Iarnród Éireann
Irish Rail

Rosslare ORE Hub

EIAR Environmental Topic Chapters

Chapter 9:

Water Quality and Flood Risk

venterra | GDG GAVIN & DOHERTY GEOSOLUTIONS | NICHOLAS O'DWYER an RSK company

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LIST OF ABBREVIATIONS

AEP	Annual Exceedance Probability
cSPA	Candidate Special Protection Area
CFRAM	Catchment-based Flood Risk Assessment and Management
CWB	Coastal Water Body
DWW	Domestic Waste Water
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EPA	Environmental Protection Agency
EQS	Environmental Quality Standards
GSI	Geological Survey Ireland
GWB	Groundwater Body
HMWB	Heavily Modified Waterbody
IFI	Inland Fisheries Ireland
IEMA	Institute of Environmental Management and Assessment
IRCG	Irish Coast Guard
LoLo	Lift-On Lift-Off
LPS	Local Port Services Plan
NDP	National Development Plan
NHA	Natural Heritage Area
NPWS	National Parks and Wildlife Service
NSA	Nutrient Sensitive Area
NTU	Notional Turbidity Unit
OPW	Office of Public Works
ORE	Offshore Renewable Energy
OSRP	Oil Spill Response Plan
PE	Population Equivalent
pNHA	Proposed Natural Heritage Area
RBMP	River Basin Management Plan
RoRo	Roll-On Roll-Off
SAC	Special Area of Conservation
SC	Subcatchment
SFRA	Strategic Flood Risk Assessment
SOP	Standard Operating Procedure
SPA	Special Protection Agency
SSC	Suspended Sediment Concentration
WWTP	Wastewater Treatment Plan
WFD	Water Framework Directive
ZoI	Zone of Influence

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9 WATER QUALITY AND FLOOD RISK

9.1 INTRODUCTION

Iarnród Éireann – Irish Rail is applying for development permission for the Rosslare Offshore Renewable Energy Hub (hereafter the 'Proposed Development'), located immediately adjacent and to the northwest of the existing Rosslare Europort at Rosslare Harbour in County Wexford, which is operated by Iarnród Éireann. The Proposed Development includes capital dredging to achieve navigable depths for vessels delivering ORE components; land reclamation to create a storage area for these components; and construction of two new berths to facilitate loading and unloading of ORE components. The land reclamation works include infilling the existing small boat harbour, after the construction of a new small boat harbour. The Proposed Development also includes the installation of a new slipway and facility for local clubs, such as the Sea Scouts.

The purpose of the Proposed Development is to provide a facility for the efficient handling and storage, marshalling, staging and integration of ORE components to facilitate installation of offshore wind energy projects by ORE developers and operators. The Proposed Development is designed to provide facilities that accommodate a wide range of infrastructure uses, both for current requirements and anticipated future needs. For instance, the Proposed Development could be used for traditional port activities if required, including during periods of reduced ORE-related activity. Refer to EIAR Chapter 6: Project Description for further detail.

This chapter of the Environmental Impact Assessment Report (EIAR) presents the assessment of the likely significant effects (as per the EPA (2022) Guidance) of the Proposed Development on Water Quality and Flood Risk arising from the construction and operation of the Proposed Development, both alone and cumulatively with other projects. The scope of this chapter was determined following the issue of a scoping report to the following topic-relevant stakeholders (see Chapter 4: Scoping and Consultation for full details of consultation):

- Inland Fisheries Ireland
- Marine Institute Ireland
- Wexford County Council

The assessment presented in this chapter is informed by the following EIAR chapters/technical appendices:

- Chapter 7: Soils, Geology, Hydrogeology and Contamination
- Chapter 8: Coastal Processes
- Chapter 24: Climate
- EIAR Technical Appendix 7: Geotechnical Interpretative Report
- EIAR Technical Appendix 8: Coastal Processes
- EIAR Technical Appendix 11: Benthic Ecology

The primary purpose of this chapter is to establish the characteristics of the construction and operational phases of the Proposed Development for the purposes of assessing the environmental impact of the development on Water Quality and Flood Risk receptors.

This chapter comprises the following elements:

- Summary of relevant policy and guidance
- Data sources used to characterise the Study Area
- Summary of consultations with stakeholders
- Methodology followed in assessing the impact of the Proposed Development (such as information on the Study Area and the approach taken in assessing the potential effects)
- Review of baseline conditions
- Assessment of likely effects arising from the construction of the Proposed Development
- Identification of further mitigation measures and/or monitoring requirements (if any) in respect of any significant effects (following the 'mitigation hierarchy' of avoidance, minimisation, restoration and offsets in consecutive order)
- Assessment of residual effects following implementation of any additional mitigation measures identified during this process

9.1.1 RELEVANT LEGISLATION AND GUIDELINES

The assessment of likely significant environmental effects arising from the construction and operation stages of the Proposed Development, on water quality and flood risk, has been undertaken in accordance with the EIA Directive as amended and the Planning and Development Act 2000 as amended and the Planning and Development Regulations 2001 as amended, insofar as they relate to the preparation of an EIAR.

9.1.1.1 NATIONAL AND INTERNATIONAL LEGISLATION

This chapter has been prepared having regard, inter alia, to the following key international and national legislation:

International (including European Union)

- Water Framework Directive (WFD) (2000/60/EC)
- Floods Directive (2007/60/EC)
- Integrated Pollution and Prevention Control Directive (2008/1/EC)
- Urban Wastewater Directive (91/271/EEC)
- Drinking Water Directive (98/83/EC)
- Groundwater Directive to the Water Framework Directive (2006/118/EC)
- Groundwater Directive (2014/80/EU)
- Nitrates Directive (91/676/EEC)

- Sewage Sludge Directive (86/278/EEC The Shellfish Water Regulations (Amended 2009), (2006/113/EC)
- Marine Strategy Framework Directive (2008/56/EC)
- Bathing Water Directive (2006/7/EC)
- UK Government - Environmental Protection Act 1990.

National (Ireland)

- Climate Action and Low Carbon Development Act 2015
- Climate Action and Low Carbon Development (Amendment) Act 2021
- Water Services Act 2007
- Local Government (Water Pollution) Act 1977 and amendments to 1990
- Planning and Development Act 2000, as amended
- Fisheries Consolidation Act 1959, as amended
- Waste Management Act 1996
- Sea Pollution (Amendment) Act 1999
- Sea Fisheries and Maritime Jurisdiction Act 2006
- Planning and Development Regulations 2001, as amended
- S.I. No. 722/2003 - European Communities (Water Policy) Regulations, 200
- S.I. No. 413/2005 - European Communities (Water Policy) (Amendment) Regulations, 2005
- S.I. No. 219/2008 - European Communities (Water Policy) (Amendment) Regulations, 2008
- S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations, 2009
- S.I. No. 386/2015 - European Union Environmental Objectives (Surface Waters) (Amendment) Regulations, 2015
- S.I. No. 77/2019 - European Union Environmental Objectives (Surface Waters) (Amendment) Regulations, 2019
- S.I. No. 9/2010 - European Communities Environmental Objectives (Groundwater) Regulations, 2010
- S.I. No. 389/2011 - European Communities Environmental Objectives (Groundwater) (Amendment) Regulations, 2011
- S.I. No. 149/2012 - European Communities Environmental Objectives (Groundwater) (Amendment) Regulations, 2012
- S.I. No. 366/2016 - European Union Environmental Objectives (Groundwater) (Amendment) Regulations, 2016

- S.I. No. 459/2001 - Quality of Shellfish Waters (Amendment) Regulations, 2001
- S.I. No. 55/2009 - European Communities (Quality of Shellfish Waters) (Amendment) Regulations, 2009
- S.I. No. 464/2009 - European Communities (Quality of Shellfish Waters) (Amendment) (No. 2) Regulations, 2009
- S.I. No. 268/2006 - European Communities (Quality of Shellfish Waters) Regulations, 2006
- S.I. No. 155/1992 - Quality of Bathing Waters Regulations, 1992
- S.I. No. 79/2008 - Bathing Water Quality Regulations, 2008
- S.I. No. 322/2024 - Bathing Water Quality (Amendment) Regulations, 2024.

9.1.1.2 RELEVANT POLICIES AND PLANS

The Proposed Development has been reviewed in relation to planning policy specific to the hydrological environment. Statutory national and local planning policy frameworks, and associated supplementary guidelines, pertinent to this chapter include:

- Department of the Environment, Climate and Communications (2024). The Climate Action Plan 2024 and Annex of Actions
- Department of Housing, Local Government and Heritage (2019). The National Marine Planning Policy Statement
- Department of Housing, Local Government and Heritage (2021). National Marine Planning Framework
- National Development Plan (NDP) (Department of Public Expenditure and Reform, 2021)
- Our Sustainable Future – A Framework for Sustainable Development for Ireland (Department of the Environment, Community and Local Government, 2012)
- Flood mapping and management information developed and published through the National CFRAMS Programme (Office of Public Works, 2009 to present (January 2024)
- River Basin Management Plan for Ireland (Department of Housing, Local Government and Heritage, 2018)
- The Planning System and Flood Risk Management: Guidelines for Planning Authorities (Department of Environment, Heritage and Local Government/Office of Public Works, 2009)
- Local Government (Water Pollution) Acts 1977 to 2007
- Wexford County Development Plan 2022-2028.

9.1.1.3 GUIDANCE

The assessment is carried out in accordance with guidance listed below:

- Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports

- National Roads Authority (2008) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes
- Inland Fisheries Ireland (2016): Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters
- National Road Authority (NRA) (2009) Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes
- Department of Housing, Local Government and Heritage (2009) The Planning System and Flood Risk Management - Guidelines for Planning Authorities
- Construction Industry Research and Information Association (CIRIA) (2001) C532 - Control of Water Pollution from Construction Sites
- CIRIA (2001) C32 - Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors
- CIRIA (2015) C741 - Environmental Good Practice On-Site
- CIRIA (2019) C786 - Culverts, Screen and Outfall manual
- Department of Transport (2020) Maritime Oil/HNS Spill Contingency Plan 2020
- Environment Agency (2017) Water Framework Directive assessment: estuarine and coastal waters
- Inland Fisheries Ireland (2016) Guidelines on Protection of Fisheries During Construction Works in and Adjacent to Waters
- Office of Public Works (2013) Irish Coastal Protection Strategy Study
- EPA (2020) Bathing Water Quality in Ireland: A report for the year 2020
- EPA (2008) Irelands Environment 2008, Chapter 9, Estuarine and Coastal Waters
- EPA (2003) Towards Setting Guideline Values for the Protection of Groundwater in Ireland
- Marine Institute (2006) Guidelines for the assessment of dredge material for disposal in Irish waters.
- Institute of Environmental Management and Assessment (IEMA) Impact Assessment Guidelines (2024): Implementing the Mitigation Hierarchy from Concept to Construction

9.2 ASSESSMENT METHODOLOGY

9.2.1 STATEMENT OF COMPETENCE

Gavin & Doherty Geosolutions Ltd (GDG) is a specialist engineering consultancy with a foundation in geoscience, environmental services and geotechnical engineering. The company was founded in 2011 and is committed to supporting projects which contribute to the global sustainability agenda, such as enhancing infrastructure, supporting onshore and offshore wind farm developments and general civil infrastructure design.

The members of the GDG EIAR team involved in this assessment include:

- Alasdair Pilmer is Senior Hydrogeologist at GDG and a Chartered Hydrogeologist (BSc, MSc, PGeo, EurGeol) with the Institute of Geologists of Ireland. He has six years of post-graduate experience working in the environmental, civil engineering and renewables sectors. Alasdair has worked on multiple onshore and offshore wind fam projects in the UK and Ireland including Yellow River Wind Farm, Cushaling Wind Farm, Setanta Wind Park and Codling Wind Park.
- Roy Harrison is a Chartered Geologist and Member of the Institution of Environmental Sciences with over 20 years' experience working in the sector, and has led the geoenvironmental EIAR aspects of multiple large-scale developments in wind farm projects (e.g. Middle Muir Wind Farm, Kype Muir Wind Farm, Kype Muir Extension Wind Farm), large-scale transportation projects (e.g. Clyde Waterfront, Renfrew Riverside and Glasgow Airport Investment Area Infrastructure Development Projects, Cross Tay Link Road, A96 Hardmuir to Fochabers) and urban redevelopments (e.g. Dublin Street north, Monaghan).
- Charlotte Manwaring is a Senior Environmental Scientist at GDG with 25 years' experience and an IEMA Practitioner. She has worked across the environmental, compliance, planning and monitoring public and private sector. She has experience in EIAR for port expansion, onshore windfarms and energy from waste projects and marine licencing.
- Joey O'Connor is Principal Marine Environmental Scientist in GDG and has 15 years' experience across environmental monitoring, assessment and consenting in the public and private sectors. Through his project experience and leadership roles he has led and managed large multidisciplinary teams to deliver scientifically robust coastal and marine environmental assessments. Joey is the Environmental Lead and EIA Coordinator for the Rosslare ORE Hub Project.

9.2.2 TOPIC-SPECIFIC CONSULTATION

A programme of consultation was undertaken in relation to the scoping report for the Proposed Development, and a response from An Bord Pleanála was received. See Chapter 4: Scoping and Consultation for further details of the consultation process.

Table 9.1: Consultation Responses

Consultee	Consultee Comments during EIA Scoping	Addressed within EIAR
An Bord Pleanála	The boards representatives asked if contamination issues arise with dredged materials.	A review of surveyed boreholes was undertaken and it was determined that there is no evidence of contamination above the levels permitted for dumping at sea in any of the samples collected.

9.2.3 DATA SOURCES

A review of desk study information has been undertaken to ascertain baseline conditions for the Proposed Development. Data was compiled from publicly available datasets, the findings of ground investigations and hydrodynamic modelling, design information, a walkover survey, and other sources. The findings are presented in Section 9.3, which comprised review of the following sources of information:

- EPA Online mapping (https://gis.epa.ie/EPAMaps/)
- EPA Consented abstractions, discharges and licences (www.epa.ie)
- EPA Catchments - water quality and WFD surface water status (https://www.catchments.ie/)
- EPA River Quality and Hydrometric Data (www.epa.ie)
- EPA - Monitoring & Assessment: Freshwater & Marine Publications (www.epa.ie)
- Geological Survey Ireland spatial resources mapping (https://dcenr.maps.arcgis.com)
- Irish Soil Information System National Soils Map (https://gis.epa.ie)
- Met Éireann Meteorological Databases (www.met.ie)
- National Parks and Wildlife Services Public Map Viewer (https://www.npws.ie)
- Water Framework Directive WFD Map Viewer (http://www.wfdireland.ie/maps.html)
- Department of Environment, Community and Local Government map viewer (www.myplan.ie)
- Office of Public Works (OPW) Flood Maps viewer (www.floodinfo.ie)
- Bathing Water Areas (https://www.beaches.ie/)
- River Basin Management Plan (RBMP) 2022 - 2017 (www.gov.ie)
- Inland Fisheries Ireland (IFI) survey and water quality information(www.fisheriesireland.ie)
- Marine Institute – Data Centre and Publications (www.marine.ie)
- Tailte Éireann – Irish Townland and Historical Map Viewer (https://storymaps.arcgis.com/)
    - 6” First Edition Black

- 25” First Edition (Colour).

9.2.4 APPROACH TO ASSESSMENT OF EFFECTS

The baseline information obtained has been used to provide an understanding of the value of each receptor relevant to this topic (the ‘baseline scenario’), and its sensitivity to the potential effects associated with the construction and operation of the Proposed Development. This includes consideration of the likely Zone of Influence (ZoI) of the development on Water Quality and Flood Risk receptors. The baseline scenario has been determined with due consideration of the ‘do nothing’ scenario.

The ‘source-pathway-receptor’ model, a connection between the source of contamination and a sensitive receptor via an appropriate environmental pathway as defined in the UK Government’s 1990 Environmental Protection Act, has been used to identify potential effects resulting from the proposed project activities on the environment and sensitive receptors within it.

The potential environmental effects identified have been assessed using a systematic approach to identify and evaluate the significance of the potential effects both alone and in combination with other plans and projects. During each phase (construction and operation) of the Proposed Development, a number of activities will take place on site which will have the potential to cause effects on water quality and flood risk at the Proposed Development.

The method used for assessment of effects is based on a combination of the ‘Guidelines on the Information to be Contained in Environmental Impact Assessment Reports’ published by the EPA (2022), and where relevant the ‘Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes’ published by the NRA in 2008.

The importance or sensitivity of hydrological receptors in the study area is determined using the criteria set out in Table 9.2. The magnitude of the potential effect is described as per Table 9.3, which when combined with the sensitivity of the receptor allows an assessment of the significance of the effect to be made following the matrix presented in Figure 9.1.

The significance of the effects of the Proposed Development on hydrological receptors is discussed in Section 9.4. Mitigation measures, where required, are presented in Section 9.5, whilst Residual Effects are considered in Section 9.6.

Table 9.2: Sensitivity Criteria (following EPA 2022).

Importance (Sensitivity)	Definition and Examples
High Receptors with a high quality and/ or rarity, regional or national scale and limited potential for substitution/ replacement.	Attribute has a high quality or value on an international, regional or national scale. Examples: River, Wetland or surface water body ecosystem designated by EU legislation, i.e. designated under the Habitats, Birds, Shellfish, Bathing Water or Freshwater Fish, Drinking Water or Nitrate Directives, or; River, wetland or surface water body

Importance (Sensitivity)	Definition and Examples
	ecosystem designated by national legislation (NHA status); regionally important potable water source supplying >2500 homes; nationally important amenity site for wide range of leisure activities; Quality Class A water bodies (Biotic Index Q4, Q5); flood plain protecting more than 50 residential or commercial properties from flooding. High' or 'Good' overall WFD status.
Medium Receptors with a medium quality and/ or rarity, local scale and limited potential for substitution/ replacement or receptor with a low quality and rarity, regional or national scale and limited potential for substitution/ replacement.	Attribute has a medium quality or value on a local scale. Examples: Salmon fishery; locally important potable water source supplying >1000 homes; Quality Class B water bodies (Biotic Index Q3-4); flood plain protecting 5 to 50 residential or commercial properties from flooding; locally important amenity site for wide range of leisure activities. 'Moderate' overall WFD status.
Low Receptors with a low quality and/ or rarity, local scale and limited potential for substitution/ replacement or receptor with a negligible quality and rarity, regional or national scale and limited potential for substitution/ replacement.	Attribute has a low quality or value on a local scale. Examples: Coarse fishery; local potable water source supplying >50 homes; Quality Class C water bodies (Biotic Index Q3, Q2-3); flood plain protecting between 1 and 5 residential or commercial properties from flooding. 'Poor' overall WFD status.
Negligible Receptors with a negligible quality and/ or rarity, local scale and potential for substitution/ replacement. Environmental equilibrium is stable and is resilient to changes that are greater than natural fluctuations, without detriment to its present character.	Attribute has a very low quality or value on a local scale. Examples: Locally important amenity site for small range of leisure activities; local potable water source supplying <50 homes, Quality Class D water bodies (Biotic Index Q2, Q1); flood plain protecting 1 residential or commercial property from flooding; amenity site used by small numbers of local people. 'Bad' overall WFD status.

Table 9.3: Criteria for Rating Magnitude of Effects (following EPA, 2022).

Magnitude of Effects	Criteria
High Adverse	Results in loss of attribute and /or quality and integrity of attribute, i.e. Loss or extensive change to a water body or water dependent habitat, increase in predicted peak flood level >100mm, extensive loss of fishery (commercial and / or angling), extensive reduction in amenity value / utility function, potential high risk of pollution to water body from routine run-off, potential high risk of pollution to surface water changing water quality status, loss of local water supply or change in quality with respect to drinking water standards (DWS), significant and permanent change over large scale such as changes to erosion and deposition regimes.
Medium Adverse	Results in impact on integrity of attribute or loss of part of attribute, i.e. Increase in predicted peak flood level >50mm, partial loss of fishery (commercial and / or angling), partial reduction in amenity value / utility function, potential medium risk of pollution to water body from routine run-off, changing water quality status, temporary loss of local water supply or minor change in quality of supply with respect to drinking water standards, detectable change to river morphology / fluvial geomorphology over a small scale.
Low Adverse	Results in minor impact on integrity of attribute or loss of small part of attribute, i.e. Increase in predicted peak flood level >10mm, minor loss of fishery (commercial and / or angling, slight reduction in amenity value / utility function, minor deterioration in water quality unlikely to affect the most sensitive receptor or insignificant change in water quality conditions not exceeding those expected due to naturally occurring fluctuations, no change in pressure or flow to local water supply or minor change in quality of supply with respect to drinking water standards, minor change to river morphology / fluvial geomorphology.
Negligible	Results in an impact on attribute but of insufficient magnitude to affect either use or integrity, i.e. No perceptible changes to baseline conditions, no measurable change in water quality, no change in the water feature's capacity to dilute pollutants and waste products, negligible change in predicted peak flood level, negligible reduction in amenity value / utility function, no measurable change to a surface water dependent ecosystem or fishery (commercial and / or angling), unquantifiable or unqualifiable change to river morphology / fluvial geomorphology.

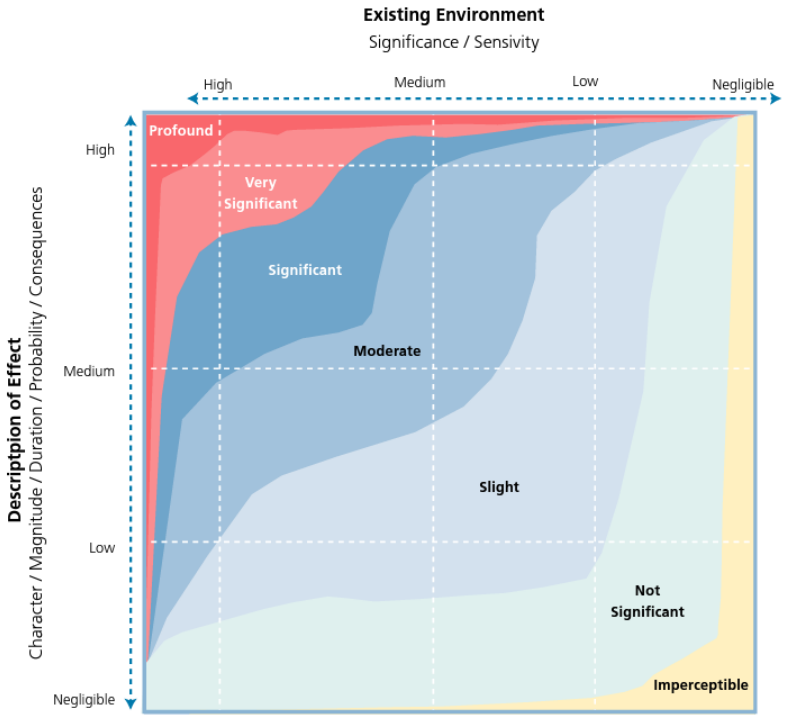

Figure 9.1: Determining the significance of effects by comparing the character of the predicted effect to the sensitivity of the receiving environment

Source: Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022).

Effects can be beneficial (positive), neutral or adverse (negative) in nature.

Significance of effects has been categorised as follows:

- 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 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.

Adverse effects of 'Significant' significance and above are considered 'significant'. Effects of 'Moderate' significance or below are not considered to be significant.

9.2.5 MITIGATION

Three types of mitigation measures are considered in this chapter, following IEMA (2024).

- **Primary mitigation** is an inherent part of the project design. Primary mitigation relates to the location, design or timing of the project, and these measures are intended to avoid and reduce significant adverse effects on the environment.
- **Secondary mitigation** requires further activity in order to achieve the anticipated outcome and, is required. Where potentially significant adverse effects have not been avoided by project location, design or timing or require to be further reduced to within acceptable levels, secondary mitigation may be required. These measures, where required, are recommended in this chapter of the EIAR, and may include measures that are set out in best practice guidance.
- **Tertiary mitigation** measures are required regardless of any EIA assessment and may include measures that are set out as a result of legislative requirements and/or standard sectoral practices. Typically, these measures are standardised and often covered by other forms of legislation or controls, therefore they are not presented in extensive detail in the EIA.

The assessment described above includes consideration of integrated measures that are built into the project design (i.e., primary mitigation) and tertiary mitigation, and which are intended to prevent, reduce and where possible offset any significant adverse effects on the environment.

Where potentially significant adverse effects have not been eliminated by project design, further mitigation measures (i.e., secondary mitigation) have been proposed.

For each significant effect identified, appropriate secondary mitigation measures are prescribed. Where no secondary mitigation measures are required (i.e., where a significant effect has not been identified), secondary mitigation may still be applied.

9.2.6 RESIDUAL EFFECTS

Where relevant, residual effects have been determined for each significant effect, considering all proposed mitigation.

In cases where residual uncertainty of impact is identified within the EIAR, or the success of implemented mitigation measures requires validation, commitments have been made for the provision of monitoring.

9.2.7 DIFFICULTIES AND UNCERTAINTIES

Assumptions related to the assessment undertaken at this stage are as follows:

- All publicly available scientific information ascertained to inform this assessment, is accurate and up to date reflecting the current environment baseline

Limitations related to the assessment undertaken at this stage are as follows:

- This assessment does not include a review of river discharge or flows, stage or temporal variations in hydrological water body levels. It is not deemed necessary due to the limited scope of onshore watercourses relevant to this assessment.

- Marine water sampling was undertaken during the month of February 2024, in line with the procedures for the Marine Institute's bi-annual winter nutrients survey. Therefore, it is not possible to make specific inferences on seasonal variations in marine water chemistry from this data set but the data are deemed sufficient for an accurate marine water quality baseline.

9.3 BASELINE: WATER QUALITY AND FLOOD RISK IN RECEIVING ENVIRONMENT

9.3.1 INTRODUCTION

This section describes the existing conditions and important features in terms of the water quality and flood risk at the Proposed Development. A regional overview is followed by a description of site-specific baseline conditions.

The Zone of Influence (ZoI) considered in this chapter comprises both onshore and offshore elements and is governed by the potential hydrological linkages between the site and different interacting WFD waterbodies (i.e. river, transitional, coastal, and groundwater). As a result, the ZoI comprises a large area which spans onshore watercourses around Rosslare Harbour, Rosslare Town and the South Slob Channel, to the offshore waterbodies ranging from Wexford Harbour and Slobs to the Southwestern Irish Sea.

9.3.2 TOPOGRAPHY, SETTING AND LAND USE

The Proposed Development Boundary is comprised of coastal waters on the northern shore of the existing Rosslare Europort harbour, which is Ireland's main ferry port for passenger and commercial freight to the United Kingdom and European Mainland. The current port and its berths are to the east of the site and are operated by Irish Rail. The port is connected to the national roads network via the N25 and N11 roads which are both to the southeast of the site (Figure 9.2).

Within the Proposed Development Boundary, on the southern edge, is a developed small boat harbour. The southern boundary of the development is inclusive of the shoreline, comprised of rock armour revetment. Adjacent to the Proposed Development Boundary is a mix of discontinuous urban fabric and industrial/commercial transport surfaces and non-irrigated arable land. Urban areas and arable land are uphill of the site to the south.

Coordination of Information on the Environment - CORINE (2018) land use mapping, shown in Chapter 7: Soils, Geology, Hydrogeology and Contamination, indicates the Proposed Development Boundary comprises artificial surfaces described as industrial, commercial and transport units, and agricultural areas described as arable land.

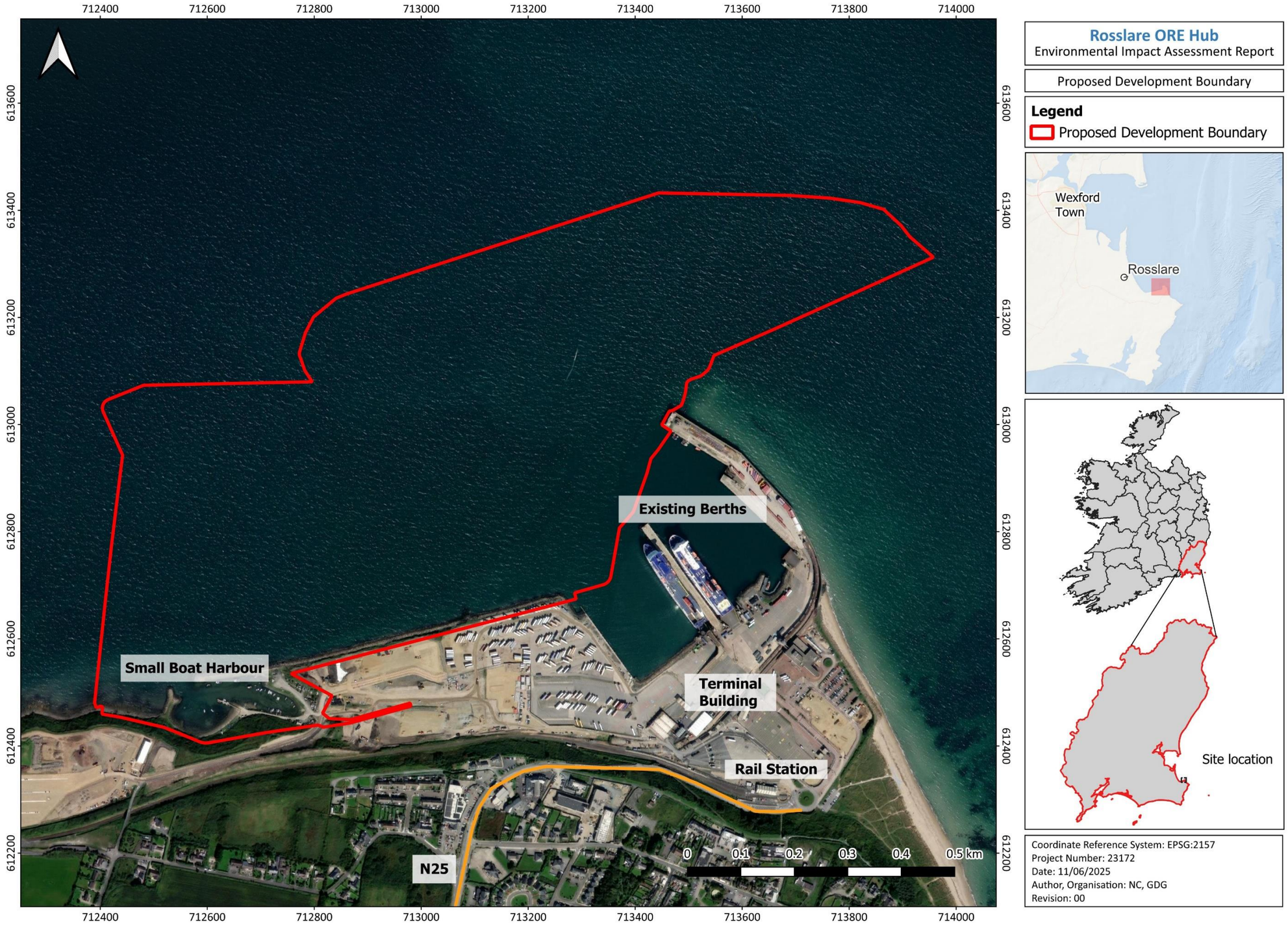

Figure 9.2: Proposed Development Boundary

9.3.3 REGIONAL HYDROLOGY

The Proposed Development is located within the Slaney & Wexford Harbour WFD Catchment (Figure 9.3) which is approximately 1,980 km^2 in total area and comprises much of Co. Wexford, south Co. Wicklow and east Co. Carlow (EPA, 2021).

The wider Catchment includes a broad geographic area drained by the River Slaney, which flows in a south-southeasterly direction through Enniscorthy, before entering tidal water between the Raven Point and Greenore Point, Co. Wexford.

The Proposed Development is situated in the southeastern extremity of the Slaney & Wexford Harbour Catchment, within the Forth_Commons_SC_010 WFD Subcatchment. This section of the Catchment is not directly hydrologically linked to the main River Slaney.

Hydrological flow directions in this area of the Catchment are north and northwest towards the Lower Slaney Estuary and Wexford Harbour area. Some waterbodies discharge to the South Slob Channel first, located between Rosslare and Wexford Town.

Within the immediate vicinity of the Proposed Development, low subsoil permeability and limited recharge of groundwater means the majority of precipitation will result in surface runoff. Any water not directed into artificial drainage will follow local topographic gradients and discharge directly northwards to the Southwestern Irish Sea. There are no lake waterbodies or reservoirs within the ZoI.

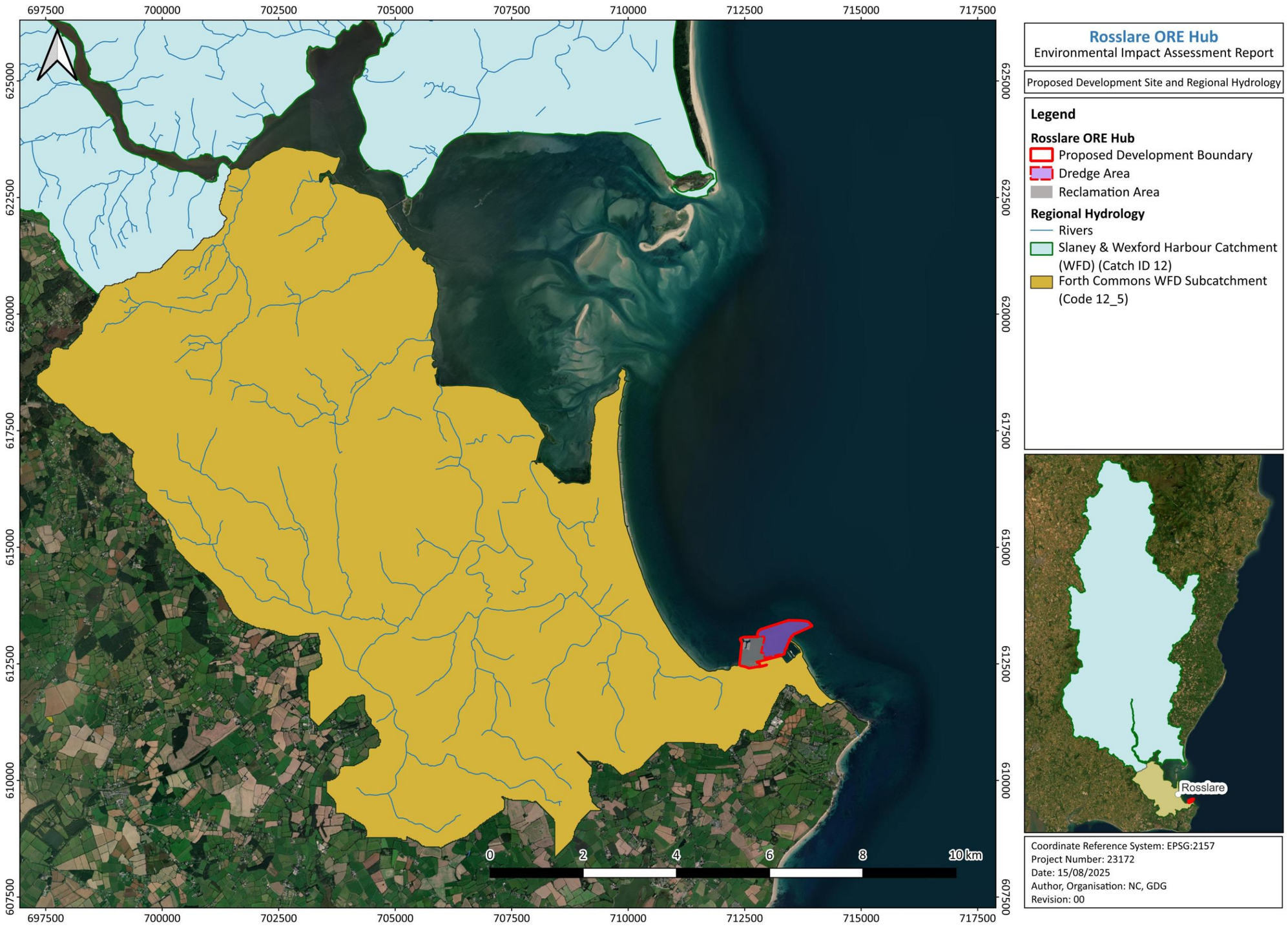

Figure 9.3: Regional hydrological setting

9.3.4 WATER FRAMEWORK DIRECTIVE

9.3.4.1 RIVER WATER QUALITY

A review of EPA hydrological data has not identified river channels entering the Proposed Development boundary or terminating within Rosslare Harbour.

The Proposed Development is located within the Milltown Rosslare_010 WFD River Sub Basin (Figure 9.4). This WFD River waterbody (RWB) flows north-northwest by Rosslare town and eventually discharges into Wexford Harbour. At its closest point, the river flows approximately 550m southwest of the Proposed Development boundary. There is no clear direct hydrological connection between the waterbody and the Proposed Development.

A review of EPA WFD water quality mapping indicates:

- WFD river waterbody status for the Milltown Roslare_010 currently achieves 'Moderate' for the 2016 – 2021 WFD assessment period (Figure 9.5). This represents no change since the 2015 - 2018 iteration.
- According to the latest WFD 3rd risk assessment cycle (2015 – 2018), the Milltown Roslare_010 is currently designated as under 'Review' with regards to meeting WFD environmental objectives by 2027 (Figure 9.6)

Biotic indices "Q-values" (Q1-Q5) represent a classification of the biological and chemical condition of surface watercourses, with Q1 representing the poorest quality and Q5 signifying unpolluted / 'high' water quality status. The latest Q-values for the nearby Milltown Roslare_010 are Q3-4, reflecting 'Moderate' water quality status.

9.3.4.2 TRANSITIONAL WATERBODY QUALITY

According to the WFD, transitional waters connect fresh waters such as rivers and marine waters, for example estuaries. There is one WFD Transitional waterbody (TWB) within the ZoI, the South Slob Channel, approximately 5.8km to the northwest and downstream of the Milltown Roslare_010 stream. There is no clear direct hydrological connection between the waterbody and the Proposed Development.

A review of EPA WFD water quality mapping indicates:

The South Slob Channel currently achieves 'Moderate' status for the 2016 – 2021 assessment period (Figure 9.7). It was previously 'Unassigned' a water quality status in the 2015 -2018 iteration. According to the latest WFD 3rd risk assessment cycle (2015 – 2018), the South Slob Channel is currently designated as under 'Review' with regards to meeting WFD environmental objectives by 2027 (Figure 9.8)

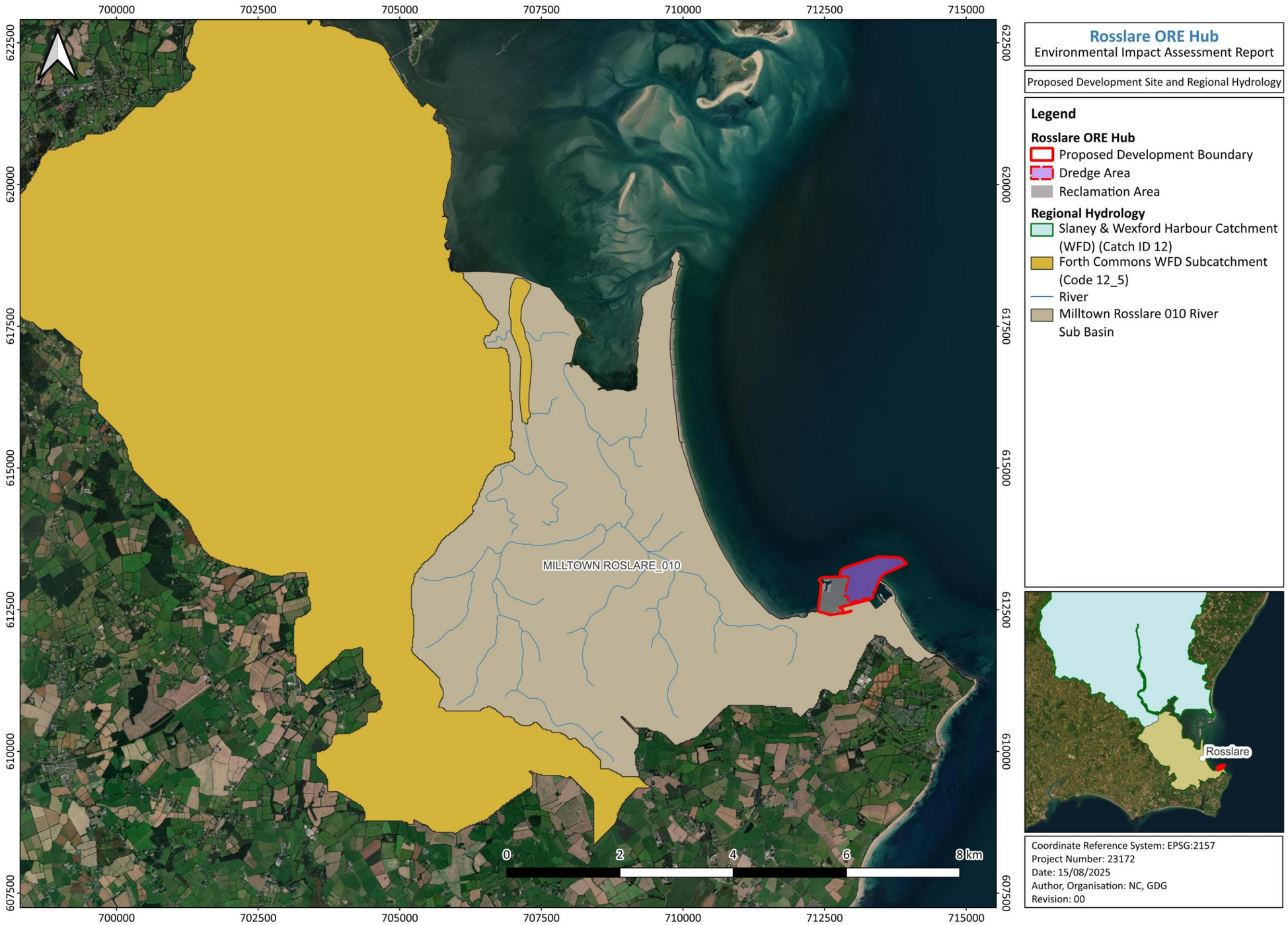

Figure 9.4: WFD Subcatchments and river watercourses

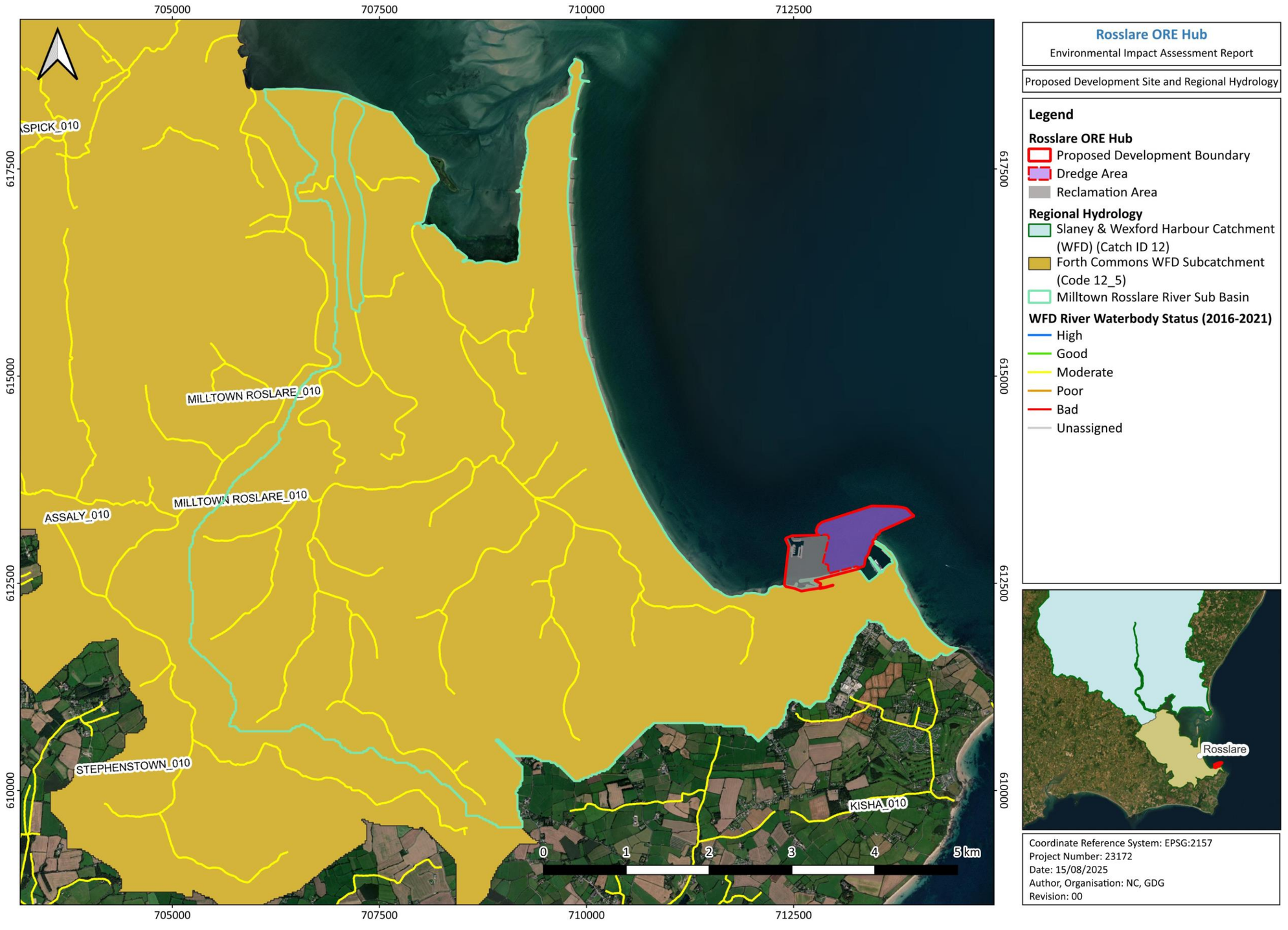

Figure 9.5: WFD River waterbody status

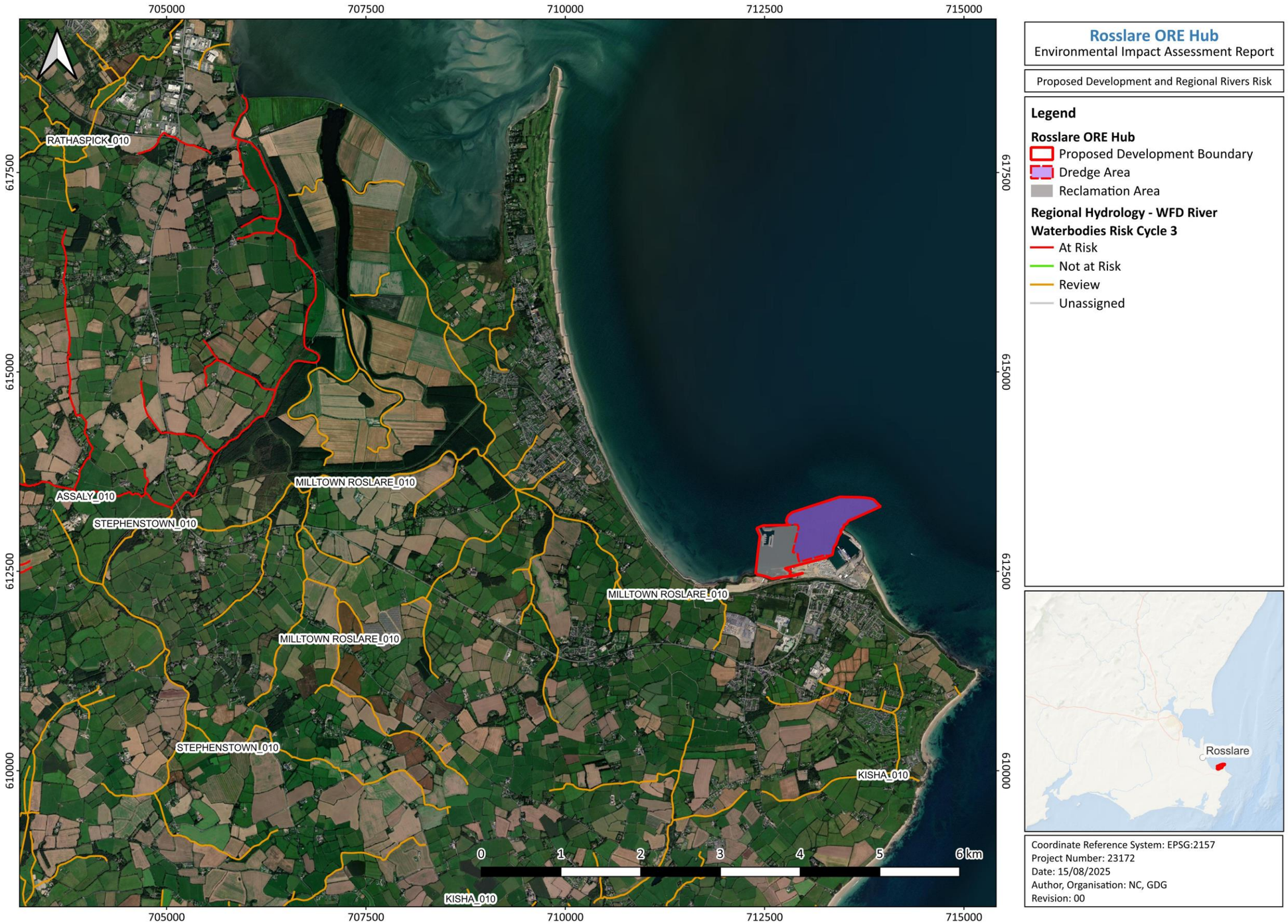

Figure 9.6: WFD River waterbody risk

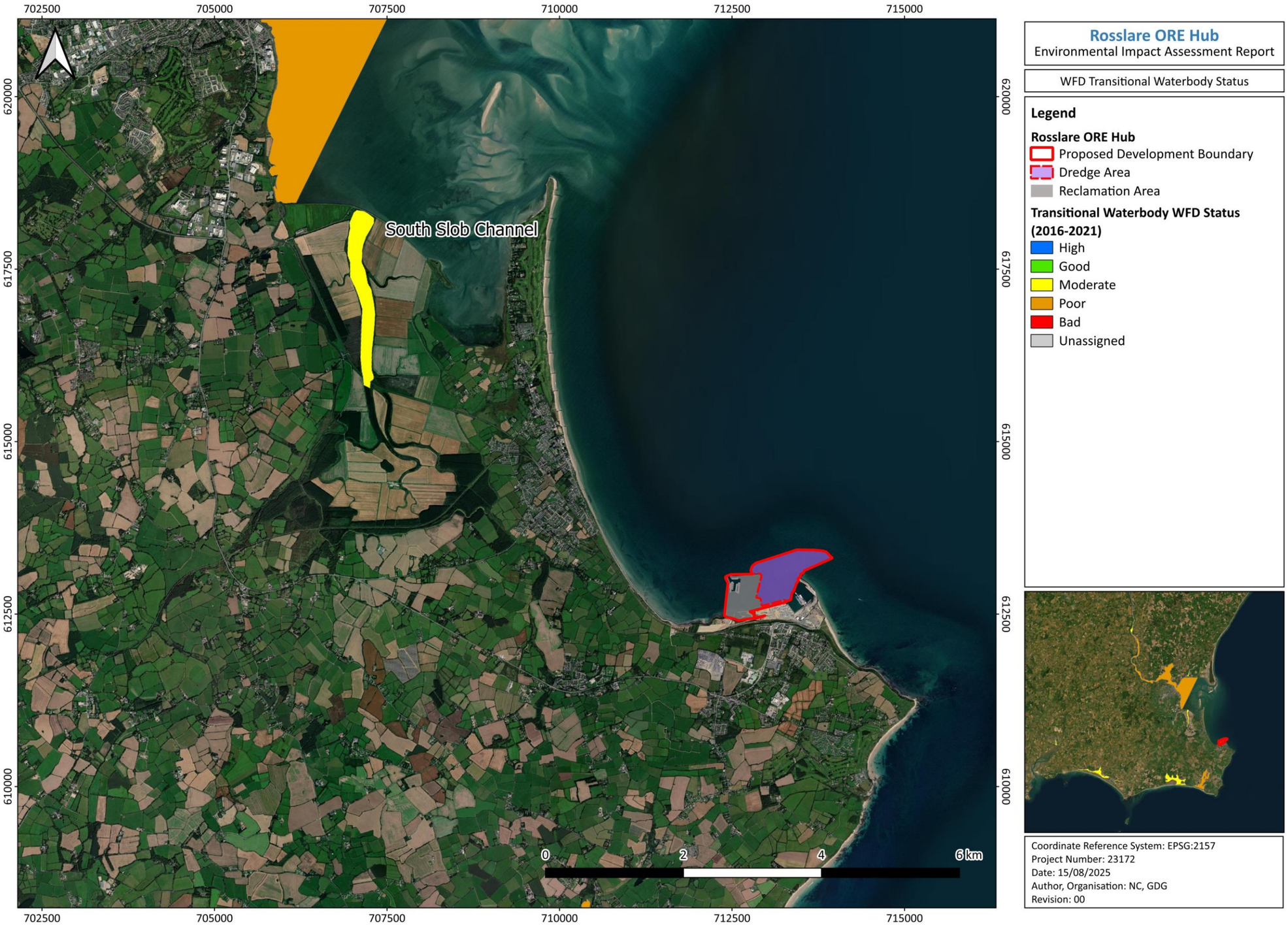

Figure 9.7: WFD Transitional waterbody status

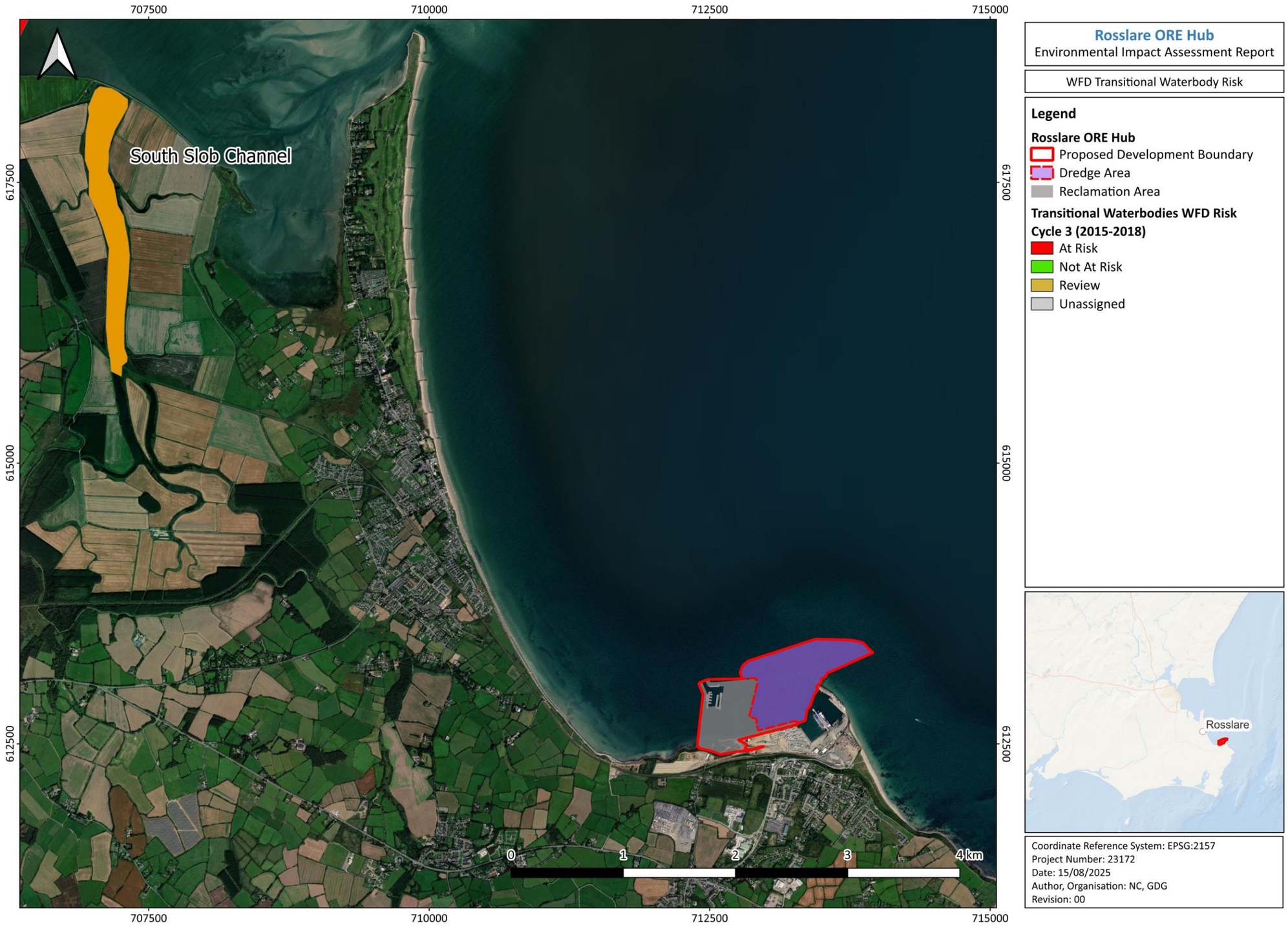

Figure 9.8: WFD Transitional waterbody risk

9.3.4.3 COASTAL WATER QUALITY

There are three WFD Coastal waterbodies (CWB) within the ZoI.

- The Proposed Development is located within the Southwestern Irish Sea (HAs 11;12)
- Rosslare Harbour overlaps the eastern Proposed Development boundary, where dredging is proposed. It is the only waterbody within the ZoI that is designated as a heavily modified water body (HMWB).
- Wexford Harbour is located approximately 4.7km to the northwest and is downstream of the Milltown_Roslare_010 and South Slob Channel waterbodies. There is no clear direct hydrological connection between the waterbody and the Proposed Development.

A review of EPA WFD water quality mapping indicates:

- Southwestern Irish Sea (HAs 11;12) currently achieves 'Good' status for the 2016 – 2021 assessment period (Figure 9.9). This represents an improvement in water quality from 'Moderate' status since the 2015 - 2018 iteration.
- Rosslare Harbour currently achieves 'Good' status for the 2016 – 2021 period. This represents a deterioration in water quality from 'High' status since the 2015 -2018 iteration.
- Wexford Harbour currently achieves 'Moderate' status for the 2016 – 2021 period. This represents a deterioration in water quality from 'Good' status since the 2015 -2018 iteration.
- According to the WFD 3rd risk assessment cycle, both the Wexford Harbour and Southwestern Irish Sea (HAs 11;12) are currently 'At Risk' of failing to meet their WFD environmental objectives by 2027 (Figure 9.10). Rosslare Harbour is currently designated as under 'Review'.

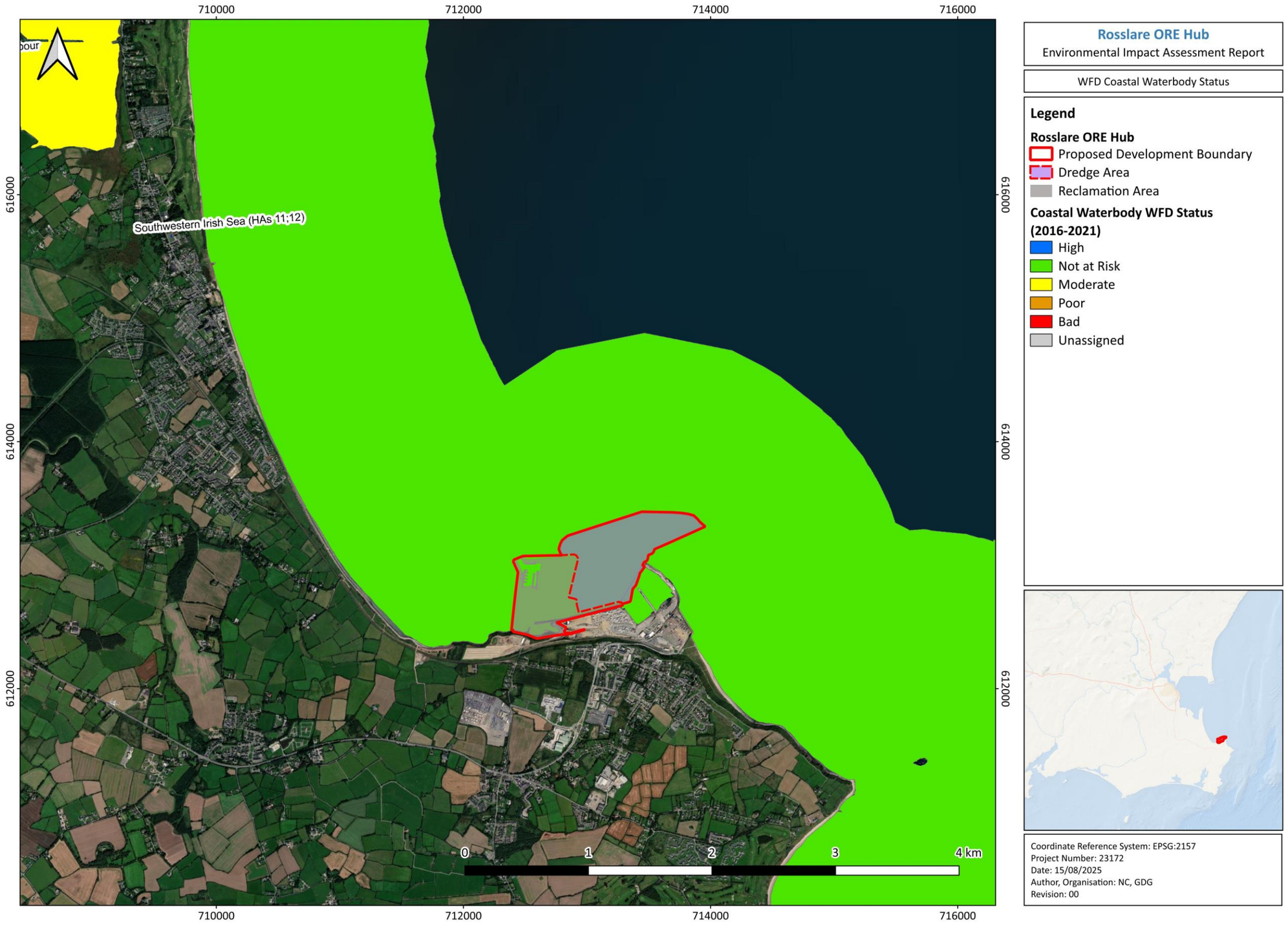

Figure 9.9: WFD Coastal waterbodies status

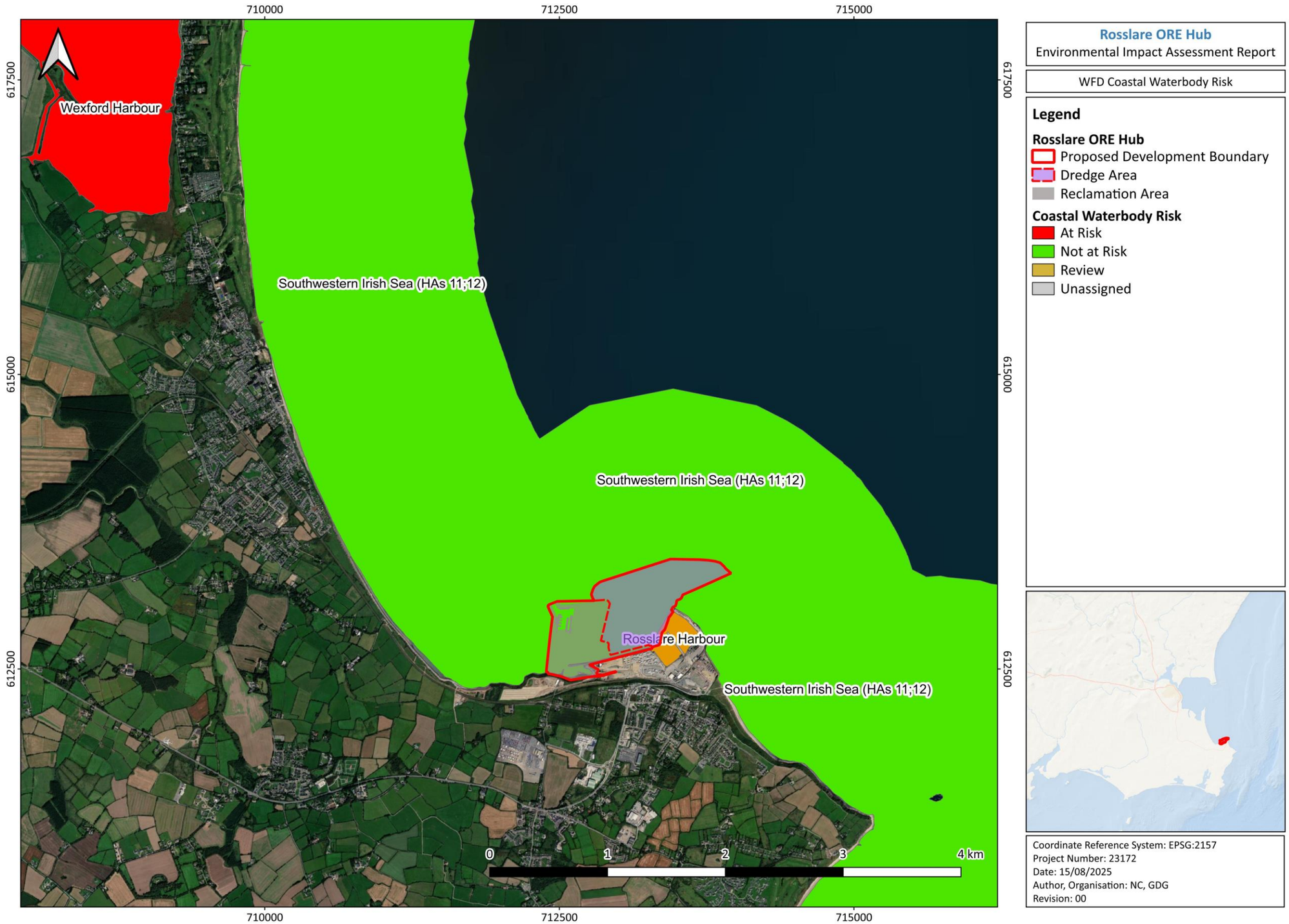

Figure 9.10: WFD Coastal waterbodies risk

9.3.4.4 GROUNDWATER QUALITY

The Proposed Development overlies the Bridgetown GWB which encompasses the southeastern extremity of Co. Wexford, from Rosslare to Kilmore Quay. Aquifer classification for the area is Pl – 'Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones' and groundwater vulnerability is 'Moderate' (GSI, 2017).

A review of EPA WFD water quality mapping indicates:

- Bridgetown GWB currently achieves 'Good' status for the 2016 – 2021 assessment period (Figure 9.11). This represents no change in status since the 2015 -2018 iteration.
- According to the latest WFD 3rd risk assessment cycle (2015 – 2018), the Bridgetown GWB is currently designated as 'Not at risk' of failing to meet WFD environmental objectives by 2027 (Figure 9.12).

There are no GSI Groundwater Protection Scheme or Water Quality reports for Wexford to date.

There is no baseline hydrochemical signature information available with the Bridgetown GWB characterisation report to determine current water quality. However, bedrock strata are noted to be siliceous in nature with the resulting hydrochemical signature expected to reflect this (Cullen, 1978; GSI, 2005).

Groundwater chemical quality is considered within the water quality impact assessment due to its potential to subsequently impact on surface water. A full assessment of potential effects on hydrogeology can be found in Chapter 7: Soils, Geology, Hydrogeology and Contamination.

Figure 9.11: WFD Groundwater body status

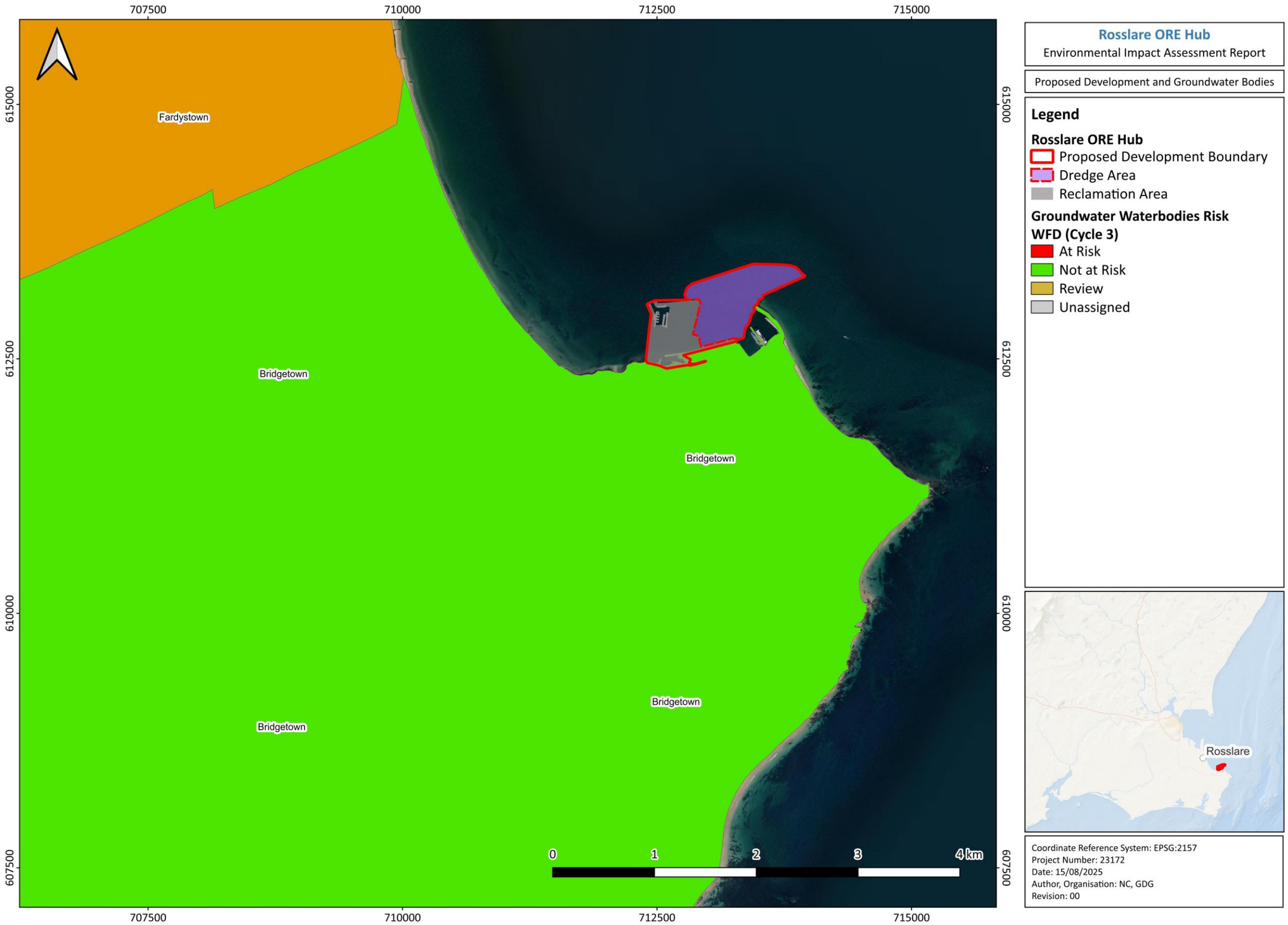

Figure 9.12: WFD Groundwater body risk

9.3.4.5 WATER FRAMEWORK DIRECTIVE SUMMARY

Catchment reporting (EPA, 2019) identifies several significant pressures which are affecting water quality status within aforementioned waterbodies. These include agricultural activities and pollutants, Domestic Waste Water (DWW), Urban Waste Water (UWW) and diffuse urban run-off.

A summary of waterbody status, risk classification and known significant pressures on water quality are outlined in Table 9.4.

Table 9.4: WFD Waterbody status, risk classification and significant water quality pressures

WFD ID	Waterbody Name	Waterbody type	WFD Waterbody Status 2016-2021	WFD Risk Classification 2015 – 2018	Significant Pressures (EPA, 2021)
IE_SE_12M860440	Milltown Roslare_010	River	Moderate	Review	Agriculture, Urban Waste Water, Domestic Waste Water
IE_SE_040_0400	South Slob Channel	Transitional	Moderate	Review	Anthropogenic Pressures
IE_SE_040_0000	Wexford Harbour	Coastal	Moderate	At risk	Agriculture, Urban Waste Water
IE_SE_010_0000	Southwestern Irish Sea (HAs 11;12)	Coastal	Good	At risk	n/a
IE_SE_045_0000	Rosslare Harbour	Coastal	Good	Review	n/a
IE_SE_G_022	Bridgetown	Groundwater	Good	Not at risk	n/a

9.3.5 DRINKING WATER

A review of EPA and Irish Water datasets found that no surface waterbodies within the ZoI are currently used for drinking water resources.

No Group Water Scheme Source Protection Areas or Public Supply Source Protection Areas were found to be hydrologically connected to the Proposed Development.

For the purposes of water quality assessment, the entire onshore of the Republic of Ireland is considered a 'Drinking Water Protected Area' for groundwater, under Article 7 of the WFD.

9.3.6 UISCE ÉIREANN INFRASTRUCTURE

Uisce Éireann were contacted with regards to their assets that may potentially be affected by the Proposed Development. A review of the datasets provided identified the following assets:

- An existing foul sewer main, 375mm precast concrete, with an outfall which discharges directly to Rosslare Harbour at the existing Europort Terminal facility
- An Uisce Éireann water distribution mains network which services the existing port to the east of the Proposed Development

Potable water for the Proposed Development will be drawn from the Iarnród Éireann internal water main at the new roundabout at the western end of the Terminal 7 development. The T7 development has already received approval from Uisce Éireann and is nearing completion of site works. A further application by Iarnród Éireann to Uisce Éireann has been lodged to cover the additional fresh water required for both potable needs and for a fire water retention tank.

9.3.7 URBAN WASTEWATER

Datasets of EPA Urban Wastewater licenced activities were screened as part of the assessment. Rosslare Harbour Wastewater Treatment Plant (WWTP), Reg. No. D0165, is located approximately 500m southwest of the Proposed Development.

This is an urban WWTP with an assigned subcategory agglomeration PE of 2,001 to 10,000. The primary discharge points are:

- A stormwater overflow discharge located immediately southwest of the plant and discharges directly to the Milltown Roslare_010 watercourse
- The foul sewer main which discharges at the existing Europort Terminal facility

A review of the Uisce Éireann annual environmental report (2023) for the WWTP notes the following:

- To date, six overflow events have been recorded have been recorded at the WWTP. The current maximum hydraulic loading observed at the WWTP is 2,626 m^3/day, compared to the 'as constructed' peak capacity of 6,363 m^3/day.
- The WWTP discharge was compliant with the Emission Limit Values (ELV) set in the wastewater discharge licence
- The discharge from the wastewater treatment plant does not have an observable impact on the water quality
- The discharge from the wastewater treatment plant does not have an observable negative impact on the Water Framework Directive status
- The discharge from the wastewater treatment plant does not have an observable impact on the coastal/transitional water quality

Results from the national water ambient monitoring station at the Old Lagoon, Rosslare Harbour, meet the required Environmental Quality Standards (EQS). The EQS relates to the Oxygenation and Nutrient Conditions set out in the Surface Water Regulations 2009.

9.3.8 LICENSED ACTIVITIES

Datasets of EPA licenced activities including Integrated Pollution Control (IPC) sites, Industrial Emissions Licensing (IEL) facilities, and waste facilities were screened as part of the assessment.

The closest licenced facility is the Bord Na Móna recycling waste facility (W0229-01) located approximately 1.4km to the southeast of the Proposed Development. This facility is located in the separate Kisha_SC_010 WFD subcatchment. There are no IPC and IEL facilities in the study area.

Given the distance and hydrological divide between the waste facility and Proposed Development, pollutants cannot feasibly be transmitted between them. Therefore, no licenced activities are likely to affect, or be affected by, the Proposed Development.

9.3.9 BATHING WATERS

Bathing waters classifications are based on the guidelines in the 2006 EU Bathing Water Directive and can be classified as 'Excellent', 'Good', 'Sufficient' or 'Poor', with 'Sufficient' being the minimum required status for Irish bathing waters. Annually, bathing water quality for designated locations is assessed in Ireland by Local Authorities under Quality of Bathing Waters Regulations, 1992 (S.I 155 of 1992).

Rosslare Strand bathing water is located approximately 3km northwest of the Proposed Development. Based on the most recent bathing water data (EPA, 2023), this bathing area is currently classified as having 'Excellent' water quality.

9.3.10 MARINE WATER SAMPLING

Marine water sampling was undertaken to determine a baseline water chemistry within the water column of the Benthic Ecology study area. The rationale, locations, method and results are presented in the EIAR Technical Appendix 11: Benthic Ecology.

In summary, surface water samples were collected at 15 stations throughout the Proposed Development survey area. Station locations and depth was recorded. Simultaneous with water sampling, in-situ readings of water temperature, conductivity, salinity and dissolved oxygen saturation were collected.

In-situ water sampling results are presented in Table 9.5. The results of the laboratory analysis are given in Table 9.6.

Results of marine water sampling are consistent across all monitoring locations and throughout the depth profile of the water column. Laboratory test results did not identify any concerning elevated concentrations when compared to key marine water quality indicators outlined in the EPA (2023) water quality report. For example, all samples fall within the threshold range for Phosphorous (<0.04 mg/l P), an important pollution indicator. As such, no sensitivities associated with coastal waterbody receptors have been identified within the marine chemistry baseline.

Table 9.5: In-situ water sampling data

Station No.	Sample ID	Easting (ITM)	Northing (ITM)	Time	Date	Depth (m)	Temp (°C)	Cond (mS/cm)	Sal (PSU)	DO (% Saturation)
1	1711053	713239	613001	14:03	15.2.2024	10.5	9.18	54.57	34.57	95.90
2	1711054	712787	612991	14:09	15.2.2024	5.7	8.94	54.57	34.63	95.60
3	1711055	712410	612976	14:16	15.2.2024	5.0	8.93	54.78	34.72	95.40
4	1711056	712023	613007	14:23	15.2.2024	4.3	9.02	54.44	34.67	95.60
5	1711057	712402	613189	14:30	15.2.2024	5.8	8.95	54.30	34.40	95.60
6	1711058	712985	613221	14:38	15.2.2024	5.3	8.98	54.70	34.73	96.00
7	1711059	713475	613244	14:46	15.2.2024	8.5	8.97	54.76	34.70	95.70
8	1711060	713368	613395	14:56	15.2.2024	9.7	9.04	54.75	34.69	96.00
9	1711061	712822	613384	15:02	15.2.2024	6.1	9.12	54.44	34.67	96.00
10	1711062	712221	613329	15:09	15.2.2024	5.3	9.10	54.67	34.67	95.00
11	1711063	712422	613607	15:19	15.2.2024	6.1	9.10	54.70	34.68	96.10
12	1711064	713191	613614	15:26	15.2.2024	6.2	9.05	54.64	34.56	96.20
13	1711065	713600	613510	15:34	15.2.2024	9.2	9.07	54.71	34.68	96.50
14	1711066	713022	612796	15:40	15.2.2024	3.7	9.21	54.48	34.60	96.70
15	1711067	713198	612805	15:48	15.2.2024	7.0	9.15	54.51	34.60	96.00

Table 9.6: Water sampling laboratory test results

Sample No.	Report No.	Receipt Date	Sample ID	Salinity	Dissolved Oxygen (%)	DOC	Depth	Conductivity (field measurement)	Alkalinity Total by Autotitration	Temperature (at lab)	Phosphate as P filtered (low level SW or saline)	Nitrate as N saline waters Calculated	Nitrite as N saline waters	Ammonia as N (saline water)	Silica, reactive as Si	TON as N saline waters	DIC (Dissolved Carbon DC - DOC)	DC (dissolved Carbon)
				ppt	%Sat	mg/l	m	uS/cm	mg/l CaCO3	°C	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
1711053	548348	19/02/24	1 @14.03(713239, 613001) 14.03	33.0	95.9	1.3	10.5	54.57	112	17.9	0.021	0.245	0.003	<0.010	0.245	0.248	27.2	28.5
1711054	548349	19/02/24	2 @14.09 (712787, 612991)	33.2	95.6	1.17	5.7	54.57	110	17.9	0.023	0.24	0.004	0.01	0.244	0.244	27.9	29.1
1711055	548350	19/02/24	3 @14.16 (712410, 612976)	33.1	95.4	1.37	5.0	54.78	109	17.9	0.023	0.248	0.004	0.011	0.255	0.252	27.4	28.8
1711056	548351	19/02/24	4 @14.23 (712023, 613007)	32.9	95.6	1.05	4.3	54.44	112	17.8	0.022	0.244	0.004	0.031	0.248	0.248	25.3	26.4
1711057	548352	19/02/24	5 @14.30(712402, 613189)	33.2	95.6	1.08	5.8	54.30	115	17.8	0.022	0.257	0.003	<0.010	0.253	0.26	26.5	27.6
1711058	548353	19/02/24	6 @14.38(712985, 613221)	33.2	96	1.04	5.3	54.70	110	17.8	0.021	0.245	0.003	0.013	0.245	0.248	26.8	27.8

Sample No.	Report No.	Receipt Date	Sample ID	Salinity	Dissolved Oxygen (%)	DOC	Depth	Conductivity (field measurement)	Alkalinity Total by Autotitration	Temperature (at lab)	Phosphate as P filtered (low level SW or saline)	Nitrate as N saline waters Calculated	Nitrite as N saline waters	Ammonia as N (saline water)	Silica, reactive as Si	TON as N saline waters	DIC (Dissolved Carbon DC - DOC)	DC (dissolved Carbon)
				ppt	%Sat	mg/l	m	uS/cm	mg/l CaCO3	°C	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
1711059	548354	19/02/24	7@ 14.46(713475, 613244)	33.3	95.7	<1	8.5	54.76	118	17.9	0.025	0.244	0.004	<0.010	0.256	0.248	27.1	28.1
1711060	548355	19/02/24	8 @14.56(713368, 613395)	33.4	96	1.12	9.7	54.75	112	17.9	0.024	0.241	0.003	<0.010	0.243	0.244	27.2	28.3
1711061	548356	19/02/24	9 @15.02(712822, 613384)	33.2	96	1.03	6.1	54.44	117	17.9	0.025	0.252	0.004	<0.010	0.236	0.256	27	28
1711062	548357	19/02/24	10 @15.09(712221, 613329)	33.2	95	<1	5.3	54.67	109	18.0	0.025	0.248	0.004	0.01	0.238	0.252	26.8	27.8
1711063	548358	19/02/24	11 @15.19(712422, 613607)	33.2	96.1	<1	6.1	54.70	111	18.0	0.023	0.252	0.004	<0.010	0.242	0.256	27.4	28.4
1711064	548359	19/02/24	12 @15.26(713191, 613614)	33.6	96.2	1.03	6.2	54.64	114	18.0	0.023	0.26	0.004	<0.010	0.24	0.264	26.8	27.9

Sample No.	Report No.	Receipt Date	Sample ID	Salinity	Dissolved Oxygen (%)	DOC	Depth	Conductivity (field measurement)	Alkalinity Total by Autotitration	Temperature (at lab)	Phosphate as P filtered (low level SW or saline)	Nitrate as N saline waters Calculated	Nitrite as N saline waters	Ammonia as N (saline water)	Silica, reactive as Si	TON as N saline waters	DIC (Dissolved Carbon DC - DOC)	DC (dissolved Carbon)
				ppt	%Sat	mg/l	m	uS/cm	mg/l CaCO3	°C	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l	mg/l
1711065	548360	19/02/24	13 @15.34(713600, 613510)	33.3	96.5	1.05	9.2	54.71	117	17.9	0.024	0.248	0.004	0.01	0.236	0.252	26.5	27.5
1711066	548361	19/02/24	14 @15.40(713022, 612796)	33.2	96.7	1.28	3.7	54.48	114	17.9	0.024	0.248	0.004	0.015	0.242	0.252	26.4	27.7
1711067	548362	19/02/24	15 @1548(713198, 612805)	33.2	96	1.2	7.0	54.51	113	17.8	0.026	0.268	0.004	0.015	0.271	0.272	27.2	28.4

9.3.11 PROTECTED AREAS

A review of National Parks & Wildlife Service (NPWS) and EPA public map viewers was undertaken to assess potential hydrological connections to the following designated sites; Special Areas of Conservation (SACs), Special Protection Areas (SPAs), National Heritage Areas (NHAs), Proposed National Heritage Areas (pNHAs).

- There are four SACs which are potentially hydraulically linked to the Proposed Development
    - The Milltown Rosslare_010 discharges to the Slane River Valley SAC approximately 5km to the northwest
    - The Long Bank SAC, Blackwater Blank SAC and Carnsore Point SAC are all located offshore within 10km of the Proposed Development reclamation area
- The following SPAs are potentially hydraulically linked to the Proposed Development
    - The Wexford Harbour and Slobs SPA is located approximately 3.5km northwest of the Proposed Development and is directly hydraulically linked to the Milltown Rosslare_010
    - The Raven SPA is located approximately 9km north of the Proposed Development, downstream of the Wexford Harbour and Slobs SPA, at the outlet of the main WFD Catchment
- The Proposed Development is within the Seas off Wexford candidate SPA, which encompasses the majority of County Wexford's coastline.
- The Lady's Island Lake SPA, Tacumshin Lake SPA and Ballyteige Burrow SPA are all hydraulically connected to the Bridgetown GWB. However, given the scale of the Bridgetown GWB, location in the separate Ballyteigue-Bannow WFD Catchment, and distance to the Proposed Development, they are not considered further in this assessment.
- There are no NHAs within the ZoI that are hydraulically linked to the Proposed Development
- There is one pNHA which is potentially hydraulically linked to the Proposed Development
    - The Wexford Slobs and Harbour pNHA, located approximately 2.5km west of the Proposed Development and comprises the entire Milltown Rosslare_010 river waterbody downstream of Rosslare Town

The potential for significant effects from the Proposed Development on these Natura 2000 sites has been considered within Biodiversity chapters of this EIAR (Chapter 10: Terrestrial Ecology, Chapter 11: Benthic Ecology, Chapter 12: Fish, Shellfish and Turtle Ecology, Chapter 13: Marine Mammals, and Chapter 14: Ornithology), and the Screening for Appropriate Assessment and Natura Impact Statement which accompany this application.

9.3.12 OTHER DESIGNATED HABITATS

There are no waterbodies within the ZoI which are designated as Salmonid waters in accordance with the Salmonid Regulations (S.I. 293 / 1988). The closest such watercourse is the River Slaney

which is designated as a Salmonid water upstream of Edermine Bridge (approximately 2km south of Enniscorthy). This is hydrologically upgradient on the Proposed Development.

Shellfish areas are identified under the Shellfish Water Directive (2006/113/EC) of the European Parliament and of the Council of 12th December 2006 on the quality required of shellfish waters. The nearest Shellfish Area is the Wexford Harbour Outer located approximately 12km northwest of the Proposed Development.

Nutrient Sensitive Areas (NSA) are designated identified in accordance with the Urban Waste Water Treatment Directive 91/271/EEC, S.I. 254 / 2001, S.I. 440/2004 and S.I. 48/2010 of the European Parliament and of the Council of 12th December 2006 on the quality required of shellfish waters. The closest NSA is the Wexford Harbour CWB approximately 7.5km northwest.

9.3.13 FLOOD RISK

The Proposed Development was assessed in relation to the former Rosslare & Kilrane Local Area Plan (Wexford Co. Co., 2012) and Office of Public Works (OPW) Flood Maps which provide an indication of predicted Low, Medium, and High probability flood extents and information on past flood events.

The Proposed Development does not interact with any OPW arterial drainage schemes.

According to the Strategic Flood Risk Assessment (SFRA) which accompanies the Rosslare & Kilrane Local Area Plan (LAP), a large proportion of the current Rosslare Europort, including the terminal building, car parking area and ancillary developments are designated as Flood Zone 'A' (Figure 9.13). This describes an area where the probability of fluvial flooding is greater than 1% Annual Exceedance Probability (AEP), or 1-in-100-year return period or where the possibility of coastal flooding is greater than 0.5% Annual Exceedance Probability (AEP), or 1-in-200-year return period. There is also approximately 12ha of brownfield (reclaimed) land to the west of the port which is located in Flood Zone A.

Where a planning authority is considering proposals for new development in areas at risk of flooding that includes types of development that are vulnerable to flooding and that would generally be inappropriate, the planning authority must be satisfied that the development satisfies all the criteria of the Development Management Justification Test outlined in Box 5.1 of the Planning System and Flood Risk Management Guidelines (OPW, 2009). The Planning System and Flood Risk Management Guidelines set out classes of vulnerability for different types of development, as summarised in Table 9.7.

Table 9.7 Classification of vulnerability of different types of development (OPW, 2009)

Vulnerability class	Land uses and types of development which include*:
Highly vulnerable development (including essential infrastructure)	Garda, ambulance and fire stations and command centres required to be operational during flooding; Hospitals; Emergency access and egress points; Schools; Dwelling houses, student halls of residence and hostels; Residential institutions such as residential care homes, children's homes and social services homes; Caravans and mobile home parks; Dwelling houses designed, constructed or adapted for the elderly or, other people with impaired mobility; and Essential infrastructure, such as primary transport and utilities distribution, including electricity generating power stations and sub-stations, water and sewage treatment, and potential significant sources of pollution (SEVESO sites, IPPC sites, etc.) in the event of flooding.
Less vulnerable development	Buildings used for: retail, leisure, warehousing, commercial, industrial and non-residential institutions; Land and buildings used for holiday or short-let caravans and camping, subject to specific warning and evacuation plans; Land and buildings used for agriculture and forestry; Waste treatment (except landfill and hazardous waste); Mineral working and processing; and Local transport infrastructure.
Water-compatible development	Flood control infrastructure; Docks, marinas and wharves; Navigation facilities; Ship building, repairing and dismantling, dockside fish processing and refrigeration and compatible activities requiring a waterside location; Water-based recreation and tourism (excluding sleeping accommodation); Lifeguard and coastguard stations; Amenity open space, outdoor sports and recreation and essential facilities such as changing rooms; and Essential ancillary sleeping or residential accommodation for staff required by uses in this category (subject to a specific warning and evacuation plan).
*Uses not listed here should be considered on their own merits	

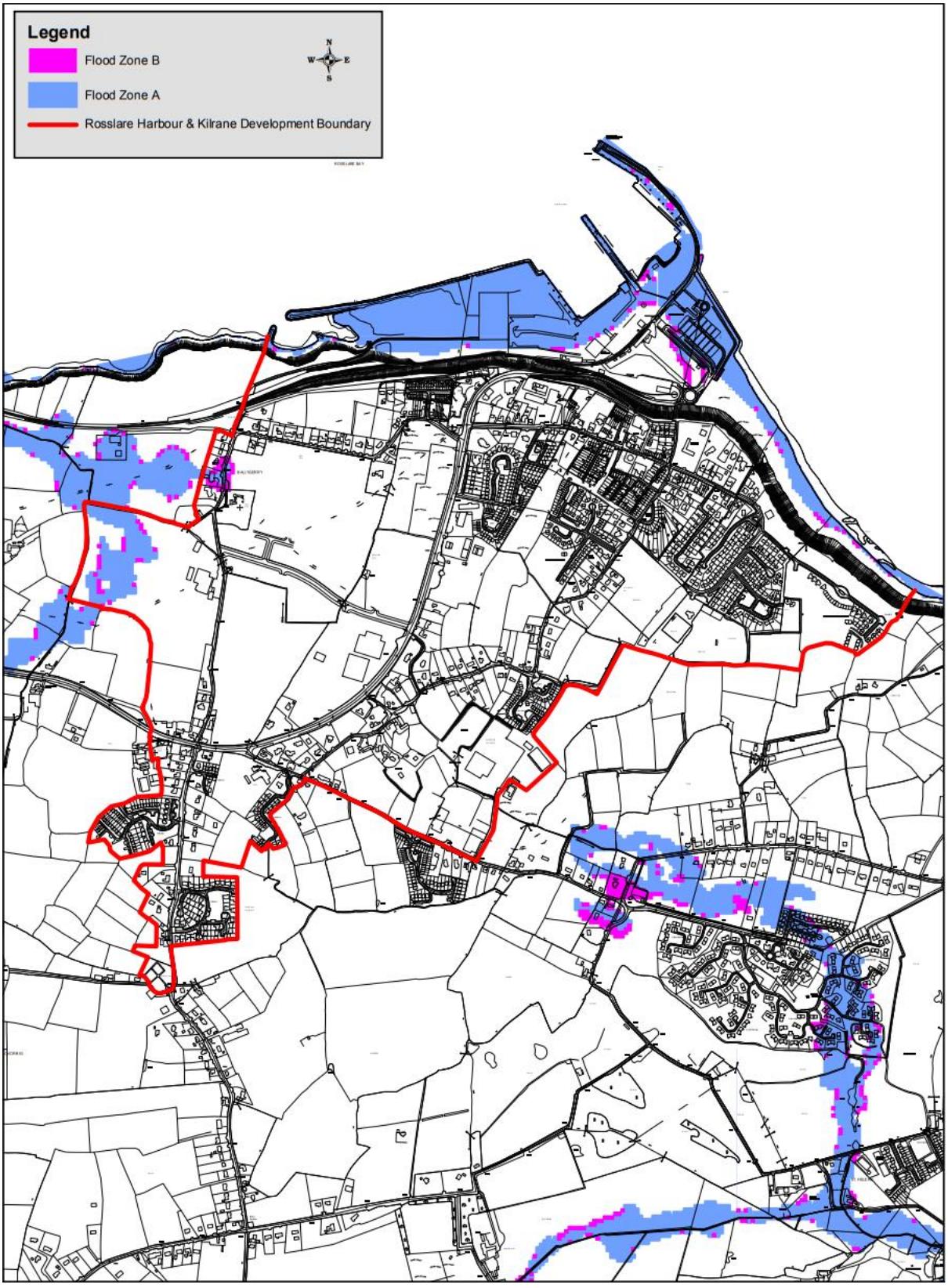

Figure 9.13: Rosslare and Kilrane Strategic Flood Risk Assessment zoning (Wexford Co. Co., 2012)

9.3.13.1 HISTORICAL FLOODING

The OPW gathers and collates data from reported flood events throughout the country. From a review of the OPW's National Flood Hazard Mapping database. The nearest events include:

- A single reported flood event at existing Rosslare Harbour in 2006, immediately adjacent to the Proposed Development boundary, which was caused by backing of high tides in surface water drains, with follow-up remedial works
- Several reported flood events shown to have occurred on the Milltown_Rosslare_010 watercourse, coinciding with the area demarcated in OPW mapping as having Medium probability flood risk

9.3.13.2 FLUVIAL FLOODING

OPW National Indicative Fluvial Mapping (NIFA) does not indicate any current risk of fluvial flooding at the Proposed Development. There are instances of Medium probability fluvial flooding (1% AEP), on downstream sections of the Milltown_Roslare_010 watercourse. The closest mapped section of flood risk on this watercourse is 2.3 km west of the Proposed Development.

This OPW's Catchment-based Flood Risk Assessment and Management (CFRAM) programme mapping for fluvial flooding indicates areas further downstream to be at risk of fluvial flooding, north-northwest of Rosslare town and the South Slob Channel (Figure 9.14).

Overall, existing fluvial flood risk is low due to the coastal setting and distance from any surface watercourses.

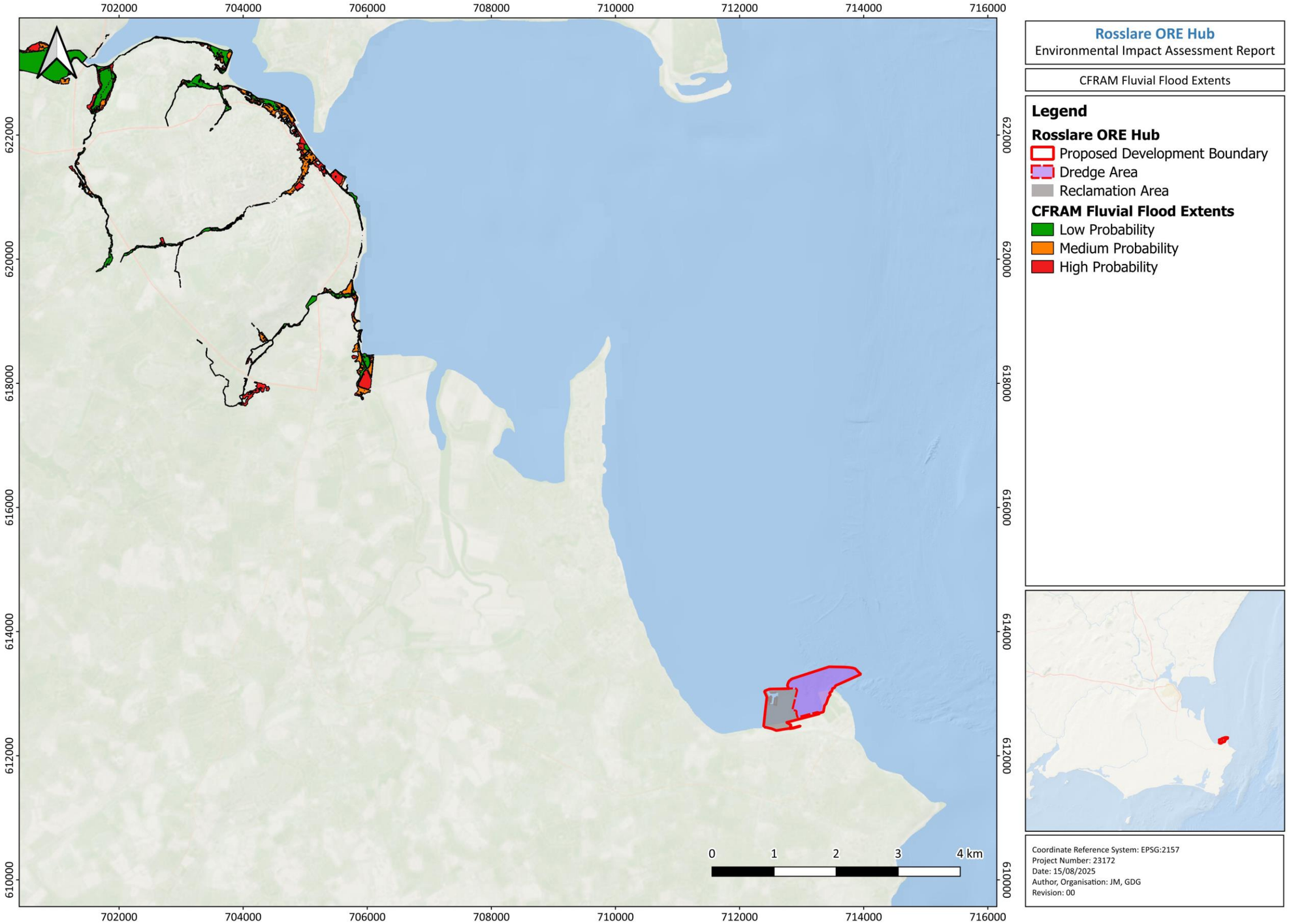

Figure 9.14: CFRAM fluvial food extents

9.3.13.3 PLUVIAL FLOODING

OPW Pluvial Flood Risk Assessment (PFRA) mapping indicates the Proposed Development is not currently at risk of pluvial flooding.

9.3.13.4 COASTAL FLOODING

OPW CFRAM coastal flood mapping does not indicate any risk of coastal flooding at the Proposed Development. There are, however, instances of high probability coastal flooding (10% AEP, 1-in-10-year return period) mapped further northwest along the County Wexford coastline. The closest area to the Proposed Development with high probability coastal flooding predicted is located approximately 2.6km northwest at Rosslare town (Figure 9.15).

According to the Strategic Flood Risk Assessment (SFRA) which accompanies the Rosslare & Kilrane Local Area Plan (LAP), a large proportion of the current Rosslare Europort, including the terminal building, car parking area and ancillary developments are designated as Flood Zone 'A' (Figure 9.13). This describes an area where the probability of coastal flooding is greater than 0.5% Annual Exceedance Probability (AEP), or 1-in-200-year return period and the possibility of fluvial flooding is greater than 1% Annual Exceedance Probability (AEP), or 1-in-100-year return. There is also approximately 12ha of brownfield (reclaimed) land to the west of the port which is located in Flood Zone A.

The Planning System and Flood Risk Management Planning Guidelines (Department of Environment, Heritage and Local Government/Office of Public Works, 2009) state that "only water-compatible development, such as docks and marinas, dockside activities that require a waterside location, amenity open space, outdoor sports and recreation, would be considered appropriate" in Flood Zone A. Table 3.2 of the PSFRMP Guidelines further states that "water-compatible development" is considered appropriate for all Flood Zones, including Flood Zone A, and therefore is not subject to the Justification Test.

The Proposed Development consists of 'docks and marinas' and 'dockside activities that require a waterside location' and is therefore classed as 'Water-compatible development'. As such, the Proposed Development is considered appropriate for development and therefore a Justification Test is not required.

The South Slob Channel and lower reaches of the Milltown_Rosslare_010 watercourse are identified as being more likely to be affected by coastal flooding (10% AEP), and are located greater than 7km from the Proposed Development.

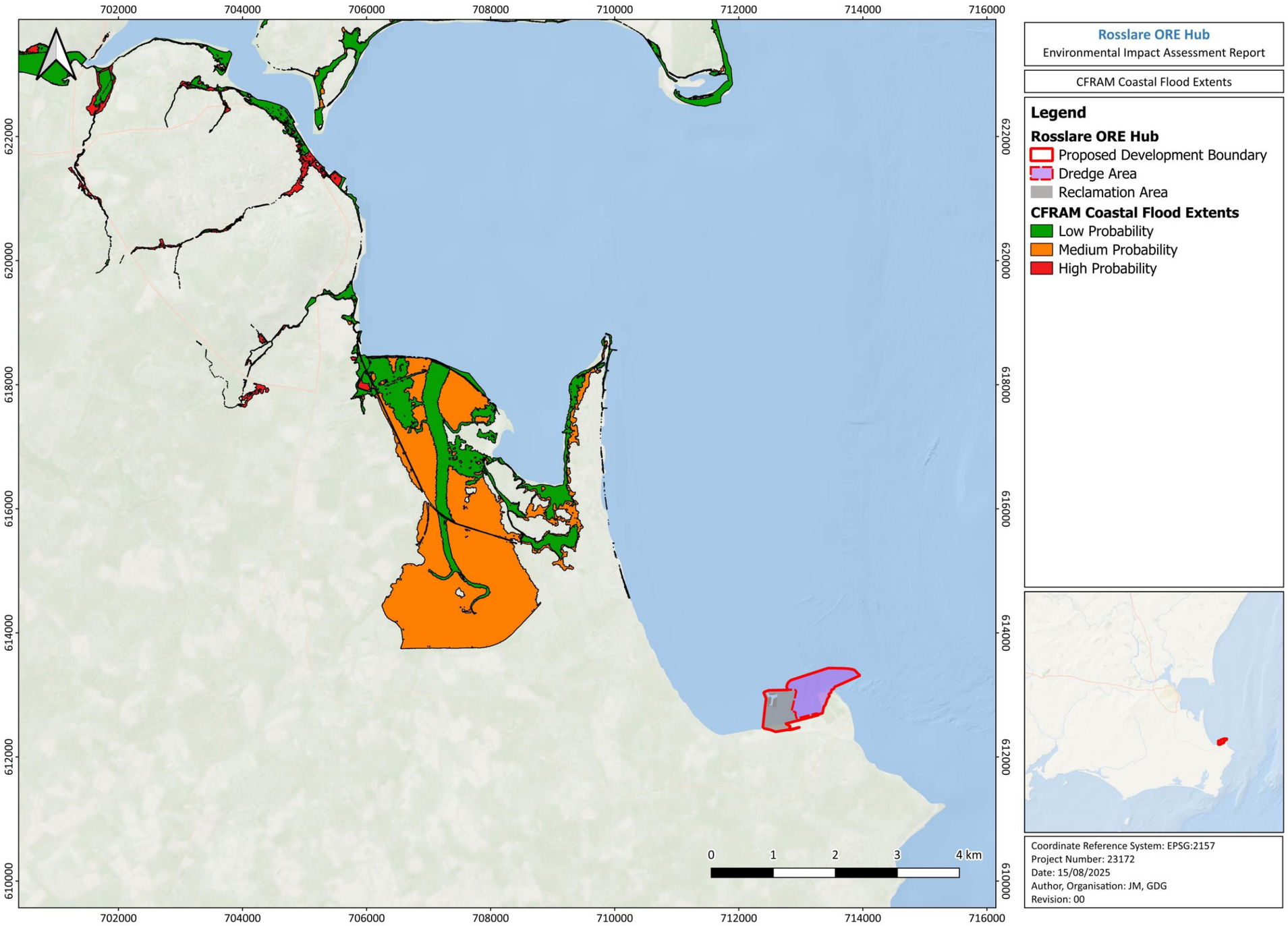

Figure 9.15: CFRAM coastal flood extents

9.3.13.5 GROUNDWATER FLOODING

A review of the GSI Maximum Historic Groundwater Flooding did not identify any groundwater flood risk areas, or previous groundwater flood events within the vicinity of the Proposed Development. No surface water flood risk areas, or previous surface water flood events within the vicinity of the Proposed Development which could lead to groundwater flooding, were identified. There is considered to be negligible risk of groundwater flooding, and it has not been considered further in this assessment.

9.3.14 SUMMARY OF BASELINE CONDITIONS

A review of desk study information on the Proposed Development indicates the following baseline conditions:

The Proposed Development is situated in the Forth_Commons_SC_010 WFD Subcatchment, at the southeastern extremity of the broader Slaney & Wexford Harbour WFD Catchment.

Regional hydrological flow direction is north and northwest towards the Lower Slaney Estuary and Wexford Harbour. Within the immediate vicinity of the Proposed Development, surface runoff will follow topographic gradients and discharge directly to the Southwestern Irish Sea.

A review of WFD waterbody assessments found the following:

- Water quality for the nearby Milltown Rosslare_010 stream achieves 'Moderate' status, and it is currently designated as under 'Review' with regards to meeting WFD environmental objectives by 2027. The latest Q-values for the stream are Q3-4, reflecting 'Moderate' biotic water quality.
- Coastal waterbodies range from 'Good' to 'Moderate' status. At the Proposed Development, Rosslare Harbour and the Southwestern Irish Sea (HAs 11;12) both currently achieve 'Good' water quality status. However, Wexford Harbour and the Southwestern Irish Sea (HAs 11;12) are designated as being 'at risk' of failing to meet environmental objectives.
- Current significant pressures which are affecting water quality status within surface waterbodies include; agriculture, domestic wastewater, urban wastewater and diffuse urban run-off
- There are no known groundwater quality issues at the Proposed Development. The underlying Bridgetown GWB currently achieves 'Good' status and is designated as 'Not at risk'.
- Rosslare Harbour is the only waterbody within the ZoI that is designated as a heavily modified water body (HMWB)
- There are no public or private drinking supplies within the vicinity of the Proposed Development
- Uisce Éireann records indicate an existing foul sewer main, 375mm precast concrete, with an outfall which discharges to Rosslare Harbour from beneath the existing Europort Terminal facility
- Rosslare Harbour WWTP is located approximately 450m to the southwest and discharges directly to the Milltown Roslare_010 stream and existing Rosslare Europort facility. However, Uisce Éireann reporting indicates this does not have an observable impact on the water quality.

- The closest licenced facility is the Bord Na Móna recycling waste facility (W0229-01) which is located in a separate hydrological catchment
- Rosslare Strand bathing water is located approximately 3km northwest of the Proposed Development. This bathing area is currently classified as having 'Excellent Water Quality'
- Marine water chemistry was assessed as part of the Benthic Ecology EIAR Technical Appendix 11 and is discussed in detail in Chapter 11. The results of the in-situ sampling and laboratory analysis are displayed in section 9.3.10 of this chapter.
- With regards to protected areas and designated habitats that may be impacted by the water environment:
    - There are four Special Areas of Conservation (SACs) which are potentially hydraulically linked to the Proposed Development: Slane River Valley SAC, Long Bank SAC, Blackwater Blank SAC and Carnsore Point SAC
    - There are two Special Protection Areas (SPAs) which are potentially hydraulically linked to the Proposed Development: Wexford Harbour and Slobs SPA and Raven SPA and one candidate SPA, the Seas off Wexford cSPA, which encompasses the majority of County Wexford's coastline
    - There is one pNHA, the Wexford Slobs and Harbour pNHA, located approximately 2.5km west of the Proposed Development which covers much of the downstream Milltown Roslare_010 waterbody
    - The nearest Shellfish Area is the Wexford Harbour Outer located approximately 12km northwest and the closest NSA is the Wexford Harbour CWB approximately 7.5km northwest
- With regards to flood risk:
    - According to the SFRA accompanying the Rosslare & Kilrane LAP, a large proportion of the existing Rosslare Europort and adjacent reclaimed land are located in Flood Zone A. As a result, a section of the Proposed Development will be located within this zone.
    - There are instances of Medium probability fluvial flooding 2.3km downstream sections on the Milltown_Rosslare_010 watercourse.
    - PFRA mapping indicates that the Proposed Development Boundary is not currently at risk of pluvial flooding.
    - OPW CFRAM coastal flood mapping does not indicate any risk of coastal flooding at the Proposed Development, albeit instances of high probability coastal flooding occurs 2.6km northwest at Rosslare town.
    - Historical records indicate a single flood event at Rosslare Harbour in 2006 which was caused by backing of high tides in surface water drains, with follow-up remedial works undertaken.

9.4 ASSESSMENT OF EFFECTS

9.4.1 "DO-NOTHING" SCENARIO

Should the Proposed Development not be constructed then there would be no changes made to existing land-use. The water quality and flood risk of sensitive receptors would remain subject to existing pressures outlined within the environmental baseline, as per Section 9.3.

Current operation of the existing small boat harbour and Rosslare Harbour would continue undisturbed.

9.4.2 PRIMARY MITIGATION

The assessment of effects described below includes consideration of integrated measures built into the project design (i.e. primary mitigation), which are intended to prevent, reduce and where possible offset any significant adverse effects on the water environment.

Primary mitigation measures built into the project design which are relevant to water quality and flood risk receptors are:

- Piling and blasting works during quay construction will be undertaken from a rockfill bund rather than directly through the water column to minimise direct sedimentation of the water column.
- The drainage system for permeable stone-fill at the ORE storage yard has been designed to ensure any potential contaminant that is released into the stone surface via percolating water is expected to be collected within and conveyed to an oil/silt interceptor via a perimeter drain lined with free draining stone and a geotextile layer in the trench.
- The perimeter drainage will comprise a perforated pipe drain to capture percolating water draining horizontally from the ORE storage yard.
- The underlying infilled dredged material will be sufficiently compacted and will limit the horizontal and vertical migration of percolating groundwater.
- A wastewater and foul drainage system will be incorporated into the Proposed Development to convey surface water and foul water captured in the development footprint to an outfall point and there will be treatment of wastewater prior to any discharge.
- The surface water drainage network has been designed to accommodate run-off generated from the road network and therefore minimise risk of contribution to fluvial flooding.
- A French drain will be situated along the toe of the existing slope at the south of the Proposed Development which is designed to capture the surface drainage from the vegetated slope and convey it westwards to a sea outfall. This minimises run-off from the slope onto the new access road to the Small Boat Harbour. This drain will be a perforated pipe surrounded by free draining stone and wrapped in geotextile to minimise loss of fines. No interceptor is proposed since this water is draining straight off the embankment and thus has extremely low risk of contamination.
- A proposed top level of +6.1m CD (+4.41m OD) for Berth 1 and +6.29m CD (+4.2m OD) for Berth 2 has been selected for design of the quay wall berth structures and reclamation area.

- A balance of volumes between dredging and reclamation was sought to avoid disposal of dredged material to sea and make most efficient beneficial use of the resulting dredge spoil; all dredge material will be used for the reclamation with none disposed of at sea.
- Disposal of dredge spoil within the reclamation area will be undertaken within bunded lagoons with minimal spillover of fines controlled through the use of a weirbox.
- Dredging works are expected to be carried out on a 24 hours per day, 7 days per week, working basis to reduce the overall duration of the works.
- No dredging is required to provide for marine access to the new small boat harbour, as it has been located in sufficiently deep water to avoid the requirement for capital dredging and to minimise future dredging requirements during operation.
- Maintenance dredging of the existing Rosslare Europort will not occur at the same time as capital dredging for the Proposed Development.

9.4.3 TERTIARY MITIGATION – CONSTRUCTION PHASE

Tertiary mitigation measures are imposed as a result of legislative requirements and/or standard sectoral practices. As these measures are standardised and covered by other forms of legislation or controls, they are not presented in extensive detail in the EIAR (IEMA, 2024).

The following tertiary mitigation measures based on standard sectoral practices shall be undertaken to minimise the risk of impacting on soil or groundwater quality within the receiving environment:

9.4.3.1 GENERAL CONSTRUCTION WORKS, EXCAVATIONS AND SITE CLEARANCE ACTIVITIES

A Water Quality Management Plan will be prepared prior to construction and implemented for the duration of the proposed construction works.

The following precautionary measures shall be undertaken to minimise the risk of impacting on water quality within the receiving environment:

- Sound design principles will be followed to adhere to relevant Irish guidelines and recognised international guidelines for best practice
- Temporary surface water management requirements will be identified prior to commencement of construction works
- Should drainage ditches or discharge of surface water from sumps be required during construction, a treatment system will be put in place (i.e. settlement skips etc.) to allow additional settlement of suspended solids entrained within storm water before discharging
- Whilst a major incident is highly unlikely to occur in circumstances where the mitigation measures are fully implemented, a major incident response plan will be outlined prior to construction

9.4.3.2 PILING

Pile installation operations have the potential to cause a temporary increase in suspended sediment due to disturbance causing the resuspension of sediments in the water column. All necessary mitigation measures adopted during construction will be outlined in greater details within the CEMP.

The following key relevant mitigation measures will be undertaken to ensure piling activities limit sedimentation and do not pollute the water column:

- A Piling Risk Assessment will be prepared in advance of construction works to assess the potential risk to water quality arising from piling activities
- A Construction Piling Method Statement will be prepared in advance of construction works and shall outline the appropriate precautionary measures to offset, or avoid, any potential sediment generating activities
- Erosion and sediment controls during construction to prevent sediment pollution will be implemented, i.e. silt fencing or other suitable barriers will be used at preferential surface flow paths to ensure sediment runoff does not discharge directly to waterbody receptors or drainage network
- Vibration monitoring will be undertaken to assess and minimise the soil disturbance, and subsequently the volumes of sediment particles available to entrainment within runoff, in the immediate vicinity of piling locations

9.4.3.3 DREDGING

A Dredging Management Plan will be prepared prior to construction.

In general, the following key relevant mitigation measures will apply to each dredging campaign to limit sedimentation of the water column:

- Loading will be conducted by a back-hoe dredger or trailing suction hopper dredger (TSHD)
- TSHD pumps will be switched off for up to 30 minutes while the drag head is being lifted and returned to the bottom as the dredger turns between successive lines of dredging to minimise the risk of entrainment
- No over-spilling from the vessel will be permitted while the dredging activity is being conducted within the Proposed Development Boundary
- A maximum fill limit for the dredger hopper will be outlined within the Drainage Management Plan to control suspended solids release at the dumping site. This will include for entrained water/wet weight.
- A full record of loading and dumping trucks and a record of the material being dumped will be maintained for each trip
- Additional Accident Prevention Procedure and Emergency Response Procedure documentation will be put in place prior to dredging commencement and outlined within the Dredging Management Plan

- Dredging loading operations will be designed to minimise the disturbance and escape of material at the seabed and during removal through the water column. Loading operations are of relatively short duration and intermittent in nature and the works area is limited.

9.4.3.4 CONCRETE WORKS DURING QUAYSIDE WALL AND BERTH CONSTRUCTION

The following precautionary measures shall be undertaken to minimise the risk of highly alkaline contaminants impacting on water quality during berth construction and general concrete works on site.

- Use of wet concrete and cement will be carefully controlled so as to minimise the risk of any material entering the water, particularly from shuttered structures or the washing of equipment. A barrier between the dust source and waterbody receptor will be erected during the breaking of concrete (associated with existing structure demolition).
- Concrete use and production shall adhere to control measures outlined in Guidance for Pollution Prevention (GPP5): Works and maintenance in or near water (DEFRA, 2018). Any on-site concrete production during berth construction will have the following mitigation measures:
    - Bunded designated concrete washout area
    - Closed circuit wheel wash
    - Siting of concrete mixing facilities such that there is no production within a minimum of 10m from the water environment
- Where concrete is emplaced under water or in tidal conditions, specific fast-setting mix will be mandated to limit segregation and any washout of fine material/alkaline components of cement. Use of chemical admixtures, a higher-than-normal fines content, or a higher cement content will be considered by the Main Contractor and addressed in the detailed CEMP.

9.4.3.5 OIL, FUEL AND CHEMICAL LEAKS/SPILLAGES

General water quality effects may arise associated with works machinery, and on-land operations including the temporary storage of construction materials, oils, fuels and chemicals. As such the potential for spillage or release of fuel oil and other dangerous substances will be mitigated through the following measures:

- The risk of water quality effects associated with works machinery, on-land operations, and leakages/spillages of fuels, oils, other chemicals and waste water, will be controlled through good site management and the adherence to codes and practices outlined prior to construction
    - This includes management and auditing procedures such as tool box talks, and adherence to permits, licences, certificates and planning permissions
- All potentially polluting liquids will be sited on an impervious base and stored within containers and/or fully bunded areas which are secured
    - The control measures in GPP2: Above Ground Oil Storage Tanks (DEFRA, 2017) and GPP26 “Safe storage – drums and intermediate bulk containers” (DEFRA, 2021) shall be implemented to ensure safe storage of oils and chemicals

    - The base and bund walls will be impermeable to the material stored and of adequate capacity
    - Storage of potentially polluting liquids will be conducted using the necessary equipment
- Safe operation of refuelling activities shall be in accordance with GPP 7 “Safe Storage – The safe operation of refuelling facilities” (DEFRA, 2011)
- Storage of hazardous material, oil and fuel containers will be distanced more 10m away from any watercourses
- A spillage control procedure and project specific Pollution Incident Response Plan will be in place prior to construction and all staff should be trained on how to deal with spillages.
- Emergency spill kits will be readily available on study area to protect against accidental release, leakage or spillage of potentially polluting substances
- All plant and equipment will be regularly inspected for any signs of damage leaks. A checklist must be present to make sure that the checks have been carried out

Mitigation will also make use of the existing Rosslare Europort Oil Spill Response Plan (OSRP), (Rosslare Europort, 2018) which was prepared in 2018 in accordance with the template “expanded contents of local authority Oil/HNS contingency plan annex 3” as issued to the Harbour Master by IRCG in February 2012. The preparation of an OSRP is a mandatory requirement (as per the Sea Pollution (Amendment) Act, 1999). As such OSRPs are standard practices and are not implemented to prevent adverse effects on European Sites.

It is the responsibility of the Port Operations team to update the existing Rosslare Europort OSRP ahead of construction and operation phases. This Port OSRP is designed to:

- Guide response personnel at Rosslare Europort through the process required to manage an Oil/HNS spill originating from operations within Harbour Limits
- Initiate an appropriate response to an Oil/HNS spill incident within Rosslare Europort and to set in motion the necessary actions to stop or minimise the pollution and to reduce its effects on the environment
- Act as a guide for the Harbour Master at Rosslare Europort, as to the actions and decisions that will be required in an incident response
- Describe the tiered response strategy that considers the spill risk associated with the operation; the nature of the hydrocarbons that could be spilt; the prevailing meteorological and hydrographic conditions and any environmental sensitivity of the surrounding area

A copy of each scheduled vessel Shipboard Marine Pollution Emergency Plan (SOPEP) is forwarded to the Harbour Master annually, or subsequent to a major update. Regulation 37 of MARPOL Annex I require that oil tankers of 150 gross tonnage and above and all ships of 400 gross tonnage and above carry an approved SOPEP.

There will be no planned release of potentially harmful substances from the survey vessels. Strict maritime regulations, normal vessel operating standards and precautions, compliant with all International Maritime Law and National Maritime Legislation, will ensure the risk of a release is low and no significant effects are predicted. In addition, all vessels used shall, as required by law, be MARPOL compliant and fully certified by the Maritime Safety Office (if required). Therefore, it is considered unlikely that there would be any occurrence of a pollution event that could directly or indirectly affect the marine environment.

In addition, the Rosslare Europort Harbour Master is on the circulation list of the Wexford County Council Coastal Pollution Plan. Close cooperation is maintained with the Marine Officer, Wexford County Council as the coastline is adjacent to the Harbour Limits.

With the above mitigation measures in place, it is anticipated that any accidental spillage, sediments, particulate matter, chemicals, fuels during works with the potential to have direct or indirect effect on the surrounding waterbodies will be successfully prevented.

9.4.3.6 WASTE LIQUIDS

The following mitigation measures are proposed to reduce or offset potential adverse effects on water quality due to accidental release or leakage of wastewater associated with temporary site facilities:

- Existing and proposed surface water drainage and discharge points will be mapped on a drainage layout. These will be noted on construction site plans and protected accordingly to ensure water bodies are not impacted from sediment and other pollutants using measures to intercept the pathway for such pollutants. Such measures will be set out prior to construction.
- Containerised waste facilities will be utilised at temporary works areas to prevent accidental release, leakage or spillage of potentially polluting wastewater
- Emergency spill kits will be readily available on study area to protect against accidental release, leakage or spillage of potentially polluting substances

9.4.4 TERTIARY MITIGATION - OPERATIONAL PHASE

The following tertiary mitigation measures will be implemented in full to reduce, avoid or offset the potential effects, in relation to operation of the different elements of the Proposed Development.

The operational phase will be subject to Rosslare Europort's Local Port Services Plan (LPS).

The LPS will be updated to include all new infrastructure within the Proposed Development and is supported by a comprehensive suite of Standard Operating Procedures (SOPs) providing mitigation of all environmental aspects identified and mechanisms to ensure effective implementation.

The risk to the Proposed Development from future climate change will require periodical updates and active management to ensure the Proposed Development remains resilient to future climate impacts.

9.4.4.1 OIL, FUEL AND CHEMICAL LEAKS/SPILLAGES

The ongoing operation of the port will involve the use of vehicle movement, machinery associated with landside ancillary works and high traffic of maritime vessels. This may cause the pollution of watercourses or waterbodies from accidental fuel or chemical compound leakages. Further leakages may also occur from temporary storage of renewables components, oils, chemical, fuel or materials storage.

As such the potential for spillage or release of fuel oil and other dangerous substances will be mitigated through the following measures during the operational phase:

- Leakages/spillages of fuels, oils, other chemicals and wastewater, will be controlled through good site management and the adherence to codes and practices outlined by the Port Operation team in the LPS. This includes management and auditing procedures such adherence to permits, licences, certificates and planning permissions.
- SOPs will be prepared for oil and chemical spill responses, waste handling and monitoring and maintenance of surface water interceptors. These will further include for transport, handling and storage of hazardous materials, ship cargo, dry bulk material, surface water runoff, fuelling and bunkering of vessels and ship discharges.
- All potentially polluting liquids will be sited on an impervious base and stored within containers and/or fully bunded areas which are secured
    - The control measures in GPP2: Above Ground Oil Storage Tanks (DEFRA, 2017) and GPP26 "Safe storage – drums and intermediate bulk containers" (2021) shall be implemented to ensure safe storage of oils and chemicals
    - The base and bund walls will be impermeable to the material stored and of adequate capacity
    - Storage of potentially polluting liquids will be conducted using the necessary equipment in accordance with the SEMP
- Safe operation of refuelling activities shall be in accordance with GPP 7 "Safe Storage – The safe operation of refuelling facilities" (DEFRA, 2011)
- Storage of hazardous material, oil and fuel containers will be distanced more 10m away from any watercourses
- A spillage control procedure and project specific Pollution Incident Response Plan will be in place and all staff should be trained on how to deal with spillages. This procedure will be outlined in the LPS.
- Emergency spill kits will be readily available on study area to protect against accidental release, leakage or spillage of potentially polluting substances
- All plant and equipment will be regularly inspected for any signs of damage leaks. A checklist must be present to make sure that the checks have been carried out.

Mitigation will also make use of the existing Rosslare Europort Oil Spill Response Plan (OSRP), (Rosslare Europort, 2018) which was prepared in 2018 in accordance with the template "expanded contents of local authority Oil/HNS contingency plan annex 3" as issued to the Harbour Master by Irish Coast Guards (IRCG) in February 2012. The preparation of an OSRP is a mandatory requirement (as per the Sea Pollution (Amendment) Act, 1999).

The OSRP will be updated by the Port Operation team ahead of the operational phase.

A copy of each scheduled vessel Shipboard Marine Pollution Emergency Plan (SOPEP) is forwarded to the Harbour Master annually, or subsequent to a major update. Regulation 37 of MARPOL Annex I require that oil tankers of 150 gross tonnage and above and all ships of 400 gross tonnage and above carry an approved SOPEP.

There will be no planned release of potentially harmful substances from the survey vessels. Strict maritime regulations, normal vessel operating standards and precautions, compliant with all International Maritime Law and National Maritime Legislation, will ensure the risk of a release is low and no significant effects are predicted. In addition, all vessels used shall, as required by law, be MARPOL compliant and fully certified by the Maritime Safety Office (if required). Therefore, it is considered unlikely that there would be any occurrence of a pollution event that could directly or indirectly affect the marine environment.

In addition, the Rosslare Europort Harbour Master is on the circulation list of the Wexford County Council Coastal Pollution Plan. Close cooperation is maintained with the Marine Officer, Wexford County Council as the coastline is adjacent to the Harbour Limits.

9.4.5 CONSTRUCTION PHASE EFFECTS

The major elements of the construction programme are outlined in Chapter 6: Project Description. In total, it is expected that construction work will span up to 24 months from commencement to completion, with multiple tasks ongoing in parallel.

This assessment accounts for the difference between onshore and offshore construction activities and which receptors they have the potential to affect, i.e. the difference between the imperceptible effect of onshore works on surface water receptors versus the physical impossibility of an effect from offshore works on surface water receptors.

The construction activities associated with the Proposed Development which could give rise to potential effects on water quality and flood risk are summarised as follows:

- Removal of existing building and marine structures
- Temporary site establishment
- Road construction and upgrades
- Construction plant, equipment & storage of materials
- Land reclamation and infill
- Quayside wall/berth construction

- Piling
- Blasting
- Dredging
- Excavation and earthworks
- Construction of rock armour revetment and placement of breakwater armour units
- Hard landscaping and surfacing

Temporary effects on water quality and flood risk have the potential to occur during the construction phase of the works.

The following key effects have been considered in this assessment:

- Increased suspended sediment levels due to the release of sediment runoff and plumes to the water column during activities such as demolition of buildings and structures, construction/upgrading of access roads, construction of rock armour revetment and placement of breakwater armour units, land reclamation and infill, piling, dredging and material dispersal, temporary site establishment, and excavations and earthworks
- Release of highly alkaline contaminants from concrete and cement during the demolition of buildings and structures, temporary site establishment, quayside wall and berth construction, hard landscaping and surfacing, and general concrete works
- General water quality effects associated with construction plant, maritime vessels, equipment and storage of materials, such as pollution of watercourses or waterbodies from accidental fuel or chemical compound leakages, or poor practices regarding other liquids on-site such as wastewater associated with temporary site facilities
- Increased potential for fluvial flooding due to creation of preferential pathway for runoff during construction and upgrading of access roads, and earthworks and excavations
- Increased risk of pluvial flooding due to increase in impermeable surfaces that contribute greater proportions of surface water run-off from hardstanding areas

A brief description and identification of the potential effects associated with key construction activities is provided below and summarised in Table 9.8. These activities are outlined in greater detail within Chapter 6: Project Description of this EIAR.

9.4.5.1 SITE CLEARANCE AND REMOVAL OF EXISTING BUILDING AND MARINE STRUCTURES

Decommissioning and removal of minor existing structures such as the sheds, steel plinths and anchors in the Small Boat Harbour are required to facilitate the construction of the new port facilities. This will include a small extent of localised breaking out of concrete using a rock breaker mounted on an excavator. Demolition of concrete structures has the potential to create highly alkaline dust which could find its way into waterbodies and pose a threat of pollution.

Surface water quality could also be impacted during the site clearance works through the generation of sediment plumes during site clearance by exposing soils/rubble to erosion by rainwater and drainage water run-off from the site.

Given the lack of direct hydrological connection, length of distances involved and low likelihood of impact, the magnitude of potential effects on surface watercourses, downstream transitional waterbodies and coastal bodies (Wexford Harbour and Rosslare Strand) is considered to be **negligible**, and the potential effects are judged to be **imperceptible**.

Despite proximity to the Rosslare Harbour and Southwestern Irish Sea coastal waterbodies, considering the low likelihood of deterioration in water quality, the magnitude of potential impact on water quality with respect to coastal waterbodies is considered to be **low adverse** and the potential effect is judged to be of **slight** significance.

9.4.5.2 TEMPORARY SITE ESTABLISHMENT

A temporary site compound will be constructed close to the eastern edge of the existing small boat harbour. Construction will include potential for generation of sediment runoff during intrusive works, wastewater associated with welfare facilities (water and foul connections) and cement pollution from heavy concrete blocks used in fencing.

Given the lack of direct hydrological connection, length of distances involved and low likelihood of impact, the magnitude of potential effects on surface watercourses, downstream transitional waterbodies and coastal bodies (Wexford Harbour and Rosslare Strand) is considered to be **negligible**, and the potential effects are judged to be **imperceptible**.

Despite proximity to the Rosslare Harbour and Southwestern Irish Sea coastal waterbodies, considering the low likelihood of deterioration in water quality, the magnitude of potential impact on water quality with respect to coastal waterbodies is considered to be **low adverse** and the potential effect is judged to be of **slight** significance.

9.4.5.3 ROAD CONSTRUCTION AND UPGRADES

Upgrades to internal road infrastructure and construction to the north side of the new access facility (where the replacement small boat harbour will be located).

Direct effects on waterbodies are expected to be minimal; however, construction works can give rise to mobilisation and release of sediments during excavation and exposure of unprotected soils, stockpiling, and the construction of road infrastructure and active travel link. This could potentially result in an increase in suspended sediment concentrations in run-off to waterbodies from the site.

There is also potential for increased fluvial flooding due to creation of preferential pathways for runoff during construction and upgrading of access roads.

Given the lack of direct hydrological connection, length of distances involved and low likelihood of impact, the magnitude of potential effects on surface watercourses, downstream transitional waterbodies and coastal bodies (Wexford Harbour and Rosslare Strand) is considered to be **negligible**, and the potential effects are judged to be **imperceptible**.

Despite proximity to the Rosslare Harbour and Southwestern Irish Sea coastal waterbodies, considering the low likelihood of deterioration in water quality, the magnitude of potential impact on water quality with respect to coastal waterbodies is considered to be **low adverse** and the potential effect is judged to be of **slight** significance.

9.4.5.4 CONSTRUCTION PLANT, MARITIME VESSELS, EQUIPMENT & STORAGE OF MATERIALS

The construction works will involve the use of construction machinery, equipment and maritime vehicle movement. This may cause the pollution of watercourses or waterbodies from accidental fuel or chemical compound leakages and sediment compaction/dispersal.

Further leakages may also occur from associated temporary storage of oil, chemical, fuel or construction materials storage and poor practices regarding other liquids on-site such as wastewater. Although the potential site compounds will not be sited immediately adjacent to the water body there is the potential for contaminants to drain into the harbour area and coastal waterbodies in the absence of mitigation.

Given the lack of direct hydrological connection, length of distances involved and low likelihood of impact, the magnitude of potential effects on surface watercourses, downstream transitional waterbodies and coastal bodies (Wexford Harbour and Rosslare Strand) is considered to be **negligible**, and the potential effects are judged to be **imperceptible**.

Although there is the potential for direct pollution to affect water quality in adjacent coastal waterbodies, following primary and tertiary mitigation measures outlined in Sections 9.4.2 and 9.4.3 there is a low likelihood of deterioration in water quality, and so the magnitude of potential impact on water quality with respect to coastal waterbodies is considered to be **low adverse** and the potential effect is judged to be **slight** significance.

9.4.5.5 CONSTRUCTION OF ROCK ARMOUR REVETMENT AND PLACEMENT OF BREAKWATER ARMOUR UNITS

The rock armour revetments will be installed and breakwater armour united placed in-situ. These will partially surround the reclaimed area and provide the boundary protection for the proposed small boat harbour. They will be designed to minimise effects to the existing wave climate and local hydrodynamic regime.

The construction process for rock armour revetments and breakwater armours may cause temporary suspension and release of sediments within the water column.

Given the lack of direct hydrological connection, length of distances involved and low likelihood of impact, the magnitude of potential effects on surface watercourses, downstream transitional waterbodies and coastal bodies (Wexford Harbour and Rosslare Strand) is considered to be **negligible**, and the potential effects are judged to be **imperceptible**.

Despite proximity to the Rosslare Harbour and Southwestern Irish Sea coastal waterbodies, considering the low likelihood of deterioration in water quality, the magnitude of potential impact on water quality with respect to coastal waterbodies is considered to be **low adverse** and the potential effect is judged to be of **slight** significance.

9.4.5.6 LAND RECLAMATION AND INFILL

A phased approach is anticipated to infilling and reclamation, consisting of imported rockfill placed along the boundary and dredged material that will be dozed or moved by excavator and dumper into the remaining reclamation zone through sequenced placement of the dredged infill.

The dispersion of dredged material will occur during the reclamation process. If not adequately mitigated, this may cause increases in the suspended sediment totals within the water column. Given the lack of direct hydrological connection, length of distances involved and low likelihood of impact, the magnitude of potential effects on surface watercourses, downstream transitional waterbodies and coastal bodies (Wexford Harbour and Rosslare Strand) is considered to be **negligible**, and the potential effects are judged to be **imperceptible**.

Despite proximity to the Rosslare Harbour and Southwestern Irish Sea coastal waterbodies, considering the low likelihood of deterioration in water quality, the magnitude of potential impact on water quality with respect to coastal waterbodies is considered to be **low adverse** and the potential effect is judged to be of **slight** significance.

9.4.5.7 QUAYSIDE WALL/BERTH CONSTRUCTION

As described in Chapter 6, the Proposed Development will include the construction of two ORE berths and associated quays.

A significant amount of concrete works are required at ORE 1 and ORE 2 berths as they are constructed from a suspended concrete deck resting on tubular steel piles filled with concrete. The open piled quay structures will comprise a composite concrete deck slab (precast and in situ concrete elements) which will be supported on steel tubular piles installed in a grid pattern. ORE Berth 1 will include a revetment. Concrete will be poured in-situ during construction. Precast structures will be filled with reinforced concrete. Steel combi-walls will have concrete capping beams and any cofferdam voids be filled with reinforced concrete. Fresh concrete and cement is highly alkaline and therefore will affect water quality (particularly in terms of pH) if washed into the adjacent waterbody.

Given the lack of direct hydrological connection, length of distances involved and low likelihood of impact, the magnitude of potential effects on surface watercourses, downstream transitional waterbodies and coastal bodies (Wexford Harbour and Rosslare Strand) is considered to be **negligible**, and the potential effects are judged to be **imperceptible**.

Although there is the potential for fresh concrete to affect water quality if washed into the adjacent waterbody, following primary and tertiary mitigation measures outlined in Sections 9.4.2 and 9.4.3 there is a low likelihood of deterioration in water quality, and so the magnitude of potential impact on water quality with respect to coastal waterbodies is considered to be **low adverse** and the potential effect is judged to be **slight** significance.

9.4.5.8 PILING AND BLASTING

Piling works are required to construct the two main ORE quays as well as provide facilities in the small boat harbour for fishing quay, berths and pontoon restraints. The extent of piling and methodology for construction is outlined in Chapter 6: Project Description.

Pile installation operations include tubular steel piling, infill sheet piles and combi wall piling at the ORE Berths, and steel sheet piling at the small boat harbour, CTV berths and pontoon restraints. Sheet piling will also be used to reinforce the existing foul sewer main at ORE Berth 2, which will otherwise remain unchanged.

Piling has the potential to cause a temporary increase in suspended sediment due to disturbance of the materials causing the resuspension of sediments in the water column - leading to the localised reduction in water quality. As noted in Chapter 6, piling during quay construction will be undertaken from a rockfill bund rather than directly through the water column to minimise direct sedimentation of the water column.

Small scale blasting may be required to facilitate the short lengths of driven sheet piles to connect between the main bearing piles during quay construction. The line of the retaining wall along the face of the quay would be pre-drilled and blasted using explosives to fracture the underlying rock. This could potentially introduce minor amounts of nitrate contamination to the adjacent coastal waterbody.

Given the lack of direct hydrological connection, length of distances involved and low likelihood of impact, the magnitude of potential effects on surface watercourses, downstream transitional waterbodies and coastal bodies (Wexford Harbour and Rosslare Strand) is considered to be **negligible**, and the potential effects are judged to be **imperceptible**.

Despite proximity to Rosslare Harbour and Southwestern Irish Sea coastal waterbodies, considering the low likelihood of deterioration in water quality, the magnitude of potential impact from sediment run-off on water quality with respect to coastal waterbodies is considered to be **low adverse** and the potential effect is judged to be **slight** significance.

Despite proximity to Rosslare Harbour and Southwestern Irish Sea coastal waterbodies, considering the low likelihood of deterioration in water quality, the magnitude of potential impact from nitrate pollution associated with blasting on water quality with respect to coastal waterbodies is considered to be **low adverse** and the potential effect is judged to be of **slight** significance.

9.4.5.9 DREDGING AND MATERIAL DISPERSION

The total development area, or Project Development Boundary, lies largely within the maritime area and includes a considerable portion of dredge area. Dredging will be carried out to achieve water

depths of -12 metres Chart Datum (mCD) in the berth pockets and -10 mCD in the approach channel. The total dredged volume, considering over-dredged allowances, is approximately 1,400,000m^3. As such, significant amounts of dredge material will be removed and deposited during dredging activities and therefore have the potential to negatively impact the water column if not mitigated appropriately.

The dispersion of dredged material will occur during the dredging works. Therefore, initial dredging works will cause temporary suspension and release of sediments at the loading sites and dumping/dispersal of sediments will also give rise to temporary sediment plumes. A full description of the potential extent, distribution and concentration of dispersed dredged material is available in EIAR Technical Appendix 8: Coastal Processes.

There is also a potential risk of fuel leakages associated with the operation of the dredging maritime vessels.

Given the lack of direct hydrological connection, length of distances involved and low likelihood of impact, the magnitude of potential effects on surface watercourses, downstream transitional waterbodies and coastal bodies (Wexford Harbour and Rosslare Strand) is considered to be **negligible**, and the potential effects are judged to be **imperceptible**.

Due to the control of sedimentation levels in the water column from reclamation area infilling through the use of the bunded lagoon and weirbox, the magnitude of potential impact on water quality with respect to the Rosslare Harbour and Southwestern Irish Sea coastal waterbodies is considered to be **low adverse** and the potential effect is judged to be of **slight** significance.

9.4.5.10 EXCAVATION AND EARTHWORKS

A small extent of excavation around the northern side of the cliff face adjacent to the small boat harbour is required to tie-in with the infilled levels from reclamation. General earthworks will be required to re-handle dredged spoil as it is deposited into the reclamation lagoons. This material will be re-handled by bulldozers and wide tracked excavators.

Excavation and earthworks activities during the construction phase have the potential to generate increased suspended sediment levels from sediment runoff during soil stripping and topsoil removal.

Given the lack of direct hydrological connection, length of distances involved and low likelihood of impact, the magnitude of potential effects on surface watercourses, downstream transitional waterbodies and coastal bodies (Wexford Harbour and Rosslare Strand) is considered to be **negligible**, and the potential effects are judged to be **imperceptible**.

Despite proximity to the Rosslare Harbour and Southwestern Irish Sea coastal waterbodies, considering the low likelihood of deterioration in water quality, the magnitude of potential impact on water quality with respect to coastal waterbodies is considered to be **low adverse** and the potential effect is judged to be of **slight** significance.

9.4.5.11 HARD LANDSCAPING AND SURFACING

Hard landscaping and surfacing will be required on-site, for example surfacing of the port storage yard after reclamation and berth construction. An increase in the area of impermeable surfaces may

contribute to increased proportions of surface water run-off and pluvial flooding within hardstanding areas of the Proposed Development, in the absence of appropriate mitigation through drainage.

The use of fresh concrete and cement may produce runoff which is highly alkaline and therefore will affect water quality if washed into the adjacent waterbody.

Given the lack of direct hydrological connection, length of distances involved and low likelihood of impact, the magnitude of potential effects on surface watercourses, downstream transitional waterbodies and coastal bodies (Wexford Harbour and Rosslare Strand) is considered to be **negligible**, and the potential effects are judged to be **imperceptible**.

Despite proximity to the Rosslare Harbour and Southwestern Irish Sea coastal waterbodies, considering the low likelihood of deterioration in water quality, the magnitude of potential impact on water quality with respect to coastal waterbodies is considered to be **low adverse** and the potential effect is judged to be of **slight** significance.

9.4.6 OPERATIONAL PHASE EFFECTS

The operational phase effects associated with the Proposed Development, such as buildings/structures, roads, berths and associated marine berths and landside works areas, will represent an increase in the wider port activities. These associated effects are well understood and managed within the current Rosslare Harbour operational and maintenance procedures.

As before, this assessment accounts for the difference between onshore and offshore operational activities and which receptors they have the potential to affect, i.e. the difference between the imperceptible effect of onshore activities on surface water receptors versus the physical impossibility of an effect from offshore activities on surface water receptors.

Long-term effects on water quality and flood risk have the potential to occur throughout the operation phase of the Rosslare Europort ORE Hub.

The following key effects have been considered in this assessment:

- Increased suspended sediment levels due to port operations including number and size of vessels and ongoing maintenance dredging and associated sediment dispersal to facilitate maritime access
- General effects on water quality arising from contaminants percolating through the permeable stone-fill used to construct the ORE storage yard and into sensitive waterbodies
- General effects on water quality associated with maritime vessels, LoLo and RoRo activities, and on-land operations, including the temporary storage of renewables components, oils, fuels, and chemicals
- General effects on water quality associated with wastewater releases associated with the operation and maintenance of surface water and foul drainage systems.

- Surface water drainage installed in RoRo hardstand areas and the reconfigured road network facilitating potential pathways for a wide range of contaminants arising from general port operations to waterbodies
- Increased potential for fluvial flooding due to creation of preferential pathway for runoff via access roads
- Increased risk of pluvial flooding due to impermeable surfaces that contribute greater proportions of surface water run-off from hardstanding areas
- Increased risk of coastal flooding due to tidal inundation and long-term changes in sea level associated with climate change
- In addition to normal day-to-day port activities and potential impact on water quality, any long-term hydromorphological and hydrodynamic effects, associated with the operation of coastal and bankside structures, have been assessed based on the coastal process modelling in Chapter 8: Coastal Processes of this EIAR.

A description of the effects associated with key operational activities is provided below. These activities are outlined in greater detail within Chapter 6: Project Description.

9.4.6.1 PERMEABLE SURFACING

The ORE yard is expected to consolidate after construction as the reclaimed dredged spoil becomes compacted and consolidates over time, with consolidation aided by use of vertical band drains and surcharge loading.

As such, there is potential for effects on water quality arising from contaminants percolating through the permeable stone-fill and band drains used during reclamation and infill and construction of the ORE storage yard, into sensitive waterbodies during the operational phase. However, the underlying infilled dredging material will be sufficiently compacted and will limit the horizontal and vertical migration of percolating groundwater.

Additionally, although the band drains represent a potential pathway for contaminants from the surface through the reclamation area, the drainage system for permeable stone-fill at the ORE storage yard has been designed to ensure any potential contaminant that is released into the stone surface via percolating water is expected to be collected within and conveyed to an oil/silt interceptor.

The perimeter drainage will comprise a perforated pipe drain to capture percolating water draining horizontally from the ORE storage yard. This perimeter drain ranges from 225mm diameter up to 450mm diameter with free draining stone surround and geotextile liner in the trench. All the perimeter drains run to collector chamber points and run through oil/silt interceptors before discharging to the sea. The level of the drain is set to be maintained above Highest Astronomical Tide (HAT) level so that incoming salt water at high tides is not typically picked up and conveyed through these perimeter drains. This minimises the risk of high tide interacting with any potential contaminant in the perforated perimeter drain and ensures that any potential contaminant is conveyed to the interceptors.

The potential impact upon all categories of waterbodies has been assessed and because of primary mitigation measures associated with permitter drainage and use of oil/silt interceptors for contaminants, this is considered to have been reduced by the design process. It is therefore judged to have a **negligible** impact, and the potential effect is judged to be **imperceptible**.

9.4.6.2 VEHICLE MOVEMENT, MARITIME VESSELS, AND STORAGE OF MATERIALS

The ongoing operation of the port will involve the use of vehicle movement, machinery associated with landside works, Lift On Lift Off (LoLo) and Roll On Roll Off (RoRo) activities, and high traffic of maritime vessels. This may cause the pollution of watercourses or waterbodies from accidental fuel or chemical compound leakages.

Further leakages may also occur from temporary storage of renewables components, oils, chemical, fuel or materials storage. Although the site compounds will not be sited immediately adjacent to the water body there is the potential for contaminants to drain into the harbour area and coastal waterbodies in the absence of mitigation. The drainage system described in Section 9.4.3.1 will also ensure that any residual potential contamination from oils, chemicals, fuel or contaminant runoff from stored materials that is released into the stone surface via percolating water is expected to be collected within and conveyed to an oil/silt interceptor.

Given the lack of direct hydrological connection, length of distances involved and low likelihood of impact, the magnitude of potential effects on surface watercourses, downstream transitional waterbodies and coastal bodies (Wexford Harbour and Rosslare Strand) is considered to be **negligible**, and the potential effects are judged to be **imperceptible**.

Although there is the potential for fresh concrete to affect water quality if washed into the adjacent waterbody, following primary and tertiary mitigation measures outlined in Sections 9.4.2 and 9.4.3 there is a low likelihood of deterioration in water quality, and so the magnitude of potential impact on water quality with respect to coastal waterbodies is considered to be **low adverse** and the potential effect is judged to be **slight** significance.

9.4.6.3 WASTEWATER AND FOUL DRAINAGE

There are two main potential effects of wastewater and surface water drainage during the operational phase of the Proposed Development. Firstly, the potential effects on water quality due to wastewater releases and, secondly, the potential effects due to surface water drains installed in new hardstand areas providing potential pathways for a wide range of contaminants arising from general port operations.

A wastewater and foul drainage system will be incorporated into the Proposed Development to convey surface water and foul water captured in the development footprint to an outfall point. There will also be treatment of wastewater prior to any discharge. Foul water from the ORE development will be pumped into a pressure main, along the new access road, away from the new ORE development area to the existing foul pumping station at Terminal 7, currently under the control of Iarnród Éireann. From there, the foul water flows westwards by gravity towards the Rosslare WWTP in Uisce Éireann pipework for treatment and disposal.

The potential impact upon all categories of waterbodies has been assessed and because of primary mitigation measures associated with construction of a suitable wastewater and foul sewer network outlined within Chapter 6: Project Description, this is considered to have been reduced by the design process. It is therefore judged to have a **negligible** impact, and the potential effect is judged to be **imperceptible**.

9.4.6.4 ACCESS ROAD AND INTERNAL TRACKS

There is increased potential for fluvial flooding due to the creation of preferential pathway for runoff via construction of access roads and tracks within the Proposed Development. This could generate increased volumes of overland flow during periods of high rainfall intensity and storm events. The reconfigured road network may also provide potential pathways for a wide range of contaminants arising from general port operations which could negatively impact water quality. The surface water drainage network has been designed to accommodate run-off generated from the road network and therefore minimise risk of contribution to fluvial flooding.

In addition, a French drain will be situated along the toe of the existing slope at the south of the Proposed Development which is designed to capture the surface drainage from the vegetated slope and convey it westwards to a sea outfall. This minimises run-off from the slope onto the new access road to the Small Boat Harbour. This drain will be a perforated pipe surrounded by free draining stone and wrapped in geotextile to minimise loss of fines. No interceptor is proposed since this water is draining straight off the embankment and thus has extremely low risk of contamination.

With regard to impact of climate change on fluvial flood risk, the design has taken this into account and applied significant design mitigation and will maintain management plans to mitigate this risk. Specific construction and operational stage impacts for fluvial flooding, and integrated measures built into the project design are detailed within Chapter 24: Climate.

The potential impact has been assessed for all waterbodies and due to a combination of distances involved and integrated measures built into the project design, such as the implementation of a road network drainage system as outlined within Chapter 6: Project Description, this is considered to have been reduced by the design process and is therefore judged to have a **negligible** impact and the potential effect is judged to be **imperceptible**.

9.4.6.5 HARDSTANDING AND OTHER IMPERMEABLE SURFACING

Use of impermeable surfaces may contribute to increased proportions of surface water run-off and pluvial flooding within hardstanding areas of the Proposed Development, in the absence of appropriate mitigation through drainage. This could generate increased volumes of overland flow during periods of high rainfall intensity and storm events.

The surface water drainage network within the Proposed Development has been designed to accommodate run-off generated from precipitation events and minimise risk of pluvial flooding. Local rainfall data from Met Eireann has been used to design the surface water drainage network taking into consideration the following:

- A 1 in 50-year rainfall storm event and coincident MHWS tidal event

- A 1 in 20-year joint rainfall storm and tidal event
- Storm duration of 15 minutes for calculation of rainfall intensity
- Rainfall depths for durations and return periods to be taken from Met Eireann Depth Duration Frequency (DDF) model 2023
- To slow the influx of water to interceptors and pipework, temporary surface ponding of less than 20mm depth is acceptable at gullies and drainage lines for a predicted maximum duration of 5 minutes during extreme storm events of 15-minute duration intensity
- All storm drainage will be required to pass through suitably sized interceptors before discharging into the sea

With regard to impact of climate change on pluvial flood risk, the design has taken this into account and applied significant design mitigation and will maintain management plans to mitigate this risk. Specific construction and operational stage impacts for pluvial flooding, and integrated measures built into the project design are detailed within Chapter 24: Climate.

The potential impact has been assessed for all waterbodies and because of integrated measures built into the project design as outlined above and within Chapter 6: Project Description, this is considered to have been reduced by the design process and is therefore judged to have a **negligible** impact and the potential effect is judged to be **imperceptible**.

9.4.6.6 COASTAL FLOODING OF MARINE INFRASTRUCTURE

Given the location of the Proposed Development, coastal flood risk due to sea level rise and wave overtopping is considered a hazard. The design team have considered this within the design and reduced the sensitivity of the assets within the Proposed Development by primary (i.e. engineering design) and tertiary (i.e. management plans) mitigation measures. This includes the height of the quay, which is above the high-end future scenario (or RCP8.5) of 1m of sea level rise projected by the OPW from the current sea level. The quay deck is designed for a lowest elevation at +4.2mOD (Malin). The current highest astronomical tide (HAT) level, which is the highest tide predicted to occur at a specific location, is +0.9mOD. With this taken into consideration the quay can be considered to have an additional 3.3m of freeboard at HAT, which is significantly above the projected sea level rises for the high-end future scenarios.

The High-End Future Scenario (HEFS) maps represent a projected future scenario for the end of century (circa 2100) and include allowances for projected future changes in sea levels and glacial isostatic adjustment (GIA).

A management plan will be put in place for the operational stage to ensure that in the event of a tidal or storm event, which has the potential to impact of the materials stored at the hub, any sensitive elements are removed or stored in a suitable manner to protect them.

In addition, the drainage risk calculations include an additional 30% for future climate change, which is in line with high-end future scenarios for climate change (RCP8.5). The management plan will also include a procedure for when the car parks will require closure due to potential for overtopping.

While the exposure of the Proposed Development to sea level rise and tidal events will increase with climate change resulting in a high exposure, the combination of primary and tertiary mitigation limits ensure the sensitivity remains low, i.e. an adverse event that can be absorbed by taking business continuity actions, as the project is aware of the likely increasing future exposure and has adapted to it.

The potential impact of tidal inundation and long-term sea level rise has been assessed for all waterbodies. Due to the integrated measures built into the project design as outlined above, this is considered to have been reduced by the design process and is therefore judged to have a **negligible** impact and the potential effect is judged to be **imperceptible**.

9.4.7 CUMULATIVE EFFECTS AND OTHER INTERACTIONS

9.4.7.1 CUMULATIVE EFFECTS

Potential cumulative effects may arise from the Proposed Development when combined with other existing and/or approved projects where the zones of influence overlap. In accordance with the EPA Guidelines (2022), existing and/or approved projects with the potential for cumulative effects have been identified. These include projects within the Rosslare Europort Masterplan area, those located outside but proximal to the Proposed Development and those offshore projects which located a greater distance from the Rosslare Europort entirely. A summary table of all projects, with the scale and nature of development, is provided in Chapter 25: Interactions.

For the purpose of water quality, the following developments may give rise to cumulative effects in conjunction with the Proposed Development:

Projects within the Rosslare Europort Masterplan area:

- Permission for an extension to the existing Berth 3, the replacement of the existing linkspan at Berth 3 with a new linkspan and support structures, and the demolition and removal of the existing Berth 4 linkspan within Rosslare Europort (Planning ref: 20211672)
- Permission for a new main access road, roundabout internal road and freight entrance plaza. Construction completed but operational overlap (Planning ref: 20200725)

Projects which overlap with, or are entirely outside of, the Rosslare Europort Masterplan area:

- N25 Rosslare Europort Access Road. Granted in Q3 of 2023. The development progressed from Phase 4 (Statutory Processes) to Phase 5 (Enabling and Procurement) in Q2 of 2024. On completion of Phase 5, the project will progress to Phase 6 (Construction and Implementation), (Planning ref: 314015).
- Rosslare Coastal Erosion and Flood Relief Scheme. The scheme is currently in Stage 1 Options Assessment, Scheme Development and Preliminary Design. Stage 4 Construction is anticipated Q4 2027 to Q1 2029.

Offshore projects which are of greater distance outside the Rosslare Europort area:

- Maintenance dredging at Rosslare Europort and Ballygeary Harbour, Co. Wexford (Planning ref: S0016-02).

9.4.7.2 INTERACTIONS WITH OTHER DISCIPLINES

The effects on water quality and flood risk, and the overall significance of effect, also considers the potential for interactions with other environmental factors assessed within this EIAR. For example, Chapter 7: Soils, Geology, Hydrogeology and Contamination, Chapter 8: Coastal Processes and Chapter 11: Benthic Ecology.

- There is strong interaction between Chapter 7 and the potential effects on water quality, for example: identifying an environmental baseline for contamination within soils and the geological environment which may contribute to the physico-chemical conditions of waterbodies
- Coastal processes have a strong interaction with water quality and flood risk. Effects identified within the Chapter 8 have informed the impact of the project on the supporting physico-chemical conditions of waterbodies in addition to the hydromorphological and hydrodynamic processes such as tidal levels, wave action and sea levels to inform flooding risk.
- Chapter 11 further considers the effects of water quality on the biological elements, particularly benthic ecology, and how the supporting physico-chemical and hydromorphological elements of the water environment can impact on the biology

There are no transboundary effects likely to occur with respect to water quality and flood risk as a result of the Proposed Development.

9.4.8 SUMMARY OF EFFECTS

The potential effects of the construction and operation of Proposed Development on the receiving hydrological environment are discussed from Section 9.4.1 to Section 9.4.4. Each effect has been assigned a ranking of Importance and Magnitude (based on the respective receptor sensitivity and criteria for assessing magnitude given in Table 9.2 and Table 9.3). Significance has been assessed using the methodology described in Section 9.2, whereby the significance of the effect is determined by comparing the character of the predicted effect to the sensitivity of the receiving environment, as outlined in Table 9.8.

Table 9.8: Summary of pre-mitigation effects during the construction and operation phases of the Proposed Development

Receptor	Potential Effects	Importance (sensitivity)	Magnitude	Significance
Construction Phase				
Surface watercourses, streams and rivers (i.e. Miltown_Roslare_020)	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff and plumes generated during demolition of buildings and structures.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff generated during construction and upgrading of internal access roads.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff generated during temporary site establishment.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff generated during soil stripping and topsoil removal associated with excavations and earthworks.	High	Negligible	Imperceptible

Receptor	Potential Effects	Importance (sensitivity)	Magnitude	Significance
	Potential adverse effects on water quality through release of highly alkaline contaminants from concrete and cement during demolition of buildings and structures.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through release of highly alkaline contaminants from concrete and cement during temporary site establishment.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through release of highly alkaline contaminants from concrete and cement during hard landscaping, surfacing and general concrete works.	High	Negligible	Imperceptible
	Potential adverse effects on water quality due to accidental fuel or chemical compound leakages from construction plant, equipment & storage of materials polluting waterbodies.	High	Negligible	Imperceptible
	Potential adverse effects on water quality due to accidental release or leakage of other liquids on-site such as wastewater associated with temporary site facilities.	High	Negligible	Imperceptible
Transitional waterbodies (i.e. South Slob Channel)	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff and plumes generated during demolition of buildings and structures.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff generated during construction and upgrading of internal access roads.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through increased suspended sediment levels from sediment	High	Negligible	Imperceptible

Receptor	Potential Effects	Importance (sensitivity)	Magnitude	Significance
	plumes generated during construction of rock armour revetment and placement of breakwater armour units.			
	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff and plumes generated during land reclamation and infill.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff and plumes generated during piling.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through nitrate concentrations released by blasting during tubular piling preparation.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through increased suspended sediment levels from sediment plumes generated during dredging and material dispersal.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff generated during temporary site establishment.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff generated during soil stripping and topsoil removal associated with excavations and earthworks.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through release of highly alkaline contaminants from concrete and cement during demolition of buildings and structures.	High	Negligible	Imperceptible

Receptor	Potential Effects	Importance (sensitivity)	Magnitude	Significance
	Potential adverse effects on water quality through release of highly alkaline contaminants from concrete and cement during temporary site establishment.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through release of highly alkaline contaminants from concrete and cement during quayside wall and berth construction.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through release of highly alkaline contaminants from concrete and cement during hard landscaping, surfacing and general concrete works.	High	Negligible	Imperceptible
	Potential adverse effects on water quality due to accidental fuel or chemical compound leakages from construction plant, maritime vessels, equipment & storage of materials polluting waterbodies.	High	Negligible	Imperceptible
	Potential adverse effects on water quality due to accidental release or leakage of other liquids on-site such as wastewater associated with temporary site facilities.	High	Negligible	Imperceptible
Coastal Waterbodies located greater than 2.5km from the development boundary (i.e. Wexford Harbour and Rosslare Strand bathing water)	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff and plumes generated during demolition of buildings and structures.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff generated during construction and upgrading of internal access roads.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through increased suspended sediment levels generated during	High	Negligible	Imperceptible

Receptor	Potential Effects	Importance (sensitivity)	Magnitude	Significance
	construction of rock armour revetment and placement of breakwater armour units.			
	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff and plumes generated during land reclamation and infill.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff and plumes generated during piling.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through nitrate concentrations released by blasting during tubular piling preparation.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through increased suspended sediment levels from sediment plumes generated during dredging and material dispersal.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff generated during temporary site establishment.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff generated during soil stripping and topsoil removal associated with excavations and earthworks.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through release of highly alkaline contaminants from concrete and cement during demolition of buildings and structures.	High	Negligible	Imperceptible

Receptor	Potential Effects	Importance (sensitivity)	Magnitude	Significance
	Potential adverse effects on water quality through release of highly alkaline contaminants from concrete and cement during temporary site establishment.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through release of highly alkaline contaminants from concrete and cement during quayside wall and berth construction.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through release of highly alkaline contaminants from concrete and cement during hard landscaping, surfacing and general concrete works.	High	Negligible	Imperceptible
	Potential adverse effects on water quality due to accidental fuel or chemical compound leakages from construction plant, maritime vessels, equipment & storage of materials polluting waterbodies.	High	Negligible	Imperceptible
	Potential adverse effects on water quality due to accidental release or leakage of other liquids on-site such as wastewater associated with temporary site facilities.	High	Negligible	Imperceptible
Coastal Waterbodies within, or adjacent to, development boundary (i.e. Rosslare Harbour and Southwestern Irish Sea),	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff and plumes generated during demolition of buildings and structures.	High	Low adverse	Slight
	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff generated during construction and upgrading of internal access roads.	High	Low adverse	Slight
	Potential adverse effects on water quality through increased suspended sediment levels generated during	High	Low adverse	Slight

Receptor	Potential Effects	Importance (sensitivity)	Magnitude	Significance
	construction of rock armour revetment and placement of breakwater armour units.			
	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff and plumes generated during land reclamation and infill.	High	Low adverse	Slight
	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff and plumes generated during piling.	High	Low adverse	Slight
	Potential adverse effects on water quality through nitrate concentrations released by blasting during tubular piling preparation.	High	Low adverse	Slight
	Potential adverse effects on water quality through increased suspended sediment levels from sediment plumes generated during dredging and material dispersal.	High	Low adverse	Slight
	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff generated during temporary site establishment.	High	Low adverse	Slight
	Potential adverse effects on water quality through increased suspended sediment levels from sediment runoff generated during soil stripping and topsoil removal associated with excavations and earthworks.	High	Low adverse	Slight
	Potential adverse effects on water quality through release of highly alkaline contaminants from concrete and cement during demolition of buildings and structures.	High	Low adverse	Slight

Receptor	Potential Effects	Importance (sensitivity)	Magnitude	Significance
	Potential adverse effects on water quality through release of highly alkaline contaminants from concrete and cement during temporary site establishment.	High	Low adverse	Slight
	Potential adverse effects on water quality through release of highly alkaline contaminants from concrete and cement during quayside wall and berth construction.	High	Low adverse	Slight
	Potential adverse effects on water quality through release of highly alkaline contaminants from concrete and cement during hard landscaping, surfacing and general concrete works.	High	Low adverse	Slight
	Potential adverse effects on water quality due to accidental fuel or chemical compound leakages from construction plant, maritime vessels, equipment & storage of materials polluting waterbodies.	High	Low adverse	Slight
	Potential adverse effects on water quality due to accidental release or leakage of other liquids on-site such as wastewater associated with temporary site facilities.	High	Low adverse	Slight
Groundwater bodies (i.e. Bridgetown GWB)	Potential adverse effects on water quality through release of highly alkaline contaminants from concrete and cement during demolition of buildings and structures.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through release of highly alkaline contaminants from concrete and cement during temporary site establishment.	High	Negligible	Imperceptible
	Potential adverse effects on water quality through release of highly alkaline contaminants from concrete and cement during hard landscaping, surfacing and general concrete works.	High	Negligible	Imperceptible

Receptor	Potential Effects	Importance (sensitivity)	Magnitude	Significance
	Potential adverse effects on water quality due to accidental fuel or chemical compound leakages from construction plant, equipment & storage of materials polluting waterbodies.	High	Negligible	Imperceptible
Fluvial Flooding	Increased potential for fluvial flooding due to creation of preferential pathway for runoff during construction and upgrading of internal access roads.	High	Negligible	Imperceptible
Pluvial Flooding	Increased potential for pluvial flooding due to increase in impermeable surfaces that contribute greater proportions of surface water run-off from hardstanding areas.	High	Negligible	Imperceptible
Operational Phase				
Surface watercourses, streams and rivers (i.e. Miltown_Roslare_020)	Potential adverse effects on water quality due to accidental fuel or chemical compound leakages from use of vehicle movement, machinery associated with landside ancillary, Lift On Lift Off (LoLo) and Roll On Roll Off (RoRo) activities, maritime vessels & storage of renewables materials polluting waterbodies.	High	Negligible	Imperceptible
	Potential adverse on water quality arising from contaminants percolating through the permeable stone-fill used to construct the ORE storage yard and into sensitive waterbodies.	High	Negligible	Imperceptible
	Potential adverse effects on water quality due to surface water drains installed in new hardstand areas providing potential pathways for a wide range of contaminants arising from general port operations.	High	Negligible	Imperceptible
	Potential adverse effects on water quality due to the reconfigured road network providing potential pathways	High	Negligible	Imperceptible

Receptor	Potential Effects	Importance (sensitivity)	Magnitude	Significance
	for a wide range of contaminants arising from general port operations.			
Transitional waterbodies (i.e. South Slob Channel)	Potential adverse effects on water quality through increased suspended sediment levels from sediment plumes generated during maintenance dredging.	High	Negligible	Imperceptible
	Potential adverse effects on water quality due to accidental fuel or chemical compound leakages from use of vehicle movement, machinery associated with landside ancillary, Lift On Lift Off (LoLo) and Roll On Roll Off (RoRo) activities, maritime vessels & storage of renewables materials polluting waterbodies.	High	Negligible	Imperceptible
	Potential adverse on water quality arising from contaminants percolating through the permeable stone-fill used to construct the ORE storage yard and into sensitive waterbodies.	High	Negligible	Imperceptible
	Potential adverse effects on water quality due to wastewater releases associated with the operation and maintenance of surface water and foul drainage systems.	High	Negligible	Imperceptible
	Potential adverse effects on water quality due to surface water drains installed in new hardstand areas providing potential pathways for a wide range of contaminants arising from general port operations.	High	Negligible	Imperceptible
	Potential adverse effects on water quality due to the reconfigured road network providing potential pathways for a wide range of contaminants arising from general port operations.	High	Negligible	Imperceptible

Receptor	Potential Effects	Importance (sensitivity)	Magnitude	Significance
Coastal Waterbodies (i.e. Rosslare Harbour, Southwestern Irish Sea, Wexford Harbour and Rosslare Strand bathing waters)	Potential adverse effects on water quality due to accidental fuel or chemical compound leakages from use of vehicle movement, machinery associated with landside ancillary, Lift On Lift Off (LoLo) and Roll On Roll Off (RoRo) activities, maritime vessels & storage of renewables materials polluting waterbodies.	High	Low adverse	Slight
	Potential adverse effects on water quality arising from contaminants percolating through the permeable stone-fill used to construct the ORE storage yard and into sensitive waterbodies.	High	Negligible	Imperceptible
	Potential adverse effects on water quality due to wastewater releases associated with the operation and maintenance of surface water and foul drainage systems.	High	Negligible	Imperceptible
	Potential adverse effects on water quality due to surface water drains installed in new hardstand areas providing potential pathways for a wide range of contaminants arising from general port operations.	High	Negligible	Imperceptible
	Potential adverse effects on water quality due to the reconfigured road network providing potential pathways for a wide range of contaminants arising from general port operations.	High	Negligible	Imperceptible
Groundwater bodies (i.e. Bridgetown GWB)	Potential adverse effects on water quality due to accidental fuel or chemical compound leakages from mobile plant, works machinery, Lift On Lift Off (LoLo) and Roll On Roll Off (RoRo) activities, maritime vessels, equipment & storage of materials polluting waterbodies.	High	Negligible	Imperceptible

Receptor	Potential Effects	Importance (sensitivity)	Magnitude	Significance
	Potential adverse effects on water quality arising from contaminants percolating through the permeable stone-fill used to construct the ORE storage yard and into sensitive waterbodies.	High	Negligible	Imperceptible
Fluvial Flooding	Increased potential for fluvial flooding due to creation of preferential pathway for runoff via internal access roads.	High	Negligible	Imperceptible
Pluvial Flooding	Increased risk of pluvial flooding due to post-construction increase in impermeable surfaces that contribute greater proportions of surface water run-off from hardstanding areas.	High	Negligible	Imperceptible
Coastal Flooding	Potential increased risk of coastal flooding due to tidal inundation.	High	Negligible	Imperceptible
	Potential increased risk of coastal flooding due to long-term changes in sea level associated with climate change.	High	Negligible	Imperceptible

9.5 MITIGATION MEASURES FOR WATER QUALITY & FLOOD RISK

The assessment of effects undertaken in Section 9.4 includes consideration of integrated measures built into the project design (i.e. primary mitigation), which are described in Section 9.4.2, and tertiary mitigation measures, which are described in Section 9.4.3.

No 'Significant' effects have been identified, and consequently further mitigation measures (i.e., secondary mitigation) are not considered necessary.

9.6 RESIDUAL EFFECTS

9.6.1 RESIDUAL EFFECTS ON WATER QUALITY

Overall residual effects upon water quality arising from the Proposed Development are considered to be not significant in EIA terms.

9.6.2 RESIDUAL EFFECTS ON FLOOD RISK

The flood risk has been assessed and both the primary mitigation incorporated into the design and tertiary measures adopted during the construction and operational phases of the Proposed Development will provide a level of protection to reduce the likelihood of impacts from flooding events as far as reasonably possible.

Overall residual effects upon flood risk arising from the Proposed Development are therefore considered to be not significant in EIA terms.

Under the Planning System and Flood Risk Management Planning Guidelines, the Proposed Development consists of areas located within Flood Zones A and B. As the Proposed Development consists of 'docks and marinas' and 'dockside activities that require a waterside location' it is classed as 'Water-compatible development', and as such is considered appropriate for development in all Flood Risk Zones. The Proposed Development can be considered as appropriate for the identified flood zones, and therefore a Justification Test is not required. The Proposed Development is considered to be aligned with the guidance outlined in the Planning System and Flood Risk Management: Guidelines for Planning Authorities (Department of Environment, Heritage and Local Government/Office of Public Works, 2009).

9.7 CUMULATIVE EFFECTS

This assessment takes into account the projects outside of the Rosslare ORE Hub development plan which are detailed in Chapter 25: Interactions, which also highlights the interactions between this topic and soils, geology, hydrogeology and contamination receptors, coastal processes receptors and biodiversity receptors.

The cumulative effect of the Proposed Development combined with the development of other proposed schemes within the nearby area have been considered. Due to all construction and operational activities predicted as having an imperceptible effect on surface watercourses and transitional waterbodies, these receptors are judged to have no potential for cumulative effects

when considered in conjunction with other developments, for example the N25 Rosslare Europort Access Road.

With regards to coastal waterbodies the following effects are discussed with regards to cumulative effects when considering other developments:

- Potential adverse effects on water quality through release of highly alkaline contaminants from concrete and cement during construction of the quayside wall and berth at the Proposed Development in conjunction with an extension to the existing Berth 3 and the demolition and removal of the existing Berth 4 linkspan within the wider Rosslare Europort. This potential cumulative effect is judged to be a localised, short-term construction issue which is unlikely to have a measurable adverse effect following implementation of appropriate mitigation measures outlined within Section 9.5. Dispersal of potential alkaline contaminants within the water column is unlikely to result in prolonged adverse cumulative effects on marine water quality across both developments.
- Potential adverse effects on water quality through increased suspended sediment levels from sediment plumes generated during future maintenance dredging of the Proposed Development in conjunction with ongoing dredging schemes within Rosslare Harbour/Europort and Ballygeary Harbour, Co. Wexford. This potential cumulative effect is judged to be of low cumulative risk to water quality following implementation of appropriate mitigation measures outlined within Section 9.5. This will serve to ameliorate any potential increase in turbidity or sedimentation of the water column which could give rise to adverse cumulative effects.

The potential for cumulative effects of sedimentation in the water column impacting benthic ecology is discussed in detail within Chapter 11 of this EIAR. In addition, cumulative effects regarding hydrogeology and groundwater body receptors are addressed within Chapter 7.

9.8 MONITORING

9.8.1 CONSTRUCTION PHASE MONITORING

Monitoring of turbidity in real-time will be achieved using turbidity monitors within Rosslare Europort harbour bounds to identify any increased Suspended Sediment Concentration that arises and will implement controls if the SSC limit of 300mg/l above background is breached at the monitored locations.

Monitoring will comprise one offshore buoy in a typically up-current location and another buoy in a typically down-current location corresponding to locations to the east of the dredged boundary and the north-west of the dredged boundary. The tide tends to flow east to north-west and vice-versa between flood to ebb. The buoys will be positioned approximately 300m outside the boundary of dredging and outside of regular navigation routes for RoRo vessels and construction plant. The background reading will be read from the up-current monitoring buoy and the assessment of turbidity will be read from the down-current monitoring buoy. Up-current and down-current positions must be swapped between flood and ebb tidal cycles.

This limiting control value of SSC will be correlated with Notional Turbidity Units (NTU) for samples of sediment initially recovered from the site prior to commencement. This allows instantaneous readings to be taken with real-time NTU meters on the monitoring buoys which are matched to suspended sediment values. The buoys will be set to relay real-time events (including trigger values) and warn the contractor of high values of suspended sediment.

9.8.2 OPERATIONAL PHASE MONITORING

The Ports Operations Team will monitor and clear interceptors and gullies on a regular basis.

In the event of a potential environmental incident which may affect water quality, the Port Operations Team will initiate additional investigative sampling as required to seek to identify the possible source and nature of any pollutants present. General observations which could aid the investigation should be recorded (i.e. weather conditions, visual observations of the water surface for discolouration or liquids, olfactory observations such as unusual smells, etc.).

It may be necessary to conduct water quality sampling with laboratory analysis of standard contaminant suites in the event of a potential environmental incident.

9.8.3 REPORTING

With regards to reporting, data from ongoing monitoring programmes will be collated at regular intervals (i.e. monthly) and summarised in brief reports by the Port Operations Team.

Any breaches of threshold values or compliance values will be indicated in the report along with the findings of any relevant investigation. An annual environmental summary report will be prepared.

9.9 SUMMARY

This chapter of the EIAR has assessed the potential environmental impacts on Water Qualiy and Flood Risk from the construction and operation phases of the Proposed Development, the assessment is summarised in Table 9.9.

Table 9.9: Assessment Summary

Potential Effect	Construction/ Operation	Beneficial/ Adverse/ Neutral	Extent (Site/Local/National/ Transboundary)	Short term/ Long term	Direct/ Indirect	Permanent/ Temporary	Reversible/ Irreversible	Significance of Effect following primary and tertiary mitigation (according to defined criteria)	Proposed secondary mitigation	Residual Effects (according to defined criteria)
Potential adverse effects on water quality of surface watercourses through increased suspended sediment levels from sediment runoff and plumes generated during demolition of buildings and structures.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of surface watercourses through increased suspended sediment levels from sediment runoff generated during construction and upgrading of internal access roads.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of surface watercourses through increased suspended sediment levels from sediment runoff generated during temporary site establishment.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of surface watercourses through increased suspended sediment levels from sediment runoff generated during soil stripping and topsoil removal associated with excavations and earthworks.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of surface watercourses through release of highly alkaline contaminants from concrete and cement during demolition of buildings and structures.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of surface watercourses through release of highly alkaline contaminants from concrete and cement during temporary site establishment.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of surface watercourses through release of highly alkaline contaminants from concrete and cement during hard landscaping, surfacing and general concrete works.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of surface watercourses due to accidental fuel or chemical compound leakages from construction plant, equipment & storage of materials polluting waterbodies.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of surface watercourses due to accidental release or leakage of other liquids on-site such as wastewater associated with temporary site facilities.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of transitional waterbodies through increased suspended sediment levels from sediment runoff and plumes generated during demolition of buildings and structures.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-

Potential Effect	Construction/ Operation	Beneficial/ Adverse/ Neutral	Extent (Site/Local/National/ Transboundary)	Short term/ Long term	Direct/ Indirect	Permanent/ Temporary	Reversible/ Irreversible	Significance of Effect following primary and tertiary mitigation (according to defined criteria)	Proposed secondary mitigation	Residual Effects (according to defined criteria)
Potential adverse effects on water quality of transitional waterbodies through increased suspended sediment levels from sediment runoff generated during construction and upgrading of internal access roads.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of transitional waterbodies through increased suspended sediment levels from sediment plumes generated during construction of rock armour revetment and placement of breakwater armour units.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of transitional waterbodies through increased suspended sediment levels from sediment runoff and plumes generated during land reclamation and infill.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of transitional waterbodies through increased suspended sediment levels from sediment runoff and plumes generated during piling.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of transitional waterbodies through nitrate concentrations released by blasting during tubular piling preparation.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of transitional waterbodies through increased suspended sediment levels from sediment plumes generated during dredging and material dispersal.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of transitional waterbodies through increased suspended sediment levels from sediment runoff generated during temporary site establishment.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of transitional waterbodies through increased suspended sediment levels from sediment runoff generated during soil stripping and topsoil removal associated with excavations and earthworks.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of transitional waterbodies through release of highly alkaline contaminants from concrete and cement during demolition of buildings and structures.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of transitional waterbodies through release of highly alkaline contaminants from concrete and cement during temporary site establishment.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of transitional waterbodies through release of highly alkaline contaminants	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-

Potential Effect	Construction/ Operation	Beneficial/ Adverse/ Neutral	Extent (Site/Local/National/ Transboundary)	Short term/ Long term	Direct/ Indirect	Permanent/ Temporary	Reversible/ Irreversible	Significance of Effect following primary and tertiary mitigation (according to defined criteria)	Proposed secondary mitigation	Residual Effects (according to defined criteria)
from concrete and cement during quayside wall and berth construction.										
Potential adverse effects on water quality of transitional waterbodies through release of highly alkaline contaminants from concrete and cement during hard landscaping, surfacing and general concrete works.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of transitional waterbodies due to accidental fuel or chemical compound leakages from construction plant, maritime vessels, equipment & storage of materials polluting waterbodies.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of transitional waterbodies due to accidental release or leakage of other liquids on-site such as wastewater associated with temporary site facilities.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of coastal waterbodies located greater than 2.5km from the development boundary through increased suspended sediment levels from sediment runoff and plumes generated during demolition of buildings and structures.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of coastal waterbodies located greater than 2.5km from the development boundary through increased suspended sediment levels from sediment runoff generated during construction and upgrading of internal access roads.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of coastal waterbodies located greater than 2.5km from the development boundary through increased suspended sediment levels generated during construction of rock armour revetment and placement of breakwater armour units.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of coastal waterbodies located greater than 2.5km from the development boundary through increased suspended sediment levels from sediment runoff and plumes generated during land reclamation and infill.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of coastal waterbodies located greater than 2.5km from the development boundary through increased suspended sediment levels from sediment runoff and plumes generated during piling.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-

Potential Effect	Construction/ Operation	Beneficial/ Adverse/ Neutral	Extent (Site/Local/National/ Transboundary)	Short term/ Long term	Direct/ Indirect	Permanent/ Temporary	Reversible/ Irreversible	Significance of Effect following primary and tertiary mitigation (according to defined criteria)	Proposed secondary mitigation	Residual Effects (according to defined criteria)
Potential adverse effects on water quality of coastal waterbodies located greater than 2.5km from the development boundary through nitrate concentrations released by blasting during tubular piling preparation.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of coastal waterbodies located greater than 2.5km from the development boundary through increased suspended sediment levels from sediment plumes generated during dredging and material dispersal.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of coastal waterbodies located greater than 2.5km from the development boundary through increased suspended sediment levels from sediment runoff generated during temporary site establishment.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of coastal waterbodies located greater than 2.5km from the development boundary through increased suspended sediment levels from sediment runoff generated during soil stripping and topsoil removal associated with excavations and earthworks.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of coastal waterbodies located greater than 2.5km from the development boundary through release of highly alkaline contaminants from concrete and cement during demolition of buildings and structures.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of coastal waterbodies located greater than 2.5km from the development boundary through release of highly alkaline contaminants from concrete and cement during temporary site establishment.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of coastal waterbodies located greater than 2.5km from the development boundary through release of highly alkaline contaminants from concrete and cement during quayside wall and berth construction.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of coastal waterbodies located greater than 2.5km from the development boundary through release of highly alkaline contaminants from concrete and cement during hard landscaping, surfacing and general concrete works.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of coastal waterbodies located greater than 2.5km from the	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-

Potential Effect	Construction/ Operation	Beneficial/ Adverse/ Neutral	Extent (Site/Local/National/ Transboundary)	Short term/ Long term	Direct/ Indirect	Permanent/ Temporary	Reversible/ Irreversible	Significance of Effect following primary and tertiary mitigation (according to defined criteria)	Proposed secondary mitigation	Residual Effects (according to defined criteria)
development boundary due to accidental fuel or chemical compound leakages from construction plant, maritime vessels, equipment & storage of materials polluting waterbodies.										
Potential adverse effects on water quality of coastal waterbodies located greater than 2.5km from the development boundary due to accidental release or leakage of other liquids on-site such as wastewater associated with temporary site facilities.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of coastal waterbodies within, or adjacent to, development boundary through increased suspended sediment levels from sediment runoff and plumes generated during demolition of buildings and structures.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Slight	n/a	-
Potential adverse effects on water quality of coastal waterbodies within, or adjacent to, development boundary through increased suspended sediment levels from sediment runoff generated during construction and upgrading of internal access roads.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Slight	n/a	-
Potential adverse effects on water quality of coastal waterbodies within, or adjacent to, development boundary through increased suspended sediment levels generated during construction of rock armour revetment and placement of breakwater armour units.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Slight	n/a	-
Potential adverse effects on water quality of coastal waterbodies within, or adjacent to, development boundary through increased suspended sediment levels from sediment runoff and plumes generated during land reclamation and infill.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Slight	n/a	-
Potential adverse effects on water quality of coastal waterbodies within, or adjacent to, development boundary through increased suspended sediment levels from sediment runoff and plumes generated during piling.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Slight	n/a	-
Potential adverse effects on water quality of coastal waterbodies within, or adjacent to, development boundary through nitrate concentrations released by blasting during tubular piling preparation.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Slight	n/a	-
Potential adverse effects on water quality of coastal waterbodies within, or adjacent to, development boundary through increased suspended sediment levels from sediment plumes generated during dredging and material dispersal.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Slight	n/a	-

Potential Effect	Construction/ Operation	Beneficial/ Adverse/ Neutral	Extent (Site/Local/National/ Transboundary)	Short term/ Long term	Direct/ Indirect	Permanent/ Temporary	Reversible/ Irreversible	Significance of Effect following primary and tertiary mitigation (according to defined criteria)	Proposed secondary mitigation	Residual Effects (according to defined criteria)
Potential adverse effects on water quality of coastal waterbodies within, or adjacent to, development boundary through increased suspended sediment levels from sediment runoff generated during temporary site establishment.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Slight	n/a	-
Potential adverse effects on water quality of coastal waterbodies within, or adjacent to, development boundary through increased suspended sediment levels from sediment runoff generated during soil stripping and topsoil removal associated with excavations and earthworks.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Slight	n/a	-
Potential adverse effects on water quality of coastal waterbodies within, or adjacent to, development boundary through release of highly alkaline contaminants from concrete and cement during demolition of buildings and structures.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Slight	n/a	-
Potential adverse effects on water quality of coastal waterbodies within, or adjacent to, development boundary through release of highly alkaline contaminants from concrete and cement during temporary site establishment.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Slight	n/a	-
Potential adverse effects on water quality of coastal waterbodies within, or adjacent to, development boundary through release of highly alkaline contaminants from concrete and cement during quayside wall and berth construction.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Slight	n/a	-
Potential adverse effects on water quality of coastal waterbodies within, or adjacent to, development boundary through release of highly alkaline contaminants from concrete and cement during hard landscaping, surfacing and general concrete works.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Slight	n/a	-
Potential adverse effects on water quality of coastal waterbodies within, or adjacent to, development boundary due to accidental fuel or chemical compound leakages from construction plant, maritime vessels, equipment & storage of materials polluting waterbodies.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Slight	n/a	-
Potential adverse effects on water quality of coastal waterbodies within, or adjacent to, development boundary due to accidental release or leakage of other liquids on-site such as wastewater associated with temporary site facilities.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Slight	n/a	-
Potential adverse effects on groundwater quality through release of highly alkaline contaminants from concrete and cement during demolition of buildings and structures.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-

Potential Effect	Construction/ Operation	Beneficial/ Adverse/ Neutral	Extent (Site/Local/National/ Transboundary)	Short term/ Long term	Direct/ Indirect	Permanent/ Temporary	Reversible/ Irreversible	Significance of Effect following primary and tertiary mitigation (according to defined criteria)	Proposed secondary mitigation	Residual Effects (according to defined criteria)
Potential adverse effects on groundwater quality through release of highly alkaline contaminants from concrete and cement during temporary site establishment.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on groundwater quality through release of highly alkaline contaminants from concrete and cement during hard landscaping, surfacing and general concrete works.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on groundwater quality due to accidental fuel or chemical compound leakages from construction plant, equipment & storage of materials polluting waterbodies.	Construction	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Increased potential for fluvial flooding due to creation of preferential pathway for runoff during construction and upgrading of internal access roads.	Construction	Adverse	Local	Long term	Direct	Permanent	Reversible	Imperceptible	n/a	-
Increased potential for pluvial flooding due to increase in impermeable surfaces that contribute greater proportions of surface water run-off from hardstanding areas.	Construction	Adverse	Local	Long term	Direct	Permanent	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of surface watercourses due to accidental fuel or chemical compound leakages from use of vehicle movement, machinery associated with landside ancillary, Lift On Lift Off (LoLo) and Roll On Roll Off (RoRo) activities, maritime vessels & storage of renewables materials polluting waterbodies.	Operational	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of surface watercourses arising from contaminants percolating through the permeable stone-fill used to construct the ORE storage yard and into sensitive waterbodies.	Operational	Adverse	Local	Long term	Direct	Permanent	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of surface watercourses due to surface water drains installed in new hardstand areas providing potential pathways for a wide range of contaminants arising from general port operations.	Operational	Adverse	Local	Long term	Direct	Permanent	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of surface watercourses due to the reconfigured road network providing potential pathways for a wide range of contaminants arising from general port operations.	Operational	Adverse	Local	Long term	Direct	Permanent	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of transitional waterbodies through increased suspended sediment levels from sediment plumes generated during maintenance dredging.	Operational	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of transitional waterbodies due to accidental fuel or chemical compound	Operational	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-

Potential Effect	Construction/ Operation	Beneficial/ Adverse/ Neutral	Extent (Site/Local/National/ Transboundary)	Short term/ Long term	Direct/ Indirect	Permanent/ Temporary	Reversible/ Irreversible	Significance of Effect following primary and tertiary mitigation (according to defined criteria)	Proposed secondary mitigation	Residual Effects (according to defined criteria)
leakages from use of vehicle movement, machinery associated with landside ancillary, Lift On Lift Off (LoLo) and Roll On Roll Off (RoRo) activities, maritime vessels & storage of renewables materials polluting waterbodies.										
Potential adverse effects on water quality of transitional waterbodies arising from contaminants percolating through the permeable stone-fill used to construct the ORE storage yard and into sensitive waterbodies.	Operational	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of transitional waterbodies due to wastewater releases associated with the operation and maintenance of surface water and foul drainage systems.	Operational	Adverse	Local	Long term	Direct	Permanent	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of transitional waterbodies due to surface water drains installed in new hardstand areas providing potential pathways for a wide range of contaminants arising from general port operations.	Operational	Adverse	Local	Long term	Direct	Permanent	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of transitional waterbodies due to the reconfigured road network providing potential pathways for a wide range of contaminants arising from general port operations.	Operational	Adverse	Local	Long term	Direct	Permanent	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality of coastal waterbodies within, or adjacent to, development boundary due to accidental fuel or chemical compound leakages from use of vehicle movement, machinery associated with landside ancillary, Lift On Lift Off (LoLo) and Roll On Roll Off (RoRo) activities, maritime vessels & storage of renewables materials polluting waterbodies.	Operational	Adverse	Local	Short term	Direct	Temporary	Reversible	Slight	n/a	-
Potential adverse effects on bathing water quality arising from contaminants percolating through the permeable stone-fill used to construct the ORE storage yard and into sensitive waterbodies.	Operational	Adverse	Local	Long term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on bathing water quality due to wastewater releases associated with the operation and maintenance of surface water and foul drainage systems.	Operational	Adverse	Local	Long term	Direct	Permanent	Reversible	Imperceptible	n/a	-
Potential adverse effects on bathing water quality due to surface water drains installed in new hardstand areas providing potential pathways for a wide range of contaminants arising from general port operations.	Operational	Adverse	Local	Long term	Direct	Permanent	Reversible	Imperceptible	n/a	-
Potential adverse effects on bathing water quality due to the reconfigured road network providing potential pathways for	Operational	Adverse	Local	Long term	Direct	Permanent	Reversible	Imperceptible	n/a	-

Potential Effect	Construction/ Operation	Beneficial/ Adverse/ Neutral	Extent (Site/Local/National/ Transboundary)	Short term/ Long term	Direct/ Indirect	Permanent/ Temporary	Reversible/ Irreversible	Significance of Effect following primary and tertiary mitigation (according to defined criteria)	Proposed secondary mitigation	Residual Effects (according to defined criteria)
a wide range of contaminants arising from general port operations.										
Potential adverse effects on water quality due to accidental fuel or chemical compound leakages from mobile plant, works machinery, Lift On Lift Off (LoLo) and Roll On Roll Off (RoRo) activities, maritime vessels, equipment & storage of materials polluting waterbodies.	Operational	Adverse	Local	Short term	Direct	Temporary	Reversible	Imperceptible	n/a	-
Potential adverse effects on water quality arising from contaminants percolating through the permeable stone-fill used to construct the ORE storage yard and into sensitive waterbodies.	Operational	Adverse	Local	Long term	Direct	Permanent	Reversible	Imperceptible	n/a	-
Increased potential for fluvial flooding due to creation of preferential pathway for runoff via internal access roads.	Operational	Adverse	Local	Long term	Direct	Permanent	Reversible	Imperceptible	n/a	-
Increased risk of pluvial flooding due to post-construction increase in impermeable surfaces that contribute greater proportions of surface water run-off from hardstanding areas.	Operational	Adverse	Local	Long term	Direct	Permanent	Reversible	Imperceptible	n/a	-
Potential increased risk of coastal flooding due to tidal inundation.	Operational	Adverse	Local	Long term	Direct	Permanent	Reversible	Imperceptible	n/a	-
Potential increased risk of coastal flooding due to long-term changes in sea level associated with climate change.	Operational	Adverse	Local	Long term	Direct	Permanent	Reversible	Imperceptible	n/a	-

9.10 REFERENCES

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