MWP

REMEDIAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT (rEIAR)

Ros an Mhíl Deep Water Quay

Chapter 12 Air Quality and Climate

Department of Agriculture, Food and the Marine

October 2025

Contents

Tables

Figures

Project No.	Doc. No.	Rev.	Date	Prepared By	Checked By	Approved By	Acceptance Code / Status
24984	6002	P01	22/08/2025	CB	MT/WM	CF	FINAL

MWP, Engineering and Environmental Consultants

Address: Reen Point, Blennerville, Tralee, Co. Kerry, V92 X2TK, Ireland

www.mwp.ie

12. Air and Climate

12.1 Introduction

This chapter describes the likely significant effects the construction works for the deep-water quay development carried out during the period January 2023 to May 2024 has had on air quality and climate. For a full description of the development, refer to **Volume II, Chapter 2 Project Description** of this remedial Environmental Impact Assessment Report (rEIAR).

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 12.1.1.1** to **Section 12.1.1.4**.

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**).

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
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

Pollutant	Limit Value Objective	Averaging Period	Limit Value µg/m³	Limit Value ppb	Basis of Application of the Limit Value
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: Target values for Ozone defined in Directive 2008/50/EC

Objective	Parameter	Target Value for 2010	Target Value for 2020
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
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
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 (PM2.5 & PM10), 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 2023;
- 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 ;
- 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 National Climate Action Plan 2023

The 2023 Climate Action Plan was launched in December 2022. The plan was the second annual update to Ireland's Climate Action Plan 2019. The plan states:

Our climate is changing rapidly and is transforming our world. Since 1850 there has been an increase of 1.1OC in average global temperature, and the increase since 1970 has been faster than in any other 50-year period over the last 2,000 years. Warming is being propelled by increases in greenhouse gases (GHGs) in the atmosphere mainly produced when we burn fossil fuels and power industrial processes, together with emissions associated with land-use. These increased GHG emissions are being driven by unsustainable patterns of production and consumption. Today, atmospheric carbon dioxide (CO^2) concentrations are higher than at any time in at least 2 million years, and concentrations of methane (CH^4) and nitrous oxide (N^2O) are higher than at any time in at least 800,000 years.

Human influence has warmed the atmosphere, ocean and land leading to widespread and rapid change. Projections of future global and regional climate change indicate that continued emissions of GHGs will cause further warming and further changes to our climate. The science is indisputable, and the effects of climate change are already clear. As global temperatures increase, the extremes of weather and climate we experience will also increase, and this will lead to increased risks to people and to nature. Scientists warn that without rapid, deep, and sustained reductions in GHGs, global warming will be greater than 2°C above pre-industrial levels and, at current emission rates, could rise to 5°C by the end of the century. Limiting warming to 1.5°C will substantially reduce losses and damage to people and to ecosystems, although it will not eliminate them altogether.

The actions to deliver on our ambition and decarbonise our economy will be supported by a robust governance structure that now includes Ireland's first carbon budget programme and sectoral emission ceilings. The Climate Action Delivery Board will have an enhanced role in relation to delivery, including providing recommendations for overcoming barriers, while taskforces will be established to focus on key specific areas or initiatives of climate delivery that require cross Government collaboration. In addition to this, an annual climate action planning and reporting cycle will be introduced. The Environmental Protection Agency and the Climate Change Advisory Council reports will continue to inform the monitoring of Ireland's climate action performance on a sectoral level. The Government will annually update the new Climate Action Plan and the roadmap of actions to reflect developments in the previous year, developments in technology and research in relation to climate action, and to ensure the required emissions reductions are achieved.

Key Messages

State of Play

- The world's climate is changing rapidly with temperatures increasing faster in the last 50 years, than in any other 50-year period in the last 2,000 years
- Human influence has warmed the atmosphere, ocean and land, leading to widespread and rapid change, including changes to our weather system
- Ireland has experienced first-hand the consequences of climate change as set out in the Climate Status Report for Ireland 2020
- Continued emissions of GHGs will cause further warming and further changes to our climate and will lead to increased risks to people and to nature

Current and Future Action

- It is essential that the international community steps up its efforts towards meeting the 2015 Paris Agreement and the UN's Sustainable Development Goals
- The European Green Deal commits to delivering net-zero GHG emissions at EU level by 2050
- Ireland is committed to achieving a 51% reduction in GHG emissions from 2021 to 2030, and to achieving net-zero emissions no later than 2050; with legally binding requirements to achieve these objectives set out in legislation

Expected Outcomes

- Following on from Climate Action Plans 2019 and 2021, Climate Action Plan 2023 sets out the roadmap to deliver on Ireland's climate ambition. It aligns with the legally binding economy-wide carbon budgets and sectoral ceilings that were agreed by Government in July 2022

12.1.1.4 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 regional spatial and economic strategy 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 12.1.1.1 to Section 12.1.1.4.

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. Mitigation measures are described to minimise or off-set any effects that have occurred or are occurring as a result of the development works undertaken.

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 development 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 global climate have been summarised (see Section 12.3.2.1).

12.2.1 Scope of Assessment

The aim of this assessment is to consider whether the development has or is having 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 impacted 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 normally be required where there is:

- a 'human receptor' within: - 250 m of the boundary of the site; or - 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).
- an 'ecological receptor' within: - 50 m of the boundary of the site; or - 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).

Each receptor and/or environmental resource which may be effected 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 12-3 indicates how sensitive receptors would be defined for the purposes of this report:

Table 12-3: 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 be one where individuals may be exposed for eight hours or more in a day).	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 dust sensitive species. Indicative examples include a Special Area of

Classification	Human	Ecological
	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.	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, a 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 250m of the development boundary. The nearest receptors would be commercial activities such as the Irish Coast Guard unit or the Ferry Company. The nature of the workplace (office/quayside/ferry) would indicate that the exposure to changes in air quality would be transient and therefore classed as low sensitivity. There are two potential sensitive ecological receptors just within 250m east of the development site. However, the prevailing south westerly winds and wet weather of this region would reduce the risk of dust effects on these receptors. Consequently, these receptors would be considered to have low sensitivity to dust impacts from the development.

Step 2: Assess the Risk of Dust Impacts

The risk of dust arising in sufficient quantities to cause annoyance and/or health and/or ecological impacts 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 impacts (Step 2B) which is defined as low, medium or high sensitivity.

These two factors are combined to determine the risk of dust impacts with no mitigation applied.

Step 2A: Mobilisation and development of construction compound, installation of concrete batching plant, reclamation with imported rock fill, delivery of pre-cast concrete structures, installation of protective berm, drilling and blasting of quay wall trench and berthing pocket, dredging and removal of all construction materials from site.

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.

Table 12-4: 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. The baseline average annual mean PM_{10} concentration for Zone D Rural is 11.94 µg/m^3 (see **Table 12-5**).

Table 12-5: 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
		1-10	Medium	Low	Low	Low	Low
	28-32µg/m^3	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from source (m)				
			<20	<50	<100	<200	<350
	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 ecological receptors to dust effects. 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 development is not located within or adjacent to any SAC, SPA or NHA. The sensitivity of ecological receptors to dust effects can be considered low as per Table 12-6.

Table 12-6: Sensitivity of Ecological Receptors to Dust 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 were some pollutants named in the CAFÉ directive arising from plant and machinery exhaust emissions associated with 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 development lies within Zone D, Rural Ireland.

Dust

There was potential for temporary disturbance /nuisance 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 development site by an assessment of EPA monitoring data. Thereafter, the effect of the construction phase of the development on air quality was determined by a qualitative assessment of the nature and scale of dust generating construction activities 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 impacts of a project can be scoped out or require an assessment based on changes between 'Do-Something' traffic scenario (with the development) compared to the 'Do-Minimum' traffic scenario (without the 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 was greater than 200 HGV deliveries for the development. The requirement for a quantitative assessment of construction traffic can be scoped in.

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 would relate to 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 Fugaro 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 would have been implemented in order to minimise the impact 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 dredging works.

12.2.3.2 Climate

A greenhouse gas assessment (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 would 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).

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 zero by 2050".

Significance is determined using the criteria outlined in **Table 12-7** (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 development aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

Table 12-7: 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.
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.

12.2.4 Statement on Limitations and Difficulties Encountered

It is not possible to quantify exactly what effect the development has had on Climate Change and Air Quality beyond the site boundary. However, it has been possible to determine the significance of the effects. The information provided in this chapter is considered appropriate to enable an informed decision to be made on the effects of the 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 property owned by the Ferry Company and is approximately 590m to the northwest. There are no other residential properties located within 500m of the development site boundary. There are a number of discrete one off houses located along the Ballynahown Road. Colaiste Chamis is also 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 2021 was made available in conjunction with the report published 'Air Quality in Ireland Report 2021' EPA 2022. The report identifies that in 2021 air monitoring results from EPA stations across Ireland show that fine particulate matter ($PM_{2.5}$) mainly from burning solid fuel in our homes, and nitrogen dioxide (NO_2) mainly from road transport, continue to be the main threats to good air quality. EPA monitoring shows that $PM_{2.5}$ and NO_2 levels are within the current EU legal limits, however these pollutants exceed the World Health Organisation (WHO) Air Quality guidelines (AQGs) for health. The EPA wants the Clean Air Strategy for Ireland to be published and fully implemented. Ireland should move towards WHO Air Quality Guidelines. The data summarised for Zone D is shown in Table12-8.

Table 12-8: Air pollutant concentrations Zone D 2021 (EPA Report 2022)

Pollutant Concentrations	Zone D – annual average	CAFÉ Limits* µg/m^3
Nitrogen Dioxide (NO_2)	7.52µg/m^3	40 µg/m^3
Particulate Matter PM10	11.94 µg/m^3	40 µg/m^3
Particulate Matter PM2.5	8.71 µg/m^3	25 µg/m^3
Sulphur Dioxide (SO2)	4.16 µg/m^3	125** µg/m^3
Ozone (O3)	60.22 µg/m^3	100*** µg/m^3

* 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 2021 for small towns (incl rural Zone D) (see Figure 12-1).

A summary of the key messages from the 2021 EPA report include:

- Air quality monitoring results in 2021 showed that fine particulate matter ($PM_{2.5}$) mainly from burning solid fuel in our homes, and nitrogen dioxide (NO_2) mainly from road transport, remain the main threats to good air quality.
- EPA monitoring shows that $PM_{2.5}$ and NO_2 levels are within the current EU legal limits, however these pollutants exceed the World Health Organisation (WHO) Air Quality guidelines (AQGs) for health.
- Air pollution can be a major environmental risk to people's health, with approximately 1,300 premature deaths annually in Ireland due to poor air quality.

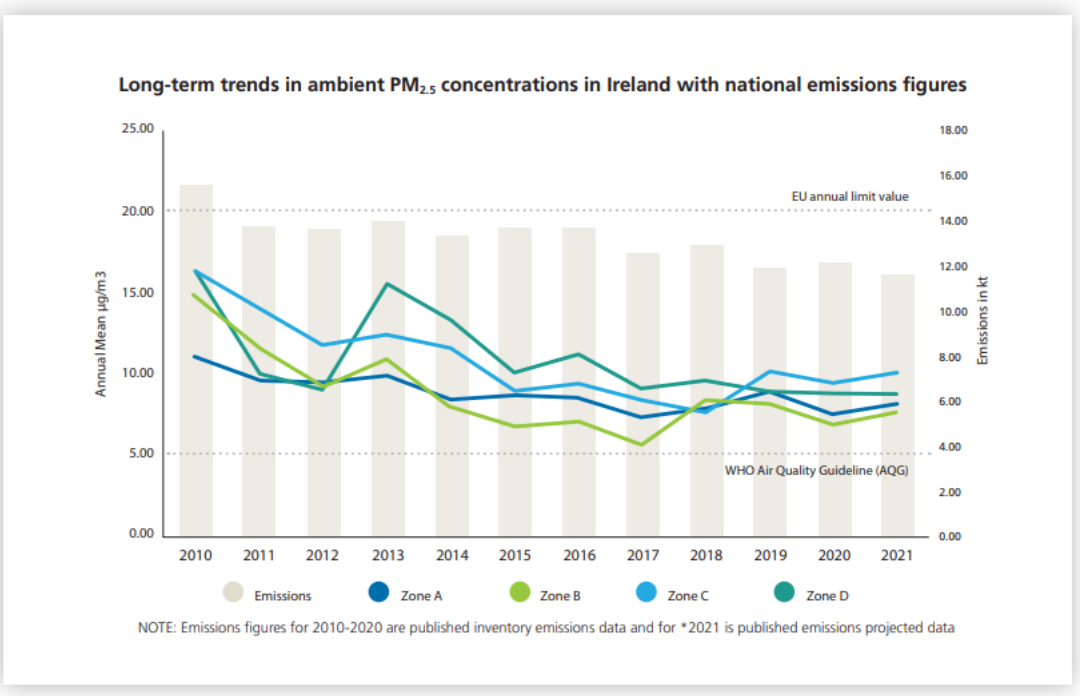

Figure 12-1: Long Term trends in ambient $PM_{2.5}$ in Ireland

12.3.2 Climate

12.3.2.1 Global Climate Trends

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 2022'[1] are as follows:

- The global mean temperature in 2022 was 1.15 [1.02–1.28] °C above the 1850–1900 average. The years 2015 to 2022 were the eight warmest in the 173-year instrumental record. The year 2022 was the fifth or sixth warmest year on record, despite ongoing La Niña conditions.
- Concentrations of the three main greenhouse gases – carbon dioxide, methane and nitrous oxide – reached record highs in 2021, the latest year for which consolidated global values are available (1984–

[1] https://library.wmo.int/records/item/66214-state-of-the-global-climate-2022

2021). The annual increase in methane concentration from 2020 to 2021 was the highest on record. Real-time data from specific locations show that levels of the three greenhouse gases continued to increase in 2022.

- Around 90% of the energy trapped in the climate system by greenhouse gases goes into the ocean. Ocean heat content, which measures this gain in energy, reached a new observed record high in 2022.
- Despite continuing La Niña conditions, 58% of the ocean surface experienced at least one marine heatwave during 2022. In contrast, only 25% of the ocean surface experienced a marine cold spell.
- Global mean sea level continued to rise in 2022, reaching a new record high for the satellite altimeter record (1993–2022). The rate of global mean sea level rise has doubled between the first decade of the satellite record (1993–2002, 2.27 mm per year) and the last (2013–2022, 4.62 mm per year).
- Record-breaking heatwaves affected China and Europe during the summer. In some areas, extreme heat was coupled with exceptionally dry conditions. Excess deaths associated with the heat in Europe exceeded 15,000 in total across Spain, Germany, the United Kingdom, France and Portugal.
- Record-breaking rain in July and August led to extensive flooding in Pakistan. There were at least 1,700 deaths, and 33 million people were affected, while almost 8 million people were displaced. Total damage and economic losses were assessed at US$ 30 billion.
- In East Africa, rainfall has been below average in five consecutive wet seasons, the longest such sequence in 40 years. As of August 2022, an estimated 37 million people faced acute food insecurity across the region, under the effects of the drought and other shocks.

12.3.2.2 National Greenhouse Gas Emissions

In July 2022, the EPA updated the 1990-2021 greenhouse gas emissions inventory data. In 2021, Ireland's GHG emissions are estimated to be 61.53 million tonnes carbon dioxide equivalent (Mt CO_2eq) which is 4.7% higher than emissions in 2020. This increase in total emissions was driven by increased use of coal and oil for electricity generation and increases in both the Agriculture and Transport. The provisional estimates of greenhouse gas emissions indicate that Ireland will exceed its 2021 annual limit, without the use of flexibilities, set under the EU's Effort Sharing Regulation (ESR) by 2.71 Mt CO_2eq. This is the first year of compliance under the ESR.

Provisional National total emissions (including LULUCF) for 2021 at 69.29 Mt CO_2eq have used 23.5% of the 295 Mt CO_2eq Carbon Budget for the five-year period 2021-2025. This leaves 76.5% of the budget available for the succeeding four years, requiring an 8.4 per cent average annual emissions reduction from 2022-2025 to stay within budget.

12.3.2.3 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 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 12-9.

Table 12-9: 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 2022 released by Met Éireann[2] states that all mean air temperatures across the country were above their 1981-2010 Long-Term Average (LTA). The year's highest temperature was reported at Phoenix Park, Co Dublin on Monday 18th July with a temperature of 33.0 °C (the second highest temperature ever recorded in Ireland and highest since 1887). The year's lowest air and grass temperature minimum was recorded at Mount Dillon, Co Roscommon with the lowest air temperature reported on Friday 16th December with -8.8 °C.

The majority of annual rainfall totals across the country were below their 1981-2010 Long-Term Average (LTA). Percentage of annual rainfall values ranged from 90% (annual rainfall total of 1068.6 mm and 1124.0 mm) at both Sherkin Island, Co Cork and Finner, Co Donegal respectively to 107% (the year's highest annual rainfall total of 1678.7 mm) at Valentia Observatory, Co Kerry.

Annual mean wind speeds ranged from 5.9 knots (10.9 km/h) at Moore Park, Co Cork to 14.9 knots (27.6 km/h) at Malin Head, Co Donegal.

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.

[2]https://www.met.ie/climate/past-weather-statements

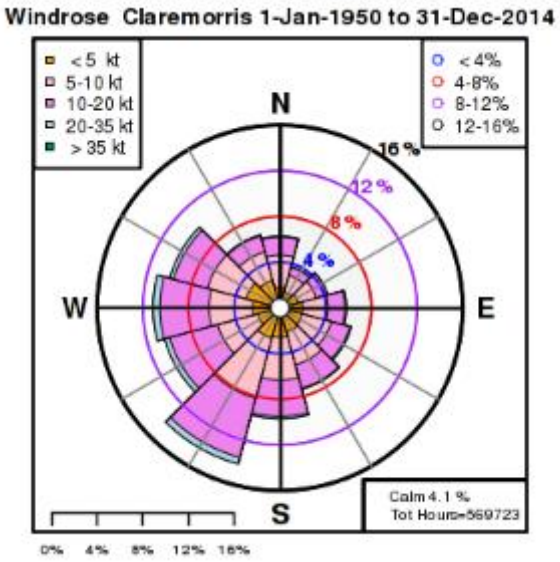

Figure 12-2: Windrose data Claremorris 1950-2014

12.4 Construction Activities

A total of 16 months of construction works were completed between January 2023 and the 20th May 2024.

The previous development works included:

- Mobilisation and development of the construction compound and facilities;
- Reclamation works – Rock fill material was imported to reclaim land from the sea and raise the ground level to the high-water mark (+5mCD). This reclaimed land was then used as a construction surface;
- Sequential construction and movement of the 20 drilling and blasting platforms over the quay wall and berthing pocket using imported quarry rock;
- Dredging works to remove the blasted seabed and construct the protective berm around the quay wall trench;
- installation of 75m of rock armour revetments on the northern and southern ends of the reclamation area;
- Installation of the on-site concrete batching plant;
- Offsite manufacture and delivery of precast concrete caissons. 358 were manufactured and 92 were delivered to site;
- Offsite manufacture of the L-shaped blocks for wall and foundation beams;
- Installation of 48m of quay wall foundations.

Upon confirmation that the planning permission had expired and would not be extended, all construction materials, equipment and facilities were dismantled and removed from the site.

12.5 Mitigation Measures Applied

12.5.1 Dust and Air Quality

A Dust Minimisation Plan was implemented for the development works as construction activities were likely to generate some dust. The Plan included the following dust related mitigation measures:

- Site roads were regularly cleaned and maintained as appropriate. Hard surface roads were swept to remove mud and aggregate materials from their surface while any un-surfaced roads were restricted to essential site traffic only. Furthermore, any road that had the potential to give rise to fugitive dust was regularly watered, as appropriate, during dry and/or windy conditions;
- Skips were covered;
- Use of appropriately covered vehicles for transport of potential dust generating materials such as sand;
- Vehicles using site roads had their speeds restricted where there was a potential for dust generation;
- Public roads outside the site were regularly inspected for cleanliness and cleaned as necessary. Before entrance onto public roads, trucks were inspected to ensure no potential for dust emissions.
- Material handling systems and site stockpiling of materials were designed and laid out to minimise exposure to wind;
- The Dust Minimisation Plan was 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.

12.5.2 Odour

The CEMP also included an Odour Management Plan to mitigate the potential for odours from the dredging of silt and clays. However, as the area dredged was limited to the quay wall and berthing pocket area, and that it was largely rock that was blasted and dredged, there was minimal risk of any odours occurring. The Odour management plan is more relevant to dredging of the approach channel and turning circle which did not take place during the development works.

12.5.3 Traffic Emissions

As described above the air quality effects from construction traffic are not considered to be significant. However, the following good practice mitigation was employed as part of the CEMP:

- Implementation of a Traffic Management Plan that was prepared in advance of the construction works and which formed part of the specification for the construction works. This outlined measures to minimise congestion and queuing, reduce distances of deliveries and eliminate unnecessary loads;
- Turning off vehicular engines when not in use. This restriction was strictly enforced unless the idle function was necessary for security or functionality reasons; and
- Regular maintenance of plant and equipment. Technical inspection of vehicles to ensure they performed the most efficiently.

12.5.4 Greenhouse Gas Emissions

The re-use of all of the dredged material minimised the use of high embedded energy materials during construction. This ensured that the release of greenhouse gases associated with the importing of fill material required for the reclamation, blasting platforms and protective berm was minimized.

As part of the Construction Environmental Management Plan, the Contractor was required to implement an Energy Management System for the duration of the works. As part of this process, the Contractor investigated opportunities for the use of energy-efficient machinery and recycled or low carbon construction materials.

Waste audits were undertaken that detailed resource recovery best practice and identified materials that could be reused and recycled. Materials were reused on-site within the areas where possible.

As much material as possible was sourced locally to reduce transport related CO2 emissions.

12.6 Assessment of the Effects of the Development

12.6.1 Air Quality and Dust Effects

The main air quality impacts that may arise during the construction phase would 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 dust relevant to health outcomes will be that measured as PM_{10}, although most of this will be in the coarse (PM2.5-10) fraction, rather than the $PM_{2.5}$ fraction.

Research undertaken, suggests that 85% to 90% by weight 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.

The development consisted of a temporary batching plant, sand and aggregate raw material stores, dredging and excavation, reclamation, blasting, construction traffic and rockfill as the main elements with dust and air quality effects.

The nearest receptors to the development site are staff working at the Irish Coast Guard or Atlantic Way Sailing/Island Ferries (see **Figure 12-3**). Due to the nature and location of the work it is unlikely there would be any lengthy periods of exposure to dust. Raw materials for the concrete batching plant were 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 for sensitivity of the area to human health effects based on the IAQM guidance, taking into consideration baseline concentration, number of receptors and distance from source, classes the overall sensitivity of the area to human health effects from the development is considered Low.

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

Traffic

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, 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 were temporary or short-term in nature.

Traffic movements during the construction phase are outlined in the Material Assets (Traffic and Transport) Chapter (**Volume II, Chapter 14** of this rEIAR). Over the course of the construction works undertaken, activities across the site varied resulting in different staff numbers and different trip generation depending on the activities being undertaken at any given time. Given the phasing of construction across the site, the peak construction period occurred when different activities were being undertaken in different phases.

The peak construction stage traffic has been reviewed against 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.

HGV traffic exceeded changes of 200 movements during peak construction therefore a more detailed assessment of air quality impacts from construction traffic is required.

Volume II, Chapter 14 Material Assets - Traffic and Transport of this rEIAR, details baseline 'Do Nothing' scenarios for 2023 and 2024. Traffic volumes at link roads R372/R336 southeast and northwest/L1201 and R372 northeast, southwest and L1200 are assessed. The annual average daily traffic with HDVs over the period 2023 to 2024 and change as a result of the development is shown in Table 12-10.

Table 12-10: AADT 2023 & 2024 Comparison with and Without Development

Link	Total LDV flow (AADT) Baseline with TII Growth	Total HDV flow (AADT) Baseline with TII Growth	Total LDV flow (AADT) With Development	Total HDV flow (AADT) With Development	% Change LDV	% Change HGV
R336 Southeast	4789.5	178.5	4819.5	237	0.63%	33%
R372	1654	99	1714	216	3.63%	118%
R336 Northwest	5410	206.5	5440.5	264.5	0.56%	28%
L1201	346	13	346	13	0.00%	0%
R372 Northeast	1126.5	75	1185.5	193	5.24%	157%
L1200	740.5	29.5	746.5	29.5	0.81%	0%
R372 Southwest	713	79.5	773	196.5	8.42%	147%

The TII Tool, Road Emissions Model (Updated May 2025) is used to assess the greenhouse and non-greenhouse emissions from vehicles on the Irish Road Network. The tool is used to calculate a change assessment and calculate local scale pollutant concentrations. The impact from construction traffic on receptors will not be significant and remain well below the ambient air quality limits (Table 12-11).

A sum of the annual total emissions for the 2023 & 2024 ADDT with no construction was compared to the 2023 & 2024 AADT with construction (Table 12-12). The % change applied to ambient air quality levels in rural Zone D will not significantly affect air quality or breach air quality standards.

Table 12-11: Effect on Human Receptors from Construction Traffic

Receptor	Background NO_2 µg/m³	Background PM_{10} µg/m³	Road NO_2 µg/m³	Road PM_{10} µg/m³	Total NO_2 µg/m³	Total PM_{10} µg/m³	CAFÉ Ambient Limits – Annual Mean
Coast Guard	7.52	11.94	0.03	0.02	7.55	11.96	40
Island Ferries	7.52	11.94	0.01	0.01	7.53	11.95	40

Table 12-12: Total Annual Emissions No Construction Compared to With Construction

Pollutant	2023 & 2024 Baseline No Construction (kg/yr)	2023 & 2024 Baseline with Construction (kg/yr)	% Change
NOx	23,031.62	24,350.89	5.73
PM_{10}	2,224.11	2,570.39	15.57

The overall effect on air quality from the as constructed works will have been negative, not significant, short - term and direct (see Table 12-13).

Table 12-13: Air Quality Effects from Traffic

Impact	Quality of Effect	Post-Mitigation Significance	Spatial Extent	Duration	Other Relevant Criteria
Traffic	Negative	Not significant	Local	Short-term	Direct

Construction Works

There was potential for dust to be generated from moving and transporting soil, stone and materials in and around the construction site and on public roads. Weather conditions would 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 west coast of Ireland receives the highest annual average rainfall in the country. During the construction period from January 2023 to end May 2024 the only period of relatively low rainfall was in February 2023 (26.1mm). For the rest of the construction period the monthly rainfall varied between 50mm and 208mm. There was therefore little if any risk of emissions due to dry weather at Ros an Mhíl, any the only risk would have been in February 2023 (winter) when the site was being set up.

The surrounding area was 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 would most commonly relate to residential dwellings but may also refer to education, health, industrial and commercial premises that have a particular sensitivity to dust effects. The effect of dust from construction would generally be localized (within 50 – 200 meters from the works – see **Figure 12-4**)).

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 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 effect from dust being friable and a nuisance to workers and local residents and 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 site boundary. Based on the number, sensitivity and location of receptors, the requirement for a more detailed assessment was screened out.

A site specific dust management plan was developed and complied with as part of the CEMP. These measures are included in section 12.5 of this report.

The effect from the development on air quality and dust is rated as be short-term, negative, not significant and direct (**Table 12-14**).

Table 12-14: Construction Air Quality and Dust Effects

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

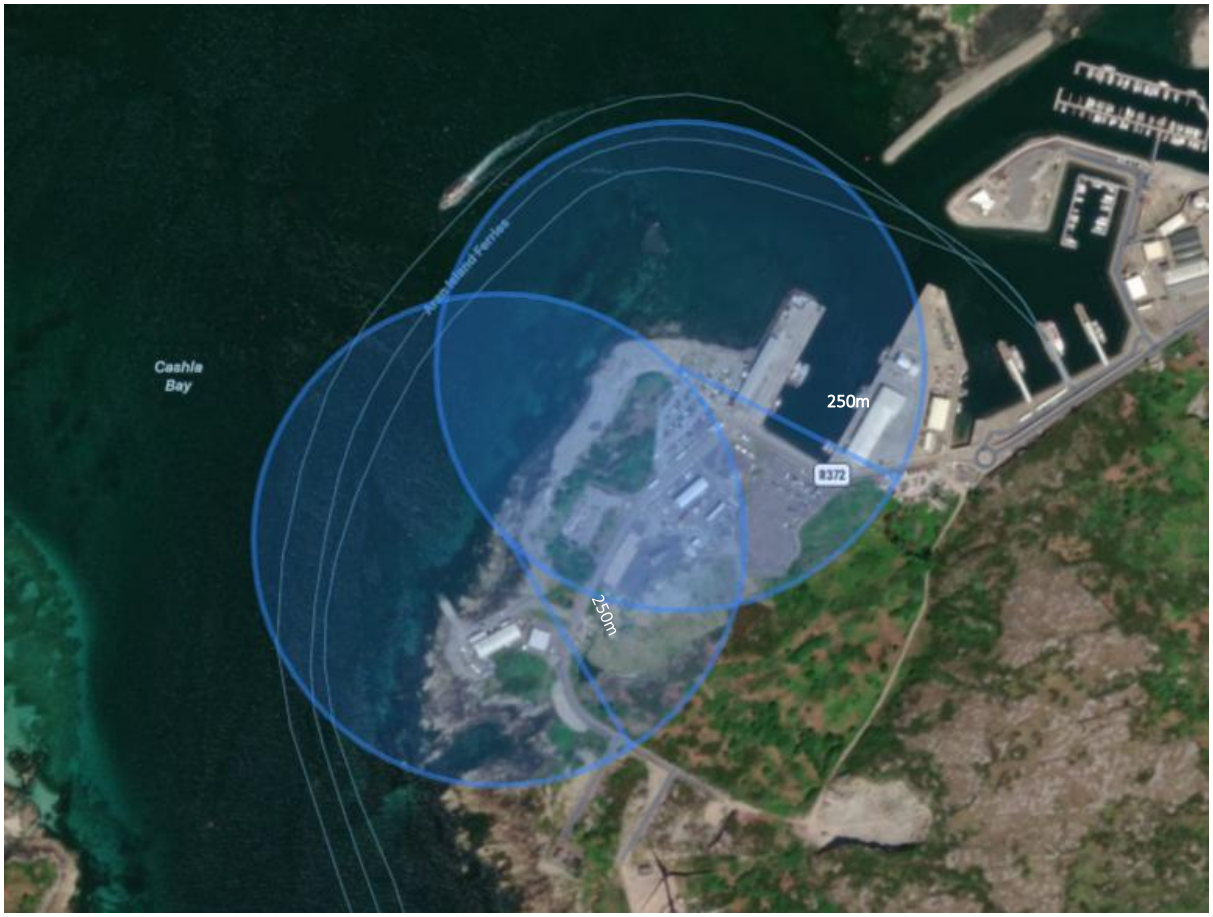

Figure 12-4: 250m radius from aggregate storage area and rock and concrete infill.

12.6.2 Odour

The main potential odour from the construction stage relates to 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. However, as the area dredged during the development works was limited to the quay wall and berthing pocket area which was largely rock that was blasted and dredged, there was minimal risk of any odour effects from dredging occurring. The Odour management plan is more relevant to dredging of the approach channel and turning circle which are works still to be completed and did not take place during the development works.

All the rock material excavated was retained on site and reused as fill in the reclamation area or to construct the blasting platforms and/or protective berm.

The effect of odour is rated as negative, temporary, imperceptible and direct (see Table 12-15).

Table 12-15: Odour Effects on Air Quality

Impact	Quality of Effect	Post-Mitigation Significance	Spatial Extent	Duration	Other Relevant Criteria
Odour	Negative	Imperceptible	Local	Temporary	Direct

12.6.3 Greenhouse Gas Assessment (GHHA)

Ireland's greenhouse gas emissions were 60.8 million tonnes of carbon dioxide equivalent in 2022. This was down from 62 million tonnes in 2021 but was 9.2% higher than the 1990 figure of 55.6 million tonnes. Carbon dioxide accounts for the majority of Greenhouse gases in Ireland with the remainder consisting of methane, nitrous oxide and F-gases. GHG emissions can be measured in terms of CO_2 equivalent which involves converting different GHGs into the CO_2 equivalent based on the Global Warming Potential (GWP).

In 2022, embodied carbon emissions, which are those associated with extracting, manufacturing, and transporting construction materials, as well as building construction and demolition, accounted for roughly 14% of total carbon emissions in the built environment.

The following carbon emissions are associated with the 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. The raw materials and pre-cast concrete elements were supplied and transported from Banagher Concrete, Co. Offaly (one way trip 121km) and Harringtons Quarry, Kilkelly, Co. Mayo (one way trip 107km). Imported rock and gravel materials were sourced from three local quarries.

Materials required and transported to site include:

- 2090 m^3 rock armour for revetments;
- 190m^3 wet concrete;
- 190m^3 aggregate for concrete batching plant;
- 392,765 tonnes rock fill imported;
- 92 caissons delivered to site;
- 48 beams (168 tonnes) and 121 L-shaped sections (2316 tonnes) delivered to site.

The construction works took place over a period of 17 months. Emissions have been compared against Ireland's EU 2030 target of a 42% reduction in non-ETS sector emissions based on 2005 levels (set out in Regulation EU 2018/842 of the European Parliament and of the Council).

The total construction phase embodied emissions totals 32,850 tonnes CO_2eq; which equates to 0.01% of Ireland's 2021-2025 Carbon Budget (295 MtCO_2eq) and 0.11% the Industry Sectoral Emissions Ceiling 2021-2025 (30MtCO_2eq) (Table 12-16). The likely effect on climate was considered cumulatively across the lifespan of the development.

Table 12-16: Predicted Construction Stage Emissions GHG

Source	Construction Phase Embodied Emissions (tonnes CO_2eq)
Product (Embodied Carbon)	28,823
Construction Activities (Transport & Installation)	4,027
Total	32,850
Total Emissions as % of Irelands 2021-2025 Carbon Budget	0.01
Total Emissions as % of the 2021-2025 Industry Sectoral Emissions Ceiling	0.11

Mitigation measures for greenhouse gas emissions are detailed in Section 12.5.

The effect on greenhouse gas emissions from the construction of the development at Ros an Mhíl is considered to have a long term, not significant (minor), negative effect on air quality and climate (Table 12-17).

Table 12-17: Climate Effects from Construction Stage

Impact	Quality of Effect	Post-Mitigation Significance	Spatial Extent	Duration	Other Relevant Criteria
GHG Emissions	Negative	Not Significant (Minor Adverse)	National/International	Long-Term	Direct

12.7 Remedial Mitigation and Residual Effects

Minimal effects on the air quality and climate have occurred or are occurring as a result of the construction works completed to date. No remedial mitigation is required (Table 12-18).

Table 12-18: Remedial Effects from Completed Works

Impact/Activity/Receptor	Quality of Effect	Post-Mitigation Significance Rating	Remedial Mitigation Measures	Residual Significance Rating
CONSTRUCTION EFFECTS				
Air Quality and Dust Effects (Traffic)	Negative	Not Significant	None	Not Significant
Air Quality and Dust Effects (Construction Works)	Negative	Not Significant	None	Not Significant
Odour	Negative	Imperceptible	None	Imperceptible.
GHG Emissions	Negative	Not Significant	None	Not Significant

12.8 Cumulative Effects

Other projects considered for cumulative effects are detailed in Volume II, Chapter 1 Introduction of this rEIAR. An effect during the construction phase on air quality is only likely to arise if these phases of the 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 was 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 effects 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.

12.9 Conclusions

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

During the development works, best practice measures were implemented to minimise any adverse effects on air quality and climate.

The effect on air quality and climate from the development works undertaken is not considered significant, and there are no ongoing effects to air quality and climate arising from the development in place.

12.10 References

- Civil Engineering Standard Method of Measurement (CESSM) (2013) Carbon and Price Book database.
- Construction Industry Federation (2021) Modern Methods of Construction.
- Department of the Taoiseach (2022) Carbon Budgets Available at https://www.gov.ie/en/publication/9af1b-carbon-budgets/
- Environmental Protection Agency (EPA) (2020a) Research 339: High-resolution Climate Projections for Ireland – A Multi-model Ensemble Approach.
- Environmental Protection Agency (2020b) State of the Irish Environment Report (chapter 2: climate change)
- Environmental Protection Agency (EPA) (2021a) What impact will climate change have for Ireland? [Online] Available at https://www.epa.ie/environment-and-you/climate-change/what-impact-will-climate-change-have-for-ireland/#:~:text=All%20major%20cities%20in%20Ireland,damage%20to%20property%20and%20infrastructure.
- Environmental Protection Agency (2022a) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports Environmental Protection Agency (2022b)
- Air Quality Monitoring Report 2023 (& previous annual reports) Environmental Protection Agency (EPA) (2023)
- Ireland's Final Greenhouse Gas Emissions 1990-2023
- European Commission (2021a) Technical guidance on the climate proofing of infrastructure in the period 2021-2027.
- European Commission (2021b) Forging a climate-resilient Europe - the new EU Strategy on Adaptation to Climate Change.
- European Union (2018). Regulation 2018/842 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013
- German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft
- Government of Ireland (2015) Climate Action and Low Carbon Development Act
- Government of Ireland (2019) Climate Action Plan 2019
- Transport Infrastructure Ireland (2022a) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106
- Transport Infrastructure Ireland (TII) (2022b) PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document
- Transport Infrastructure Ireland (TII) (2022c) PE-ENV-01105: Climate Assessment Standard for Proposed National Roads (PE-ENV-01105)
- Transport Infrastructure Ireland (TII) (2022d) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document
- Met Éireann (2023) Met Eireann website: https://www.met.ie/.
- Institute of Environmental Management & Assessment (IEMA) (2020b) GHG Management Hierarchy. Assessing Greenhouse Gas Emissions and Evaluating their Significance
- Government of Ireland (2023) Long-term Strategy on Greenhouse Gas Emissions Reductions