MWP

ENVIRONMENTAL IMPACT ASSESSMENT REPORT (EIAR)

Ros an Mhíl Deep Water Quay

Chapter 12: Air Quality & Climate

Department of Agriculture, Food and the Marine

November 2025

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12. Air and Climate

12.1 Introduction

This chapter describes the likely significant effects the construction and operation of the proposed development of the deep-water quay has had and will have on air quality and climate. For a full description of the proposed development, refer to Chapter 2 Description of the Development of this EIAR.

12.1.1 Guidelines and Legislation

The assessment has been prepared in accordance with the Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA 2022), as well as guidelines and legislation outlined in Section 12.1.2.1 to Section 12.1.2.3.

12.1.1.1 Air Quality

The statutory ambient air quality standards in Ireland are set out in the Ambient Air Quality Standards Regulations 2022, which incorporate the ambient air quality limits set out in Directive 2008/50/EC of the European Parliament and of the Council (21st May 2008) on ambient air quality and cleaner air for Europe (hereafter referred to as the CAFÉ Directive) (as amended by Directive EU 2015/1480), for a range of air pollutants. (Table 12-1).

In October 2024, the European Council formally adopted a directive setting updated air quality standards across the EU. The revised Ambient Air Quality Directive entered into force on the 10th December, aligning 2030 EU air quality standards more closely with World health Organisation recommendations. Member states will have two years after the entry into force to transpose the directive into national law. The new directive air quality limits are shown in Table 12-2 and updated targets for Ozone in Table 12-3.

To reduce the risk of poor air quality, National and European statutory bodies have set limit values in ambient air for a range of air pollutants. These limits are set for the protection of human health and ecosystems. Air Quality significance criteria are assessed on the basis of compliance with the appropriate standards or limit values which incorporate European Commission Directive 2008/50/EC which has set limit values for pollutants SO_2, NO_2, PM_{10}, Lead, Benzene and Carbon Monoxide. Council Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC). Provisions are also made for the inclusion of ambient limit values relating to $PM_{2.5}$.

Table 12-1: Air Quality Standards regulations 2011 – Limit Values (based on EU Council Directive 2008/50/EC)

Pollutant	Limit Value Objective	Averaging Period	Limit Value µg/m³	Limit Value ppb	Basis of Application of the Limit Value
SO_2	Protection of human health	1 hour	350	132	Not to be exceeded more than 24 times in a calendar year
SO_2	Protection of human health	24 hours	125	47	Not to be exceeded more than 3 times in a calendar year

Pollutant	Limit Value Objective	Averaging Period	Limit Value µg/m³	Limit Value ppb	Basis of Application of the Limit Value
SO_2	Protection of vegetation	Calendar	20	7.5	Annual Mean
SO_2	Protection of vegetation	1 Oct to 31 Mar	30	7.5	Annual Mean
NO_2	Protection of Human Health	1 hour	200	105	Not to be exceeded more than 18 times in a calendar year
NO_2	Protection of Human Health	Calendar Year	40	21	Annual Mean
NO & NO_2	Protection of ecosystems	Calendar Year	30	16	Annual Mean
PM_{10}	Protection of Human Health	24 hours	50	-	Not to be exceeded more than 35 times in a calendar year
PM_{10}	Protection of Human Health	Calendar Year	40	-	Annual Mean
$PM_{2.5}$ – Stage 1	Protection of Human Health	Calendar Year	25	-	Annual Mean
$PM_{2.5}$ – Stage 2	Protection of Human Health	Calendar Year	20	-	Annual Mean
Carbon Monoxide	Protection of Human Health	8 hours	10,000	8,620	Not to be exceeded
Lead	Protection of Human Health	Calendar Year	0.5	-	Annual Mean
Benzene	Protection of Human Health	Calendar Year	5	1.5	Annual Mean

Table 12-2: New Directive Proposed Limit Values for air quality to be attained by 1 January 2030.

Pollutant	Limit Value Objective	Averaging Period	Limit Value µg/m³	Basis of Application of the Limit Value
SO_2	Protection of Human Health	1 hour	350	Not to be exceeded more than 3 times in a calendar year
SO_2	Protection of human health	24 hours	50	Not to be exceeded more than 18 times in a calendar year
SO_2	Protection of vegetation	Calendar year	20	Annual mean
SO_2	Protection of vegetation	Calendar Year and Winter (1st Oct to 31st Mar)	20	Winter mean
NO_2	Protection of human health	1 hour	200	Not to be exceeded more than 3 times in a calendar year
NO_2	Protection of human health	24 hours	50	Not to be exceeded more than 18 times in a calendar year
NO_2	Protection of human health	Calendar year	20	Annual mean
NO & NO_2	Protection of ecosystems	Calendar year	30	Annual mean

Pollutant	Limit Value Objective	Averaging Period	Limit Value µg/m³	Basis of Application of the Limit Value
PM_{10}	Protection of human health	24 hours	45	Not to be exceeded more than 18 times in a calendar year
PM_{10}	Protection of human health	Calendar year	20	Annual mean
$PM_{2.5}$	Protection of human health	24 hours	25	Not to be exceeded more than 18 times in a calendar year
$PM_{2.5}$	Protection of human health	Calendar year	10	Annual mean
Lead (Pb)	Protection of human health	Calendar year	0.5	Annual mean
CO	Protection of human health	Maximum daily 8 hour mean	10	8 hour mean
CO	Protection of human health	24 hours	4	Not to be exceeded more than 18 times in a calendar year
Benzene (C_6H_6)	Protection of human health	Calendar Year	3.4	Annual mean

Table 12-3: Target values for Ozone defined in Directive 2008/50/EC & Proposed Long Term objectives for Ozone (Source: EPA)

Objective	Parameter	Target Value for 2010	Target Value for 2020	Long-term objective (1 Jan 2050)
Protection of human health	Maximum daily 8-hour mean	120 mg/m³ not to be exceeded more than 25 days per calendar year averaged over 3 years	120 µg/m³	100 µg/m³
Protection of vegetation	AOT40 calculated from 1 hour values from May to July	18,000 mg/m³.h averaged over 5 years	6,000 µg/m³.h	6,000 µg/m³.h
Information Threshold	1-hour average	180 mg/m³	-	
Alert Threshold	1-hour average	240 mg/m³	-	

In addition to the specific statutory air quality standards, the assessment has been prepared in accordance with national guidelines, where available, in addition to international standards and guidelines. These are summarised below:

- Clean Air Strategy (Government of Ireland 2023);
- Air quality assessment of proposed national roads – Standard' and 'Air quality assessment of specified infrastructure projects – overarching technical document' (TII, 2022);
- Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (TII 2011);
- Guidelines for Assessment of Ecological Impacts of National Roads Schemes (TII 2009);

- UK Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) – LA 105 Air Quality (UKHA 2024); World Health Organization (WHO) Global Air Quality Guidelines for Particulate Matter ($PM_{2.5}$ & PM_{10}), Ozone, Nitrogen Dioxide, Sulphur Dioxide and Carbon Monoxide 2021 (WHO 2021);
- A guide to the assessment of air quality impacts on designated nature conservation sites – Version 1.1 May 2020 (Institute of Air Quality Management – IAQM);
- Assessment of dust from demolition and construction 2024, V2.2, (Institute of Air Quality Management – IAQM);
- S.I. No. 48/2017 - Sea Pollution (Prevention of Air Pollution from Ships) (Amendment) Regulations 2017.

12.1.1.2 Climate

This assessment has been prepared in accordance with national guidelines, where available, in addition to international standards and guidelines relating to the assessment of Greenhouse Gas (GHG) emissions and associated climatic impact. References to legislation include, amendments to same. These are summarised below:

- DCCAE (2017) National Adaption Plan;
- DCCAE (2024) Climate Action Plan 2025;
- Department of Transport, Tourism and Sport (DTTAS) (2019) Transport – Climate Change Sectoral Adaption Plan;
- Climate Action and Low Carbon Development (Amendment) Act 2021 (No.46 of 2015) (hereafter referred to as the 2021 Climate Act);
- Galway County Development Plan 2022-2028;
- Údarás na Gaeltachta Strategic plan 2021-2025;
- European Commission (EC) (2014) 2030 Climate and Energy Policy Framework;
- Transport Infrastructure Ireland (TII) (2022) Climate Assessment of Proposed National Roads – Standard (PE-ENV-01105);
- Transport Infrastructure Ireland (TII) (2022) Climate Guidance for National Roads, Light Rail, and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (PE-ENV-01104);
- Transport Infrastructure Ireland (TII) (2022) Climate Adaption Strategy 2023 ;
- UKHA (2019) Design Manual for Roads and Bridges: A 114 – Climate;
- European Green Deal (EC, 2022);
- Kyoto Protocol (United Nations Framework Convention on Climate Change (UNFCC, 1997);
- Paris Agreement (UNFCC, 2015);
- The Climate Action and Low Carbon Development (Amendment) Act 2021;
- Glasgow Climate Pact (COP26);
- Summary of Global Climate Action at COP 27 (UNFCC, 2022).

12.1.1.3 Local Policy and Guidelines

The Údarás na Gaeltachta Strategic plan 2021-2025 sets out a vision for the Gaeltacht as a creative, innovative and viable region. During the lifetime of the Strategy, it will focus on viable development, the principles of sustainability and the circular economy.

Strategic projects include the 'Green Gaeltacht'. This strategic proposal will ensure that the majority of An tÚdarás business parks will have renewable energy by the end of this strategy. A preliminary plan for the development of a service centre for the renewable energy industry on the West coast of Ireland in Ros an Mhíl, Co Galway will be developed to support this industry

Galway County Development Plan 2022-2028 Chapter 9, Marine and Coastal Management:

9.8 Shipping and Maritime Transport

Ports, harbours and associated infrastructure play a significant role in the continued development of the Marine and Coastal economy. Support for their improvements and upkeep will be imperative in the coming years with the renewable energy agenda now focusing on offshore renewable energy.

Ros an Mhíl is the largest and busiest port within the County Galway with a number of key functions that are pivotal to the success of the marine sector. This facility is an established location as a fishing port, which in turns makes it one of the country's top ten ports for fish landings.

It is also the headquarters for the Galway and Árann Deep-Sea fishing fleet and it has been designated as one of the country's six Major Fishery Harbour Centres.

RPO 4.31 of the RSES seeks to protect, upgrade and expand key fisheries ports including Ros an Mhíl to ensure adequate continued investment in facilities to safeguard its continued prosperity.

The port supports the islands and the tourism industry by providing a year-round ferry service to Oileáin Árann for both passengers and goods. Other routes to offshore islands from Ros an Mhíl will be supported as appropriate. The continued improvement of the marine sector is reliant on the delivery of additional port capacity.

Policy Objectives Shipping and Marine Transport

SMT 1 Marine Potential

To support the marine potential of the county's piers and harbours and related infrastructure and other appropriate marine related development and support the sustainable development of this infrastructure to enable the marine economy to develop.

SMT 2 Expansion of Ros an Mhíl

To support within the lifetime of this plan the potential of Ros an Mhíl as a port of significance and to ensure its development potential is fully realised in accordance with environmental considerations.

12.2 Methodology

The methodology accords with guidance and best practice outlined in Sections 12.2.2.1 to Section 12.2.2.2

The air quality was characterised at a local level to establish a baseline. The nature, scale and duration of the construction works was examined and its potential to have significantly affected or to significantly affect local air quality assessed. Mitigation measures are described to minimise the potential effects.

As part of this assessment, the local climate was characterised based on 30-year averages measured at a representative weather observatory. The compatibility of the proposed project with the National Climate Action

Plan (CAP) was examined. Climate is a global rather than a national consideration, therefore current reports on the state of the climate have been summarised.

12.2.1 Scope of Assessment

The aim of this assessment is to consider whether the development has or will likely result in significant air quality and climate effects. The cumulative effect of the development in combination with neighbouring existing and permitted developments is then assessed to determine any likely cumulative significant air quality and climate effects.

12.2.2 Assessment of Dust Sensitivity of Receptors

A receptor is a location that may be affected by dust emissions during demolition and construction. Human receptors include locations where people spend time and where property may be affected by dust. Ecological receptors are habitats that might be sensitive to dust. The Institute of Air Quality Management (IAQM) have guidance for the assessment of dust from demolition and construction. Transport Infrastructure Ireland (TII) has published guidance for 'Air Quality Assessment of Proposed National Roads' (PE-ENV-01107). This standard refers to the IAQM procedures.

The objectives of the AQA process are to:

- Determine baseline air quality within the study area.
- Identify human receptors where a potential significant change in NO_2, PM_{10} or $PM_{2.5}$ concentrations, due to the proposed national road scheme, may occur.
- Identify sensitive designated habitats where a potential significant change in NOx or ammonia concentrations, due to the proposed national road scheme, may occur.
- Identify human and sensitive designated habitats where there is risk of dust and traffic movement effects occurring during the construction phase.
- Determine suitable mitigation measures to reduce significant air quality effects to an acceptable level.

A key principle of the air quality assessment process is to be proportional to the nature and scale of the project as it relates to the potential for significant air quality effects.

Step 1: Screen the need for a detailed assessment: An assessment will be required where there are sensitive receptors located within 200m of the boundary of the site or route used by construction vehicles on the public highway. Sensitive receptors can be classed as human and ecological.

Each receptor and/or environmental resource which may be affected by the Development is identified and assigned a value on the basis of its importance or sensitivity to the potential effects. The terminology used to describe the sensitivity of the receptor is High, Medium or Low. Table 12-4 indicates how sensitive receptors would be defined for the purposes of this report:

Table 12-4: Receptor Sensitivity Classification

Classification	Human	Ecological
High Sensitivity Receptor	Locations where members of the public are exposed over a time period relevant to the air quality objective for PM10 (in the case of the 24-hour objectives, a relevant location would	Locations with an international or national designation and the designated features may be affected by dust soiling or locations where there is a community of a particularly

Classification	Human	Ecological
	be one where individuals may be exposed for eight hours or more in a day). Indicative examples include residential properties. Hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this assessment.	dust sensitive species. Indicative examples include a Special Area of Conservation (SAC) that is dust sensitive.
Medium Sensitivity Receptor	Locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objectives, at relevant locations would be one where individuals may be exposed for eight hours or more in a day). Indicative examples include office and shop workers but will generally not include workers occupationally exposed to PM10, as protection is covered by Health and Safety at Work Legislation.	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or locations with a national designation where the features may be affected by dust deposition. Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features
Low Sensitivity Receptor	Locations where human exposure is transient. Indicative examples include public footpaths, playing fields, parks and shopping streets.	Locations with a local designation where the features may be affected by dust deposition. Indicative example is a local Nature Reserve with dust sensitive features

There are no highly sensitive receptors (either people or ecological) identified within 200m of the development boundary. The nearest receptors would be commercial activities such as the Irish Coast Guard unit or the Ferry Company. There would be some employees based on the Ferry Company (Aran Island Ferries) therefore the closest receptors would be classed as medium sensitivity. There are no ecological receptors sensitive to dust within 200m of the development boundary therefore the area would be considered low sensitivity to dust effects.

Step 2: Assess the Risk of Dust Effects

The risk of dust arising in sufficient quantities to cause annoyance and/or health and/or ecological effects should be determined using four risk categories: negligible, low, medium and high risk. A site is allocated to a risk category based on two factors:

- The scale and nature of the works (Step 2A), which determines the potential dust emission magnitude as small, medium or large and;
- The sensitivity of the area to dust effects (Step 2B) which is defined as low, medium or high sensitivity.
- These two factors are combined to determine the risk of dust effects with no mitigation applied.

Step 2A EIAR: Re-establishment of temporary site compound, re-install the temporary concrete batching plant, delivery of pre cast concrete units, dredging, installation of remaining foundations, quay wall construction and infill with concrete and construction of 200m length of quay wall and return walls and services.

Step 2B: Define the Sensitivity of the Area

The sensitivity of the area takes account of a number of factors:

The specific sensitivities of receptors in the area;

The proximity and number of those receptors;

In the case of PM_{10}, the local background concentration and;

Site specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

Sensitivity of the area to dust effects on people and property is defined in **Table 12-5**.

Table 12-5: Sensitivity of the Area to Dust Soil Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from source (m)			
		<20	<50	<100	<200
High	>100	High	High	Low	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health effects. The criteria take into consideration the current annual mean PM_{10} concentration, receptor sensitivity and the number of receptors affected within various distance bands from the construction works (**Table 12-6**). The baseline average annual mean PM_{10} concentration for Zone D Rural is 10.9 µg/m^3.

Table 12-6: Sensitivity of the Area to Human Health Effects

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from source (m)				
			<20	<50	<100	<200	<350
High	>32µg/m^3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32µg/m^3	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28µg/m^3	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	<32 µg/m^3	>10	High	Medium	Low	Low	Low

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from source (m)				
			<20	<50	<100	<200	<350
		1-10	Medium	Low	Low	Low	Low
	28-32µg/m^3	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low	Low

The IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to ecological effects from dust. The criteria take into consideration whether the receiving environment is classified as a Special Area of Conservation (SAC), a Special Protected Area (SPA), a Natura Heritage Area (NHA) or a proposed Natural Heritage Area (pNHA) as dictated by the EU Habitats Directive or whether the site is a local natura reserve or home to a sensitive plant or animal species. The proposed development is not located within or adjacent to any SAC, SPA or NHA. The sensitivity of the area to ecological effects can be considered low as per **Table 12-7**.

Table 12-7: Sensitivity of the Area to Ecological Effects

Sensitivity of Area	Distance from the Source (m)	
	<20	<50
High	Medium	Medium
Medium	Medium	Low
Low	Low	Low

12.2.3 Assessment Criteria

12.2.3.1 Air Quality

In the EU, Directives set down Air Quality Standards to protect health, vegetation, and ecosystems. The Ambient Air Quality and Cleaner Air for Europe (CAFÉ) Directive (2008/50/EC) (as amended by Directive EU 2015/1480) was published in May 2008 and was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) and has since been revoked and replaced by S. I. No. 739/2022 Ambient Air Quality Standards Regulations 2022.

There will be some pollutants named in the CAFÉ directive arising from plant and machinery exhaust emissions associated with the construction phases of the development. These include carbon dioxide (CO_2), sulphur dioxide (SO_2), nitrogen oxides (NOx), carbon monoxide (CO), and particulate matter (PM_{10}).

Under the Clean Air for Europe Directive, EU member states must designate "Zones" for the purpose of managing air quality. For Ireland, four zones were defined in the Air Quality Standards Regulations (2011). The zones were amended on 1 January 2013 to take account of population counts from the 2011 CSO Census and to align with the coal restricted areas in the 2012 Regulations (S.I. No. 326 of 2012). The main areas defined in each zone are:

- Zone A: Dublin
- Zone B: Cork
- Zone C: Other cities and large towns comprising Limerick, Galway, Waterford, Drogheda, Dundalk, Bray, Navan, Ennis, Tralee, Kilkenny, Carlow, Naas, Sligo, Newbridge, Mullingar, Wexford, Letterkenny, Athlone, Celbridge, Clonmel, Balbriggan, Greystones, Leixlip and Portlaoise.
- Zone D: Rural Ireland, i.e. the remainder of the State excluding Zones A, B and C.

These zones were defined to meet the criteria for air quality monitoring, assessment and management described in the Framework Directive and Daughter Directives. The site of the proposed development lies within Zone D, Rural Ireland.

Dust

There is potential for temporary disturbance to nearby receptors to occur as a result of fugitive dust from the excavation and transport of soil and materials during construction.

Transport Infrastructure Ireland (TII) published new guidance in 2022 for assessing dust effects at a local level from road construction 'Air quality assessment of proposed national roads – Standard' (TII, 2022A) and 'Air quality assessment of specified infrastructure projects – overarching technical document' (TII,2022B). The assessment of dust has been carried out in accordance with same. The TII Guidance in relation to dust is in accordance with the 2024 IAQM Guidelines on construction dust assessments, and Guidance on the assessment of dust from demolition and construction.

This assessment of dust effects therefore focuses on identifying the existing baseline levels of PM_{10} and $PM_{2.5}$ in the region of the proposed development by an assessment of EPA monitoring data. Thereafter, the effect of the construction phase of the proposed development on air quality was determined by a qualitative assessment of the nature and scale of dust generating construction activities with the proposed development based on the guidance issued by the IAQM (2024).

Traffic

TII guidance documents (TII, 2022A/2022B) state that the following scoping criteria shall be used to determine whether the air quality effects of a project can be scoped out or require an assessment based on changes between 'Do-Something' traffic scenario (with the proposed development) compared to the 'Do-Minimum' traffic scenario (without the proposed development):

- Road alignment will change by 5m or more;
- Annual average daily traffic (AADT) flows will change by 1,000 or more; or
- Heavy duty vehicle (HDV) (vehicles greater than 3.5 tonnes, including buses and coaches) flows will change by 200 AADT or more; or
- Daily average speed change by 10 kph or more;
- Peak hour speed will change by 20kph or more.

If the above criteria are not met, then a quantitative assessment of construction traffic can be scoped out and the effects are considered to be not significant.

The peak daily HGV total two way traffic movements will be 120 for the proposed development. The AADT flows will be less than 1,000 for both typical and peak traffic movements. There will be no change in daily or peak average speeds or change in road alignment. The requirement for a quantitative assessment of construction traffic can be scoped out.

Odour

Dredging operations can sometimes lead to the release of unpleasant odours, particularly if the dredged material contains decaying organic matter or other contaminants.

The main potential odour from the construction stage relates to the potential for fugitive odours from the dredging, particularly hydrogen sulphide. This is a colourless gas with the characteristic foul odour of "rotten eggs".

During historical dredging operations in Ros an Mhíl Harbour, hydrogen sulphide (H2S) was not encountered. However, during the site investigation works undertaken by Fugro in 2001, there was evidence of a high organic content in some locations (inner harbour area) with a moderately strong to strong organic odour noted. As such, odour mitigation measures have been specified in order to minimise the effect of this operation to prevent any nuisance which might be experienced at nearby sensitive receptors.

The dredging of rock that took place after July 2023 was used to create a new blasting platform and temporary berm. All the dredged material was rock rather than sand or silt therefore there was no odour noted during previous dredging works.

12.2.3.2 Climate

The climate assessment in this Chapter is divided into two distinct sections – a greenhouse gas assessment (GHGA) and a climate change risk assessment (CCRA).

The GHGA quantifies the GHG emissions from a project over its lifetime.

The use of concrete, aggregates and steel materials in the construction of the deep water quay will result in greenhouse gas emissions. This is a consequence of any significant infrastructure construction project.

The Environmental Protection Agency (EPA) data indicates that the construction sector significantly contributes to greenhouse gas (GHG) emissions, making up a substantial portion of overall emissions. It is estimated that the Irish Built Environmental accounts for over 36% of Ireland's GHG emissions with residential buildings being a major contributor. The construction sector's emissions arise from both the construction process (embodied emissions) and the ongoing operation of buildings (operational emissions).

Shipping contributes to global greenhouse gas emissions, accounting for roughly 2.5% of global emissions, caused by combustion of fossil fuels to power ships and vessels.

The significance of GHG effects set out in PE-ENV-01104 (TII, 2022b) is based on IEMA guidance (IEMA, 2022) which is consistent with the terminology contained within the EPA's (2022) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports'.

The 2022 IEMA Guidance (IEMA, 2022) sets out the following principles for significance:

- When evaluating significance, all new GHG emissions contribute to a negative environmental effect; however, some projects will replace existing development or baseline activity that has a higher GHG

profile. The significance of a project's emissions should therefore be based on its net effect over its lifetime, which may be positive, negative or negligible;

- Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project's residual emissions at all stages; and
- Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project's remaining emissions should be considered.

TII (TII, 2022b) states that professional judgement must be taken into account when contextualising and assessing the significance of a project's GHG effect. In line with IEMA Guidance (IEMA, 2022), TII state that the crux of assessing significance is "not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero3 by 2050".

Significance is determined using the criteria outlined in Table 12-8 (derived from Table 6.7 of PE-ENV-01104 (TII, 2022b)) along with consideration of the following two factors:

- The extent to which the trajectory of GHG emissions from the proposed project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

Table 12-8: Climate Significance Criteria for GHGA

Effects	Significance Level Description	Description
Significant Adverse	Major adverse	The project's GHG effects are not mitigated. The project has not complied with do minimum standards set through regulation, nor provided reductions required by local or national policies; and No meaningful absolute contribution to Ireland's trajectory towards net zero.
	Moderate adverse	The project's GHG effects are partially mitigated. The project has partially complied with do-minimum standards set through regulation, and have not fully complied with local or national policies; and Falls short of full contribution to Ireland's trajectory towards net zero.
Not significant	Minor adverse	The project's GHG effects are mitigated through 'good practice' measures. The project has complied with existing and emerging policy requirements; and Fully in line to achieve Ireland's trajectory towards net zero.
	Negligible	The project's GHG effects are mitigated beyond design standards. The project has gone well beyond existing and emerging policy requirements; and Well 'ahead of the curve' for Ireland's trajectory towards net zero.

Effects	Significance Description	Level	Description
Beneficial	Beneficial		The project's net GHG effects are below zero and it causes a reduction in atmosphere GHG concentration. The project has gone well beyond existing and emerging policy requirements; and Well 'ahead of the curve' for Ireland's trajectory towards net zero, provides a positive climate effect.

Climate Change Risk Assessment

Climate change projections suggest a general trend of warmer, drier summers and milder, wetter winters. With the development on the coastline, it is likely that sea level rise and storm surges, as an indirect impact to the projected changes in climate, will have the potential to affect the proposed development.

Based on the flood risk assessment, the minimum level of the deep water quay was recommended to be +6.7m Chart Datum (+3.8m OD Malin) to protect against the present day 200-year return period tidal flood level. However, in order to address future sea level rise it was proposed that the finished level of the quay will be increased to +7.0mCD, thus incorporating the 300mm allowance for sea level rise. Docks and marinas are considered water compatible development and therefore less vulnerable to flooding.

It is therefore assumed that the development will be resilient to projected climate change risk and associated effects and is not considered further in this chapter.

12.2.4 Statement on Limitations and Difficulties Encountered

It is not possible to quantify exactly what effect the proposed development will have on Climate Change and Air Quality beyond the site boundary. However, it has been possible to determine the potential significance of the effects. The information provided in this chapter is considered appropriate to enable an informed decision to be made on the potential effects of the proposed development on air quality and climate.

12.3 Existing Environment

Ros an Mhíl village is located approximately 1km on the approach to the existing harbour. A number of discrete one-off residential dwellings, a local shop, community hall, and a church are located within the village.

The primary school, Scoil Naisiunta Colm Cille, is located approximately 1.7 km from the quay There are also a number of localised industries providing support to the harbour activities.

Road access to the harbour is provided by two alternative routes, R372 known as the school road, and the Ballynahown Road or Back Road. Both routes are spurs from the R336, which is the main coast road to Galway.

The closest sensitive receptor to the deep water quay project is a dwelling owned by the Ferry Company and is approximately 590m to the north-west. There are no other residential properties located within 500m of the proposed development site boundary. There are a number of discrete one-off houses located along the Ballynahown Road, Colaiste Chamis is located on this road.

The key sensitive receptors with regards to the air quality effect of the development are those in the vicinity of the existing harbour.

12.3.1 Air Quality

The EPA publishes annual reports on air quality in Ireland. Validated monitoring data from 2023 was made available in conjunction with the report published 'Air Quality in Ireland Report 2023' EPA 2024. The report identifies that in 2023 air monitoring results from EPA stations across Ireland show that fine particulate matter (PM2.5) mainly from burning solid fuel in our homes, and nitrogen dioxide (NO2) chiefly from road traffic, continue to be the main threats to good air quality. Ireland met the current EU legal air quality limits in 2023, but monitoring results were higher that the more stringent health-based World Health Organisation air quality guidelines for a number of pollutants including particulate matter, nitrogen dioxide, sulphur dioxide and ozone. In our Clean Air Strategy Ireland has committed to achieving the WHO guideline values by 2040, with interim targets for 2026 and 2030. The data summarised for Zone D is shown in **Table 12-9**.

Table 12-9: Air pollutant concentrations Zone D 2023 (EPA Report 2024)

Pollutant Concentrations	Zone D – annual average	CAFÉ Limits* µg/m³
Nitrogen Dioxide (NO_2)	8.1µg/m³	40 µg/m³
Particulate Matter PM_{10}	10.9 µg/m³	40 µg/m³
Particulate Matter $PM_{2.5}$	7.1 µg/m³	25 µg/m³
Sulphur Dioxide (SO_2)	4.3 µg/m³	125** µg/m³
Ozone (O_3)	61.5 µg/m³	100*** µg/m³

* Air Quality Standards regulations 2011 – Limit Values (based on EU Council Directive 2008/50/EC)
**24hr average
***Max daily 8-hour mean Long Term Objective

Long term trends in $PM_{2.5}$ are reported in the EPA Air Quality report 2023 for small towns (incl rural Zone D) (see **Figure 12-1**).

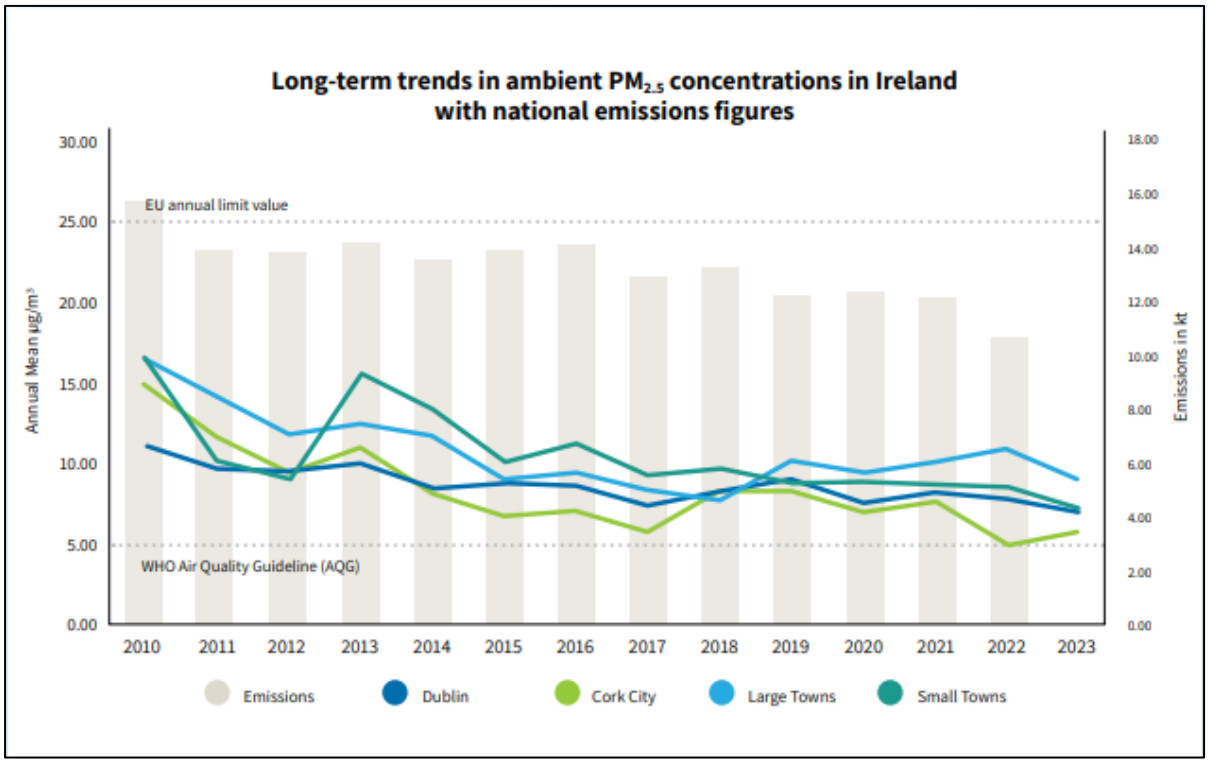

Figure 12-1: Long Term trends in ambient $PM_{2.5}$ in Ireland

A summary of the key messages from the 2023 EPA report include:

- Ireland's latest monitoring shows we are in compliance with current EU standards;
- Ireland is not on track to achieve its ambition, set out in the National Clean Air Strategy, to meet the health-based WHO air quality guideline limits in 2026. Achieving future targets will be very challenging;
- Main pollutants of concern are fine particulate matter (PM2.5) from solid fuel combustion and nitrogen dioxide (NO2) from vehicle emissions/traffic;
- Air pollution can be a major environmental risk to people's health, with approximately 1,600 premature deaths annually in Ireland due to poor air quality.

Transport Infrastructure Ireland (TII) produced an updated standard in December 2022 titles 'Air Quality Assessment of Proposed National Roads – Standard' the purpose of which was to assess the potential air quality effects of national road schemes. The guidance states that the main concern in relation to emissions from road traffic are nitrogen dioxide (NO_2) and particulate matter in the fractions of equal to or less than 10µm (PM_{10}) and equal to or less than 2.5µm ($PM_{2.5}$). During the construction phase, potential air quality effects can occur due to dust emissions and from construction traffic movements. Construction traffic movements include additional vehicle trips associated with the construction of the scheme, as well as traffic management measures. Construction phase effects will be temporary or short-term in nature.

12.3.2 Climate

12.3.2.1 Global Climate

Every year, the World Meteorological Organisation (WMO) issues a 'Statement on the State of the Global Climate'. It is based on data provided by National Meteorological and Hydrological Servies and other national and international organisations. Some of the key messages in the WMO 'Statement of the State of the Climate 2024'[1] are as follows:

- 2024 was the warmest year on record at 1.55 ± 0.13°C above the pre-industrial average.
- Ocean heat content reached its highest level in the 65-year observational record.
- Record monthly global temperatures have been observed for the ocean – from April through to September – and, starting slightly later, the land – from July through to September.
- Observed concentrations of the three main greenhouse gases – carbon dioxide, methane and nitrous oxide – reached record high levels in 2023, the latest year for which consolidated global values are available (1984-2023).
- Over the course of 2024, our oceans continued to warm, sea levels continued to rise, and acidification increased. In 2023, global mean sea level reached a record high in the satellite record (1993 to present), reflecting continued ocean warming as well as the melting of glaciers and ice sheets. The rate of global mean sea level in rise in the past ten years (2013-2022) is more than twice the rate of sea level rise I the first decade of the satellite record (1993-2002).
- Extreme weather continues to lead to severe socio-economic effects. Extreme heat affected many parts of the world. Wildfires in Hawaii, Canada and Europe led to the loss of life, the destruction of homes and large scale air pollution. Flooding associated with extreme rainfall from Mediterranean Cyclone Daniel affected Greece, Bulgaria, Turkey and Libya with particularly heavy loss of life in Libya.
- Extreme weather and climate conditions continued to trigger new, prolonged and secondary displacement in 2024 and increased vulnerability of many who were already uprooted by complex multi-casual situations of conflict and violence.

12.3.2.2 Ireland's Climate Change Assessment Synthesis Report – EPA 2023

This report is the first Ireland's Climate Change Assessment (ICCA) and the development was modelled on the work of the Intergovernmental Panel on Climate Change and the Sixth Assessment Cycle, completed in 2023, with the use of and localisation of its information for Ireland. The full report was developed through a co-creation process between leading academics in Ireland and officials from across state agencies and government departments. Key findings in the report for policy makers include:

a) Human activity has resulted in widespread and rapid changes in climate which are already affecting us all today.

b) The future climate is in our collective hands. To halt warming globally and in Ireland requires rapidly reaching at least net-zero carbon dioxide emissions and substantially cutting other greenhouse gas emissions. Every action matters; with every additional increment of warming, effects for Ireland will increase substantially.

[1] https://library.wmo.int/viewer/68835/download?file=1347_Global-statement-2023_en.pdf&type=pdf&navigator=1

c) Having peaked in 2001, Ireland's greenhouse gas emissions have reduced in all sectors except agriculture. However, Ireland currently emits more greenhouse gases per person than the EU average. A legal basis for deep, rapid and sustained national emissions cuts now exists, although current policy and action remain insufficient to meet those aims. The pathway forwards is clearer for energy, transport and the built environment than for agriculture and land use. For all sectors there are many challenges to overcome.

d) Ireland needs to be resilient to ongoing and future climate change effects. This requires increased in focus upon and investment in adaptation that can protect us from future climatic effects. Current implementation of adaptation is too slow and fragmented. Doing better requires financing, working with people and nature, monitoring and evaluating outcomes, and increasing public and private sector involvement.

e) Effective and just transformative actions will have mitigation and adaption benefits and bring broader benefits for health, wellbeing, nature and sustainable economic development. The state has a central role to play in enabling the necessary transformations, supported through action across society. Decisions taken this decade will reverberate for generations to come.

The Synthesis report is an integrated overview of four assessments including:

- Climate Science: Ireland in a Changing World.
- Achieving Climate Neutrality by 2050.
- Being prepared for Ireland's Future Climate.
- Realising the Benefits of Transition and Transformation.

It is unequivocal that human activity has warmed the climate system. Globally, widespread and rapid changes in the atmosphere, ocean, land, cryosphere and biosphere have occurred. The scale of the recent changes across the climate system as a whole – and the present state of many aspects of the climate system – are unprecedented over many centuries to many thousands of years. Human-induced climate change is already modifying extreme weather events across the globe. Increases in both the frequency and intensity of heatwaves and extreme precipitation have been consistently linked to human activities. Similarly, cold events have been made less likely and severe. Many notable recent Irish events have not yet been formally studied in the context of this rapidly emerging science of event attribution using state-of-the-art approaches. However, there is high confidence that recent changes in heat extremes and heavy precipitation events in Ireland can be linked, albeit indirectly, to human-induced climate change.

To stabilise the global climate requires global carbon dioxide emissions reduction to reach at least net-zero. Furthermore, emissions of other greenhouse gases would need to be substantially reduced on a sustained basis. Many components of the global climate system, such as temperature and precipitation, respond within years to decades to changes in radiative forcing. If we can reach net zero global carbon dioxide emissions around 2050, these components would globally stabilise within the lifetime of many of today's younger citizens. Some other components of the climate system, most notably sea level rise, will take thousands of years to stabilise even once greenhouse gas emissions reach net zero.

Future changes in climate will have effects for all aspects of Irish society, the environment and the economy. Without significant mitigation and adaption efforts, climate change will result in significant effects for many marine, terrestrial and freshwater species and habitats, potentially undermanaging capacity to adapt to climate change in other sectors. Climate change will affect aspects of Irish agriculture. While increased in productivity can be expected in some crops. Decreases can be expected for others. Pests and pathogens and likely to have an increased effect on arable and livestock farming, while increases in precipitation amounts and intensity would increase nutrient washout from land with consequent effects on water quality.

The transition to a climate-neutral society is both an urgent challenge and an opportunity to build a resilient future for all. All parts of society will play a role – from the power sector to industry, mobility, buildings, agriculture and forestry. This will require leadership from government (policymakers, policy enforcers, etc.), business, communities and individuals.

Achieving net zero carbon dioxide emissions by 2050 requires significant and unprecedented changes to Ireland's energy system. There will be difficult choices ahead. Infrastructure such as the electricity grid must be built, large investment must be sought, renewable fuels found, and homes and businesses transformed. Without these changes and societal and political support, a net zero energy system cannot be achieved.

Policies tailored to suit different stages of technology development are critical for achieving a net zero energy system. Established technologies, such as wind energy, solar photovoltaics and bioenergy, will be key in meeting short-term emission reduction targets (i.e. 2030), whereas offshore wind infrastructure is expected to be the backbone of future energy systems.

Ireland has set the national objective of transitioning to a climate-resilient, biodiversity-rich, environmentally sustainable and climate-neutral economy by 2050 at the latest. Resilience refers to the ability to absorb and respond to climate change by implementing effective adaptation actions and sustainable development to reduce negative climate effects while also taking advantage of any opportunities. Adaptation aims to increase resilience by helping us navigate extreme events and maintain flexibility and a diversity of responses in delivering actions that reduce social, ecological and economic vulnerability and exposure.

We are not starting from an ideal position for adaptation because of ageing infrastructures, declining quality of the built environment, and significant and ongoing environmental deterioration, including declines in water quality, biodiversity and ecosystem quality. Together with a growing population and a lack of investment in critical infrastructure, this has meant that many natural and human systems upon which wellbeing depend have become less resilient. Looking to the future, aside from climate change, social, environmental and economic challenges in energy, health, housing, and an increasing and ageing population, together with biodiversity loss, will all increase vulnerability to climate change effects.

Transformative change is a fundamental, system-wide reorganisation across technological, economic and social factors, including paradigms and goals, that values the climate, the environment, equity and wellbeing in decision making. It can entail mobilising society to fundamentally reorganise the systems driving greenhouse gas emissions, biodiversity loss and vulnerability to the effects of climate change.

The decisions made and actions taken this decade will have long-term consequences affecting many generations into the future. Tackling climate change and biodiversity loss together enhances the many synergies that exist between actions to address these crises while minimising and managing any remaining trade-offs. Pursuing transformative change can also deliver social, economic and environmental benefits and opportunities from climate action that would otherwise be missed, including those for the wellbeing of people and nature and for greater equity across society.

12.3.2.3 National Greenhouse Gas Emissions

In May 2025, the EPA updated the 1990-2023 greenhouse gas emissions inventory data. In 2023, Ireland's GHG emissions are estimated to be 58.82 million tonnes carbon dioxide equivalent (Mt CO_2eq) which is 6.1% lower than emissions in 2022, driven by the reductions in the Electricity generation, Residential sector, Agriculture and Industry. In 2023 the manufacturing combustion sector was responsible for 7.6% of Ireland's total greenhouse gas (GHG) emissions and the industrial processes sector was responsible for 3.9%.

The data indicates that from 2021- 2023 Ireland has used 63% (186.0 Mt CO2eq) of the 295 Mt CO2eq Carbon Budget for the five-year period 2021-2025. This leaves 37% of the budget available for the next two years, requiring a substantial 5% annual emissions reduction for 2024 and 2025 to stay within budget.

12.3.2.4 Local Climate

Ireland has a temperate, oceanic climate, resulting in mild winters and cool summers. There are a total of 20 automatic weather stations (AWS) and 5 manned weather stations (MWS) in Ireland. All weather observations record day-to-day changes of the atmosphere and are quality controlled in Met Eireann's database to formulate long-term climate records. The nearest station to the proposed development site is Athenry AWS. The following parameters are recorded at the station: Air temperature, rainfall and wind speed.

Athenry AWS is located approximately 33km east of Ros an Mhíl. A summary of 5-year data from 2018 – 2022 is shown in Table 12-10.

Table 12-10: Met Data Athenry AWS 2018-2022.

Year	Annual Precipitation Amount (mm)	Mean Air Temperature (°C)	Mean Wind Speed (knot)
2018	1179	9.75	7.15
2019	1426	9.82	7.2
2020	1481	9.90	7.59
2021	1124	10.23	6.57
2022	1179	10.27	6.98

The Annual Climate Statement for 2024 released by Met Éireann[2] states that overall the average annual air temperature for Ireland in 2024 *(using the Island of Ireland dataset*)* was 10.72 °C, which is 1.17°C above the 1961-1990 long-term average (LTA) or 0.55°C above the most recent 1991-2020 LTA. This makes 2024 the fourth

[2]https://www.met.ie/annual-climate-statement-for-2024#:~:text=The%20average%20annual%20air%20temperature,the%20warmest%20year%20on%20record.

warmest year on record, 0.49 °C cooler than 2023, the warmest year on record. Provisionally, 2024 rainfall was the 41st driest or 44th wettest since 1941.

Wind direction at Claremorris, which would be representative of the west coast, is largely from a south-westerly direction. A summary of 65 years of wind direction data is shown in Figure 12-2.

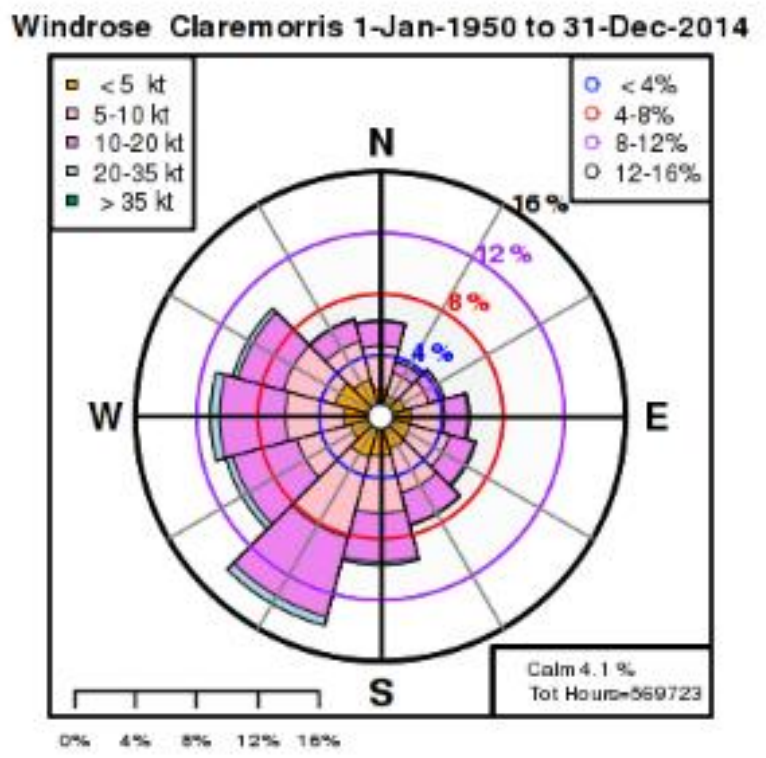

Figure 12-2: Windrose data Claremorris 1950-2014.

12.4 Potential Significant Effects of the Proposed Development

12.4.1 Do Nothing

Upgrade works to Ros an Mhíl quay were undertaken from January 2023 to May 2024 when works were ceased due to a legal challenge to the extension of the planning permission. Once works were ceased, temporary infrastructure, equipment and materials were removed from the site. If the proposed development was not to proceed there would be no effect on air quality. However, the requirement for a deep water quay to support the indigenous seafood industry as well as a berthing quay for large vessels such as Irish Navy Fleet and vessels to support potential offshore wind, may be required to be constructed elsewhere therefore the effect on a wider geographical area is still to occur.

12.4.2 Construction Phase – Proposed Works

A summary of the proposed works is as follows;

1. Works to complete a Deep Water Quay development as previously permitted by Galway County Council under Planning Ref 17/967 comprising
   (i) Completion of a 200m quay wall construction using precast beams, precast caissons and precast L-wall units to full height of the quay wall;
   (ii) Dredging of a 30m wide x 200m long berthing pocket adjacent to the new quay to a depth of -10.0m CD (previously permitted to -12.0m CD);
   (iii) Dredging for a turning circle of 150m diameter (previously permitted at 200m diameter) to a depth of -7.0m CD (previously permitted to -8.0m CD) ;
   (iv) Backfilling behind the quay wall and raising ground level of reclaimed lands using rockfill up to +7mCD;
   (v) Reinforced concrete deck behind the quay wall;
   (vi) Surfacing of the reclaimed lands;
   (vii) Asphalt roadway connecting the concrete apron at the quayside to the existing road;
   (viii) Install lighting columns, underground ducts, surface water drainage, outfalls, interceptor, foul water drainage system including pumping station;
   (ix) Placement of rock armour for revetments along northern and southern extent of reclaimed land;
   (x) Excavation by dredging and rock blasting (if required) of the navigation channel to provide for a fully dredged navigation channel of -7m CD and minimum width of 100m (previously permitted to -8.0m CD and minimum width of 74m);
   (xi) A temporary site compound for contractor personnel including an effluent holding tank;
   (xii) A temporary concrete batching plant to provide on-site concrete for the quay wall construction;
   (xiii) Install palisade fencing, roadside guard rails, gates and traffic barrier around land boundary of quay area; and
2. Further development comprising:
   (i) A wastewater pipeline to connect proposed wastewater discharge points along the proposed quay to a new pumping station for onward discharge to an Údarás na Gaeltachta wastewater treatment network and plant at Ros an Mhíl; and
   (ii) A new ESB electrical sub-station for dedicated power provision to the new deep-water quay

12.4.2.1 Air Quality and Dust Effects

The main air quality effects that may arise during the construction phase will be:

- Dust deposition, resulting in the soiling of surfaces;
- Visible dust plumes, which are evidence of dust emissions;
- Elevated PM_{10} and $PM_{2.5}$ concentrations, because of dust generating activities on-site;
- To a lesser extent, increase in concentrations of airborne particles and nitrogen dioxide due to exhaust emissions from diesel powered vehicles and equipment used on-site.

The most common effects are dust soiling and increased ambient PM_{10} concentrations due to dust arising from activities on the site. Dust soiling will arise from the deposition of the Particulate Matter (PM) in all size fractions but would be associated mostly with particulate matter greater than 10 µm. The ambient PM relevant to health

outcomes would be measured as PM_{10}, although most of this will be in the $PM_{2.5}$ fraction, rather than the $PM_{2.5}$ portion.

In general, 85% to 90% of the fugitive dust emissions of PM_{10} from construction sites are $PM_{2.5-10}$ and 10% to 15% are in the $PM_{2.5}$ fraction. For construction as a whole, it is recommended that the average $PM_{2.5}$ content of PM_{10} should be assumed to be 10%.[3]

The proposed development will consist of a temporary batching plant, sand and aggregate raw material stores, dredging and excavation, concrete pours, construction traffic, rockfill and construction of ESB substation as the main elements with dust and air quality effect potential.

The proximity of the nearest receptors is shown in **Figure 12-3**. The nearest receptors to the development are staff working at the Irish Coast Guard or Atlantic Way Sailing. Due to the nature of the work and the relatively wet climate along the west coast of Ireland, it is unlikely there would be any lengthy periods of exposure to dust. Raw materials for the concrete batching plant will be located in compounds along the northern boundary of the development site. The predominant wind will be from the south-west. There could be up to 10 operational staff at these locations for a period of time. The sensitivity of the area to dust soil effects on people and property is considered low.

The risk assessment based on the IAQM guidance, taking into consideration baseline concentration, number of receptors and distance from source, classes the overall sensitivity to human health effects from the proposed development as Low.

Figure 12-3: Location of receptors in proximity to proposed development.

[3] https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf

Traffic

Traffic movements during the construction phase are outlined in the Traffic Chapter (**Chapter 14**). Over the course of the construction of the proposed development, activities across the site will vary resulting in different staff numbers and different trip generation depending on the activities being undertaken at any given time.

The peak construction stage traffic has been reviewed and the potential for significant traffic related effects has been screened out based on the following assessment criteria:

- Annual average daily traffic (AADT) changes by 1,000 or more during construction;
- Heavy duty vehicle (HDV) changes by 200 or more;
- A change in speed band;
- A change in carriageway alignment by 5m or greater.

The peak daily HGV total two-way traffic movements will be 120 for the proposed development. The AADT flows will be less than 1,000 for both typical and peak traffic movements. There will be no change in daily or peak average speeds or change in road alignment. The requirement for a quantitative assessment of construction traffic can therefore be scoped out.

The construction stage traffic has the potential for a **not significant, negative and short-term** air quality effect.

Construction Works

There will be dust generated from moving and transporting soil, stone and materials in and around the construction site and on public roads. Weather conditions will play an important role in the quantity of dust generated. The potential for fugitive dust emissions is greatest during periods of prolonged dry weather.

The surrounding area has also been assessed for the presence of any ecological receptor, human receptor or sensitive habitat which would be affected by dust soiling. A human receptor refers to any location where a person may experience the annoyance effects of airborne dust or dust soiling, or exposure to PM_{10} over a time period relevant to the air quality objectives (PM_{10} averaging period 24 hrs). In terms of annoyance effects, this will most commonly related to residential dwellings but may also refer to industrial and commercial premises that have a particular sensitivity to dust effects. The effect of dust from construction is generally localized (within 50 – 200 meters from the works).

The risk of dust emissions from a demolition/construction site causing loss of amenity and/or health or ecological effects is related to:

- The activities being undertaken: earth moving & excavation, transport & unloading, construction of access roads and hardstands, construction of substation and vehicle movements;
- The duration of these activities: 18 months;
- The size of the site;
- The meteorological conditions (wind speed, direction and rainfall);
- The proximity of receptors to the activities;
- The adequacy of the mitigation measures applied to reduce or eliminate dust; and
- The sensitivity of the receptors to dust.

Screening the need for a more detailed assessment is in accordance with the updated January 2024 IAQM 'Guidance on the assessment of dust from demolition and construction'. An assessment will normally be required where there is:

- A human receptor within 250m of the boundary of the site and/or;
- A human receptor within 50m of the route(s) used by the construction vehicles on the public highway, up to 250m from the site entrance (S);
- An ecological receptor within 50m of the boundary of the site and/or;
- An ecological receptor within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrances

The potential effect from dust becoming friable and a nuisance to workers and local road users, if unmitigated, is considered to be slight, negative, short-term, direct effect during the construction phase. Generally, the distance the particle travels is dependent on size, disturbance activities and weather conditions. Larger dust particles tend to travel shorter distances. There are no human sensitive receptors within 250m of the proposed site boundary (see **Figure 12-4**). Based on the number, sensitivity and location of receptors, the requirement for a more detailed assessment has been screened out.

A site-specific dust management plan will be developed as part of the Construction Environmental Management Plan (CEMP) (see **Appendix 2A**). The plan will include a 'Best Practice' approach to deal with potential dust emissions during the construction phase. These measures are also included in **section 12.7** of this report.

The effect from the proposed development on air quality and dust will be **short-term, negative, not significant and direct**. (see **Table 12-11**).

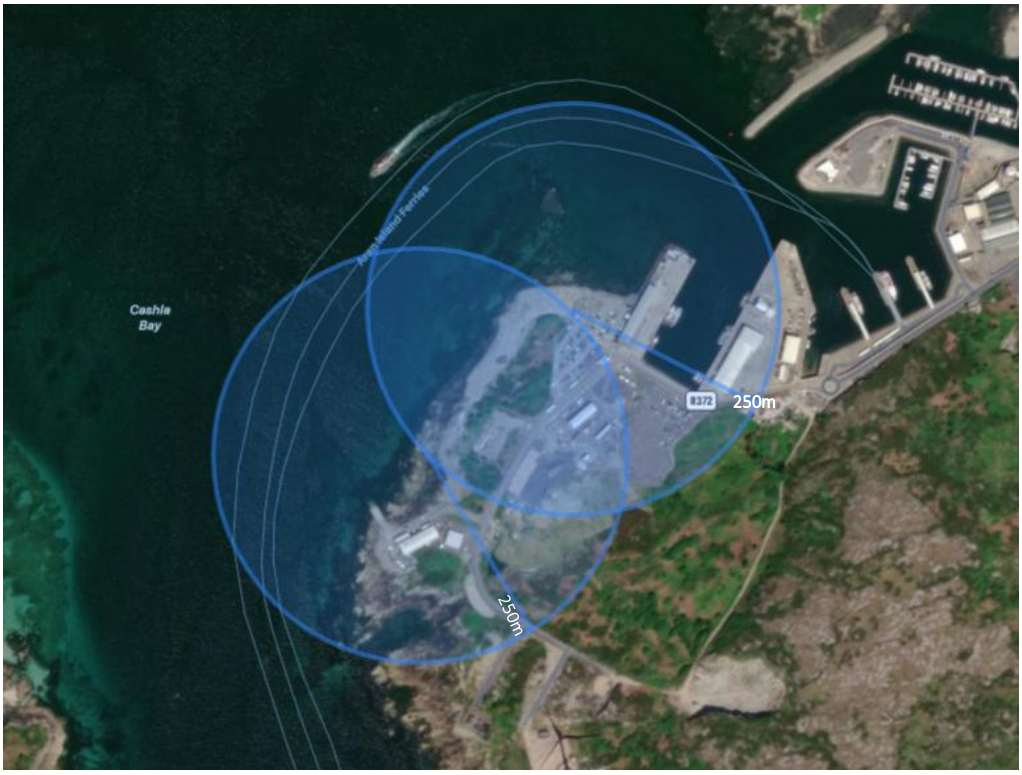

Figure 12-4: 250m radius from aggregate storage area and rock and concrete infill.

Table 12-11: Pre-mitigation Air Quality and Dust Effects

	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Construction Works	Negative	Not significant	Local	Short-term	Direct
Traffic	Negative	Not significant	Local	Short-term	Direct

Odour

The main potential odour from the construction stage relates to the potential for fugitive odours from the dredging operations, particularly hydrogen sulphide. In previous SI works undertaken by Fugro 2001, a moderate to strong organic odour was noted in the clay/silt material predominantly in the harbour area and occasionally in sheltered areas of the outer channel.

All material excavated will be retained on site and reused. The clay and silt material will be loaded by the backhoe dredger and onto a self propelled barge. The barge will sail to the adjacent shoreline where it will be loaded by land based plant which will then place the material within the reclamation area.

Odour mitigation measures have been specified in order to minimise the effect of this operation to prevent any nuisance which might be experienced by receptors outside the proposed development boundary. These measures are outlined in Section 12.6 and the CEMP (see Appendix 2A of EIAR Vol. 3).

The potential for odour effects is **negative, temporary, slight and direct** (see **Table 12-12**).

Table 12-12: Pre Mitigation Potential Odour Effects

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Odour	Negative	Slight	Local	Temporary	Direct

12.4.2.2 Greenhouse Gas Assessment (GHHA)

Carbon dioxide accounts for 61.1% of Greenhouse gases in Ireland (EPA 2025) with the remainder consisting of methane, nitrous oxide and F-gases. GHG emissions can be measured in terms of CO2 equivalent which involves converting different GHGs into the CO2 equivalent based on the Global Warming Potential (GWP).

Carbon emissions for infrastructure projects would include embodied carbon from the production, transport and construction of materials. In Ireland, embodied carbon emissions account for 14% of total emissions.

The following carbon emissions are associated with the proposed development:

- Products and Materials;
- Transport to the project site;
- Construction and installation processes.

Information on the volumes of materials was obtained from the developer and design engineers for the purposes of this assessment. For the purposes of this assessment, it is assumed that the raw materials and pre cast concrete elements are being supplied and transported from Banagher Concrete, Co. Offaly (one way trip 121km) and Harringtons Quarry, Kilkelly, Co. Mayo (one way trip 107km).

Materials required and transported to site include:

- 6661 tonnes rock armour for revetments;
- Steel for concrete works;
- 20,000m3 rock for infill;
- 26,000m3 aggregate for concrete batching plant;
- 358 caissons (10382 tonnes) delivered to site;
- 40 beams (140 tonnes) and 121 L-shaped sections (1452 tonnes) delivered to site.

The project is expected to have a construction phase of 24 months. The predicted embodied emission can be averaged over the full construction phase and the lifespan of the project to give the predicted annual emission to allow for direct comparison with national annual emissions and targets. Emissions have been compared against Ireland's EU 2030 target of a 42% reduction in non-ETS sector emissions based on 2005 levels (33.3Mt CO2eq) (set out in Regulation EU 2018/842 of the European Parliament and of the Council) in Table 12-13.

Table 12-13: Predicted Construction Stage Emissions GHG

Source	Construction Phase Embodied Emissions (tonnes CO2eq)
Pre-construction	9,981
Embodied Carbon	4,319
Construction Activities	585
Operational Use	29
Total	14,914
Total Annual Emissions as % of Irelands 2030 GHG emission target	0.0447%
Total Embodied Carbon Emissions as % of the 2030 Industry budget	0.049%

The total construction phase embodied emissions totals 14,914 tonnes CO2eq; which equates to 0.045% of Ireland's 2030 GHG emission target. The embodied carbon associated with materials, which would fall under the industry carbon budget equates to 0.049%.

The likely effect on climate will be considered cumulatively across the lifespan of the project (see Section 12.4.2.3).

Mitigation measures for greenhouse gas emissions are detailed in Section 12.5.1.4

12.4.3 Operational Phase Air Quality

12.4.3.1 Greenhouse Gas Emissions

Ships at berth can affect air quality due to emissions from their auxiliary engines which are used for power while docked. This engines power essential functions like lighting, refrigeration and communications while docked.

The proposed development will have electrical plug in points for boats when using the quay which will help in reducing emissions. Shore power allows at-berth vessels to plug into the local electrical gird and turn off auxiliary engines that would otherwise burn fossil fuels.

The International Maritime Organisation (IMO), of which Ireland is a member, establishes international regulations for safe, secure and efficient shipping on clean oceans. Ireland transposed the International Convention for the Prevention of Pollution from Ships (MARPOL) through various pieces of national legislation, primarily the Sea Pollution Acts and associated regulations. IMO is actively developing measures to reduce greenhouse gas (GHG) emissions from international shipping. The IMO 2024-2029 Strategic Plan SD3 Response to climate change and reduce greenhouse gas emissions from international shipping states:

Although shipping is one of the most energy-efficient modes of transportation, the maritime sector continues to pursue strategies and measures to reduce greenhouse gas (GHG) emissions from international shipping worldwide. Having already developed global regulations on energy efficiency for ships, the Organization continues to take concrete actions to ensure that international shipping bears its fair share of responsibility in addressing climate change. IMO adopted the Initial Strategy on Reduction of GHG Emissions from Ships in 2018, which has been replaced by the 2023 IMO Strategy on Reduction of GHG Emissions from Ships (2023 IMO GHG Strategy) with the strengthened ambition to peak GHG emissions as soon as possible and to reach net zero GHG emissions by or around, i.e. close to, 2050, taking into account different national circumstances, while pursuing efforts towards phasing them out, consistent with the long-term temperature goal set out in Article 2 of the Paris Agreement. The 2023 IMO GHG Strategy also outlines IMO's commitment to further develop and implement GHG reduction measures and the need to consider the impacts of measures on States.

In its role as the global regulator of international shipping, IMO will develop appropriate measures and solutions to reduce the shipping industry's contribution to air pollution and its effect on climate change. This includes measures to facilitate international shipping's transition to zero or near-zero GHG emission technologies, fuels and/or energy sources, as these will be integral to achieving the overall level of ambition in the 2023 IMO GHG Strategy.

In April 2025, the European Commission welcomed an agreement at the International Maritime Organisation (IMO), to take a meaningful step towards achieving net-zero greenhouse gas (GHG) emissions from global shipping by 2050. The EU and its Member States played a key role in securing the deal and will remain actively engaged in the lead-up to its adoption in October 2025 and implementation in 2027. The agreement includes a new measure, setting a global standard for gradually reducing the GHG intensity of marine fuels. It will regulate how “clean” the energy used by a ship should be, based on its climate effect. The measure applies to the full lifecycle of GHG emissions of shipping fuels. It uses standardised criteria and a common certification scheme for fuels that facilitates a level-playing field, irrespective where a fuel is produced, transported or used. As a result, it will prevent emissions from shifting to other sectors and encourage sustainable investments that will reduce emissions throughout the entire lifecycle across the globe.

The new measure also introduces a first global pricing mechanism for emissions, which along with financial incentives, will encourage shipping companies to use the cleanest fuels and technologies early on. For example, companies will be incentivised to invest in zero- and near-zero emission marine fuels, like renewable methanol and ammonia. By stimulating investment in these cleaner fuels, the measure will help reduce the shipping industry's GHG footprint.

The projects GHG effects are mitigated through good practice measures and compliance with existing and emerging policy requirements. The IMO are implementing strategies to achieve net zero targets.

The effect on greenhouse gas emissions from the construction and operational phases of the proposed development at Ros an Mhíl will have a **long term, slight, negative effect on air quality and climate** however the extent of this effect is **expected to reduce overtime** with the forthcoming measures of reducing the GHG intensity of marine fuels (see **Table 12-14**).

Table 12-14: Pre Mitigation Potential Climate Effects

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
CONSTRUCTION AND OPERATIONAL PHASES COMBINED					
GHG Emissions	Negative	Slight	National/International	Long-Term	Direct

12.4.3.2 Road Traffic Emissions

The Ros an Mhíl Deep Water Quay would provide enhanced space for fishing operations. There would be no increase in fishing quotas and no increase in fishing generated road traffic volumes.

The operational effect of road traffic on air quality and climate from the proposed development will be long term, neutral and not significant (see **Table 12-15**).

Table 12-15: Pre Mitigation Potential Traffic Effects

Impact	Quality of Effect	Significance	Spatial Extent	Duration	Other Relevant Criteria
Road Traffic Emissions	Neutral	Not significant	Local	Long-term	Direct

12.5 Mitigation Measures

12.4.4 Construction Phase Mitigation

12.4.4.1 Dust and Air Quality

A Dust Minimisation Plan will be prepared for the construction phase of the proposed deep water quay as construction activities are likely to generate some dust. The Plan will include the following dust related mitigation measures:

- Site roads will be regularly cleaned and maintained as appropriate. Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic only. Furthermore, any road that has the potential to give rise to fugitive dust must be regularly watered, as appropriate, during dry and/or windy conditions;

- Vehicles using site roads will have their speeds restricted where there is a potential for dust generation;
- Vehicles delivering material with dust potential to an off-site location will be enclosed or covered with tarpaulin at all times to restrict the escape of dust;
- Vehicles exiting the site will make use of a wheel wash facility where appropriate, prior to entering onto public roads, to ensure mud and other wastes are not tracked onto public roads;
- Public roads outside the site will be regularly inspected for cleanliness, and cleaned as necessary. Before entrance onto public roads, trucks will be adequately inspected to ensure no potential for dust emissions.
- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind;
- Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods;
- At all times, the procedures put in place will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, appropriate measures will be implemented to rectify the problem; and
- The Dust Minimisation Plan will be reviewed at regular intervals during the construction phase to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures.

12.4.4.2 Odour

The CEMP will also include an Odour Management Plan to mitigate the potential for odours from dredging operations. This Plan will utilise the guidance 'Environmental Protection Agency Odour Emissions Guidance Note AG9, 2019. In particular the measures implemented will include:

- Employ appropriate methods, including monitoring and contingencies, to control and minimise odour pollution;
- Prevent unacceptable odour pollution at all times; and
- Reduce the risk of odour releasing incidents or accidents by anticipating them and planning accordingly.

The Plan will also include for periodic odour surveys at nearby sensitive receptors during dredging activities by a suitably qualified expert. The frequency of this monitoring will be agreed as part of the overall implementation of the CEMP with Galway County Council.

12.4.4.3 Traffic Emissions

As described above the air quality effects from construction traffic are not considered to be significant. However, the following good practice mitigation will be employed;

- Implementation of a Traffic Management Plan which will be prepared in advance of the construction works and which will form part of the specification for the construction works. This will outline measures to minimise congestion and queuing, reduce distances of deliveries and eliminate unnecessary loads;
- Turning off vehicular engines when not in use. This restriction will be enforced strictly unless the idle function is necessary for security or functionality reasons; and

- Regular maintenance of plant and equipment. Technical inspection of vehicles to ensure they will perform the most efficiently.

12.4.4.4 Greenhouse Gas Emissions

The IEMA GHG Management Hierarchy (IEMA 2020b) will be followed for effect minimisation. The Hierarchy is as follows:

- First Eliminate
  - Influence business decisions/use to prevent GHG emissions across the lifecycle
  - Potential exists when organisations change, expand, rationalise or move business
  - Transition to new business model, alternative operation or new product/service
- Then Reduce
  - Real and relative (per unit) reductions in carbon and energy
  - Efficiency in operations, processes, fleet and energy management
  - Optimise approaches (e.g. technology) and digital as enablers
- If you can't eliminate or reduce, then Substitute
  - Adopt renewables/low-carbon technologies (on site, transport etc)
  - Reduce carbon (GHG) intensity of energy use and of energy purchased
  - Purchase inputs and services with lower embodied/embedded emissions
- The final option is to Compensate
  - Compensate 'unavoidable' residual emissions (removals, offsets etc)
  - Investigate land management, value chain, asset sharing, carbon credits
  - Support climate action and developing markets (beyond carbon neutral)

Embodied carbon of materials and construction activities will be the primary source of climate effects during the construction phase. The design of the deep water quay, including the re-use of all of the dredged material will minimise the use of high embedded energy materials during construction. This will ensure that the release of greenhouse gases associated with alternative construction methods, for example exporting all of the dredge material off site or importing all of the fill material required for construction of the caisson units, will be avoided.

Measures to reduce the embodied carbon of the construction works will be implemented as follows:

- A construction programme will be created to allow for sufficient time to determine reuse and recycling opportunities;
- Alignment with requirements under the Local and National Climate Action Plan;
- The replacement, where feasible, of concrete containing Portland cement with a low carbon concrete as per the Climate Action Plan;
- The IEMA mitigation hierarchy will be followed (see above);

- A suitably competent contractor will be appointed who will undertake waste audits detailing resource recovery best practice and identify materials can be reused/recycled;
- Materials will be reused on site within the new build areas where possible;
- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods;
- All plant and machinery will be well maintained and inspected regularly;
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site;
- Waste audits will be undertaken that will detail resource recovery best practice and identify materials that can be reused and recycled. Materials will be reused on-site within the areas where possible.
- Sourcing materials locally where possible to reduce transport related CO2 emissions.

12.4.5 Operational Phase Mitigation

12.4.5.1 Greenhouse Gas Emissions

All fishing vessels will be required to utilise the onshore power supply to reduce emissions while berthed.

12.4.5.2 Traffic

No mitigation measures will be required as the operational effect from traffic is not considered significant.

12.6 Residual Effects

There are not anticipated to be any significant residual effects from the construction phase following the implementation of the proposed mitigation measures (see Table 12-16).

There are not anticipated to be any significant residual effects from the operational phase.

Table 12-16: Summary of Residual Effects after the application of the proposed mitigation measures.

Impact/Activity/Receptor	Quality Of Effect	Pre-Mitigation Significance Rating	Mitigation Measures	Post-Mitigation / Residual Significance Rating
CONSTRUCTION EFFECTS				
Air Quality and Dust Effects (Construction Works)	Negative	Not Significant	Dust Minimisation Plan	Not Significant
Air Quality and Dust Effects (Traffic)	Negative	Not Significant	Traffic Management Plan, Regular Maintenance	Not Significant
Odour	Negative	Slight	Odour Management Plan	Not Significant
OPERATIONAL EFFECTS				
GHG Emissions	Negative	Slight	The IEMA GHG Management Hierarchy	Not Significant
Road Traffic Emissions	Neutral	Not Significant	Traffic Management Plan, Regular Maintenance	Not Significant

12.7 Cumulative Effects

Other projects considered for cumulative effects are detailed in Chapter 1 of this report. An effect during the construction phase on air quality is only likely to arise if these phases of the proposed developments are to run concurrently with construction of another project. Based on a review of developments, plans and projects in proximity to construction works, there will been no significant cumulative air quality.

With respect to the requirement for a cumulative assessment from greenhouse gas emissions, PE-ENV-01104 (TII, 2022b) states that "for GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable." However, by presenting the GHG effect of a project in the context of its alignment to Ireland's trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential for the project to affect Ireland's ability to meet its national carbon reduction target. Therefore, the assessment approach is considered to be inherently cumulative.

12.8 Conclusions

An assessment of the likely air quality and climate effects associated with the project has been undertaken.

During the construction phase of the project, best practice measures will be implemented to minimise any adverse effects on air quality and climate. During the operational phase, vessels will be connected to a shore electrical supply minimising greenhouse gas emissions while berthed.

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