences and stormwater drainage will be maintained
	Potential to cause major accidents and/or disasters			
R2	Vehicle collision	Human Error	Potential to cause harm, (injury) to community members.	ERP_02 The site construction operations will be designed and operated in line with best international current practice and with appropriate health and safety checks in place.
R3	Fall from Height	Human Error/Lack of training	Human Health Impacts or loss of life	ERP_03 Appropriate training, qualifications, and risk controls in place
R4	Structural collapse	Human error/Design issues	Human health impacts of loss of life	ERP_04 Safety in design criteria applied to design and build.

Table 19-4: Risk Register – Operation

Risk ID	Potential Risk	Possible Cause	Possible Impacts	Mitigation
	Potential vulnerability to accidents and/or disasters			
R5	Flooding of site	Periods of extended rainfall/storms	Impacts to properties, utilities, facilities, human health, transportation networks, surface water, flora and fauna	ERP_05 Existing flood defences and stormwater drainage will be maintained

		coinciding with high tide		
	Potential to cause major accidents and/or disasters			
R6	Vehicle collision	Human Error	Potential to cause harm, (injury) to community members/workers.	ERP_06 The site operations will be designed and operated in line with best international current practice and with appropriate health and safety checks in place.
R7	Crushing by Container/Machinery	Human error/interaction with machinery	Potential to cause harm to workers	ERP_07 The site operations will be designed and operated in line with best international current practice and with appropriate health and safety checks in place.
R8	Chemical explosion/contamination of soils	Chemicals improperly managed. Failure to manage ignition sources.	Loss of life and damage to property	ERP_08 The site operations will be designed and operated in line with best international current practice and with appropriate health and safety checks and monitoring in place. Updated Fire Risk Assessment (FRA) to be carried out.

The potential risks identified have been assessed in accordance with the relevant classification (refer to Table 19-1 and Table 19-2) and the resulting risk analysis is given in Table 19-5 and Table 19-6. The risk register is based upon possible risks associated the proposed scheme. The consequence rating assigned to each potential risk assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster.

Table 19-5: Risk Scores

Risk ID	Potential Risk	Likelihood Rating	Consequence Rating	Risk Score [1]
Construction Phase				
R1	Flooding of site	1	3	3
R2	Vehicle Collision	2	5	10
R3	Fall from a height	2	4	8
Operational Phase				
R5	Flooding of Site	1	3	3
R6	Vehicle Collision	2	5	10
R7	Crushing by container/machinery	2	5	10
R8	Chemical explosion/fire	3	4	12
R9	Environmental Incidents	4	3	12

Table 19-6: Risk Matrix

Likelihood Rating							
	Very likely	5					
	Likely	4			R9		
	Unlikely	3				R8	
	Very unlikely	2				R2	R7
	Extremely Unlikely	1			R1, R5		
			Minor	Limited	Serious	Very Serious	Catastrophic
			1	2	3	4	5
			Consequence Rating				

[1] Risk = Likelihood x Severity

[19.5] Discussion

As mentioned previously, the design of the proposed works has evolved through design iteration, with particular emphasis on avoiding or reducing the potential for environmental impacts, where practicable, whilst ensuring the objectives of the proposed scheme are attained. The design of the Proposed Scheme has been developed in compliance with the relevant design standards which include provisions to reduce the likelihood of risk events occurring (e.g. structures have been designed to avoid the risk of collapse, drainage systems have been designed to cater for increased rainfall events etc.).

Regulation 15 of the Safety, Health and Welfare at Work (Construction) Regulations places a duty on designers carrying out work related to the design of a project to take account of the 'General Principles of Prevention' as listed in Schedule 3 of the Safety, Health and Welfare at Work Act.

In addition to the duties imposed by Regulation 15 of the Safety, Health and Welfare at Work (Construction) Regulations, designers must comply with Section 17(2) of the Safety, Health and Welfare at Work Act, which requires *persons who design a project for construction work to ensure, so far as is reasonably practicable, that the project is designed and is capable of being constructed to be safe and without risk to health, can be maintained safely and without risk to health during use, and complies in all respects, as appropriate, with other relevant legislation*. This includes S.I. No. 138/2012 – Building Regulations (Part A Amendment) Regulations 2012 and, if the works being designed are intended for use as a workplace, the relevant parts of the Safety, Health and Welfare at Work (General Application) Regulations.

In accordance with these requirements, the project team established a consistent and appropriate means of assessing the risks that may arise from design decisions and of applying the General Principles of Prevention.

[19.6] Mitigation Measures and Monitoring

[19.6.1.1] Emergency Management and Mitigation

ERP_09 An Emergency Response Plan is required as part of the planning regime for the Facility, which is regularly reviewed and updated in line with those requirements. The ERP contains detailed plans for the response to emergencies including fires and severe weather events.

The Deputy Harbourmaster at the Facility is the contact with the Cork County Emergency Services, to regularly review and update the procedures. All personnel on site receive appropriate training in the contents of the ERP, are aware of their responsibilities during emergency events and participate in regular training exercises.

If contaminated, the firewater and rainwater will be sent for disposal to an off-site licensed disposal facility, as highlighted in Table 16-1, the EPA has recently published revised guidance on firewater containment in late 2019, however this guidance applies to EPA licenced facilities only.

Table 19.7 below comprises a list of the Seveso III Upper Tier and Lower Tier sites in the vicinity of Ringaskiddy Port. Ringaskiddy Port is not a Seveso III site and is sufficiently distant from the listed sites to rule out the likelihood of cumulative impact.

Table 19.7 Seveso Sites (Upper and Lower Tier)

Company	Location
Marinochem Ltd	Marino Pont, Cobh, Co. Cork (upper tier)
Novartis Ringaskiddy Ltd	Ringaskiddy, Co. Cork (upper tier)
Pfizer Ireland Pharmeceuticals	Active Pharmaceutical Ingredients Plant, PO Box 140, Ringaskiddy, Co. Cork (upper tier)
SmithKlinebeecham Cork Ltd	Currabinny, Carrigaline, Co. Cork (upper tier)
Hovione Ltd	Loughbeg, Ringaskiddy, Co. Cork (lower tier)
Carbon Chemical Group	Raheens Industrial Estate, Ringaskiddy, Co. Cork (lower tier)

[19.7] Residual Effects

There are no identified incidents and / or major accidents and / or disasters risk events that present a sufficient combination of risk and consequence that would lead to significant residual environmental impacts.

No significant residual impacts have been identified either in the Construction or Operational Phases of the Proposed Scheme, whilst meeting the scheme objectives set out in Chapter 4 (Description).

[19.8] Cumulative Effects

There are no identified incidents and / or major accidents and / or disasters risk events that present a sufficient combination of risk and consequence that would lead to significant cumulative environmental impacts.

[20] Schedule of Environmental Commitments

[20.1] Summary of Residual Effects

The summary of residual effects is set out in Table 20-1

20-1 Summary of Residual Impacts

ID	Aspect	Residual Effects
R_LA1	Landscape and Visual	Due to the open nature of the lands within the Port of Cork, as clear access to the water is required at most areas, the proposed redevelopment works will by visible or partially visible from the lands across Cork Harbour, such as Monkstown and Cobh. However, these proposed changes will be seen from some distance and against the context of the existing port activities and structures, resulting in a not significant-neutral to slight and negative impact on views within this area. It is illustrated within the photomontages that accompany this EIAR. That the structures and modifications that form the proposed redevelopment works will not break the skyline and will be seen within the context of the existing structures and activities of the working port. While none of the proposed measures, as discussed in the previous section, can fully mitigate against the visual impacts of the proposed structures and modifications, it is considered that the proposed redevelopment is consistent with the existing land use and developments in this area. Due to the above reasons and discussions in Section 7.3 of this chapter, it is considered that the surrounding landscape has the capacity to absorb a redevelopment of this scale and nature without any significant and negative impacts in terms of visual and landscape character.
R_CC1	Climate	During the construction phase, HGV movements and machinery operating on site will contribute GHG emissions, which will be managed through mitigation measures as described in Chapter 10. During the operation phase, the residual impact will come from the growth of the shipping traffic at the Port which will see continued emissions of greenhouse gases through the movements of ships. As noted in 11.6.2, improvements in engine efficiency and fuels will see a likely decrease of emissions. Further, Port of Cork Masterplan 2050 outlines a number of measures that are planned that will result in the lessening of this residual effect. More efficient port operations were proposed through ideas that included low-emission lighting, a ban on ships idling and using individual generators, the use of solar power for land- based activities, and a

		reduction in fees for low-emissions vessels (Port of Cork, 2023).
R_SGH 1	Soils, Hydrology and Hydrogeology	Given the limited potential for a contaminant transport pathway due to the surfacing of the development with hardstanding operational phase impacts to soil and groundwater are not anticipated Implementation of the mitigation measures outlined in Section 12.8 will ensure that the potential impacts of the proposed development on land and soils do not occur during the operational phase and that any residual impacts will be short term. The residual impact is therefore considered to be imperceptible overall.
R_CP 1	Coastal Processes	Residual change in bed levels beyond the licenced site below 5mm are likely to be experienced which is acceptable. Residual current direction following redevelopment is easterly towards Paddy's point
R_WE_1	Water Environment	With any development adjacent to the sea there is always a residual flood risk. The required standard of protection can be exceeded, however with the freeboard afforded to the proposed redevelopment above the 0.5% AER levels this will reduce the likelihood of such an occurrence and any residual flood risk can be considered as minor.
R_NV_1	Noise and Vibration	Some residual impacts for noise may be experienced during operation of the Port in the long term particularly at periods of high activity. These are assessed as slight temporary and long-term impacts and are carefully managed on an ongoing basis at the Port through monitoring and management.
R_ME_1	Marine Ecology	After the construction phase is complete, some habitat loss will occur where new structures have been built or areas impacted by other activities. But over time, the areas directly impacted by the activities will undergo a natural recolonisation through a succession process. Following the incorporation of the above mitigation, there will be no long term significant adverse residual effect on marine mammals from the construction phase of the development. There will be a temporary, slight residual adverse effect in terms of temporary displacement from the site during construction activities (e.g. piling) however, the marine mammals are expected to return to the site following cessation of the activities due to the

high degree of habituation to the present levels of high activity at the site. As such, there is no lasting significant adverse residual effect on marine mammals at this site.

[20.2] Schedule of Environmental Commitments

The Schedule of Environmental Commitments outlines the mitigation and monitoring commitments required during the construction and operational phases of the proposed development.

The table overleaf shows all mitigation and monitoring commitments.

Table 20-2: Schedule of Environmental Commitments – Mitigation Measures (Construction and Operational Phases)

Reference	Schedule of Environmental Commitments – Mitigation Measures	Monitoring	Construction	Operation
Population and Human Health				
PHH 01	Safety File to be maintained 24 hr Security to be maintained Health and Safety plan to be prepared	Vehicles and personnel accessing the site to be logged.	✓	
Cultural Heritage				
CH_01	Archaeological monitoring: It is recommended that archaeological monitoring by a suitably qualified and experienced maritime archaeologist licensed by the DAHG is conducted during all seabed, inter-tidal/foreshore and terrestrial disturbances associated with the development. Licence applications take a minimum of three weeks to process through the Department, and advance planning is required to ensure that the necessary permits are in place before site works commence.	Archaeological monitoring is recommended as specified in the mitigation measures.	✓	✓
CH_02	The monitoring will be undertaken in a safe working environment that will facilitate archaeological observation and the retrieval of objects that may be observed in the course of the works that require consideration.		✓	✓
CH_03	The monitoring will include a finds retrieval strategy that is in compliance with the requirements of the National Museum of Ireland.		✓	✓

CH_04	Retaining an archaeologist/s: An archaeologist experienced in maritime archaeology will be retained for the duration of the relevant works.		✓	✓
CH_05	The time scale for the construction phase will be made available to the archaeologist, with information on where and when ground disturbances will take place.		✓	✓
CH_09	Discovery of archaeological material: In the event of archaeologically significant features or material being uncovered during the construction phase, machine work will cease in the immediate area to allow the archaeologist/s to inspect any such material. The DAHG and the NMI will be notified of such discovery, in accordance with archaeological license requirements.		✓	✓
CH_10	Archaeological material: Once the presence of archaeologically significant material is established, full archaeological recording of such material will be recommended. If it is not possible for the construction works to avoid the material, full excavation will be recommended. The extent and duration of excavation will be a matter for discussion between the Port of Cork and the licensing authorities.		✓	✓
CH_11	Archaeological team: The core of a suitable archaeological team will be on standby to deal with any such rescue excavation. This would be complimented in the event of a full excavation.		✓	✓
CH_12	Archaeological dive team: An archaeological dive team will be retained on standby for the duration of any in-water disturbance works on the basis of a twenty-four or forty-eight-hour call-out response schedule, to deal with any archaeologically significant/potential material that is identified in the course of the ground disturbance activities. The permits necessary for this aspect of the site work is additional to the excavation licence required by the archaeological monitor and are generally held by the dive-team leader. The archaeological dive licence takes a minimum of three weeks	q	✓	✓

	to process. It is necessary to ensure that all permits are in place before site works commence.		
CH_13	A site office and facilities will be provided by the Port of Cork on site for use by archaeologists.	✓	✓
CH_14	Secure wet storage facilities will be provided on site by the Port of Cork to facilitate the temporary storage of artefacts that may be recorded during the course of the site work.	✓	✓
CH_15	Buoying/fencing of any such areas of discovery will be carried out if discovered and during excavation.	✓	✓
CH_16	Machinery traffic during construction will be restricted to avoid any identified archaeological site/s and their environs.	✓	✓
CH_17	The above recommendations are subject to the approval of the National Monuments Section at the DAHG.	✓	✓
Landscape and Visual Impact			

LV_01	Any lighting required during the construction phase should be located sensitively to avoid unnecessary light spill into the surrounding residential areas and into Cork Harbour.	• During site establishment stage: prior to any works taking place, clearly identify trees and hedgerows that are to be retained and protected – ensuring tree protection measures are in place. Clearly identify trees and hedgerows that are to be removed. • During site excavation stage: ensure existing vegetation is being adequately protected • During construction stage: ensure existing vegetation is being adequately protected.	✓	
LV_02	Roadway lighting and lighting of construction compounds will be by means of high quality, modern standing fixtures. They will include full cut-off (FCO) and energy efficient lighting where practicable to reduce the impacts of light pollution on the surrounding area and sky.	• Post-construction stage: periodic visits will be required to ensure that the existing tree belts have not been negatively impacted by the construction works.	✓	
LV_03	The use of flashing, moving, strobe, or blinking lights should be kept to a minimum		✓	
LV_04	Trees & hedgerows: Due to the nature of the redevelopment works and the current operations within the port there is no opportunity for the implementation of a softworks/ planting scheme to assist in the integration of the proposed structures into the landscape. Therefore, it is an important objective to retain the existing vegetation where possible. This helps to retain a mature, established character to the site and provide a			✓

	unifying, cohesive landscape framework that relates it to the surrounding landscape, as well as being of ecological benefit.	
LV_05	Colour of Tall Structures: While the visual appearance of the containers cannot be mitigated against, as the colours depends upon on the owner of the containers, the appearance of the gantries that are located above them, can be managed. The visual appearance of the gantries can be lessened by the use of appropriate colours. The colour shall be based on mid-grey in colour, similar to the colour of the tall cranes installed during Phase 1 of the redevelopment works.	✓
LV_06	Lighting: Roadway lighting and lighting of working areas will be by means of high quality, modern standing fixtures. They will include full cut-off (FCO) and energy efficient lighting where practicable to reduce the impacts of light pollution on the surrounding area and sky. The use of flashing, moving, strobe, or blinking lights should be kept to a minimum	✓
Traffic and Transportation		
TT_01	The contractor responsible for the construction of the proposed redevelopment will be required to ensure that the number of construction vehicles entering the road network during these times will be limited to 12 and 14, per direction, in the AM and PM peaks respectively.	✓

TT_02	Construction vehicles will be required to use the strategic road network to access the site i.e. using the N28 and N40.	✓
TT_03	In addition construction vehicles will be restricted from using local roads or unsuitable roads on grounds of safety	✓
TT_04	Reduce Port HGV traffic volumes during the AM (07.45-09.00) and PM (17.00- 18.00) commuter peak periods by continuing the Ringaskiddy Mobility Management Plan (RMMP) to manage freight generated by the Port during these periods until the opening of the N28 Upgrade. In 2033 (with the N28 Upgrade in place), there are no traffic impacts of major significance predicted as there is significant spare road capacity and therefore no mitigation is required.	✓
TT_05	Management of Freight through the Ringaskiddy Mobility Management Plan: This proposed mitigation control measure is to manage the additional Port related HGV traffic that is generated over Do Minimum levels during the AM and PM commuter peaks until the N28 Upgrade is in place. This means that the additional 'Do Something' LoLo, bulk and trade cars and related HGVs movements generated by the proposed redevelopment (i.e. above the existing 'Do Minimum' HGVs movement levels), would be managed and controlled to significantly reduce the additional numbers of Port HGVs travelling during the congested AM and PM Peak periods. All additional Port generated HGV traffic arising from the proposed redevelopment would be managed to operate in the non-congested inter-peak period of the day where there is significant spare road capacity available. It is important to note that currently less than 15% of all Port related HGVs travel during the AM and PM peak periods, whereas the remaining 85% currently travel outside of these times. Only a small proportion, therefore, of HGVs generated by the Port (i.e. only 15% of the additional HGV's generated by the proposed redevelopment require managing).	✓

Noise and Vibration				
NV_01	There will be an onus on the contractor to reduce construction noise levels from the construction phase to the lowest possible levels to ensure that no significant noise impact is experienced at the nearest noise sensitive receptors. The contractor must comply with all of guidance included in British Standard BS5228:2009 – Noise and vibration control on construction and open sites: Part 1 - Noise in relation to reducing construction noise levels.	The NTi programme of monitoring will be undertaken and continuously reviewed during construction phase for the proposed development.	✓	
NV_02	A complaints procedure must be operated by the Contractor throughout the construction phase and all efforts should be made to address any noise issues at the nearest noise sensitive properties.	The existing programme of quarterly compliance monitoring as well as the NTi programme will be undertaken during operation phase for the proposed development	✓	✓
NV_03	During the works, best practice noise reduction measures described in British Standard 5228-12009+A1:2009, Code of Practice for Noise and Vibration Control on Construction and Open Sites must be incorporated into the Construction and Environmental Management Plan.		✓	
NV_04	For mobile plant items such as cranes, HGV's, excavators and loaders, maintaining enclosure panels closed during operation can reduce noise levels over normal operation.		✓	
NV_05	Mobile plant will be switched off when not in use and not left idling.		✓	
NV_06	For steady continuous noise, such as that generated by diesel engines, noise reduction can be achieved by fitting a more effective exhaust silencer system.		✓	

NV_07	No machinery should be left running outside of the agreed operation hours, which must limit any noise emissions from the site in the late evenings and early mornings when mammal (i.e., otter) activity is at a higher level.		✓	
NV_08	The mitigation measures for alarm/beacon noise associated with the proposed redevelopment will involve setting a noise threshold limit of 100dB Lw (95dB Lw with tone) for the selected alarm system to be used. There is a range of self-adjusting 'smart' and broadband alarm systems that are capable of achieving the required noise threshold limit (e.g. manufacturers - bbs-tek, Ecco, Fleet Electrical).			✓
NV_09	In addition to the alarm noise, a series of noise barriers (block walls) have been constructed as part of the Ringaskiddy Port redevelopment to ensure that a significant proportion of ground- based noise activities are reduced as much as possible. Figure 9.15 (EIS Volume III) illustrates the location of three 4m high noise barriers which have been installed in the design of the proposed redevelopment. These barriers have resulted in significant attenuation to noise from a range of plant such as terminal transporters, reach stackers and reefers. Additional noise barriers were installed during Phase 1a of the redevelopment.			✓
NV_10	The Port shall issue periodic Notice to Mariners regarding the request for all vessels to take steps to reduce their potential noise impacts and reminding vessel operators that Ringaskiddy Basin has berths that are adjacent to residential areas in Ringaskiddy village.			✓
NV_11	The Port shall utilise sound matting in strategic locations to address noise issues.			✓
Air Quality				
AQ_01	A dust minimisation plan will be developed and implemented during the construction phase of the project.	Bergerhoff dust gauge monitoring will be undertaken during construction phase at appropriate locations on the periphery of the construction site.	✓	✓

AQ_02	A site dust monitoring programme will be put in place during the construction phase with secure monitoring locations to ensure compliance with dust deposition limits. There are already three monitoring points near the site, samples can continue to be recorded at these sites and compared to the historical trend. Monitoring must also consider recording on the peripheries of the construction site in order to confirm dust deposition is within acceptable limits.	The ongoing dust monitoring programme will be reviewed annually to ensure representative sampling locations are in place following the construction of CCT2 and DWB extension.	✓	✓
AQ_03	An odour management plan will be adopted during the construction phase of the proposed development to mitigate potential odour issues and implement remedial action through agreement with Cork County Council. The management plan will include but not be limited to odour monitoring proposals, odour control mechanisms and an odour complaint procedure.		✓	
AQ_04	Within the management plan, monitoring proposals for odour emissions will be submitted for agreement to the planning authority prior to the commencement of dredging activities in the construction phase of the proposed development. Such measures will include but not be limited to monitoring at the site perimeter and at nearby residential locations on an ongoing basis. The management plan must include diffusion tube monitoring at a minimum of 8 locations during dredging to obtain measurements of fugitive odour and to help ensure levels are below relevant limits.		✓	
AQ_05	A Construction Environmental Management Plan (CEMP) will be developed and implemented. The CEMP will provide a framework for the management and implementation of construction activities incorporating the mitigation measures identified in the relevant chapters of this EIS, including dust and odour. The CEMP will be reviewed regularly, and revised as necessary, to ensure that the measures implemented continue to be effective.		✓	
AQ_06	The emissions to air from berthed shipping will be controlled by strict international limits. Good cargo unloading practices will minimise the impact of exhaust fumes from HGVs. The emissions modelled for this report are based on a worst-case scenario.		✓	✓

AQ_07	It should also be recognised that the vehicular emissions from any generated traffic are predicted to decrease over time due to improvements in engine efficiency and stricter enforcement of vehicle emission standards. Bulk grain cargo unloading will be undertaken in a manner that minimises cargo spillage. All loading/unloading will be subject to appropriate operation specific control and containment protocols as adhered to by Port of Cork and detailed in section xxx of this Chapter. The current method of handling cargoes will be continued and extended to service the proposed berth extension and dust monitoring at site peripheries will be continued.		✓	✓
Climate				
C_01	During the construction phase, best environmental practices will be followed in order to mitigate for greenhouse gas emissions. These are detailed in Chapter 10, Air Quality.		✓	
C_02	The emissions to air from berthed shipping will be controlled by strict international limits. Good cargo unloading practices will minimise the impact of exhaust fumes from HGVs. The emissions modelled for this report are based on a worst-case scenario. It should also be recognised that the vehicular emissions from any generated traffic are predicted to decrease over time due to improvements in engine efficiency and stricter enforcement of vehicle emission standards. Bulk grain cargo unloading will be undertaken in a manner that minimises cargo spillage. All loading/unloading will be subject to appropriate operation specific control and containment protocols as adhered to by Port of Cork and detailed in section 11.3.2.1 of this Chapter. The current method of handling cargoes will be continued and extended to service the proposed berth extension and dust monitoring at site peripheries will be continued.		✓	
Soils, Geology and Hydrogeology				
SGH_01	A Groundwater Management Plan will be prepared and implemented to minimise the potential risk to groundwater from construction activities and piling. Reference should be made to CIRIA C515 Groundwater Control – Design and Practice. Any contaminated groundwater encountered during earthworks or piling will be disposed off-site to a licensed waste disposal	**SGH_05** Monitoring for land and soil will consist of weekly monitoring inspections for signs of pavement cracks, inspection of bunds and oil containers present on site for minor storage, inspection of	✓	

	facility or by passing it through a three-stage interceptor and discharged to sewer under license from the Local Authority.	integrity of spill kits, vehicle inspections. These will be recorded on the weekly monitoring checklist for the site by the Site Manager.		
SGH_02	Material imported onto the site will be assessed to ensure that contamination is not introduced to the site. Any topsoil which is imported onto the site will be chemically analysed and screened against generic screening values for a commercial end use to ensure that it does not pose a risk to human health.	Operation phase monitoring will build on the construction phase monitoring and consist of weekly inspection for pavement cracks, inspection of bunds and oil containers onsite for minor storage, inspection of integrity of spill kits and vehicle inspections.		✓
SGH_03	Any fill material imported onto the site will undergo Waste Acceptance Criteria (as per BS 12457/3) testing to ensure that the material is classified as inert and does not pose a risk to the underlying groundwater through leaching of contaminants.		✓	
SGH_04	This Oil and HNS Spill contingency plan is to be maintained and will be effective in dealing with any operational incidents associated with the development.		✓	✓
Coastal Processes				
CP_01	To reduce sediment dispersion, dredging operations will be undertaken with no overspill from the hopper.	The suspended sediment concentration will vary significantly over the course of the dredging operations depending on tidal levels, flows and due to the operations. Therefore, the sediment concentrations outside the operation sites are suggested to be monitored. Water Quality monitoring of the loading	✓	✓

		areas will be undertaken at locations to be agreed with the EPA.		
CP_02	A full record of loading and dumping tracks and record of the material being dumped will be maintained for each trip	The two tidal gauge locations at Cobh and Ringaskiddy (indicated in **Error! Reference source not found.**), will be monitored continuously. Within the Ringaskiddy Basin the residual current is circulatory in nature with some maintenance dredging being required, therefore the bed elevation needs to be monitored accordingly.	✓	✓
CP_03	No over-spilling (overflowing) from the dredger(s) will be permitted		✓	✓
CP_04	Dumping will be limited to 29,376 dry tonnes per day		✓	✓
CP_05	No dumping will occur in either November or February		✓	✓
CP_06	Not dumping will occur at the same time as the Port of Cork's maintenance dredging permit			
CP_07	The dumpsite will be divided into subsections with each used sequentially to ensure uniform spread of the dredged sediments		✓	✓

CP_08	A 250m radius exclusion zone will be implemented around an archaeological anomaly at location 188723.5, 54463.1 (ITM coordinates)	✓	✓
CP_09	An Archaeologist will witness all the work in line with the Underwater Archaeology Impact Assessment	✓	✓
CP_10	A Marine Mammal Observer will witness all the work in line with the Species Risk Assessment	✓	✓
CP_11	Water Quality monitoring of the loading areas will be undertaken at locations to be agreed with the EPA	✓	✓
CP_12	A documented Accident Prevention Procedure will be put in place prior to commencement	✓	✓
CP_13	A documented Emergency Response Procedure will be put in place prior to commencement.	✓	✓
Water Environment			
W_01	Water quality monitoring will be carried out by the main contractor- continuous in-situ monitoring will be carried out in advance of the works to establish a water quality baseline and during the dredging activities to ensure effective response to any incidents that may impact on water quality at sensitive sites. Water quality trigger levels and corresponding response or remedial actions will be determined after the establishment of a water quality baseline. The location of water quality monitoring stations and the	✓	

	monitoring programme will be agreed with the relevant agencies and based on the results of the coastal process modelling with regard to predicted dispersal of currents and location of sensitive receptors and protected areas;	
W_02	A protocol for regular communication between the appointer contractor, the engineer's representatives, statutory agencies, such as NPWS and Cork County Council, and other third parties shall be established;	✓
W_03	Management and auditing procedures, including tool-box talks to personnel, shall be put in place to ensure that any works which have the potential to impact on the aquatic environment are being carried out in accordance with required permits, licences, certificates and planning permissions.	✓
W_04	Existing and proposed surface water drainage and discharge points shall be mapped on a site plan which should also include the location of existing and proposed measures such as monitoring points, sediment traps, settlement lagoon and oil interceptors.	✓
W_05	*PPG 6 Working at demolition & construction sites* (Environment Agency, 2012) shall be adhered to particularly in relation to safe and secure on site storage and minimising storage time, wheel washing, placing of concrete and dealing with silty water.	✓
W_06	The use of concrete in close proximity to water bodies requires a great deal of care. Fresh concrete and cement are very alkaline and corrosive and can cause serious pollution in water bodies. It is essential to ensure that the use of wet concrete and cement in or close to any water body is carefully controlled so as to minimise the risk of any material entering the water, particularly from shuttered structures or the washing of equipment.	✓
W_07	Concrete use and production shall adhere to control measures outlined in *PPG 6 Working at demolition & construction sites* (Environment Agency, 2012) particularly if on-site concrete production is proposed and careful initial siting of concrete mixing facilities is required with no production within a minimum of 50 m from the aquatic zone.	✓

W_08	For the sections of concrete that are under water, pre-cast units should be used for construction; however *in situ* stitching of these will be required. Where the use of pre-cast units is not possible or where *in situ* stitching is required or where concrete is to be placed under water or in tidal conditions, specific fast-setting mix is required to limit segregation and washout of fine material / cement. This will normally be achieved by having either a higher-than-normal fines content, a higher cement content or the use of chemical admixtures.	✓	
W_09	Fuel, oil and chemical storage must be sited on an impervious base within a bund and secured. The base and bund walls must be impermeable to the material stored and of adequate capacity. PPG 26 "*Safe storage – drums and intermediate bulk containers"* (Environment Agency, 2011a) shall be implemented to ensure safe storage of oils and chemicals.	✓	
W_10	The safe operation of refuelling activities shall be in accordance with PPG 7 *"Safe Storage – The safe operation of refuelling facilities"* (Environment Agency, 2011b).	✓	
W_11	With regard to potential oil spills during dredging operations, an emergency spill kit and oil spill containment equipment will be held on board by the dredging operator;	✓	
W_12	The Port of Cork has in place an Oil Spill Contingency Plan which is adhered to by all staff including those employed to carry out capital dredging on behalf of the Port. This plan is provided to assist the Harbour Master, or in his absence the Deputy Harbour Master of the Port of Cork Company in dealing with an accidental discharge of oil and/or Hazardous Noxious Substances (HNS). Its primary purpose is to set in motion the necessary actions to stop or minimise the discharge and to mitigate its effects. Effective planning ensures that the necessary actions are taken in a structured, logical and timely manner. This plan (Oil Spill/HNS Plan) guides Port of Cork staff (and other related organisations who hold a copy of the plan) through the various actions and decisions which will be required in an incident response.	✓	✓

W_13	A contingency plan for the construction works shall be prepared in accordance with *PPG 21 Pollution Incident Response Planning* (Environment Agency, 2009). The Plan should also detail the procedures to be followed if there is a breach in any licence conditions or a non-compliance.	✓	v
W_14	It will be important to ensure that the Environmental Manager is notified of all incidents where there has been a breach in agreed environmental management procedures. Suitable training shall be provided to relevant personnel detailed within the Pollution Incident Response Plan to ensure that appropriate and timely actions will be taken.	✓	✓
W_15	Compliance with the Port of Cork's Oil Spill Contingency Plan as outlined under the construction mitigation section;	✓	✓
W_16	Adequate bunding for any fuel, oils or chemicals stored on-land in accordance with relevant PPGs and following the same guidance outlined for storage and refuelling during the construction phase;	✓	✓
W_17	Regular inspection of the condition of chemical and fuel storage facilities along with routine maintenance to ensure the risk of leaks is minimised;	✓	✓
W_18	Bilge water shall be treated in accordance with Marpol standards	✓	✓
W_19	De-ballasting shall be undertaken offshore in accordance with International Maritime Organisation (IMO) guidelines;	✓	✓
W_20	Vessels shall be equipped with oil-water separation systems in accordance with Marpol requirements;	✓	✓

W_21	Spills on deck shall be contained and controlled using absorbing materials;		✓	✓
W_22	Vessels without sewage treatment systems shall have suitable holding tanks and will bring waste onshore for treatment by licensed contractors;		✓	✓
W_23	Chemicals shall be stored appropriately in suitably bunded areas and with material safety data sheets.		✓	✓
W_24	Site levels will be designed to guide water away from sensitive areas such as buildings. Storm water runoff from the site will be collected in a dedicated storm water drainage system for discharge to the harbour waters.		✓	✓
W_25	All surface drainage waters, including road drainage, will be presumed to be contaminated and will be routed through highway quality oil interceptors and sediment traps prior to discharge into the sea, therefore, there will be no adverse impact on water quality in the harbour and vessels will be strictly prohibited from discharging waste water into the harbour waters.		✓	✓
Marine Ecology				
ME_01	Two Marine Mammal Observers (MMO's) will be appointed to monitor for marine mammals and to log all relevant events using a standardised data form (Locations 1&2 on **Error! Reference source not found.** in Marine Ecology Chapter). Two Marine Mammal Observers is recommended instead of the mandatory one (as per DAHG 2014 guidelines), to ensure a complete 180-degree arc view of the study area, and to ensure any marine mammal which may enter the 1000m-radius exclusion zone are spotted.	Physicochemical monitoring using multiparameter sondes inside and outside of the Ringaskiddy basin at strategic locations would be helpful to assess potential impacts on water quality. Key parameters to monitor include temperature, conductivity (salinity), pH, turbidity, and dissolved oxygen levels, as these factors can be affected by construction activities such as dredging or pollutant release.	✓	

		Regular measurements of turbidity can detect increased sediment suspension, while monitoring oxygen levels helps assess the health of the aquatic environment for species sensitive to hypoxia. Salinity and pH levels should also be tracked to identify any deviations from natural freshwater inputs. Additionally, using a chlorophyll sensor could provide valuable data on changes in nutrient inputs by detecting algal blooms, which may indicate nutrient enrichment from runoff or construction activities. Continuous monitoring of these indicators will help ensure early detection of environmental changes and guide mitigation measures.	
ME_02	Pile driving activities shall only commence in daylight hours where effective visual monitoring can be achieved. Where effective visual monitoring, as determined by the MMO, is not possible the sound-producing activities shall be postponed until effective visual monitoring is possible.		✓
ME 03	An agreed and clear on-site communication signal must be used between the MMO and the Works Superintendent as to whether the relevant activity may or may not proceed, or resume following a break (see below). It shall only proceed on positive confirmation from the MMO.		✓
ME_04	Due to the proximity of a harbour seal haul-out site to the proposed works area, an Acoustic Mitigation Device (AMD) will be used prior to the soft-start procedure. This device will be an Acoustic Deterrent Device (ADD), which will transmit loud (170-200dB), mid-frequency sound from the site to the surrounding waters. This will deter the seals of the area away from the vicinity of the works area, as the seals will find the		✓

ME_05	The MMO shall conduct a pre-start-up constant effort monitoring at least 30 minutes before the sound producing activity is due to commence until at least 30 minutes have elapsed with no marine mammals detected within the Monitored Zone by an MMO.	✓
ME_06	This prescribed Pre-Start Monitoring shall subsequently be followed by an appropriate Ramp-Up Procedure which should include continued monitoring by the MMO's.	✓
ME_07	As the potential noise levels underwater from the proposed piling activity at this site is unknown, on a precautionary basis, an appropriate Ramp-Up procedure (soft-start) must be used.	✓
ME_08	Where it is possible according to the operational parameters of the equipment and materials concerned, the underwater acoustic energy output shall commence from a lower energy start-up (i.e., a peak sound pressure level not exceeding 170 dB re: 1µPa @1m) and thereafter be allowed to gradually build up to the necessary maximum output over a period of 20-40 minutes.	✓
ME_09	This controlled build-up of acoustic energy output shall occur in consistent stages to provide a steady and gradual increase over the ramp-up period.	✓
ME_10	In all cases where a Ramp-Up procedure is employed the delay between the end of ramp-up and the necessary full output must be minimised to prevent unnecessary high-level sound introduction into the environment.	✓
ME_11	As recommended by ACCOBAMS (2022), a suitable qualified Passive Acoustic Monitoring (PAM) technician should be employed for the duration of the pile driving works, if the work is to be carried out during a time of year where weather conditions are likely unfavourable for MMO visibility (i.e. November to January) or if the pile driving work is to occur at nighttime. This is in addition to the two recommended Marine Mammal Observers, to serve as an additional form of mitigation. While PAM will not detect pinnipeds, as cetaceans have been recorded in the project area (as noted during the desk study carried out for this assessment), it is highly recommended.	✓

ME_12	If there is a break in pile driving sound output for a period greater than 30 minutes (e.g. due to equipment failure, shut down or location change) then all Pre-Start Monitoring and a subsequent Ramp-up procedure (where appropriate following Pre-start Monitoring) must be undertaken.	✓
ME_13	Only the minimum quantities of explosives to achieve the desired result must be used. While the duration of individual blasting events must also be minimised, a series of smaller explosions should be undertaken rather than fewer larger explosions.	✓
ME_14	Two Marine Mammal Observers (MMO's) will be appointed to monitor for marine mammals and to log all relevant events using a standardised data form (Locations 1&2 on **Error! Reference source not found.**). Two Marine Mammal Observers is recommended instead of the mandatory one (as per DAHG 2014 guidelines), to ensure a complete 180-degree arc view of the study area, and to ensure any marine mammal which may enter the 1000m-radius exclusion zone are spotted.	✓
ME_15	Where possible, blasting events must be scheduled to occur early in the daytime to allow a buffer for delays caused by marine mammal presence within the immediate area of operations.	✓
ME_16	Where possible, individual explosive charges should be placed within a borehole drilled into the substratum or an excavated depression and covered or packed with stemming material (e.g., loose gravels, clean angular crushed rock and/or overburden).	✓
ME_17	Blasting activity shall not commence if marine mammals are detected within a 1,000m radial distance of the sound source, i.e., within the Monitored Zone. Pre-Start Monitoring	✓
ME_18	Blasting activities shall only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, has been achieved. Where effective visual monitoring, as determined by the MMO, is not possible the sound-producing activities shall be postponed until effective visual monitoring is possible.	✓

ME_19	An agreed and clear on-site communication signal must be used between the MMO and the Works Superintendent as to whether the relevant activity may or may not proceed. It shall only proceed on positive confirmation with the MMO.	✓
ME_20	The MMO shall conduct pre-start-up constant effort monitoring at least 30 minutes before the sound-producing activity is due to commence. Sound-producing activity shall not commence until at least 30 minutes have elapsed with no marine mammals detected within the Monitored Zone by the MMO.	✓
ME_21	The prescribed Pre-Start Monitoring shall subsequently be followed by a pre-arranged Ramp-Up Procedure wherever possible. This should include continued monitoring by the MMO.	✓
ME_22	The use of a clear Ramp-Up Procedure must be considered; for example, whereby charges of smaller mass are detonated first in a progressive series of blasts aimed at reducing the acoustic/environmental impact caused by individual high energy pulse sounds, and allowing animal avoidance, surfacing or other potential safeguarding behaviour of marine mammals to occur.	✓
ME_23	Sequential detonations within an overall blast cycle should employ a short inter-charge time delay (of milliseconds in duration) in order to minimise the cumulative effect of separate individual blast pulses.	✓
ME_24	In all cases where a Ramp-Up Procedure is employed the delay between the end of ramp-up and the necessary full output must be minimised.	✓
ME_25	Any proposed Ramp-Up Procedure should be informed by the risk assessment undertaken giving due consideration to all technical and operational specifications, the size/weight and scale of the intended detonation(s), the receiving substrate, the duration of the blasting activity, the receiving environment and species therein, and other information (see section 3).	✓

ME_26	Full reporting on MMO operations and mitigation undertaken must be provided to the Regulatory Authority as outlined in Appendix 7.	✓
ME_27	A qualified and experienced marine mammal observer (MMO) shall be appointed to monitor for marine mammals and to log all relevant events using standardised data forms.	✓
ME_28	Unless information specific to the location and/or plan/project is otherwise available to inform the mitigation process (e.g., specific sound propagation and/or attenuation data) and a distance modification has been agreed with the Regulatory Authority, drilling activity shall not commence if marine mammals are detected within a 500m radial distance of the drilling sound source, i.e., within the Monitored Zone.	✓
ME_29	Drilling activities shall only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, has been achieved. Where effective visual monitoring, as determined by the MMO, is not possible the sound-producing activities shall be postponed until effective visual monitoring is possible.	✓
ME_30	An agreed and clear on-site communication signal must be used between the MMO and the Works Superintendent as to whether the relevant activity may or may not proceed, or resume following a break (see below). It shall only proceed on positive confirmation with the MMO.	✓
ME_31	In waters up to 200m deep, the MMO shall conduct pre-start-up constant effort monitoring at least 30 minutes before the sound-producing activity is due to commence. Sound-producing activity shall not commence until at least 30 minutes have elapsed with no marine mammals detected within the Monitored Zone by the MMO.	✓
ME_32	Where operations occur in waters greater than 200m depth (i.e., >200m), pre-start-up monitoring shall be conducted at least 60 minutes before the sound-producing activity is due to commence. Sound-producing activity shall not commence until at least 60 minutes have elapsed with no marine mammals detected within the Monitored Zone by the MMO.	✓

ME_33	This prescribed Pre-Start Monitoring shall subsequently be followed immediately by normal drilling operations. The delay between the end of Pre-Start Monitoring and the necessary full drilling output must be minimised.	✓		
ME_34	Once normal drilling operations commence, there is no requirement to halt or discontinue the activity at night-time, nor if weather or visibility conditions deteriorate nor if marine mammals occur within a 500m radial distance of the sound source, i.e., within the Monitored Zone.	✓		
ME_35	If there is a break in drilling sound output for a period greater than 30 minutes (e.g., due to equipment failure, shut-down or location change) then all Pre-Start Monitoring must be undertaken in accordance with the above conditions prior to the recommencement of drilling activity.	✓		
ME_36	Siltation Control/ dredger type: Use methodologies of dredging that reduce the spread of sediment. Silt curtains or other barriers to limit the drift of suspended sediments during dredging.	✓		
ME_37	Minimised Dredging Footprint: Employ techniques that limit the footprint of dredging operations, such as progressive or targeted dredging, to avoid habitat loss.	✓		
ME_38	Habitat Restoration: Where feasible, restore affected habitats post-dredging by reintroducing species, such as reseeding mussel beds or transplanting seaweed species.	✓	✓	
ME_39	Two Marine Mammal Observers (MMO's) will be appointed to monitor for marine mammals and to log all relevant events using a standardised data form (Locations 3&4 on **Error! Reference source not found.**). Two Marine Mammal Observers is recommended instead of the mandatory one (as per DAHG 2014 guidelines), to ensure a complete 180-degree arc view of the study area, and to ensure any marine mammal which may enter the 500m-radius exclusion zone are spotted.	✓	✓	

ME_40	Dredging activities shall only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO's, has been achieved. Where effective visual monitoring, as determined by the MMO's, is not possible the sound-producing activities shall be postponed until effective visual monitoring is possible.	✓	✓
ME_41	An agreed and clear on-site communication signal must be used between the MMO's and the Works Superintendent as to whether the relevant activity may or may not proceed, or resume following a break. It shall only proceed on positive confirmation with the MMO's.	✓	✓
ME_42	Due to the proximity of a harbour seal haul-out site to the proposed works area, an Acoustic Mitigation Device (AMD) will be used prior to the soft-start procedure. This device will be an Acoustic Deterrent Device (ADD), which will transmit loud (170-200dB), mid-frequency sound from the site to the surrounding waters. This will deter the seals of the area away from the vicinity of the works area, as the seals will find the frequency and volume of the sound aversive. The ADD will be activated for 30 minutes prior to the Soft-start procedure.	✓	✓
ME_43	The MMO's shall conduct pre-start-up constant effort monitoring at least 30 minutes before the sound-producing activity is due to commence. Sound-producing activity shall not commence until at least 30 minutes have elapsed with no marine mammals detected within the monitored zone by the MMO's.	✓	✓
ME_44	This prescribed pre-start monitoring shall subsequently be followed immediately by normal dredging operations. The delay between the end of Pre-Start monitoring and the necessary dredging output must be minimised.	✓	✓
ME_45	If there is a break in dredging sound output for a period greater than 30 minutes (e.g. due to equipment failure, shut-down or location change) then all pre-Start Monitoring must be undertaken in accordance with the above conditions prior to the recommencement of dredging activity.	✓	✓

ME_46	Prior to the beginning of works, all works areas will be clearly marked out using marking tape or temporary fencing and no works will be undertaken outside of these areas.	✓	✓
ME_47	The site compound will be located within a set works area and will be clearly fenced off.	✓	✓
ME_48	All hazardous materials will be stored and handled in bunded areas located at least 50m from the water.	✓	✓
ME_49	To avoid site runoff of contaminated materials and/or debris, site clearance will not be undertaken during wet conditions, when rainfall of more than 0.5mm/hour is forecast within the next 24 hours.	✓	✓
ME_50	Refuelling of construction equipment will not be undertaken within 50m of the water.	✓	✓
ME_51	No overflow of the dredger will be permitted during dredging.	✓	✓
ME_52	Scheduling: Conduct dredging operations during periods when biotopes are less sensitive, such as outside of breeding or spawning seasons.		
ME_53	Siltation Control/ dredger type: Use methodologies of dredging that reduce the spread of sediment. Silt curtains or other barriers to limit the drift of suspended sediments during dredging.		

ME_54	Minimised Dredging Footprint: Employ techniques that limit the footprint of dredging operations, such as progressive or targeted dredging, in order to avoid habitat loss.		
ME_55	Habitat Restoration: Where feasible, restore affected habitats post-dredging by reintroducing species, such as reseeding mussel beds or transplanting seaweed species.		
ME_56	The conditions of the maintenance dredging licence will be adhered to with regard to marine mammals during the operational phase. Additionally, all mitigation prescribed for dredging during the construction period of this development, should be replicated for the maintenance dredging of the site.		
Terrestrial Ecology and Ornithology			
TEO_01	All Site construction will be undertaken in accordance with the CIRIA (2015) Environmental Good Practice on Site (Charles and Edwards 2015);	A species protection plan should be designed by a professional ecologist to ensure that works related to this proposal take into account any protected bird species present on site and the nearby surroundings. An Ecological Clerk of Works (ECoW) should be employed to monitor the works under license, and to inform the team through Ecological Toolbox Talks during the proposed works and tree felling activities. A pre-construction survey of the scheme will be undertaken by an experienced Ecological Clerk of Works (ECoW), who shall walk the entire length of the scheme alongside the Site Manager / Site Engineer in order to highlight	✓

locations where environmental mitigation (as described below) is required prior to construction works commencing on the site. A minimum of 1 no. ECoW visit shall be conducted per week during the course of the construction works at this site during the construction phase. The ECoW shall be present on-site during commencement of works. As such the following points must be adhered to for this scheme:

- An Ecological Clerk of Works (ECoW) will be involved as required during the construction period for this scheme, in order to ensure that the required mitigation is implemented.

- Once planning permission has been secured, pre-construction ecology surveys will be carried out within the proposed scheme area well in advance (ideally 3-4 months prior to construction works) in order to ensure that sufficient updated information is available to inform derogation licence applications as required.

- The ECoW and the Appointed Contractor will walk the proposed scheme together prior to work commencing on the site, in order to discuss the ecological constraints, to highlight all required mitigation

		and to demarcate exclusion zones appropriately.	
TEO_02	Mitigation described in this report will be followed during site construction and operation phases;		✓
TEO_03	There shall be no discharges to Cork Harbour from the construction activities on the site;		✓
TEO_04	A site-specific CEMP will be written by the contractor prior to site works commencing. This CEMP will incorporate the mitigation measures listed here.		✓
TEO_05	The site compound shall be located within the site boundary. • The compound will be sited as far from any water course (>50m) as possible in order to minimise any potential impacts. • Only plant and materials necessary for the construction of the works will be permitted to be stored at the compound location.		✓
TEO_06	Monitoring of the water quality during the operational phases must take place. ○ The monitoring must be in accordance with any issued licence/approval needed to undertake the proposed works. ○ The monitoring must include sampling and testing of the waters to show compliance with the approval.		✓

- The licence must not be surrendered until the EPA are satisfied there is no environmental liability with the proposed project.

TEO_07	To minimise exacerbated adverse effects, the prevailing weather conditions and time of year is to be taken into account when the site development manager is planning the removal of vegetation, soil, existing concrete, and/or general construction works.	✓
TEO_08	Fuels, lubricants and hydraulic fluids for equipment used on the construction site, as well as any solvents and oils, will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, provided with spill containment and stored >10m from watercourses;	✓
TEO_09	Fuelling and lubrication of equipment will not be carried out within 10m of watercourses where this is possible, and shall only be undertaken in designated bunded areas;	✓
TEO_10	Any spillage of fuels, lubricants or hydraulic oils must be immediately contained, and the contaminated soil removed from the site and dispatched to a suitably authorised waste facility.	✓
TEO_11	Refuelling must be carried out using 110% capacity double bunded mobile bowsers. The refuelling bowser must be operated by trained personnel. The bowser must have spill containment equipment which the operators must be fully trained in using.	✓
TEO_12	Plant nappies or absorbent mats to be place under refuelling point during all refuelling to absorb drips.	✓
TEO_13	Mobile bowsers, tanks and drums should be stored in secure, impermeable storage area, away from drains and open water.	✓

TEO_14	To reduce the potential for oil leaks, only vehicles and machinery will be allowed onto the site that are mechanically sound. An up-to-date service record must be required from the main contractor.	✓
TEO_15	Should there be an oil leak or spill, the leak or spill must be contained immediately using oil spill kits; the nearby dirty water drain outlet must be blocked with an oil absorbent boom until the fuel/oil spill has been cleaned up and all oil and any contaminated material removed from the area. This contaminated material must be properly disposed of in a licensed facility.	✓
TEO_16	The site Environmental representative must be immediately informed of the oil leak/spill and must assess the cause and the management of the clean-up of the leak or spill. They must inspect nearby drains for the presence of oil and initiate the cleanup if necessary.	✓
TEO_17	Immediate action must be facilitated by easy access to oil spill kits. An oil spill kit that includes absorbing pads and socks must be kept at the site compound and also in site vehicles and machinery.	✓
TEO_18	Correct action in the event of a leak or spill must be facilitated by training all vehicle/machinery operators in the use of the spill kits and the correct containment.	✓
TEO_19	During the works, best practice noise reduction measures described in British Standard 5228-12009+A1:2009, Code of Practice for Noise and Vibration Control on Construction and Open Sites must be incorporated into the Construction and Environmental Management Plan.	✓
TEO_20	For mobile plant items such as cranes, HGV's, excavators and loaders, maintaining enclosure panels closed during operation can reduce noise levels over normal operation.	✓
TEO_21	Mobile plant will be switched off when not in use and not left idling.	✓

TEO_22	For steady continuous noise, such as that generated by diesel engines, noise reduction can be achieved by fitting a more effective exhaust silencer system.	✓
TEO_23	Acoustic screens are required to be erected as required in certain locations for the duration of the redevelopment works. These screens shall be carefully positioned to be as effective as possible. In general, the barrier shall have no gaps or openings in the joins of the barrier material. The barrier material shall have a minimum mass per unit area of 7 kg/m2 and minimum recommended height of 2.4m.	✓
TEO_24	No machinery should be left running outside of the agreed operation hours, which must limit any noise emissions from the site in the late evenings and early mornings when mammal (i.e., otter) activity is at a higher level.	✓
TEO_25	Surface water protective measures outlined in Section 16.11.1.2.1 of the specific mitigation measures will be adhered to for the protection of watercourses used by otters. This will help avoid the contamination of prey that otters feed on as well as maintaining the water quality of the river in which the otters forage.	✓
TEO_26	No machinery should be left running outside of the agreed operation hours, which must limit any noise emissions from the site in the late evenings and early mornings when mammal (i.e., otter) activity is at a higher level.	
TEO_26	No machinery should be left running outside of the agreed operation hours, which must limit any noise emissions from the site in the late evenings and early mornings when mammal (i.e., otter) activity is at a higher level.	✓
TEO_27	Mitigation measures such as cordoning off of hazardous machinery with temporary fencing at the end of the working day and the restriction of works to daylight hours (otters are largely nocturnal) should be implemented by the contractor on site. These mitigation works will necessarily be implemented throughout the entire construction period.	✓

TEO_28	Vertical barriers and/or ground protection must protect all trees that are being retained on site. It is essential that these provisions be put in place prior to any development work or soil excavations are carried out. The purpose of protective barriers is to exclude any harmful construction activity that may damage the Root Protection Area. A root protection area is calculated as using the diameter of the tree trunk at 1.5 meters height x12 (Woodland Trust, 2021). These barriers help protect the main stem of the tree. Tree protection barriers should be fit for the purposes of excluding construction activities and be durable to withstand an impact. The barrier should consist of a vertical and horizontal frame and should be at least 2.3m in height. To ensure the protection barriers are respected, clear concise signage must be affixed to the barrier in an unrestricted easily viewed location. The signage must specify that no construction activity is to take place within the RPA. This should remain the case until completion of all works unless certain works are deemed acceptable following consultation with an arborist. The signage must also state that no materials of any description are to be stored or the “spilling out” of materials should not occur within the RPA. Site personnel must be made aware of the importance of the protective barrier.	✓
TEO_29	Any excavation works carried out within the RPA should be undertaken with extreme care and should be carried out with due diligence, avoiding damage to the protective bark covering larger roots. This may involve excavation by mini-digger and/or hand as deemed appropriate. Exposed roots should be wrapped in a hessian sacking to avoid desiccation and roots less than 2.5cm in diameter can be pruned back to a side root. The advice of a qualified arborist should be sought if larger roots that influence anchorage need to be severed. Trunk protection should also be put in place using hessian sacking and timber strips clad around the tree, in order to mitigate any potential damage that may occur.	✓

TEO_30	Alteration of ground levels within the RPA should only be carried out following a considered assessment of the likely impact on the tree. In general, a ground alteration in excess of 75mm should be avoided. Changes in ground levels in the vicinity of a tree may alter the existing soil hydrology and necessitate the incorporation of adequate drainage around the tree. New impermeable surfaces should not cover more than 20% of the RPA. An increase in ground level up to a maximum of 1m is tolerable for certain species using specific techniques (beech and oak are not amenable to such a level of disturbance). This involves the construction of a dry well around the tree trunk allowing for future growth and the incorporation of coarse aggregates to provide sufficient drainage and allow for gaseous diffusion in the raised ground.		✓
TEO_31	To limit the potential impact of construction on breeding birds, removal of woody vegetation should be restricted to the non-breeding season (September to February, inclusive). Where the construction programme does not allow this, an ecologist should undertake a breeding bird check immediately prior to vegetation clearance. Where no breeding birds are present, clearance may proceed without requiring a derogation licence from the NPWS. However, given that breeding birds and the nests of all bird species are protected under the Wildlife Acts, a licence would be required from the NPWS to permit the destruction of nest sites and disturbance to breeding birds during the breeding season (1st of March to the 31st of August). If the applicant intends to carry out clearance works during the bird breeding season, guidance should be sought from the NPWS with regard to compliance with Section 40 (1) and Section 40 (2) (e) of the Wildlife Acts (see below): ***40.*** *(1) (a) It shall be an offence for a person to cut, grub, burn or otherwise destroy, during the period beginning on the 1st day of March and ending on* *the 31st day of August in any year, any vegetation growing on any land not then cultivated.*	✓	

(1) (b) It shall be an offence for a person to cut, grub, burn or otherwise destroy any vegetation growing in any hedge or ditch during the period mentioned in paragraph (a) of this subsection.

***40.** (2) Subsection (1) of this section shall not apply in relation to—*

(e) the clearance of vegetation in the course of road or other construction works or in the development or preparation of sites on which any building or other structure is intended to be provided.

TEO_32	Surface water protective measures outlined in Section 16.11.1.2.1 of the specific mitigation measures will be adhered to for the protection of watercourses used by waterbirds. This will help avoid the contamination of mudflats, sandflats and water bodies where birds forage in the harbour.	✓
TEO_33	Sudden loud noises (or impulsive noises) should be avoided when construction activity is underway. This will help limit the potential for nearby birds to become startled and displaced from their habitat, especially species of birds that are resident to Ireland and are located in the country all year round, not just during the breeding season. Noise emission measures outlined in Section 16.11.1.2.2 of the specific mitigation measures will be adhered to for the protection of surrounding waterbirds. This will help avoid significant negative impacts to surrounding bird species from potential noise emissions from the site.	✓
TEO_34	Treelines and areas of scrub offer birds suitable nesting habitat locations. These areas should be protected and remain untouched during construction. The proposed works will be carried out with the aim of avoiding as much damage to this potential bird nesting habitat as possible. Any trees or scrub in the way of the development layout are to be removed in such a manner not to cause damage to those trees to be retained. Root	✓

protection areas will be marked out around the trees to be retained. No machinery will enter these areas.

TEO_35	To avoid the spread of Invasive Plant Species to and from the redevelopment the following mitigations must be implemented: • Construction machinery is to be visually inspected and power-washed prior to arrival at the site in order to avoid importation of invasive species; • All excavation/access areas are to be pre-checked for invasive species and no machinery is to enter these fenced-off locations, unless instructed by the Client or its Representatives and appropriate management measures are put in place. Throughout the period of the works, in order to comply with national legislation that prohibits any 'polluting matter' to enter 'waters', *e.g.* Fisheries (Consolidation) Act 1959, Environmental Protection Agency Acts 1992 and 2003, and Local Government (Water Pollution) Acts 1977 and 1990, standard operational procedures, both published and unpublished, will be implemented and adhered to. The adherence to these environmental protection measures would be implemented on-site irrespective of the presence of a designated European Site.	
TEO_36	The project site will be typical of ongoing Port operations during the operational phase. As part of the Port of Cork Environmental Management System (EMS), they are required to monitor surface water, ground water, noise and dust emissions from the site to ensure that they meet EPA (Environmental Protection Agency) standards. This will continue during the operational phase and will ensure that surrounding receptors will not be negatively impacted on.	✓

Material Assets		
MA_01	Stockpile in the temporary storage area (e.g. bituminous mixes) shall be minimised both spatially and temporally.	✓
MA_02	Increased vehicular traffic within CCT1 and DWB due to construction/dredging and quay wall construction works will be managed by implementation of a Traffic Management Plan for the construction project.	✓
MA_03	Impacts to air from construction dust will be mitigated by dampening during construction as required.	✓
MA_04	Spill kits will be made available by the Contractor during the works and shall be stocked regularly.	✓
MA_05	Material imported onto the site will be assessed to ensure that contamination is not introduced to the site. Any topsoil which is imported onto the site will be chemically analysed and screened against generic screening values for a commercial end use to ensure that it does not pose a risk to human health.	✓
MA_06	Further investigations into services will be necessary during the detailed design stage. Methods such as ground penetrating radar (GPR) and test trenching can be used to verify or locate existing services.	✓
MA_07	Services drawings shall be reviewed in detail prior to project inception and potential conflicts with construction works shall be noted and monitored.	✓
MA_08	Excavated material on site will be managed in accordance with the requirements of the Waste Management Act 1996 (as amended). The Contractor will be required to ensure that the facility, to which any excavated material which requires transfer off-site is brought to/ is authorised in accordance with Waste Management Legislation. The	✓

	Contractor, as holder of the waste, will be responsible under the Waste Management Act for ensuring that all statutory obligations are met. All waste activities at the site will be subject to best practice waste handling procedures (i.e. source segregation, storage and collection). Material will be re-used where possible.	
MA_09	At a minimum the Contractor shall ensure: • That any waste haulier employed by the contactor is authorised by a waste collection permit or is exempt from such a requirement; Waste Management Acts or any other legislation, as necessary; • That the terms and conditions of the authorisations of the waste haulier and next destination waste facility allow for acceptance of the waste in question (i.e. allow the facility to accept the specific EWC/LoW type of waste); and • That these authorisations will not expire within the lifetime of the project.	✓
MA_10	Waste arisings generated will only be treated at facilities that are authorised to carry out the appropriate waste treatment activity for the specific waste stream. Records of all waste movements and associated documentation shall be maintained on-site such as waste facility authorisation number, expiry date, class of waste accepted, weighbridge records, treatment methods for each waste stream accepted i.e., backfilling, crushing, screening, etc.	✓
MA_11	Where waste generated is not reusable on-site or deemed suitable for dumping at sea, samples will be taken and waste acceptance criteria (WAC) laboratory testing will be undertaken on the excavated material. The results of the laboratory testing will be used to determine whether a waste as inert, non-hazardous or hazardous. Authorised waste facilities will be contacted to establish what their waste acceptance criteria are. The waste from the proposed development will be compared with the facility waste acceptance criteria and sent to the waste facilities which are authorised to accept the material in line with the waste acceptance criteria. Where practical, the closest suitable facilities to the proposed	✓

	development will be selected to reduce impacts associated with vehicle movement such as air emissions.		
MA_12	The Contractor(s) will store, handle and transport waste material arising in accordance with best practice guidelines and the Waste Management Act 1996 (as amended). Waste arisings that cannot be re-used or disposed of at sea will be sampled, tested and disposed of, to a licensed waste management facility.	✓	
MA_13	A survey/condition assessment of POCC assets shall be undertaken periodically to assist in the management of such assets during port operations and maintenance.	✓	
MA_14	The PoCC operates an Oil/HNS Spill Contingency Plan (Port of Cork Company, July 2009) which outlines the measures to be undertaken in the event of an oil spill or spillage of Hazardous Noxious Substances. This contingency plan will be effective in dealing with any operational incidents with the potential to generate waste associated with the development.	✓	
MA_15	POCC Waste Management Plan outlines the measures required to manage the waste arisings from shipping and these measures will be reviewed on an ongoing basis to ensure that the waste facilities accepting waste from the port can meet the additional demand.		✓
MA_16	The Contractor shall develop a system of record keeping which records any damage or dereliction observed/encountered to existing POCC assets as a result of construction.		✓
MA_17	A survey/condition assessment of existing PoCC assets shall be undertaken at the inception of the project to assist in the management of such assets during construction and maintained throughout the duration of the programme.	✓	

MA_18	The Contractor shall develop a record keeping system that will ensure that details of all arisings, movement and treatment of C&D waste are recorded. All materials being transferred from the site, whether for recycling, recovery or disposal, shall be subject to a documented tracking system which can be verified and validated.	✓	
MA_19	A survey/condition assessment of POCC assets shall be undertaken periodically to assist in the management of such assets during port operations and maintenance.	✓	
MA_20	The Port of Cork Company shall adhere on an ongoing basis to the requirements of the Ringaskiddy Port Waste Management Plan.	✓	✓
Major Accidents and Disasters			
ERP_01	Existing flood defences and stormwater drainage will be maintained	✓	✓
ERP_02	The site construction operations will be designed and operated in line with best international current practice and with appropriate health and safety checks in place.	✓	✓
ERP_03	Appropriate training, qualifications, and risk controls in place	✓	✓
ERP_04	Safety in design criteria applied to design and build.	✓	✓
ERP_05	Existing flood defences and stormwater drainage will be maintained	✓	✓

ERP_06	The site operations will be designed and operated in line with best international current practice and with appropriate health and safety checks in place.	✓	✓
ERP_07	The site operations will be designed and operated in line with best international current practice and with appropriate health and safety checks in place.		✓
ERP_08	The site operations will be designed and operated in line with best international current practice and with appropriate health and safety checks and monitoring in place. Updated Fire Risk Assessment (FRA) to be carried out.		✓
ERP_09	An Emergency Response Plan is required as part of the planning regime for the Facility, which is regularly reviewed and updated in line with those requirements. The ERP contains detailed plans for the response to emergencies including fires and severe weather events.		✓

[19] Major Accidents & Disasters

[19.1] Introduction

This Chapter describes likely significant negative effects on the environment arising from the vulnerability of the proposed development to risks of major accidents and/or natural disasters, and the potential for the proposed scheme to cause major accidents and/or disasters. The underlying objective of this assessment is to ensure that appropriate precautionary actions are taken for those projects where their vulnerability to major accidents and/or natural disasters may result in significant adverse effects on the environment.

The assessment of the vulnerability of the proposed scheme to major accidents and natural disasters is carried out in compliance with the EIA Directive whereby the chapter will seek to:

- Identify potential major accidents and/or disasters, if any, that the proposed scheme could be vulnerable to,
- Determine whether these major accidents and/or disasters are likely to result in significant adverse environmental impacts, and
- Define the measures in place, or need to be in place, to prevent or mitigate the possible significant adverse effects of such events on the environment.

The scope and methodology of this assessment is centred on the understanding that the proposed scheme will be designed, built and operated in line with best international current practice. As such, major accidents resulting from the proposed scheme will be very unlikely.

[19.2] Assessment Methodology

[19.2.1] Legislation

The scope and methodology presented in the following sections is based on the provisions of the EIA Directive, the EPA Guidelines 2022 and other published risk assessment methodologies as described in the following sections.

Article 3 of the EIA Directive requires that the EIAR shall identify, describe and assess in the appropriate manner, the direct and indirect significant effects on population and human health, biodiversity, land, soil, water, air and climate, material assets, cultural heritage and landscape deriving from (amongst other things) the “vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned”.

The information relevant to major accidents and/or disasters to be included in the EIAR is set out in Section 8 of Annex IV of the EIA Directive as follows:

“(8) A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this Directive are met. Where appropriate, this description should include measures envisaged to prevent or mitigate the significant adverse effects of such events on

the environment and details of the preparedness for and proposed response to such emergencies".

[19.2.2] Local Policy & Guidelines

Cork Major Emergency Management and Major Emergency Plan - https://www.corkcoco.ie/en/resident/fire-and-building-control/major-emergency-management-and-major-emergency-plan

The objective of this Major Emergency Plan is to protect life and property, to minimise disruption to the community and to provide immediate support for those affected. To achieve this objective the Plan sets out the basis for a co-ordinated response to a Major Emergency and the different roles and functions to be performed by the various agencies.

The priorities of Cork County Council's response in an emergency are;

- Protection and care of the public at times of vulnerability.
- Clear leadership in times of crisis.
- Early and appropriate response.
- Efficient, coordinated operations.
- Realistic and rational approach, capable of being delivered.
- Transparent systems, with accountability.
- Harnessing community spirit.
- The ethos of self-protection.
- Maintenance of essential services.
- Safe working.

This Major Emergency Plan provides for a co-ordinated response to Major Emergencies that may arise, for example, from fires, explosions, gas releases, and transportation accidents, spillages of dangerous substances and from severe weather. The types of emergency normally resulting from oil supply crises, electrical power blackouts, industrial disputes etc. are of a different nature and are not catered for in this Plan. It is recognised, however, that such emergencies could result in a situation, such as a major gas explosion, requiring activation of the Major Emergency Plan.

In certain circumstances, the local response to a Major Emergency may be scaled up to a Regional Level Response, requiring the activation of the Plan for Regional Level Coordination The Major Emergency Plan also contains specific sub-plans such as the Severe Weather Plan, Flood Emergency Response Plan, Drinking Water Incident Response Plan and External Emergency Plans for Upper Tier Establishments coming under the Seveso Regulations.

A Major Emergency will be declared by an Authorised Officer of whichever Principal Response Agency (PRA) considers that the criteria in the definition of a 'Major Emergency' below have been satisfied.

A Major Emergency is any event, usually with little or no warning, causes or threatens death or injury, serious disruption of essential services or damage to property, the environment of infrastructure beyond the normal capabilities of the Principal Emergency Services in the area in which the event occurs, and requires the activation of specific additional procedures and the mobilisation of additional resources to ensure an effective, co-ordinated response.

The Major Emergency Plan will immediately be activated when a Major Emergency is declared. The Plan will be activated by whichever of the following agencies first becomes aware of the declaration: -

- Health Service Executive
- Local Authority
- An Garda Síochána

The Major Emergency Plan will also be activated in other specific circumstances as follows:

- On request from a national body acting under the provisions of one of the following National Emergency Plans:
    - National Emergency Plan for Nuclear Accidents,
    - Public Health (Infectious Diseases) Emergency Plan,
    - Animal Health Plan;
- In response to a request from the Irish Coast Guard following a threatened or actual emergency in the Irish Maritime Search and Rescue Region
- In response to a request from a Minister of Government in light of an emergency/crisis situation.

There are both legislative and procedural arrangements, which require that Emergency Plans be prepared for specific sites or events (e.g. SEVESO sites, airports, ports, major sports events, etc.). Arising from the risk assessment process described in Section 3, Cork County Council's Major Emergency Plan has identified sites/events where specific plans/arrangements exist for responding to emergencies. These include the following:

- Inter-Agency Emergency Plan for Cork Airport.
- Inter-Agency Emergency Plan for the Jack Lynch Tunnel.
- Port of Cork Company Emergency Plan.
- Bantry Bay Port Emergency plan.

The generic response arrangements set out in the Section 7 or the Emergency Plan, will govern the Principal Response Agencies response to such sites/events and whether a Major Emergency is declared or not.

The contents of the Port of Cork Emergency Plan are presented in Section 19.2.3 below.

[19.2.3] Port Emergency Plans

The Port of Cork Company has in place an Emergency Plan (EP) to deal with both marine and land-based emergencies.

Marine emergencies may include (but are not limited to):

- Major incident on board a vessel such as fire, flooding or cargo related
- Collision between vessels or between a vessel and a fixed object
- Grounding of a vessel.
- A major oil spillage requiring the implementation of the oil spill response plan.
- A major incident involving small craft within the ports jurisdiction.

Land based emergencies within the port may include (but are not limited to):

- Major fire within a port facility.
- Major spill of hazardous material e.g. a hazardous material transportation vehicle accident within the port area.
- Emergency in a Seveso site within or adjacent to the Port.

The EP is also compatible with the structures and arrangement outlined in the 'Framework for Major Emergency Management of 2006 which is used by the Principal Response Agencies (PRA's) and the Principal Emergency Services (PES) in Ireland.

The plan contains Action Checklist for both Marine and Land-based Emergencies to respond effectively to any serious incident occurring in the POCC operations within the port estate in order to

- Prevent or minimise loss of life.
- Prevent the release of harmful materials into the environment.
- Minimise the damage to buildings and other assets.
- Minimise the effects on port operations.

The terminal operations manager or terminal supervisor will be the incident site coordinator until the arrival of the Duty Harbourmaster. Ultimately, emergency services are in control of the incident once they arrive on site.

The senior fire officer will be briefed on his/her arrival to the incident site. Other stakeholders will be alerted at the direction of the duty Harbourmaster to the incident.

[19.2.4] Guidance

The assessment of the risk of major accidents and/or disaster considers all factors defined in the EIA Directive that have been considered in this EIAR, i.e. population and human health, biodiversity, land, soil, water, air and climate and material assets, cultural heritage and the landscape.

The EIAR already includes an assessment of some potential accidents and disaster scenarios that might arise from the Proposed Development, such as potential contamination to soils, groundwater and surface water, as well as flooding events. These are described in detail in the relevant EIAR assessment chapters (refer to Chapter 14 'Water', Chapter 12 'Soils, Geology and Hydrogeology' and Chapter 15 and 16 'Biodiversity').

A risk analysis-based methodology that covers the identification, likelihood and consequence of major accidents and/or disasters has been used for this assessment. The Department of Environment, Heritage and Local Government (DoEHLG) published 'A Framework for Major Emergency Management Guidance Document 1-A Guide to Risk Assessment in Major Emergency Management' in 2010. The document provides guidance on the various stages of the risk assessment process and how it should be employed to inform mitigation and detailed planning during major emergency situations.

[19.2.5] Risk Assessment Methodology

As defined in the DoEHLG Guidance, the risk assessment process is guided by four stages, including:

Stage 1: Establish context and describe the area.
Stage 2: Identify potential hazards.
Stage 3: Assess each hazard for potential consequences and likelihood.
Stage 4: Plot each hazard on a risk matrix (evaluating risk).

These are described in greater detail in the following sections.

[19.2.5.1] Stage 1 Establish context and describe the area.

The purpose of this stage is to describe the characteristics of the area for which the risk assessment is being completed, as this will influence both the likelihood and the impact of a major emergency. Establishing the Local/Regional context enables a better understanding of the vulnerability and resilience of the area to emergencies.

This has been achieved through (i) reviewing the baseline conditions identified during the preparation of this EIAR (chapters 6 to 15), and (ii) reviewing the local policy with regards to major accidents and disasters.

[19.2.5.2] Stage 2 Identify potential hazards

Risks have been reviewed through the identification of plausible risks in consultation with relevant specialists. The identification of risks has focused on non-standard but plausible incidents that could occur at the proposed scheme during construction and operation.

Risks have been identified as such, in respect of the proposed scheme:

1. Potential vulnerability to disaster risks; and
2. Potential to cause accidents and/or disasters.

[19.2.5.3] Stage 3: Assess each hazard for potential consequences and likelihood.

In accordance with the DoEHLG Guidelines, risks are assessed through an examination of the potential impact (severity of consequences to life and health, property and infrastructure, and

the environment) of the hazards identified. The likelihood (probability) of the hazard occurring also has to be considered and the resulting judgement recorded on a risk matrix in the next stage. The impact and likelihood criteria as outlined in Table 19-1 and Table 19-2 below are used to position all the identified hazards on the risk matrix.

Table 19-1: Risk Classification Table - Likelihood (DoEHLG, 2010)

Ranking	Likelihood	Description
1	Extremely Unlikely	May occur only in exceptional circumstances; once every 500 or more years
2	Very Unlikely	Is not expected to occur; and/or no recorded incidents or anecdotal evidence; and/or very few incidents in associated organisations, facilities or communities; and / or little opportunity, reason or means to occur; may occur once every 100-500 years.
3	Unlikely	May occur at some time; and/or few, infrequent, random recorded incidents or little anecdotal evidence; some incidents in associated or comparable organisation's worldwide; some opportunity, reason or means to occur; may occur once per 10-100 years.
4	Likely	Likely to or may occur; regular recorded incidents and strong anecdotal evidence and will probably occur once per 1-10 years
5	Very Likely	Very likely to occur; high level of recorded incidents and/or strong anecdotal evidence. Will probably occur more than once a year.

Table 19-2: Risk Classification Table – Consequence (DoEHLG, 2010)

Rank	Consequence	Impact	Description
1	Minor	Life, Health & Welfare	Small number of people affected; no fatalities and small number of minor injuries with first aid treatment.
		Environment	No contamination, localised effects
		Infrastructure	<€0.5M
		Social	Minor localised disruption to community services or infrastructure (<6 hours).
2	Limited	Life, Health & Welfare	Single fatality; limited number of people affected; a few serious injuries with hospitalisation and medical treatment required. Localised displacement of a small number of people for 6-24 hours. Personal support satisfied through local arrangements.
		Environment	Simple contamination, localised effects of short duration.
		Infrastructure	€0.5-3M.
		Social	Normal community functioning with some inconvenience.

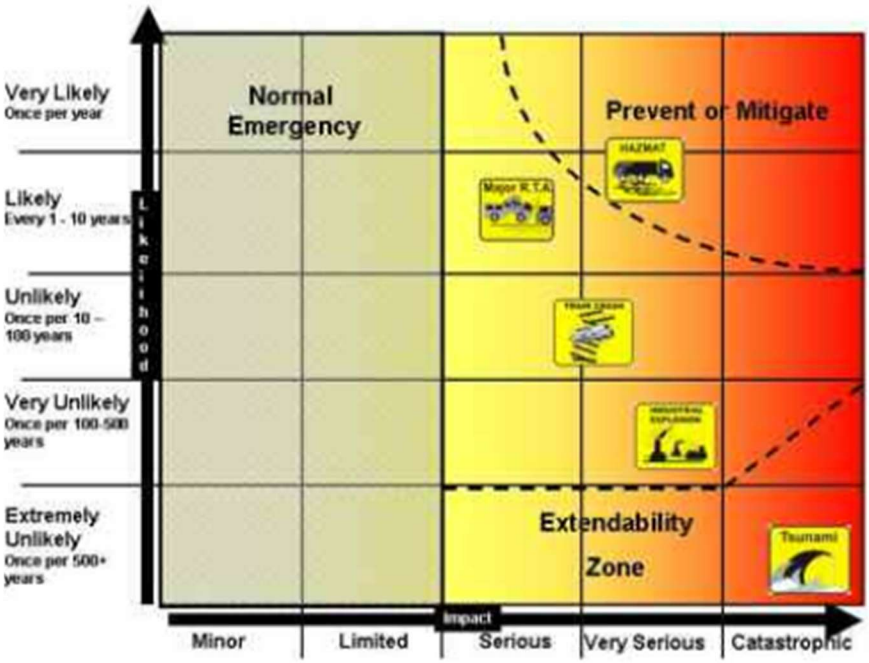
3	Serious	Life, Health & Welfare	Significant number of people in affected area impacted with multiple fatalities (<5), multiple serious or extensive injuries (20), significant hospitalisation. Large number of people displaced for 6-24 hours or possibly beyond; up to 500 evacuated. External resources required for personal support.
		Environment	Simple contamination, widespread effects or extended duration
		Infrastructure	€3-10M
		Social	Community only partially functioning, some services available.
4	Very Serious	Life, Health & Welfare	5 to 50 fatalities, up to 100 serious injuries, up to 2000 evacuated
		Environment	Heavy contamination, localised effects or extended duration
		Infrastructure	€10-25M
		Social	Community functioning poorly, minimal services available
5	Catastrophic	Life, Health & Welfare	Large numbers of people impacted with significant numbers of fatalities (>50), injuries in the hundreds, more than 2000 evacuated.
		Environment	Very heavy contamination, widespread effects of extended duration.
		Infrastructure	>€25M
		Social	Serious damage to infrastructure causing significant disruption to, or loss of, key services for prolonged period. Community unable to function without significant support.

[19.2.5.4] Stage 4: Plot each hazard on a risk matrix (evaluating risk).

Once classified, the likelihood and consequence ratings have been multiplied to establish a 'risk score' to support the evaluation of risks by means of a risk matrix, sourced from the DoEHLG (2010) (Figure 19-1). The risk matrix is colour coded to provide a broad indication of the critical nature of each risk:

- The red zone represents 'high risk scenarios'.
- The amber zone represents 'medium risk scenarios'.
- The green zone represents 'low risk scenarios'.

Figure 19-1: Risk Matrix (DoEHLG, 2010)



[19.3] Baseline Environment

The pre-development scenario involves normal port operations at CCT and DWB.

The Cork Container Terminal (CCT) was officially opened in September 2022. Large Panamax vessels can be accommodated along its 360m-long quay, where two Ship-to-Shore (STS) gantry cranes are installed. Trade vehicles are discharged at the linkspan in Ringaskiddy East, which also houses the Ferry Terminal. Ferry services are provided by Brittany Ferries to Roscoff. The current infrastructure gives the port sufficient operational capacity up to 2029.

The deepwater berth (DWB) at Ringaskiddy West currently facilitates the import of wind turbine components and other project cargoes associated with the land-based wind energy sector. Some of the longest blades in Ireland have been imported at the deepwater berth. The ADM jetty is currently used for the import of green liquid bulks, such as HVO.

The DWB is currently able to facilitate many of the vessels associated with the ORE industry, and the ADM jetty at Ringaskiddy West could be widened and an additional hammerhead berth added to allow for ORE project cargoes.

[19.4]Risk Assessment

The risk register/risk assessment for the construction and operation scenarios is set out in Table 19.3 and 19.4 below.

Table 19-3: Risk Register – Construction

Risk ID	Potential Risk	Possible Cause	Possible Impacts	Mitigation
	Potential vulnerability to accidents and/or disasters			
R1	Flooding of site	Periods of extended rainfall/storms coinciding with high tide	Impacts to properties, utilities, facilities, human health, transportation networks, surface water, flora and fauna	ERP_01 Existing flood defences and stormwater drainage will be maintained
	Potential to cause major accidents and/or disasters			
R2	Vehicle collision	Human Error	Potential to cause harm, (injury) to community members.	ERP_02 The site construction operations will be designed and operated in line with best international current practice and with appropriate health and safety checks in place.
R3	Fall from Height	Human Error/Lack of training	Human Health Impacts or loss of life	ERP_03 Appropriate training, qualifications, and risk controls in place
R4	Structural collapse	Human error/Design issues	Human health impacts of loss of life	ERP_04 Safety in design criteria applied to design and build.

Table 19-4: Risk Register – Operation

Risk ID	Potential Risk	Possible Cause	Possible Impacts	Mitigation
	Potential vulnerability to accidents and/or disasters			
R5	Flooding of site	Periods of extended rainfall/storms	Impacts to properties, utilities, facilities, human health, transportation networks, surface water, flora and fauna	ERP_05 Existing flood defences and stormwater drainage will be maintained

		coinciding with high tide		
	Potential to cause major accidents and/or disasters			
R6	Vehicle collision	Human Error	Potential to cause harm, (injury) to community members/workers.	ERP_06 The site operations will be designed and operated in line with best international current practice and with appropriate health and safety checks in place.
R7	Crushing by Container/Machinery	Human error/interaction with machinery	Potential to cause harm to workers	ERP_07 The site operations will be designed and operated in line with best international current practice and with appropriate health and safety checks in place.
R8	Chemical explosion/contamination of soils	Chemicals improperly managed. Failure to manage ignition sources.	Loss of life and damage to property	ERP_08 The site operations will be designed and operated in line with best international current practice and with appropriate health and safety checks and monitoring in place. Updated Fire Risk Assessment (FRA) to be carried out.

The potential risks identified have been assessed in accordance with the relevant classification (refer to Table 19-1 and Table 19-2) and the resulting risk analysis is given in Table 19-5 and Table 19-6. The risk register is based upon possible risks associated the proposed scheme. The consequence rating assigned to each potential risk assumes that all proposed mitigation measures and safety procedures have failed to prevent the major accident and/or disaster.

Table 19-5: Risk Scores

Risk ID	Potential Risk	Likelihood Rating	Consequence Rating	Risk Score [1]
Construction Phase				
R1	Flooding of site	1	3	3
R2	Vehicle Collision	2	5	10
R3	Fall from a height	2	4	8
Operational Phase				
R5	Flooding of Site	1	3	3
R6	Vehicle Collision	2	5	10
R7	Crushing by container/machinery	2	5	10
R8	Chemical explosion/fire	3	4	12
R9	Environmental Incidents	4	3	12

Table 19-6: Risk Matrix

Likelihood Rating							
	Very likely	5					
	Likely	4			R9		
	Unlikely	3				R8	
	Very unlikely	2				R2	R7
	Extremely Unlikely	1			R1, R5		
			Minor	Limited	Serious	Very Serious	Catastrophic
			1	2	3	4	5
			Consequence Rating				

[1] Risk = Likelihood x Severity

[19.5] Discussion

As mentioned previously, the design of the proposed works has evolved through design iteration, with particular emphasis on avoiding or reducing the potential for environmental impacts, where practicable, whilst ensuring the objectives of the proposed scheme are attained. The design of the Proposed Scheme has been developed in compliance with the relevant design standards which include provisions to reduce the likelihood of risk events occurring (e.g. structures have been designed to avoid the risk of collapse, drainage systems have been designed to cater for increased rainfall events etc.).

Regulation 15 of the Safety, Health and Welfare at Work (Construction) Regulations places a duty on designers carrying out work related to the design of a project to take account of the 'General Principles of Prevention' as listed in Schedule 3 of the Safety, Health and Welfare at Work Act.

In addition to the duties imposed by Regulation 15 of the Safety, Health and Welfare at Work (Construction) Regulations, designers must comply with Section 17(2) of the Safety, Health and Welfare at Work Act, which requires *persons who design a project for construction work to ensure, so far as is reasonably practicable, that the project is designed and is capable of being constructed to be safe and without risk to health, can be maintained safely and without risk to health during use, and complies in all respects, as appropriate, with other relevant legislation*. This includes S.I. No. 138/2012 – Building Regulations (Part A Amendment) Regulations 2012 and, if the works being designed are intended for use as a workplace, the relevant parts of the Safety, Health and Welfare at Work (General Application) Regulations.

In accordance with these requirements, the project team established a consistent and appropriate means of assessing the risks that may arise from design decisions and of applying the General Principles of Prevention.

[19.6] Mitigation Measures and Monitoring

[19.6.1.1] Emergency Management and Mitigation

ERP_09 An Emergency Response Plan is required as part of the planning regime for the Facility, which is regularly reviewed and updated in line with those requirements. The ERP contains detailed plans for the response to emergencies including fires and severe weather events.

The Deputy Harbourmaster at the Facility is the contact with the Cork County Emergency Services, to regularly review and update the procedures. All personnel on site receive appropriate training in the contents of the ERP, are aware of their responsibilities during emergency events and participate in regular training exercises.

If contaminated, the firewater and rainwater will be sent for disposal to an off-site licensed disposal facility, as highlighted in Table 16-1, the EPA has recently published revised guidance on firewater containment in late 2019, however this guidance applies to EPA licenced facilities only.

Table 19.7 below comprises a list of the Seveso III Upper Tier and Lower Tier sites in the vicinity of Ringaskiddy Port. Ringaskiddy Port is not a Seveso III site and is sufficiently distant from the listed sites to rule out the likelihood of cumulative impact.

Table 19.7 Seveso Sites (Upper and Lower Tier)

Company	Location
Marinochem Ltd	Marino Pont, Cobh, Co. Cork (upper tier)
Novartis Ringaskiddy Ltd	Ringaskiddy, Co. Cork (upper tier)
Pfizer Ireland Pharmeceuticals	Active Pharmaceutical Ingredients Plant, PO Box 140, Ringaskiddy, Co. Cork (upper tier)
SmithKlinebeecham Cork Ltd	Currabinny, Carrigaline, Co. Cork (upper tier)
Hovione Ltd	Loughbeg, Ringaskiddy, Co. Cork (lower tier)
Carbon Chemical Group	Raheens Industrial Estate, Ringaskiddy, Co. Cork (lower tier)

[19.7] Residual Effects

There are no identified incidents and / or major accidents and / or disasters risk events that present a sufficient combination of risk and consequence that would lead to significant residual environmental impacts.

No significant residual impacts have been identified either in the Construction or Operational Phases of the Proposed Scheme, whilst meeting the scheme objectives set out in Chapter 3 (Description).

[19.8] Cumulative Effects

There are no identified incidents and / or major accidents and / or disasters risk events that present a sufficient combination of risk and consequence that would lead to significant cumulative environmental impacts.

[20] Schedule of Environmental Commitments

[20.1]Summary of Residual Effects

The summary of residual effects is set out in Table 20-1

20-1 Summary of Residual Impacts

ID	Aspect	Residual Effects
R_LA1	Landscape and Visual	Due to the open nature of the lands within the Port of Cork, as clear access to the water is required at most areas, the proposed redevelopment works will by visible or partially visible from the lands across Cork Harbour, such as Monkstown and Cobh. However, these proposed changes will be seen from some distance and against the context of the existing port activities and structures, resulting in a not significant-neutral to slight and negative impact on views within this area. It is illustrated within the photomontages that accompany this EIAR. That the structures and modifications that form the proposed redevelopment works will not break the skyline and will be seen within the context of the existing structures and activities of the working port. While none of the proposed measures, as discussed in the previous section, can fully mitigate against the visual impacts of the proposed structures and modifications, it is considered that the proposed redevelopment is consistent with the existing land use and developments in this area. Due to the above reasons and discussions in Section 7.3 of this chapter, it is considered that the surrounding landscape has the capacity to absorb a redevelopment of this scale and nature without any significant and negative impacts in terms of visual and landscape character.
R_CC1	Climate	During the construction phase, HGV movements and machinery operating on site will contribute GHG emissions, which will be managed through mitigation measures as described in Chapter 10. During the operation phase, the residual impact will come from the growth of the shipping traffic at the Port which will see continued emissions of greenhouse gases through the movements of ships. As noted in 11.6.2, improvements in engine efficiency and fuels will see a likely decrease of emissions. Further, Port of Cork Masterplan 2050 outlines a number of measures that are planned that will result in the lessening of this residual effect. More efficient port operations were proposed through ideas that included low-emission lighting, a ban on

		ships idling and using individual generators, the use of solar power for land- based activities, and a reduction in fees for low-emissions vessels (Port of Cork, 2023).
R_SGH 1	Soils, Hydrology and Hydrogeology	Given the limited potential for a contaminant transport pathway due to the surfacing of the development with hardstanding operational phase impacts to soil and groundwater are not anticipated Implementation of the mitigation measures outlined in Section 12.8 will ensure that the potential impacts of the proposed development on land and soils do not occur during the operational phase and that any residual impacts will be short term. The residual impact is therefore considered to be imperceptible overall.
R_CP 1	Coastal Processes	Residual change in bed levels beyond the licenced site below 5mm are likely to be experienced which is acceptable. Residual current direction following redevelopment is easterly towards Paddy's point
R_WE_1	Water Environment	With any development adjacent to the sea there is always a residual flood risk. The required standard of protection can be exceeded, however with the freeboard afforded to the proposed redevelopment above the 0.5% AER levels this will reduce the likelihood of such an occurrence and any residual flood risk can be considered as minor.
R_NV_1	Noise and Vibration	Some residual impacts for noise may be experienced during operation of the Port in the long term particularly at periods of high activity. These are assessed as slight temporary and long-term impacts and are carefully managed on an ongoing basis at the Port through monitoring and management.
R_ME_1	Marine Ecology	After the construction phase is complete, some habitat loss will occur where new structures have been built or areas impacted by other activities. But over time, the areas directly impacted by the activities will undergo a natural recolonisation through a succession process. Following the incorporation of the above mitigation, there will be no long term significant adverse residual effect on marine mammals from the construction phase of the development. There will be a temporary, slight residual adverse effect in

	terms of temporary displacement from the site during construction activities (e.g. piling) however, the marine mammals are expected to return to the site following cessation of the activities due to the high degree of habituation to the present levels of high activity at the site. As such, there is no lasting significant adverse residual effect on marine mammals at this site.

[20.2]Schedule of Environmental Commitments

The Schedule of Environmental Commitments outlines the mitigation and monitoring commitments required during the construction and operational phases of the proposed development.

The table overleaf shows all mitigation and monitoring commitments.

Table 20-2: Schedule of Environmental Commitments – Mitigation Measures (Construction and Operational Phases)

Reference	Schedule of Environmental Commitments – Mitigation Measures	Monitoring	Construction	Operation
Population and Human Health				
PHH 01	Safety File to be maintained 24 hr Security to be maintained Health and Safety plan to be prepared	Vehicles and personnel accessing the site to be logged.	✓	
Cultural Heritage				
CH_01	Archaeological monitoring: It is recommended that archaeological monitoring by a suitably qualified and experienced maritime archaeologist licensed by the DAHG is conducted during all seabed, inter-tidal/foreshore and terrestrial disturbances associated with the development. Licence applications take a minimum of three weeks to process through the Department, and advance planning is required to ensure that the necessary permits are in place before site works commence.	Archaeological monitoring is recommended as specified in the mitigation measures.	✓	✓
CH_02	The monitoring will be undertaken in a safe working environment that will facilitate archaeological observation and the retrieval of objects that may be observed in the course of the works that require consideration.		✓	✓
CH_03	The monitoring will include a finds retrieval strategy that is in compliance with the requirements of the National Museum of Ireland.		✓	✓
CH_04	Retaining an archaeologist/s: An archaeologist experienced in maritime archaeology will be retained for the duration of the relevant works.		✓	✓

CH_05	The time scale for the construction phase will be made available to the archaeologist, with information on where and when ground disturbances will take place.		✓	✓
CH_09	Discovery of archaeological material: In the event of archaeologically significant features or material being uncovered during the construction phase, machine work will cease in the immediate area to allow the archaeologist/s to inspect any such material. The DAHG and the NMI will be notified of such discovery, in accordance with archaeological license requirements.		✓	✓
CH_10	Archaeological material: Once the presence of archaeologically significant material is established, full archaeological recording of such material will be recommended. If it is not possible for the construction works to avoid the material, full excavation will be recommended. The extent and duration of excavation will be a matter for discussion between the Port of Cork and the licensing authorities.		✓	✓
CH_11	Archaeological team: The core of a suitable archaeological team will be on standby to deal with any such rescue excavation. This would be complimented in the event of a full excavation.		✓	✓
CH_12	Archaeological dive team: An archaeological dive team will be retained on standby for the duration of any in-water disturbance works on the basis of a twenty-four or forty-eight-hour call-out response schedule, to deal with any archaeologically significant/potential material that is identified in the course of the ground disturbance activities. The permits necessary for this aspect of the site work is additional to the excavation licence required by the archaeological monitor and are generally held by the dive-team leader. The archaeological dive licence takes a minimum of three weeks to process. It is necessary to ensure that all permits are in place before site works commence.	q	✓	✓

CH_13	A site office and facilities will be provided by the Port of Cork on site for use by archaeologists.		✓	✓
CH_14	Secure wet storage facilities will be provided on site by the Port of Cork to facilitate the temporary storage of artefacts that may be recorded during the course of the site work.		✓	✓
CH_15	Buoying/fencing of any such areas of discovery will be carried out if discovered and during excavation.		✓	✓
CH_16	Machinery traffic during construction will be restricted to avoid any identified archaeological site/s and their environs.		✓	✓
CH_17	The above recommendations are subject to the approval of the National Monuments Section at the DAHG.		✓	✓
Landscape and Visual Impact				
LV_01	Any lighting required during the construction phase should be located sensitively to avoid unnecessary light spill into the surrounding residential areas and into Cork Harbour.	• During site establishment stage: prior to any works taking place, clearly identify trees and hedgerows that are to be retained and protected – ensuring tree protection measures are in place. Clearly	✓	

		identify trees and hedgerows that are to be removed. • During site excavation stage: ensure existing vegetation is being adequately protected • During construction stage: ensure existing vegetation is being adequately protected.		
LV_02	Roadway lighting and lighting of construction compounds will be by means of high quality, modern standing fixtures. They will include full cut-off (FCO) and energy efficient lighting where practicable to reduce the impacts of light pollution on the surrounding area and sky.	• Post-construction stage: periodic visits will be required to ensure that the existing tree belts have not been negatively impacted by the construction works.	✓	
LV_03	The use of flashing, moving, strobe, or blinking lights should be kept to a minimum		✓	
LV_04	Trees & hedgerows: Due to the nature of the redevelopment works and the current operations within the port there is no opportunity for the implementation of a softworks/ planting scheme to assist in the integration of the proposed structures into the landscape. Therefore, it is an important objective to retain the existing vegetation where possible. This helps to retain a mature, established character to the site and provide a unifying, cohesive landscape framework that relates it to the surrounding landscape, as well as being of ecological benefit.			✓
LV_05	Colour of Tall Structures: While the visual appearance of the containers cannot be mitigated against, as the colours depends upon on the owner of the containers, the appearance of the gantries that are located above them, can be			✓

	managed. The visual appearance of the gantries can be lessened by the use of appropriate colours. The colour shall be based on mid-grey in colour, similar to the colour of the tall cranes installed during Phase 1 of the redevelopment works.		
LV_06	Lighting: Roadway lighting and lighting of working areas will be by means of high quality, modern standing fixtures. They will include full cut-off (FCO) and energy efficient lighting where practicable to reduce the impacts of light pollution on the surrounding area and sky. The use of flashing, moving, strobe, or blinking lights should be kept to a minimum		✓
Traffic and Transportation			
TT_01	The contractor responsible for the construction of the proposed redevelopment will be required to ensure that the number of construction vehicles entering the road network during these times will be limited to 12 and 14, per direction, in the AM and PM peaks respectively.	✓	
TT_02	Construction vehicles will be required to use the strategic road network to access the site i.e. using the N28 and N40.		✓
TT_03	In addition construction vehicles will be restricted from using local roads or unsuitable roads on grounds of safety		✓

TT_04	Reduce Port HGV traffic volumes during the AM (07.45-09.00) and PM (17.00- 18.00) commuter peak periods by continuing the Ringaskiddy Mobility Management Plan (RMMP) to manage freight generated by the Port during these periods until the opening of the N28 Upgrade. In 2033 (with the N28 Upgrade in place), there are no traffic impacts of major significance predicted as there is significant spare road capacity and therefore no mitigation is required.		✓
TT_05	Management of Freight through the Ringaskiddy Mobility Management Plan: This proposed mitigation control measure is to manage the additional Port related HGV traffic that is generated over Do Minimum levels during the AM and PM commuter peaks until the N28 Upgrade is in place. This means that the additional 'Do Something' LoLo, bulk and trade cars and related HGVs movements generated by the proposed redevelopment (i.e. above the existing 'Do Minimum' HGVs movement levels), would be managed and controlled to significantly reduce the additional numbers of Port HGVs travelling during the congested AM and PM Peak periods. All additional Port generated HGV traffic arising from the proposed redevelopment would be managed to operate in the non-congested inter-peak period of the day where there is significant spare road capacity available. It is important to note that currently less than 15% of all Port related HGVs travel during the AM and PM peak periods, whereas the remaining 85% currently travel outside of these times. Only a small proportion, therefore, of HGVs generated by the Port (i.e. only 15% of the additional HGV's generated by the proposed redevelopment require managing).		✓
Noise and Vibration			
NV_01	There will be an onus on the contractor to reduce construction noise levels from the construction phase to the lowest possible levels to ensure that no significant noise impact is experienced at the nearest noise sensitive receptors. The contractor must comply with all of guidance included in British Standard BS5228:2009 – Noise and vibration control on construction and open sites: Part 1 - Noise in relation to reducing construction noise levels.	The NTi programme of monitoring will be undertaken and continuously reviewed during construction phase for the proposed development.	✓

NV_02	A complaints procedure must be operated by the Contractor throughout the construction phase and all efforts should be made to address any noise issues at the nearest noise sensitive properties.	The existing programme of quarterly compliance monitoring as well as the NTi programme will be undertaken during operation phase for the proposed development	✓	✓
NV_03	During the works, best practice noise reduction measures described in British Standard 5228-12009+A1:2009, Code of Practice for Noise and Vibration Control on Construction and Open Sites must be incorporated into the Construction and Environmental Management Plan.		✓	
NV_04	For mobile plant items such as cranes, HGV's, excavators and loaders, maintaining enclosure panels closed during operation can reduce noise levels over normal operation.		✓	
NV_05	Mobile plant will be switched off when not in use and not left idling.		✓	
NV_06	For steady continuous noise, such as that generated by diesel engines, noise reduction can be achieved by fitting a more effective exhaust silencer system.		✓	
NV_07	No machinery should be left running outside of the agreed operation hours, which must limit any noise emissions from the site in the late evenings and early mornings when mammal (i.e., otter) activity is at a higher level.		✓	
NV_08	The mitigation measures for alarm/beacon noise associated with the proposed redevelopment will involve setting a noise threshold limit of 100dB Lw (95dB Lw with tone) for the selected alarm system to be used. There is a range of self-adjusting 'smart' and broadband alarm systems that are capable of achieving the required noise threshold limit (e.g. manufacturers - bbs-tek, Ecco, Fleet Electrical).			✓

NV_09	In addition to the alarm noise, a series of noise barriers (block walls) have been constructed as part of the Ringaskiddy Port redevelopment to ensure that a significant proportion of ground- based noise activities are reduced as much as possible. Figure 9.15 (EIS Volume III) illustrates the location of three 4m high noise barriers which have been installed in the design of the proposed redevelopment. These barriers have resulted in significant attenuation to noise from a range of plant such as terminal transporters, reach stackers and reefers. Additional noise barriers were installed during Phase 1a of the redevelopment.			✓
NV_10	The Port shall issue periodic Notice to Mariners regarding the request for all vessels to take steps to reduce their potential noise impacts and reminding vessel operators that Ringaskiddy Basin has berths that are adjacent to residential areas in Ringaskiddy village.			✓
NV_11	The Port shall utilise sound matting in strategic locations to address noise issues.			✓
Air Quality				
AQ_01	A dust minimisation plan will be developed and implemented during the construction phase of the project.	Bergerhoff dust gauge monitoring will be undertaken during construction phase at appropriate locations on the periphery of the construction site.	✓	✓
AQ_02	A site dust monitoring programme will be put in place during the construction phase with secure monitoring locations to ensure compliance with dust deposition limits. There are already three monitoring points near the site, samples can continue to be recorded at these sites and compared to the historical trend. Monitoring must also consider recording on the peripheries of the construction site in order to confirm dust deposition is within acceptable limits.	The ongoing dust monitoring programme will be reviewed annually to ensure representative sampling locations are in place following the construction of CCT2 and DWB extension.	✓	✓

AQ_03	An odour management plan will be adopted during the construction phase of the proposed development to mitigate potential odour issues and implement remedial action through agreement with Cork County Council. The management plan will include but not be limited to odour monitoring proposals, odour control mechanisms and an odour complaint procedure.	✓	
AQ_04	Within the management plan, monitoring proposals for odour emissions will be submitted for agreement to the planning authority prior to the commencement of dredging activities in the construction phase of the proposed development. Such measures will include but not be limited to monitoring at the site perimeter and at nearby residential locations on an ongoing basis. The management plan must include diffusion tube monitoring at a minimum of 8 locations during dredging to obtain measurements of fugitive odour and to help ensure levels are below relevant limits.	✓	
AQ_05	A Construction Environmental Management Plan (CEMP) will be developed and implemented. The CEMP will provide a framework for the management and implementation of construction activities incorporating the mitigation measures identified in the relevant chapters of this EIS, including dust and odour. The CEMP will be reviewed regularly, and revised as necessary, to ensure that the measures implemented continue to be effective.	✓	
AQ_06	The emissions to air from berthed shipping will be controlled by strict international limits. Good cargo unloading practices will minimise the impact of exhaust fumes from HGVs. The emissions modelled for this report are based on a worst-case scenario.	✓	✓
AQ_07	It should also be recognised that the vehicular emissions from any generated traffic are predicted to decrease over time due to improvements in engine efficiency and stricter enforcement of vehicle emission standards. Bulk grain cargo unloading will be undertaken in a manner that minimises cargo spillage. All loading/unloading will be subject to appropriate operation specific control and containment protocols as adhered to by Port of Cork and detailed in section xxx of this Chapter. The current method of handling cargoes will be continued and	✓	✓

	extended to service the proposed berth extension and dust monitoring at site peripheries will be continued.		
Climate			
C_01	During the construction phase, best environmental practices will be followed in order to mitigate for greenhouse gas emissions. These are detailed in Chapter 10, Air Quality.		✓
C_02	The emissions to air from berthed shipping will be controlled by strict international limits. Good cargo unloading practices will minimise the impact of exhaust fumes from HGVs. The emissions modelled for this report are based on a worst-case scenario. It should also be recognised that the vehicular emissions from any generated traffic are predicted to decrease over time due to improvements in engine efficiency and stricter enforcement of vehicle emission standards. Bulk grain cargo unloading will be undertaken in a manner that minimises cargo spillage. All loading/unloading will be subject to appropriate operation specific control and containment protocols as adhered to by Port of Cork and detailed in section 11.3.2.1 of this Chapter. The current method of handling cargoes will be continued and extended to service the proposed berth extension and dust monitoring at site peripheries will be continued.		✓
Soils, Geology and Hydrogeology			
SGH_01	A Groundwater Management Plan will be prepared and implemented to minimise the potential risk to groundwater from construction activities and piling. Reference should be made to CIRIA C515 Groundwater Control – Design and Practice. Any contaminated groundwater encountered during earthworks or piling will be disposed off-site to a licensed waste disposal facility or by passing it through a three-stage interceptor and discharged to sewer under license from the Local Authority.	**SGH_05** Monitoring for land and soil will consist of weekly monitoring inspections for signs of pavement cracks, inspection of bunds and oil containers present on site for minor storage, inspection of integrity of spill kits, vehicle inspections. These will be recorded on the weekly monitoring checklist for the site by the Site Manager.	✓

SGH_02	Material imported onto the site will be assessed to ensure that contamination is not introduced to the site. Any topsoil which is imported onto the site will be chemically analysed and screened against generic screening values for a commercial end use to ensure that it does not pose a risk to human health.	Operation phase monitoring will build on the construction phase monitoring and consist of weekly inspection for pavement cracks, inspection of bunds and oil containers onsite for minor storage, inspection of integrity of spill kits and vehicle inspections.		✓
SGH_03	Any fill material imported onto the site will undergo Waste Acceptance Criteria (as per BS 12457/3) testing to ensure that the material is classified as inert and does not pose a risk to the underlying groundwater through leaching of contaminants.		✓	
SGH_04	This Oil and HNS Spill contingency plan is to be maintained and will be effective in dealing with any operational incidents associated with the development.		✓	✓
Coastal Processes				
CP_01	To reduce sediment dispersion, dredging operations will be undertaken with no overspill from the hopper.	The suspended sediment concentration will vary significantly over the course of the dredging operations depending on tidal levels, flows and due to the operations. Therefore, the sediment concentrations outside the operation sites are suggested to be monitored. Water Quality monitoring of the loading areas will be undertaken at locations to be agreed with the EPA.	✓	✓

CP_02	A full record of loading and dumping tracks and record of the material being dumped will be maintained for each trip	The two tidal gauge locations at Cobh and Ringaskiddy (indicated in **Error! Reference source not found.**), will be monitored continuously. Within the Ringaskiddy Basin the residual current is circulatory in nature with some maintenance dredging being required, therefore the bed elevation needs to be monitored accordingly.	✓	✓
CP_03	No over-spilling (overflowing) from the dredger(s) will be permitted		✓	✓
CP_04	Dumping will be limited to 29,376 dry tonnes per day		✓	✓
CP_05	No dumping will occur in either November or February		✓	✓
CP_06	Not dumping will occur at the same time as the Port of Cork's maintenance dredging permit			
CP_07	The dumpsite will be divided into subsections with each used sequentially to ensure uniform spread of the dredged sediments		✓	✓
CP_08	A 250m radius exclusion zone will be implemented around an archaeological anomaly at location 188723.5, 54463.1 (ITM coordinates)		✓	✓

CP_09	An Archaeologist will witness all the work in line with the Underwater Archaeology Impact Assessment	✓	✓
CP_10	A Marine Mammal Observer will witness all the work in line with the Species Risk Assessment	✓	✓
CP_11	Water Quality monitoring of the loading areas will be undertaken at locations to be agreed with the EPA	✓	✓
CP_12	A documented Accident Prevention Procedure will be put in place prior to commencement	✓	✓
CP_13	A documented Emergency Response Procedure will be put in place prior to commencement.	✓	✓
Water Environment			
W_01	Water quality monitoring will be carried out by the main contractor- continuous in-situ monitoring will be carried out in advance of the works to establish a water quality baseline and during the dredging activities to ensure effective response to any incidents that may impact on water quality at sensitive sites. Water quality trigger levels and corresponding response or remedial actions will be determined after the establishment of a water quality baseline. The location of water quality monitoring stations and the monitoring programme will be agreed with the relevant agencies and based on the results of the coastal process modelling with regard to	✓	

	predicted dispersal of currents and location of sensitive receptors and protected areas;	
W_02	A protocol for regular communication between the appointer contractor, the engineer's representatives, statutory agencies, such as NPWS and Cork County Council, and other third parties shall be established;	✓
W_03	Management and auditing procedures, including tool-box talks to personnel, shall be put in place to ensure that any works which have the potential to impact on the aquatic environment are being carried out in accordance with required permits, licences, certificates and planning permissions.	✓
W_04	Existing and proposed surface water drainage and discharge points shall be mapped on a site plan which should also include the location of existing and proposed measures such as monitoring points, sediment traps, settlement lagoon and oil interceptors.	✓
W_05	*PPG 6 Working at demolition & construction sites* (Environment Agency, 2012) shall be adhered to particularly in relation to safe and secure on site storage and minimising storage time, wheel washing, placing of concrete and dealing with silty water.	✓
W_06	The use of concrete in close proximity to water bodies requires a great deal of care. Fresh concrete and cement are very alkaline and corrosive and can cause serious pollution in water bodies. It is essential to ensure that the use of wet concrete and cement in or close to any water body is carefully controlled so as to minimise the risk of any material entering the water, particularly from shuttered structures or the washing of equipment.	✓
W_07	Concrete use and production shall adhere to control measures outlined in *PPG 6 Working at demolition & construction sites* (Environment Agency, 2012) particularly if on-site concrete production is proposed and careful initial siting of concrete mixing facilities is required with no production within a minimum of 50 m from the aquatic zone.	✓

W_08	For the sections of concrete that are under water, pre-cast units should be used for construction; however *in situ* stitching of these will be required. Where the use of pre-cast units is not possible or where *in situ* stitching is required or where concrete is to be placed under water or in tidal conditions, specific fast-setting mix is required to limit segregation and washout of fine material / cement. This will normally be achieved by having either a higher-than-normal fines content, a higher cement content or the use of chemical admixtures.	✓	
W_09	Fuel, oil and chemical storage must be sited on an impervious base within a bund and secured. The base and bund walls must be impermeable to the material stored and of adequate capacity. PPG 26 "*Safe storage – drums and intermediate bulk containers"* (Environment Agency, 2011a) shall be implemented to ensure safe storage of oils and chemicals.	✓	
W_10	The safe operation of refuelling activities shall be in accordance with PPG 7 *"Safe Storage – The safe operation of refuelling facilities"* (Environment Agency, 2011b).	✓	
W_11	With regard to potential oil spills during dredging operations, an emergency spill kit and oil spill containment equipment will be held on board by the dredging operator;	✓	
W_12	The Port of Cork has in place an Oil Spill Contingency Plan which is adhered to by all staff including those employed to carry out capital dredging on behalf of the Port. This plan is provided to assist the Harbour Master, or in his absence the Deputy Harbour Master of the Port of Cork Company in dealing with an accidental discharge of oil and/or Hazardous Noxious Substances (HNS). Its primary purpose is to set in motion the necessary actions to stop or minimise the discharge and to mitigate its effects. Effective planning ensures that the necessary actions are taken in a structured, logical and timely manner. This plan (Oil Spill/HNS Plan) guides Port of Cork staff (and other related organisations who hold a copy of the plan) through the various actions and decisions which will be required in an incident response.	✓	✓

W_13	A contingency plan for the construction works shall be prepared in accordance with *PPG 21 Pollution Incident Response Planning* (Environment Agency, 2009). The Plan should also detail the procedures to be followed if there is a breach in any licence conditions or a non-compliance.	✓	v
W_14	It will be important to ensure that the Environmental Manager is notified of all incidents where there has been a breach in agreed environmental management procedures. Suitable training shall be provided to relevant personnel detailed within the Pollution Incident Response Plan to ensure that appropriate and timely actions will be taken.	✓	✓
W_15	Compliance with the Port of Cork's Oil Spill Contingency Plan as outlined under the construction mitigation section;	✓	✓
W_16	Adequate bunding for any fuel, oils or chemicals stored on-land in accordance with relevant PPGs and following the same guidance outlined for storage and refuelling during the construction phase;	✓	✓
W_17	Regular inspection of the condition of chemical and fuel storage facilities along with routine maintenance to ensure the risk of leaks is minimised;	✓	✓
W_18	Bilge water shall be treated in accordance with Marpol standards	✓	✓
W_19	De-ballasting shall be undertaken offshore in accordance with International Maritime Organisation (IMO) guidelines;	✓	✓
W_20	Vessels shall be equipped with oil-water separation systems in accordance with Marpol requirements;	✓	✓

W_21	Spills on deck shall be contained and controlled using absorbing materials;		✓	✓
W_22	Vessels without sewage treatment systems shall have suitable holding tanks and will bring waste onshore for treatment by licensed contractors;		✓	✓
W_23	Chemicals shall be stored appropriately in suitably bunded areas and with material safety data sheets.		✓	✓
W_24	Site levels will be designed to guide water away from sensitive areas such as buildings. Storm water runoff from the site will be collected in a dedicated storm water drainage system for discharge to the harbour waters.		✓	✓
W_25	All surface drainage waters, including road drainage, will be presumed to be contaminated and will be routed through highway quality oil interceptors and sediment traps prior to discharge into the sea, therefore, there will be no adverse impact on water quality in the harbour and vessels will be strictly prohibited from discharging waste water into the harbour waters.		✓	✓
Marine Ecology				
ME_01	Two Marine Mammal Observers (MMO's) will be appointed to monitor for marine mammals and to log all relevant events using a standardised data form (Locations 1&2 on **Error! Reference source not found.** in Marine Ecology Chapter). Two Marine Mammal Observers is recommended instead of the mandatory one (as per DAHG 2014 guidelines), to ensure a complete 180-degree arc view of the study area, and to ensure any marine mammal which may enter the 1000m-radius exclusion zone are spotted.	Physicochemical monitoring using multiparameter sondes inside and outside of the Ringaskiddy basin at strategic locations would be helpful to assess potential impacts on water quality. Key parameters to monitor include temperature, conductivity (salinity), pH, turbidity, and dissolved oxygen levels, as these factors can be affected by construction activities such as dredging or pollutant release.	✓	

		Regular measurements of turbidity can detect increased sediment suspension, while monitoring oxygen levels helps assess the health of the aquatic environment for species sensitive to hypoxia. Salinity and pH levels should also be tracked to identify any deviations from natural freshwater inputs. Additionally, using a chlorophyll sensor could provide valuable data on changes in nutrient inputs by detecting algal blooms, which may indicate nutrient enrichment from runoff or construction activities. Continuous monitoring of these indicators will help ensure early detection of environmental changes and guide mitigation measures.	
ME_02	Pile driving activities shall only commence in daylight hours where effective visual monitoring can be achieved. Where effective visual monitoring, as determined by the MMO, is not possible the sound-producing activities shall be postponed until effective visual monitoring is possible.		✓
ME 03	An agreed and clear on-site communication signal must be used between the MMO and the Works Superintendent as to whether the relevant activity may or may not proceed, or resume following a break (see below). It shall only proceed on positive confirmation from the MMO.		✓
ME_04	Due to the proximity of a harbour seal haul-out site to the proposed works area, an Acoustic Mitigation Device (AMD) will be used prior to the soft-start procedure. This device will be an Acoustic Deterrent Device (ADD), which will transmit loud (170-200dB), mid-frequency sound from the site to the surrounding waters. This will deter the seals of the area away from the vicinity of the works area, as the seals will find the		✓

ME_05	The MMO shall conduct a pre-start-up constant effort monitoring at least 30 minutes before the sound producing activity is due to commence until at least 30 minutes have elapsed with no marine mammals detected within the Monitored Zone by an MMO.	✓
ME_06	This prescribed Pre-Start Monitoring shall subsequently be followed by an appropriate Ramp-Up Procedure which should include continued monitoring by the MMO's.	✓
ME_07	As the potential noise levels underwater from the proposed piling activity at this site is unknown, on a precautionary basis, an appropriate Ramp-Up procedure (soft-start) must be used.	✓
ME_08	Where it is possible according to the operational parameters of the equipment and materials concerned, the underwater acoustic energy output shall commence from a lower energy start-up (i.e., a peak sound pressure level not exceeding 170 dB re: 1µPa @1m) and thereafter be allowed to gradually build up to the necessary maximum output over a period of 20-40 minutes.	✓
ME_09	This controlled build-up of acoustic energy output shall occur in consistent stages to provide a steady and gradual increase over the ramp-up period.	✓
ME_10	In all cases where a Ramp-Up procedure is employed the delay between the end of ramp-up and the necessary full output must be minimised to prevent unnecessary high-level sound introduction into the environment.	✓
ME_11	As recommended by ACCOBAMS (2022), a suitable qualified Passive Acoustic Monitoring (PAM) technician should be employed for the duration of the pile driving works, if the work is to be carried out during a time of year where weather conditions are likely unfavourable for MMO visibility (i.e. November to January) or if the pile driving work is to occur at nighttime. This is in addition to the two recommended Marine Mammal Observers, to serve as an additional form of mitigation. While PAM will not detect pinnipeds, as cetaceans have been recorded in the project area (as noted during the desk study carried out for this assessment), it is highly recommended.	✓

ME_12	If there is a break in pile driving sound output for a period greater than 30 minutes (e.g. due to equipment failure, shut down or location change) then all Pre-Start Monitoring and a subsequent Ramp-up procedure (where appropriate following Pre-start Monitoring) must be undertaken.	✓
ME_13	Only the minimum quantities of explosives to achieve the desired result must be used. While the duration of individual blasting events must also be minimised, a series of smaller explosions should be undertaken rather than fewer larger explosions.	✓
ME_14	Two Marine Mammal Observers (MMO's) will be appointed to monitor for marine mammals and to log all relevant events using a standardised data form (Locations 1&2 on **Error! Reference source not found.**). Two Marine Mammal Observers is recommended instead of the mandatory one (as per DAHG 2014 guidelines), to ensure a complete 180-degree arc view of the study area, and to ensure any marine mammal which may enter the 1000m-radius exclusion zone are spotted.	✓
ME_15	Where possible, blasting events must be scheduled to occur early in the daytime to allow a buffer for delays caused by marine mammal presence within the immediate area of operations.	✓
ME_16	Where possible, individual explosive charges should be placed within a borehole drilled into the substratum or an excavated depression and covered or packed with stemming material (e.g., loose gravels, clean angular crushed rock and/or overburden).	✓
ME_17	Blasting activity shall not commence if marine mammals are detected within a 1,000m radial distance of the sound source, i.e., within the Monitored Zone. Pre-Start Monitoring	✓
ME_18	Blasting activities shall only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, has been achieved. Where effective visual monitoring, as determined by the MMO, is not possible the sound-producing activities shall be postponed until effective visual monitoring is possible.	✓

ME_19	An agreed and clear on-site communication signal must be used between the MMO and the Works Superintendent as to whether the relevant activity may or may not proceed. It shall only proceed on positive confirmation with the MMO.	✓
ME_20	The MMO shall conduct pre-start-up constant effort monitoring at least 30 minutes before the sound-producing activity is due to commence. Sound-producing activity shall not commence until at least 30 minutes have elapsed with no marine mammals detected within the Monitored Zone by the MMO.	✓
ME_21	The prescribed Pre-Start Monitoring shall subsequently be followed by a pre-arranged Ramp-Up Procedure wherever possible. This should include continued monitoring by the MMO.	✓
ME_22	The use of a clear Ramp-Up Procedure must be considered; for example, whereby charges of smaller mass are detonated first in a progressive series of blasts aimed at reducing the acoustic/environmental impact caused by individual high energy pulse sounds, and allowing animal avoidance, surfacing or other potential safeguarding behaviour of marine mammals to occur.	✓
ME_23	Sequential detonations within an overall blast cycle should employ a short inter-charge time delay (of milliseconds in duration) in order to minimise the cumulative effect of separate individual blast pulses.	✓
ME_24	In all cases where a Ramp-Up Procedure is employed the delay between the end of ramp-up and the necessary full output must be minimised.	✓
ME_25	Any proposed Ramp-Up Procedure should be informed by the risk assessment undertaken giving due consideration to all technical and operational specifications, the size/weight and scale of the intended detonation(s), the receiving substrate, the duration of the blasting activity, the receiving environment and species therein, and other information (see section 3).	✓

ME_26	Full reporting on MMO operations and mitigation undertaken must be provided to the Regulatory Authority as outlined in Appendix 7.	✓
ME_27	A qualified and experienced marine mammal observer (MMO) shall be appointed to monitor for marine mammals and to log all relevant events using standardised data forms.	✓
ME_28	Unless information specific to the location and/or plan/project is otherwise available to inform the mitigation process (e.g., specific sound propagation and/or attenuation data) and a distance modification has been agreed with the Regulatory Authority, drilling activity shall not commence if marine mammals are detected within a 500m radial distance of the drilling sound source, i.e., within the Monitored Zone.	✓
ME_29	Drilling activities shall only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO, has been achieved. Where effective visual monitoring, as determined by the MMO, is not possible the sound-producing activities shall be postponed until effective visual monitoring is possible.	✓
ME_30	An agreed and clear on-site communication signal must be used between the MMO and the Works Superintendent as to whether the relevant activity may or may not proceed, or resume following a break (see below). It shall only proceed on positive confirmation with the MMO.	✓
ME_31	In waters up to 200m deep, the MMO shall conduct pre-start-up constant effort monitoring at least 30 minutes before the sound-producing activity is due to commence. Sound-producing activity shall not commence until at least 30 minutes have elapsed with no marine mammals detected within the Monitored Zone by the MMO.	✓
ME_32	Where operations occur in waters greater than 200m depth (i.e., >200m), pre-start-up monitoring shall be conducted at least 60 minutes before the sound-producing activity is due to commence. Sound-producing activity shall not commence until at least 60 minutes have elapsed with no marine mammals detected within the Monitored Zone by the MMO.	✓

ME_33	This prescribed Pre-Start Monitoring shall subsequently be followed immediately by normal drilling operations. The delay between the end of Pre-Start Monitoring and the necessary full drilling output must be minimised.	✓		
ME_34	Once normal drilling operations commence, there is no requirement to halt or discontinue the activity at night-time, nor if weather or visibility conditions deteriorate nor if marine mammals occur within a 500m radial distance of the sound source, i.e., within the Monitored Zone.	✓		
ME_35	If there is a break in drilling sound output for a period greater than 30 minutes (e.g., due to equipment failure, shut-down or location change) then all Pre-Start Monitoring must be undertaken in accordance with the above conditions prior to the recommencement of drilling activity.	✓		
ME_36	Siltation Control/ dredger type: Use methodologies of dredging that reduce the spread of sediment. Silt curtains or other barriers to limit the drift of suspended sediments during dredging.	✓		
ME_37	Minimised Dredging Footprint: Employ techniques that limit the footprint of dredging operations, such as progressive or targeted dredging, to avoid habitat loss.	✓		
ME_38	Habitat Restoration: Where feasible, restore affected habitats post-dredging by reintroducing species, such as reseeding mussel beds or transplanting seaweed species.	✓	✓	
ME_39	Two Marine Mammal Observers (MMO's) will be appointed to monitor for marine mammals and to log all relevant events using a standardised data form (Locations 3&4 on **Error! Reference source not found.**). Two Marine Mammal Observers is recommended instead of the mandatory one (as per DAHG 2014 guidelines), to ensure a complete 180-degree arc view of the study area, and to ensure any marine mammal which may enter the 500m-radius exclusion zone are spotted.	✓	✓	

ME_40	Dredging activities shall only commence in daylight hours where effective visual monitoring, as performed and determined by the MMO's, has been achieved. Where effective visual monitoring, as determined by the MMO's, is not possible the sound-producing activities shall be postponed until effective visual monitoring is possible.	✓	✓
ME_41	An agreed and clear on-site communication signal must be used between the MMO's and the Works Superintendent as to whether the relevant activity may or may not proceed, or resume following a break. It shall only proceed on positive confirmation with the MMO's.	✓	✓
ME_42	Due to the proximity of a harbour seal haul-out site to the proposed works area, an Acoustic Mitigation Device (AMD) will be used prior to the soft-start procedure. This device will be an Acoustic Deterrent Device (ADD), which will transmit loud (170-200dB), mid-frequency sound from the site to the surrounding waters. This will deter the seals of the area away from the vicinity of the works area, as the seals will find the frequency and volume of the sound aversive. The ADD will be activated for 30 minutes prior to the Soft-start procedure.	✓	✓
ME_43	The MMO's shall conduct pre-start-up constant effort monitoring at least 30 minutes before the sound-producing activity is due to commence. Sound-producing activity shall not commence until at least 30 minutes have elapsed with no marine mammals detected within the monitored zone by the MMO's.	✓	✓
ME_44	This prescribed pre-start monitoring shall subsequently be followed immediately by normal dredging operations. The delay between the end of Pre-Start monitoring and the necessary dredging output must be minimised.	✓	✓
ME_45	If there is a break in dredging sound output for a period greater than 30 minutes (e.g. due to equipment failure, shut-down or location change) then all pre-Start Monitoring must be undertaken in accordance with the above conditions prior to the recommencement of dredging activity.	✓	✓

ME_46	Prior to the beginning of works, all works areas will be clearly marked out using marking tape or temporary fencing and no works will be undertaken outside of these areas.	✓	✓
ME_47	The site compound will be located within a set works area and will be clearly fenced off.	✓	✓
ME_48	All hazardous materials will be stored and handled in bunded areas located at least 50m from the water.	✓	✓
ME_49	To avoid site runoff of contaminated materials and/or debris, site clearance will not be undertaken during wet conditions, when rainfall of more than 0.5mm/hour is forecast within the next 24 hours.	✓	✓
ME_50	Refuelling of construction equipment will not be undertaken within 50m of the water.	✓	✓
ME_51	No overflow of the dredger will be permitted during dredging.	✓	✓
ME_52	Scheduling: Conduct dredging operations during periods when biotopes are less sensitive, such as outside of breeding or spawning seasons.		

ME_53	Siltation Control/ dredger type: Use methodologies of dredging that reduce the spread of sediment. Silt curtains or other barriers to limit the drift of suspended sediments during dredging.		
ME_54	Minimised Dredging Footprint: Employ techniques that limit the footprint of dredging operations, such as progressive or targeted dredging, in order to avoid habitat loss.		
ME_55	Habitat Restoration: Where feasible, restore affected habitats post-dredging by reintroducing species, such as reseeding mussel beds or transplanting seaweed species.		
ME_56	The conditions of the maintenance dredging licence will be adhered to with regard to marine mammals during the operational phase. Additionally, all mitigation prescribed for dredging during the construction period of this development, should be replicated for the maintenance dredging of the site.		
Terrestrial Ecology and Ornithology			
TEO_01	All Site construction will be undertaken in accordance with the CIRIA (2015) Environmental Good Practice on Site (Charles and Edwards 2015);	A species protection plan should be designed by a professional ecologist to ensure that works related to this proposal take into account any protected bird species present on site and the nearby surroundings. An Ecological Clerk of Works (ECoW) should be employed to monitor the works under license, and to inform the team through Ecological Toolbox Talks during the proposed works and tree felling activities.	✓

A pre-construction survey of the scheme will be undertaken by an experienced Ecological Clerk of Works (ECoW), who shall walk the entire length of the scheme alongside the Site Manager / Site Engineer in order to highlight locations where environmental mitigation (as described below) is required prior to construction works commencing on the site. A minimum of 1 no. ECoW visit shall be conducted per week during the course of the construction works at this site during the construction phase. The ECoW shall be present on-site during commencement of works. As such the following points must be adhered to for this scheme:

- An Ecological Clerk of Works (ECoW) will be involved as required during the construction period for this scheme, in order to ensure that the required mitigation is implemented.

- Once planning permission has been secured, pre-construction ecology surveys will be carried out within the proposed scheme area well in advance (ideally 3-4 months prior to construction works) in order to ensure that sufficient updated information is available to inform derogation licence applications as required.

- The ECoW and the Appointed Contractor will walk the

		proposed scheme together prior to work commencing on the site, in order to discuss the ecological constraints, to highlight all required mitigation and to demarcate exclusion zones appropriately.	
TEO_02	Mitigation described in this report will be followed during site construction and operation phases;		✓
TEO_03	There shall be no discharges to Cork Harbour from the construction activities on the site;		✓
TEO_04	A site-specific CEMP will be written by the contractor prior to site works commencing. This CEMP will incorporate the mitigation measures listed here.		✓
TEO_05	The site compound shall be located within the site boundary. • The compound will be sited as far from any water course (>50m) as possible in order to minimise any potential impacts. • Only plant and materials necessary for the construction of the works will be permitted to be stored at the compound location.		✓
TEO_06	Monitoring of the water quality during the operational phases must take place. ○ The monitoring must be in accordance with any issued licence/approval needed to undertake the proposed works.		✓

- The monitoring must include sampling and testing of the waters to show compliance with the approval.
- The licence must not be surrendered until the EPA are satisfied there is no environmental liability with the proposed project.

TEO_07	To minimise exacerbated adverse effects, the prevailing weather conditions and time of year is to be taken into account when the site development manager is planning the removal of vegetation, soil, existing concrete, and/or general construction works.	✓
TEO_08	Fuels, lubricants and hydraulic fluids for equipment used on the construction site, as well as any solvents and oils, will be carefully handled to avoid spillage, properly secured against unauthorised access or vandalism, provided with spill containment and stored >10m from watercourses;	✓
TEO_09	Fuelling and lubrication of equipment will not be carried out within 10m of watercourses where this is possible, and shall only be undertaken in designated bunded areas;	✓
TEO_10	Any spillage of fuels, lubricants or hydraulic oils must be immediately contained, and the contaminated soil removed from the site and dispatched to a suitably authorised waste facility.	✓
TEO_11	Refuelling must be carried out using 110% capacity double bunded mobile bowsers. The refuelling bowser must be operated by trained personnel. The bowser must have spill containment equipment which the operators must be fully trained in using.	✓
TEO_12	Plant nappies or absorbent mats to be place under refuelling point during all refuelling to absorb drips.	✓

TEO_13	Mobile bowsers, tanks and drums should be stored in secure, impermeable storage area, away from drains and open water.	✓
TEO_14	To reduce the potential for oil leaks, only vehicles and machinery will be allowed onto the site that are mechanically sound. An up-to-date service record must be required from the main contractor.	✓
TEO_15	Should there be an oil leak or spill, the leak or spill must be contained immediately using oil spill kits; the nearby dirty water drain outlet must be blocked with an oil absorbent boom until the fuel/oil spill has been cleaned up and all oil and any contaminated material removed from the area. This contaminated material must be properly disposed of in a licensed facility.	✓
TEO_16	The site Environmental representative must be immediately informed of the oil leak/spill and must assess the cause and the management of the clean-up of the leak or spill. They must inspect nearby drains for the presence of oil and initiate the cleanup if necessary.	✓
TEO_17	Immediate action must be facilitated by easy access to oil spill kits. An oil spill kit that includes absorbing pads and socks must be kept at the site compound and also in site vehicles and machinery.	✓
TEO_18	Correct action in the event of a leak or spill must be facilitated by training all vehicle/machinery operators in the use of the spill kits and the correct containment.	✓
TEO_19	During the works, best practice noise reduction measures described in British Standard 5228-12009+A1:2009, Code of Practice for Noise and Vibration Control on Construction and Open Sites must be incorporated into the Construction and Environmental Management Plan.	✓
TEO_20	For mobile plant items such as cranes, HGV's, excavators and loaders, maintaining enclosure panels closed during operation can reduce noise levels over normal operation.	✓

TEO_21	Mobile plant will be switched off when not in use and not left idling.	✓
TEO_22	For steady continuous noise, such as that generated by diesel engines, noise reduction can be achieved by fitting a more effective exhaust silencer system.	✓
TEO_23	Acoustic screens are required to be erected as required in certain locations for the duration of the redevelopment works. These screens shall be carefully positioned to be as effective as possible. In general, the barrier shall have no gaps or openings in the joins of the barrier material. The barrier material shall have a minimum mass per unit area of 7 kg/m2 and minimum recommended height of 2.4m.	✓
TEO_24	No machinery should be left running outside of the agreed operation hours, which must limit any noise emissions from the site in the late evenings and early mornings when mammal (i.e., otter) activity is at a higher level.	✓
TEO_25	Surface water protective measures outlined in Section 16.11.1.2.1 of the specific mitigation measures will be adhered to for the protection of watercourses used by otters. This will help avoid the contamination of prey that otters feed on as well as maintaining the water quality of the river in which the otters forage.	✓
TEO_26	No machinery should be left running outside of the agreed operation hours, which must limit any noise emissions from the site in the late evenings and early mornings when mammal (i.e., otter) activity is at a higher level.	
TEO_26	No machinery should be left running outside of the agreed operation hours, which must limit any noise emissions from the site in the late evenings and early mornings when mammal (i.e., otter) activity is at a higher level.	✓
TEO_27	Mitigation measures such as cordoning off of hazardous machinery with temporary fencing at the end of the working day and the restriction of works to daylight hours (otters are largely nocturnal) should be	✓

	implemented by the contractor on site. These mitigation works will necessarily be implemented throughout the entire construction period.	
TEO_28	Vertical barriers and/or ground protection must protect all trees that are being retained on site. It is essential that these provisions be put in place prior to any development work or soil excavations are carried out. The purpose of protective barriers is to exclude any harmful construction activity that may damage the Root Protection Area. A root protection area is calculated as using the diameter of the tree trunk at 1.5 meters height x12 (Woodland Trust, 2021). These barriers help protect the main stem of the tree. Tree protection barriers should be fit for the purposes of excluding construction activities and be durable to withstand an impact. The barrier should consist of a vertical and horizontal frame and should be at least 2.3m in height. To ensure the protection barriers are respected, clear concise signage must be affixed to the barrier in an unrestricted easily viewed location. The signage must specify that no construction activity is to take place within the RPA. This should remain the case until completion of all works unless certain works are deemed acceptable following consultation with an arborist. The signage must also state that no materials of any description are to be stored or the “spilling out” of materials should not occur within the RPA. Site personnel must be made aware of the importance of the protective barrier.	✓
TEO_29	Any excavation works carried out within the RPA should be undertaken with extreme care and should be carried out with due diligence, avoiding damage to the protective bark covering larger roots. This may involve excavation by mini-digger and/or hand as deemed appropriate. Exposed roots should be wrapped in a hessian sacking to avoid desiccation and roots less than 2.5cm in diameter can be pruned back to a side root. The advice of a qualified arborist should be sought if larger roots that influence anchorage need to be severed.	✓

	Trunk protection should also be put in place using hessian sacking and timber strips clad around the tree, in order to mitigate any potential damage that may occur.		
TEO_30	Alteration of ground levels within the RPA should only be carried out following a considered assessment of the likely impact on the tree. In general, a ground alteration in excess of 75mm should be avoided. Changes in ground levels in the vicinity of a tree may alter the existing soil hydrology and necessitate the incorporation of adequate drainage around the tree. New impermeable surfaces should not cover more than 20% of the RPA. An increase in ground level up to a maximum of 1m is tolerable for certain species using specific techniques (beech and oak are not amenable to such a level of disturbance). This involves the construction of a dry well around the tree trunk allowing for future growth and the incorporation of coarse aggregates to provide sufficient drainage and allow for gaseous diffusion in the raised ground.		✓
TEO_31	To limit the potential impact of construction on breeding birds, removal of woody vegetation should be restricted to the non-breeding season (September to February, inclusive). Where the construction programme does not allow this, an ecologist should undertake a breeding bird check immediately prior to vegetation clearance. Where no breeding birds are present, clearance may proceed without requiring a derogation licence from the NPWS. However, given that breeding birds and the nests of all bird species are protected under the Wildlife Acts, a licence would be required from the NPWS to permit the destruction of nest sites and disturbance to breeding birds during the breeding season (1st of March to the 31st of August). If the applicant intends to carry out clearance works during the bird breeding season, guidance should be sought from the NPWS with regard to compliance with Section 40 (1) and Section 40 (2) (e) of the Wildlife Acts (see below):	✓	

40. *(1) (a) It shall be an offence for a person to cut, grub, burn or otherwise destroy, during the period beginning on the 1st day of March and ending on the 31st day of August in any year, any vegetation growing on any land not then cultivated.*

(1) (b) It shall be an offence for a person to cut, grub, burn or otherwise destroy any vegetation growing in any hedge or ditch during the period mentioned in paragraph (a) of this subsection.

40. *(2) Subsection (1) of this section shall not apply in relation to—*

(e) the clearance of vegetation in the course of road or other construction works or in the development or preparation of sites on which any building or other structure is intended to be provided.

TEO_32	Surface water protective measures outlined in Section 16.11.1.2.1 of the specific mitigation measures will be adhered to for the protection of watercourses used by waterbirds. This will help avoid the contamination of mudflats, sandflats and water bodies where birds forage in the harbour.	✓
TEO_33	Sudden loud noises (or impulsive noises) should be avoided when construction activity is underway. This will help limit the potential for nearby birds to become startled and displaced from their habitat, especially species of birds that are resident to Ireland and are located in the country all year round, not just during the breeding season. Noise emission measures outlined in Section 16.11.1.2.2 of the specific mitigation measures will be adhered to for the protection of surrounding waterbirds. This will help avoid significant negative impacts to surrounding bird species from potential noise emissions from the site.	✓

TEO_34	Treelines and areas of scrub offer birds suitable nesting habitat locations. These areas should be protected and remain untouched during construction. The proposed works will be carried out with the aim of avoiding as much damage to this potential bird nesting habitat as possible. Any trees or scrub in the way of the development layout are to be removed in such a manner not to cause damage to those trees to be retained. Root protection areas will be marked out around the trees to be retained. No machinery will enter these areas.	✓
TEO_35	To avoid the spread of Invasive Plant Species to and from the redevelopment the following mitigations must be implemented: • Construction machinery is to be visually inspected and power-washed prior to arrival at the site in order to avoid importation of invasive species; • All excavation/access areas are to be pre-checked for invasive species and no machinery is to enter these fenced-off locations, unless instructed by the Client or its Representatives and appropriate management measures are put in place. Throughout the period of the works, in order to comply with national legislation that prohibits any 'polluting matter' to enter 'waters', *e.g.* Fisheries (Consolidation) Act 1959, Environmental Protection Agency Acts 1992 and 2003, and Local Government (Water Pollution) Acts 1977 and 1990, standard operational procedures, both published and unpublished, will be implemented and adhered to. The adherence to these environmental protection measures would be implemented on-site irrespective of the presence of a designated European Site.	

TEO_36	The project site will be typical of ongoing Port operations during the operational phase. As part of the Port of Cork Environmental Management System (EMS), they are required to monitor surface water, ground water, noise and dust emissions from the site to ensure that they meet EPA (Environmental Protection Agency) standards. This will continue during the operational phase and will ensure that surrounding receptors will not be negatively impacted on.			✓
Material Assets				
MA_01	Stockpile in the temporary storage area (e.g. bituminous mixes) shall be minimised both spatially and temporally.		✓	
MA_02	Increased vehicular traffic within CCT1 and DWB due to construction/dredging and quay wall construction works will be managed by implementation of a Traffic Management Plan for the construction project.		✓	
MA_03	Impacts to air from construction dust will be mitigated by dampening during construction as required.		✓	
MA_04	Spill kits will be made available by the Contractor during the works and shall be stocked regularly.		✓	
MA_05	Material imported onto the site will be assessed to ensure that contamination is not introduced to the site. Any topsoil which is imported onto the site will be chemically analysed and screened against generic screening values for a commercial end use to ensure that it does not pose a risk to human health.		✓	
MA_06	Further investigations into services will be necessary during the detailed design stage. Methods such as ground penetrating radar (GPR) and test trenching can be used to verify or locate existing services.		✓	

MA_07	Services drawings shall be reviewed in detail prior to project inception and potential conflicts with construction works shall be noted and monitored.	✓
MA_08	Excavated material on site will be managed in accordance with the requirements of the Waste Management Act 1996 (as amended). The Contractor will be required to ensure that the facility, to which any excavated material which requires transfer off-site is brought to/ is authorised in accordance with Waste Management Legislation. The Contractor, as holder of the waste, will be responsible under the Waste Management Act for ensuring that all statutory obligations are met. All waste activities at the site will be subject to best practice waste handling procedures (i.e. source segregation, storage and collection). Material will be re-used where possible.	✓
MA_09	At a minimum the Contractor shall ensure: • That any waste haulier employed by the contactor is authorised by a waste collection permit or is exempt from such a requirement; Waste Management Acts or any other legislation, as necessary; • That the terms and conditions of the authorisations of the waste haulier and next destination waste facility allow for acceptance of the waste in question (i.e. allow the facility to accept the specific EWC/LoW type of waste); and • That these authorisations will not expire within the lifetime of the project.	✓
MA_10	Waste arisings generated will only be treated at facilities that are authorised to carry out the appropriate waste treatment activity for the specific waste stream. Records of all waste movements and associated documentation shall be maintained on-site such as waste facility authorisation number, expiry date, class of waste accepted, weighbridge records, treatment methods for each waste stream accepted i.e., backfilling, crushing, screening, etc.	✓

MA_11	Where waste generated is not reusable on-site or deemed suitable for dumping at sea, samples will be taken and waste acceptance criteria (WAC) laboratory testing will be undertaken on the excavated material. The results of the laboratory testing will be used to determine whether a waste as inert, non-hazardous or hazardous. Authorised waste facilities will be contacted to establish what their waste acceptance criteria are. The waste from the proposed development will be compared with the facility waste acceptance criteria and sent to the waste facilities which are authorised to accept the material in line with the waste acceptance criteria. Where practical, the closest suitable facilities to the proposed development will be selected to reduce impacts associated with vehicle movement such as air emissions.		✓	
MA_12	The Contractor(s) will store, handle and transport waste material arising in accordance with best practice guidelines and the Waste Management Act 1996 (as amended). Waste arisings that cannot be re-used or disposed of at sea will be sampled, tested and disposed of, to a licensed waste management facility.		✓	
MA_13	A survey/condition assessment of POCC assets shall be undertaken periodically to assist in the management of such assets during port operations and maintenance.		✓	
MA_14	The PoCC operates an Oil/HNS Spill Contingency Plan (Port of Cork Company, July 2009) which outlines the measures to be undertaken in the event of an oil spill or spillage of Hazardous Noxious Substances. This contingency plan will be effective in dealing with any operational incidents with the potential to generate waste associated with the development.		✓	
MA_15	POCC Waste Management Plan outlines the measures required to manage the waste arisings from shipping and these measures will be reviewed on an ongoing basis to ensure that the waste facilities accepting waste from the port can meet the additional demand.			✓

MA_16	The Contractor shall develop a system of record keeping which records any damage or dereliction observed/encountered to existing POCC assets as a result of construction.		✓
MA_17	A survey/condition assessment of existing PoCC assets shall be undertaken at the inception of the project to assist in the management of such assets during construction and maintained throughout the duration of the programme.	✓	
MA_18	The Contractor shall develop a record keeping system that will ensure that details of all arisings, movement and treatment of C&D waste are recorded. All materials being transferred from the site, whether for recycling, recovery or disposal, shall be subject to a documented tracking system which can be verified and validated.	✓	
MA_19	A survey/condition assessment of POCC assets shall be undertaken periodically to assist in the management of such assets during port operations and maintenance.	✓	
MA_20	The Port of Cork Company shall adhere on an ongoing basis to the requirements of the Ringaskiddy Port Waste Management Plan.	✓	✓
Major Accidents and Disasters			
ERP_01	Existing flood defences and stormwater drainage will be maintained	✓	✓
ERP_02	The site construction operations will be designed and operated in line with best international current practice and with appropriate health and safety checks in place.	✓	✓
ERP_03	Appropriate training, qualifications, and risk controls in place	✓	✓

ERP_04	Safety in design criteria applied to design and build.	✓	✓
ERP_05	Existing flood defences and stormwater drainage will be maintained	✓	✓
ERP_06	The site operations will be designed and operated in line with best international current practice and with appropriate health and safety checks in place.	✓	✓
ERP_07	The site operations will be designed and operated in line with best international current practice and with appropriate health and safety checks in place.		✓
ERP_08	The site operations will be designed and operated in line with best international current practice and with appropriate health and safety checks and monitoring in place. Updated Fire Risk Assessment (FRA) to be carried out.		✓
ERP_09	An Emergency Response Plan is required as part of the planning regime for the Facility, which is regularly reviewed and updated in line with those requirements. The ERP contains detailed plans for the response to emergencies including fires and severe weather events.		✓

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