3FMProject

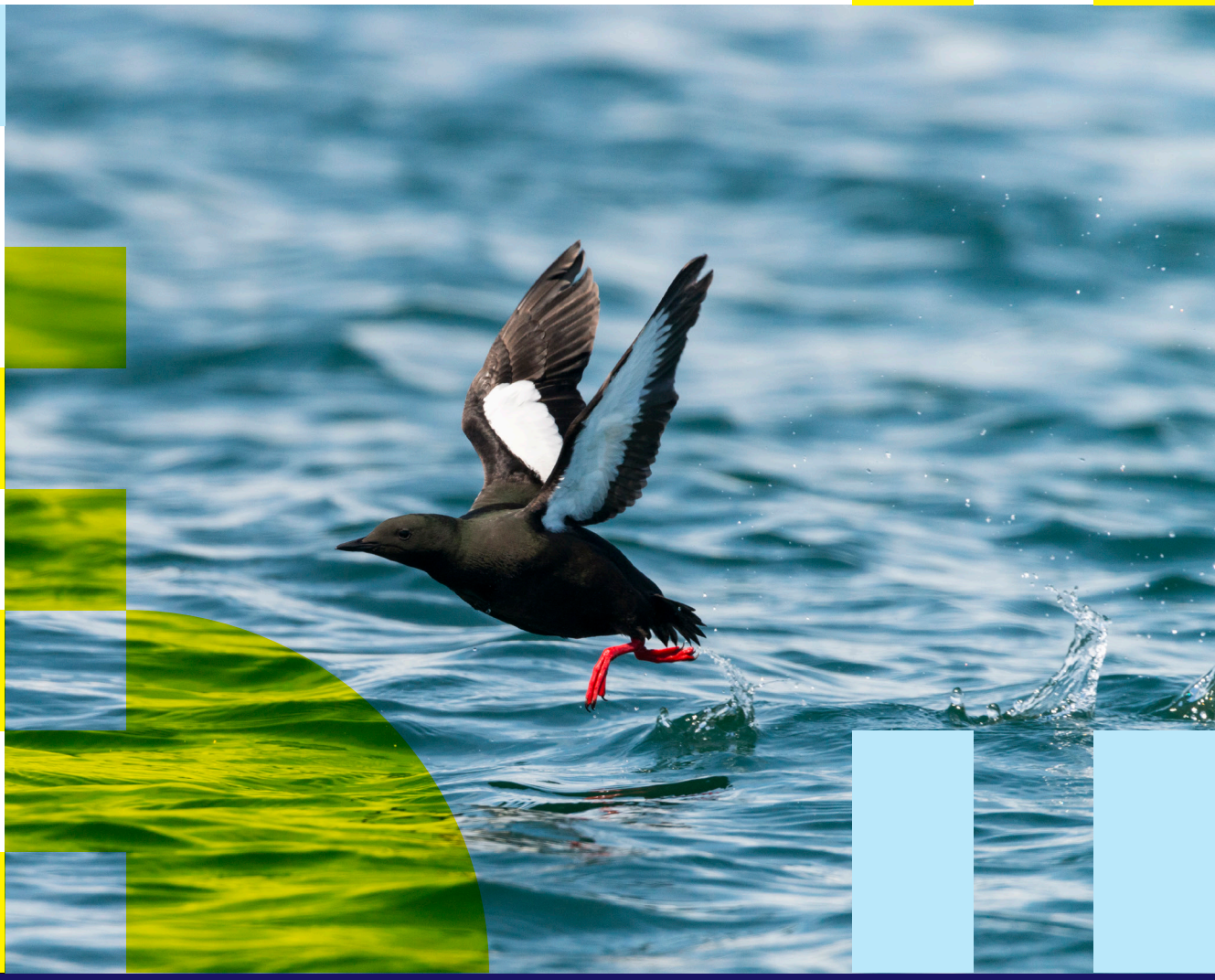
Bringing
Dublin Port
To 2040

Environmental Impact Assessment Report

Chapter 10

Air Quality

Volume 2 Part 3



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Project

10 AIR QUALITY

10.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) identifies, describes and presents an assessment of the likely significant effects of the proposed 3FM Project on air quality during both the construction and operational phases of the development. The assessment presented is informed by and should be read in conjunction with the following chapters of the EIAR:

- Chapter 5 – Project Description;
- Chapter 14 – Traffic and Transport: Predicted traffic and mobility effects;
- Chapter 7 – Biodiversity, Flora & Fauna: Terrestrial Ecology: Baseline descriptions and impact assessment related to the terrestrial aspects of biodiversity. This chapter also deals with species which rely on the aquatic environment;
- Chapter 7 – Biodiversity, Flora and Fauna: Aquatic Ecology: Baseline descriptions and impact assessment related to the aquatic ecology aspects of biodiversity;
- Chapter 11 – Climate: Baseline descriptions and impact assessment related to climate; and
- Chapter 19 –Waste: Baseline descriptions and impact assessment related to the management of waste and materials arising from the proposed 3FM Project.

Air quality standards in Ireland are set by the European Union's Air Quality Directives[1] which have resulted in national regulations outlining acceptable air pollution levels and an obligation on Dublin City Council to monitor the city's air quality through a network of local air pollution sensors.

Dublin's air quality status is currently classed as generally 'good'; however levels of nitrogen dioxide are a concern. Local authorities in the Dublin region have prepared an Air Quality Management Plan for improvement in levels of nitrogen dioxide in ambient air quality for submission to the Environmental Protection Agency (EPA).

10.1.1 Scope of the Air Quality Assessment.

The following aspects were considered in the assessment of potential effects of the proposed project on air quality.

10.1.1.1 Construction Phase

There are three potential impacts to atmosphere from the construction stage of the proposed project:

- Generation and dispersion of construction dusts during the proposed works (demolition, dredging and general construction);

[1] 2008/50/EC, 2004/107/EC, 2015/1480, and 2011/850/EU

Construction dust has the potential to cause local impacts through dust nuisance at the nearest sensitive receptors and also to sensitive ecosystems. The potential for dust generation from the construction activities associated with the proposed 3FM Project will be assessed on the basis of a review of the proposed methodologies and the proximity of these activities to sensitive receptors.

Construction activities such as stone importation, excavation, earth moving, dredging and backfilling may generate quantities of dust, particularly in dry weather conditions. The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction.

- Plant emissions from diesel use on mobile and fixed plant engaged in the construction phase.

The proposed construction operation will involve the movement of materials and reconfiguration of existing internal roadways, buildings, quays and lands. Additional infill material may be sourced offsite and transported via the newly configured access to the port. All dredged material will be barged to the dump site and will not travel by road. An analysis of construction traffic will be undertaken in accordance with the Transport Infrastructure Ireland (TII) Guidelines.

- Potential odours (such as during dredging).

The main potential odour from the construction stage relates to the potential for fugitive odours from the dredging operation, particularly hydrogen sulphide (H_2S), which can be particularly offensive. Despite the low risk of encountering odours, a series of odour mitigation measures have been presented to minimise the impact of this operation and to prevent any nuisance in the unlikely event that they are encountered.

10.1.1.2 Operational Phase

There are three main sources of operational emissions associated with the proposed project:

- Road Traffic Emissions

Road traffic emissions from traffic volumes using the scheme once operational – this parameter is assessed at national level, within the wider Dublin Port area and also at local level for individual properties.

- Shipping Emissions

Shipping emissions associated with the proposed project have been quantified using the emission factors presented in the EMEP/EEA Emission Inventory Guidebook 2023, Section 1.A.3.d Navigation (shipping).

- Operational Port Emissions

As the Dublin conurbation is subject to a ban on smoky coal under the Air Pollution Act 1987 (Marketing, Sale and Distribution of Fuels) Regulations (1998-2011), the space heating in the area (both residential and commercial) is provided by gas, oil, biomass and non-bituminous coals. Consequently, the emission levels from space heating in the area are not elevated.

10.2 Relevant Legislation and Policy

10.2.1 Legislation

Specific legislation relating to air quality which has been considered within this chapter of the EIAR includes:

- Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe;
- Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) as amended;
- Ambient Air Quality Standards Regulations 2022 (S.I. No. 739 of 2022);
- Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants;
- Directive (EU) 2016/2284 of the European Parliament and of the Council of 14 December 2016 on the reduction of national emissions of certain atmospheric pollutants, amending Directive 2003/35/EC and repealing Directive 2001/81/EC; and
- S.I. No. 232 of 2018 - European Union (National Emission Ceilings) Regulations 2018.

The details of the limit values expressed in this legislation is provided in Section 10.3.4.1 (ambient air quality) and Section 10.3.4.2 (national air quality).

10.2.2 Policy

On 12 May 2021, the European Commission (EC) adopted the EU Action Plan: 'Towards a Zero Pollution for Air, Water and Soil' which was a key deliverable of the European Green Deal. The relevant targets for 2030 of this plan to this assessment are listed as follows:

- Improving air quality to reduce the number of premature deaths caused by air pollution by 55%; and
- Reducing by 25% the EU ecosystems where air pollution threatens biodiversity.

Furthermore, as part of the European Green Deal, in October 2022 the European Commission (EC) proposed to revise the Ambient Air Quality Directives to align more closely with the recommendations of the World Health Organization (WHO). The purpose of this proposal is to:

- Put the EU on track to achieve zero pollution for air by 2050;
- Foresee a regular review of the air quality standards, in line with latest scientific evidence;
- Further improve the legal framework, providing more clarity on access to justice, damage redress, effective penalties, and better public information on air quality;
- Support local authorities in achieving cleaner air by strengthening air quality monitoring, modelling, and air quality plans; and
- Merge the current two Directives into one and streamlines provisions to clarify and simplify the rules.

Nationally, Project Ireland 2040 the National Planning Framework cite air quality as a National Policy Objective 64 as follows:

> *"Improve air quality and help prevent people being exposed to unacceptable levels of pollution in our urban and rural areas through integrated land use and spatial planning that supports public transport, walking and cycling as more favourable modes of transport to the private car, the promotion of energy efficient buildings and homes, heating systems with zero local emissions, green infrastructure planning and innovative design solutions."*

In addition, the Clean Air Strategy for Ireland was published by the Department of the Environment, Climate and Communications (DECC) in April 2023 (DECC, 2023) with the following aims:

- To set the appropriate targets and limits to ensure continuous improvements in air quality across the country, to deliver health benefits for all;
- To ensure the integration of clean air considerations into policy development across Government;
- To increase the evidence base that will help us to continue to evolve our understanding of the sources of pollution and their impacts on health, in order to address them more effectively;
- To enhance regulation required to deliver improvements across all pollutants;
- To improve the effectiveness of our enforcement systems;
- To promote and increase awareness of the importance of clean air, and the links between cleaner air and better health; and
- To develop the additional targeted/specific policy measures as required to deal with national or local air quality issues.

In compliance with EU policy, the national strategy commits to setting more stringent legal limits for ambient air quality taking into full consideration the new WHO guideline limits and the proposal for a new EU Ambient Air Quality Directive with achievement of final WHO Guidelines Value by 2040. In addition, interim values are proposed for 2026 and 2030 to track progress to meeting the WHO Guidelines by 2040.

Locally, the Dublin City Council (DCC) Development Plan 2022 - 2028 (Sustainable Environmental Infrastructure and Flood Risk Chapter 9) notes that the Council's role in relation to air quality is to promote a reduction in air pollution, through the implementation of relevant legislation and through the provision of advice and guidance on best practice. Transport emissions, primarily from road transport, is acknowledged as one of the key air pollution challenges. The following policy is noted in relation to air quality:

SI34 Management of Air Quality - To monitor, pro-actively manage and improve air quality in the city through integrated land use and spatial planning measures to avoid, mitigate and minimise unacceptable levels of air pollution in accordance with national and EU policy Directives on air quality and, where appropriate, drive compliance with established targets.

The following objectives are set out by DCC in relation to air quality:

SIO21 Air Quality Data Collection - To reduce harmful emissions and to achieve and maintain good air quality in the city by working with the Dublin local authorities and relevant agencies in the collection of local data through the Dublin City ambient air quality monitoring network.

SIO22 City Ambient Air Quality Monitoring Network - To maintain and manage a Dublin City ambient air quality monitoring network in conjunction with the EPA and to commit to make available to the public the resulting air quality measurements through the https://dublincityairandnoise.ie/ website in real time, where feasible.

10.2.3 Guidance

The assessment utilises the predictive approaches of the following TII guidance documents:

- TII Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document PE-ENV-01106 (December 2022) (TII, 2022a);
- TII Air Quality Assessment of Proposed National Roads - Standard PE-ENV-01107 (December 2022) (TII, 2022b); and

TII Road Emissions Model (REM): Model Development Report GE-ENV-01107 (December 2022) (TII, 2022c).

In addition, the following non-legislative guidance is applied to this assessment:

- World Health Organization (WHO) (2021). WHO global air quality guidelines: particulate matter ($PM_{2.5}$ and PM_{10}), ozone, nitrogen dioxide, sulphur dioxide and carbon monoxide;
- Institute of Air Quality Management (IAQM) (2024) Guidance on the assessment of dust from demolition and construction; and
- Technical Instructions on Air Quality Control – TA Luft, German Federal Ministry for Environment, Nature Conservation and Nuclear Safety, (July 2002).

10.3 Methodology

10.3.1 Overall Approach

The air quality impact assessment has followed the overall methodology and guidance relating to the EIA process and preparation as set out in Chapter 1 – Introduction.

Specifically in relation to the air quality impact assessment, the methodology adopted is based on TII and WHO guidance; refer to Section 10.2.3.

The objectives of this assessment were to undertake the following:

- 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 project, may occur;

- Identify sensitive designated habitats where a potential significant change in NOx or ammonia concentrations, due to the proposed project, may occur;
- Identify human and sensitive designated habitats where there is risk of dust, emissions and traffic movement effects occurring during the construction phase; and
- Determine suitable mitigation measures to reduce significant air quality effects to an acceptable level.

The impact of the proposed project on air quality has been assessed for both the construction and operational phases by considering the pollutant background concentrations, emissions from road traffic, emissions from shipping movements and potential for construction dust and emissions from construction traffic and machinery. Predicted concentrations have been compared to the relevant statutory limit values and the WHO guidelines for the protection of human health.

10.3.2 Study Area

10.3.2.1 Construction Phase

The Institute of Air Quality Management in the UK (IAQM) guidance document 'Guidance on the Assessment of Dust from Demolition and Construction' (2024) outlines an assessment method for predicting the impact of dust emissions from demolition, earthworks, construction and haulage activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of the 3FM Project in order to predict the likely risk of dust impacts in the absence of mitigation measures and to determine the level of site-specific mitigation required. TII recommends the use of the IAQM guidance (2024) in the TII guidance document Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 (TII, 2022a).

The Institute of Air Quality Management (IAQM) 'Guidance on the assessment of dust from demolition and construction' states that a dust assessment is typically required where there is:

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

To ensure a robust assessment and given the ecological sensitivities in the area, the zone of influence (ZoI) for the construction phase dust impacts is set at 500 metres from the application boundary.

10.3.2.2 Operational Phase

In terms of road traffic during the operational phase, the TII Air Quality Assessment of Proposed National Roads (Standard PE-ENV-01107) (TII, 2022b) state that 200 metres represents the distance within which detectable impacts of a road might be for worst case sensitive receptors. Modelled roads in for the project are buffered 200m and representative sensitive receptors are selected within that 200m distance banding to enable assessment of air quality impacts.

10.3.3 Background Data

10.3.3.1 Desktop Studies

Table 10.1 outlines the existing publicly available datasets and information used to inform the air quality assessment that was collected through the detailed desktop review with supplementary information compiled from the EPA.

Table 10.1 Summary of EPA desktop reports

Title	Source	Year
Ireland's Air Pollutant Emissions 1990-2030	EPA (2022a)	2022
National Ecosystems Monitoring Network	EPA (2022)	2022
Annual Air Quality Bulletin 2022	EPA (2023)	2023
Air Quality Bulletin 2023	EPA (2023)	2023
Air Quality in Ireland 2022 – Indicators of Air Quality	EPA (2023b)	2023
Air Quality in Ireland 2021 – Indicators of Air Quality	EPA (2022b)	2022
Air Quality Report 2021 – Supplemental information	EPA (2022c)	2022
Air Quality in Ireland 2020 – Indicators of Air Quality	EPA (2021a)	2021
Air Quality Report 2020 – Supplemental information	EPA (2021b)	2021
Technical Report 1 – Nitrogen Dioxide Diffusion Tube Assessment Dublin	EPA (2019)	2019
Technical Report 2 – Modelling Assessment of Air Quality in Dublin	EPA (2019)	2019

The EPA in partnership with Local Authorities, public/ semi state bodies and universities has established an air monitoring network. The network was completed in 2023 with 116 stations (107 operational at the end of 2022). The monitoring network provides real-time air quality results and generates public health advice for the area around local stations.

10.3.3.2 Site Specific Surveys

In addition to the desktop studies undertaken, a series of site-specific baseline monitoring was undertaken to determine the local levels and spatial variation for baseline air quality within the project area. Monitoring of oxides of nitrogen (NO and NO2, which when combined are referred to as 'NOx') and aromatic hydrocarbons (benzene, toluene, ethylbenzene and xylenes) was undertaken at numerous locations. These pollutants are predominately derived from traffic pollution and provide a spatial representation of baseline air quality in the area.

Air monitoring data from 22 monitoring stations located in the Dublin Port area over a period of 12 monitoring events were assessed against legislative limits and target values for the protection of human health and vegetation. Monitoring was carried out for NO2 and SO2 at 22 locations over 12 monitoring events in 2023. Monitoring for PM10 and PM2.5 was carried out at two locations over two monitoring events while monitoring

for Benzene, Toluene, Ethyl Benzene, Xylene isomers (BTEX) and Ammonia was carried at seven locations over four monitoring events in 2023. Total depositional dust was carried out at four locations over two monitoring events while Lead monitoring was carried out at three locations over three monitoring events in Year 2023.

Previous monitoring in Years 2014 to 2022 was carried out at between seven and 22 monitoring stations for NO2 and SO2, while in Years 2017 to 2022, monitoring was carried out at seven monitoring stations for BTEX and Ammonia. Table 10.2 presents a summary of site-specific surveys undertaken.

Table 10.2 Summary of Site Specific Surveys

Title & Summary	Source	Year Issued
Year 2023 High Level Summary Report – Air Quality Study in Dublin Port and Environs. Air monitoring data from 22 monitoring stations over a period of 12 monitoring event was assessed against legislative limits and target values for the protection of human health and vegetation. Monitoring was carried out for NO2 and SO2 at 22 locations over 12 monitoring events. Monitoring for PM10 and PM2.5 was carried out at 2 locations over 2 monitoring event while monitoring for Benzene, Toluene, Ethyl Benzene, Xylene isomers and Ammonia was carried on 7 locations over 4 monitoring events. Total depositional dust was carried out on 4 locations over 2 monitoring events while Lead was carried out at three monitoring locations over three sampling events.	Odour Monitoring Ireland Ltd	February 2024
Year 2022 High Level Summary Report – Air Quality Study in Dublin Port and Environs. Air monitoring data from 22 monitoring stations over a period of 12 monitoring event was assessed against legislative limits and target values for the protection of human health and vegetation. Monitoring was carried out for NO2 and SO2 at 22 locations over 12 monitoring events. Monitoring for PM10 and PM2.5 was carried out at 2 locations over 2 monitoring event while monitoring for Benzene, Toluene, Ethyl Benzene, Xylene isomers and Ammonia was carried on 7 locations over 4 monitoring events. Total depositional dust was carried out on 4 locations over 2 monitoring events while Lead was carried out at three monitoring locations over three sampling events.	Odour Monitoring Ireland Ltd	April 2023
Year 2021 High Level Summary Report – Air Quality Study in Dublin Port and Environs. Air monitoring data from 22 monitoring stations over a period of 9 monitoring event was assessed against legislative limits and target values for the protection of human health and vegetation. Monitoring was carried out for NO2 and SO2 at 22 locations over 9 monitoring events. Monitoring for PM10 and PM2.5 was carried out at 2 locations over 2 monitoring event while monitoring for Benzene, Toluene, Ethyl Benzene, Xylene isomers and Ammonia was carried on 7 locations over 4 monitoring events. Total depositional dust was carried out on 4 locations over 2 monitoring event while Lead was carried out at three monitoring locations over three sampling events.	Odour Monitoring Ireland Ltd	May 2022
Year 2020 High Level Summary Report – Air Quality Study in Dublin Port and Environs. Air monitoring data from 18 monitoring stations over a period of 6 monitoring event was assessed against legislative limits and target values for the protection of human health and vegetation. Monitoring was carried out for NO2 and SO2 at 18 locations over 6 monitoring events. Monitoring for PM10 and PM2.5 was carried out at 2 locations over 2 monitoring event while monitoring for Benzene, Toluene, Ethyl Benzene, Xylene isomers and Ammonia was carried on 7 locations over 3 monitoring	Odour Monitoring Ireland Ltd	March 2021

events. Total depositional dust was carried out on 4 locations over 2 monitoring event while Lead was carried out at three monitoring locations over three sampling events.		
High Level Summary Report – Air Quality Study in Dublin Port and Environs. Air monitoring data from 18 monitoring stations over a period of 6 monitoring event was assessed against legislative limits and target values for the protection of human health and vegetation. Monitoring was carried out for NO2 and SO2 at 18 locations over 6 monitoring events. Monitoring for PM10 and PM2.5 was carried out at 2 locations over 2 monitoring event while monitoring for Benzene, Toluene, Ethyl Benzene, Xylene isomers and Ammonia was carried on 7 locations over 3 monitoring events. Total depositional dust was carried out on 4 locations over 2 monitoring event while Lead was carried out at three monitoring locations over three sampling events.	Odour Monitoring Ireland Ltd	February 2020
High Level Summary Report – Air Quality Study in Dublin Port and Environs. Air monitoring data from 18 monitoring stations over a period of 4 monitoring event was assessed against legislative limits and target values for the protection of human health and vegetation. Monitoring was carried out for NO2 and SO2 at 18 locations over 4 monitoring events. Monitoring for PM10 and PM2.5 was carried out at 2 locations over 1 monitoring event while monitoring for Benzene, Toluene, Ethyl Benzene, Xylene isomers and Ammonia was carried on 7 locations over 2 monitoring events. Total depositional dust was carried out on 4 locations over 1 monitoring event.	Odour Monitoring Ireland Ltd	June 2018
High Level Summary Report – Air Quality Study in Dublin Port and Environs. Air monitoring data from 18 monitoring stations over a period of 6 monitoring event was assessed against legislative limits and target values for the protection of human health and vegetation. Monitoring was carried out for NO2, SO2, PM10, PM2.5 and Total depositional dust. there is a significant improvement in the average monitoring data for average NO2 concentrations across each of the monitoring stations over the monitoring period when compared to the results presented in the March 2016 Report.	Odour Monitoring Ireland Ltd	February 2017
High Level Summary Report – Air Quality Study in Dublin Port and Environs. Air monitoring data from 18 monitoring stations over a period of 6 monitoring event was assessed against legislative limits and target values for the protection of human health and vegetation. Monitoring was carried out for NO2, SO2, PM10, PM2.5 and Total depositional dust.	Odour Monitoring Ireland Ltd	March 2016

Appendix 10.1 presents a summary of the site-specific monitoring events. Also highlighted in Appendix 10.2 is the background pollutant concentrations used in the dispersion modelling exercise.

10.3.3.3 TII Road Emission Model

Emissions from road transport when the port development is operational have been calculated using the TII Road Emissions Model (REM). The REM calculates road transport emissions integrating the traffic volumes/ speeds for light and heavy vehicles on the proposed project with Irish fleet composition information.

Traffic data has been compiled from Chapter 14 – Traffic and Transportation and covers the road network in the port and peripheries. Emission changes from changes to traffic patterns as a result of traffic changes are quantified using the TII Road Emissions Model (REM). This tool includes the following traffic and fleet mix information:

- Traffic information from the TII National Transport Model which provides validated estimates of the volumes of light and heavy vehicles, and the speed at which they travel, on the National Roads Network.
- A Fleet Mix database developed by researchers in the Energy Policy and Modelling Group at University College Cork for cars based on economic projections, and for other light and heavy vehicles by AECOM. The Fleet Mix database is underpinned by the Central Statistics Office's goods vehicles registration data (both heavy and light goods vehicles).
- Emission Rate Database derived from the European Environment Agency's (EEA) COPERT Emissions Tool - the EU industry standard vehicle emissions calculator – published in the EMEP/EEA air pollutant emission inventory guidebook. These data were adjusted further using data published in the UK by DEFRA.

The REM calculates road transport emissions integrating traffic volumes/ speeds for light and heavy vehicles on the national road network with Irish fleet composition information.

The traffic data for the port development have been input to the model to generate vehicle emissions for total national emissions. The tool does this by multiplying together the classified vehicles in the default Fleet Mix Database with the speed-based emission rates in the specified Emissions Rate Database and the Proposed project traffic flows.

Under EU and national policy on electric vehicles and fuel and engine technology, the proportions of the different vehicle classifications (EURO classification) will change over time because it is expected the fleet will move towards increased adoption of newer and relatively lower emission vehicles in the future, including greater uptake of hybrid (HEV), battery-electric (BEV) and alternative fuelled vehicles. The extent of this change is unknown, so the results are generated for three separate Fleet Databased scenarios within the REM model as follows:

- Business as Usual (BaU) scenario; i.e. excluding strategic policy interventions for reduction of CO_2, etc, and based on existing trends in vehicle purchasing and turnover of vehicles out of the vehicle fleet;
- Climate Action Plan (CAP) based on achieving increases in EVs including 151,000 passenger car EV and PHEVs by 2025 and 840,000 passenger car EV and PHEVs by 2030; and
- An intermediate case using linear extrapolation to a central value between BaU and CAP for each vehicle sub-classification.

The BaU represents a scenario whereby there is no progression in reducing the average tailpipe greenhouse gas emissions per vehicle while the CAP scenario assumes a full implementation of current CAP policy and targets. Results for all three scenarios are presented within this assessment. Appendix 10.2 presents the roads digitised in the modelling exercise and details of traffic volumes.

10.3.3.4 Traffic Data

Construction Traffic

Construction traffic will arrive and depart the port via the national road network. All HGV movements will be in compliance with the Dublin City Council HGV Management Strategy. Within the Dublin Port Estate, traffic will be routed through the existing road network to reach the proposed 3FM Project site boundary. Traffic within

the proposed site will be diverted in a phased manner to ensure the existing facilities at Terminal 1 and Terminal 2 remain operational with minimal impact.

The Sequencing Programme for the 3FM Project (Please refer to Chapter 5 Project Description, Appendix 5-9) has been used to determine the future construction traffic on the road network. Staffing levels are also presented. The predicted daily flows split per quarter over the duration of the project are presented in Chapter 14.

Operational Traffic

The key objective of the 3FM Project is to increase the throughput of cargo by providing the infrastructure required to maximise the efficient use of existing port lands. A description of the existing port operations forms part of the application for permission (under separate cover). There are no significant changes to the existing types of operations, processes and activities (regular and occasional) proposed by the 3FM Project. Details of traffic volumes used in the air quality assessment are set out in Appendix 10.2.

10.3.4 Assessment Criteria and Significance

10.3.4.1 Ambient Air Quality Limits

In May 2008, all previous European Directives on air quality were replaced with a revised Directive on Ambient Air Quality and Cleaner Air for Europe (2008/50/EC) known as the CAFE Directive, which has been transposed into Irish legislation through the Air Quality Standards Regulations (S.I. No. 180/2011). In Ireland, ambient air quality monitoring is carried out by the EPA in accordance with the requirements of the CAFE Directive. These air quality limits, as specified in these regulations, are presented in Table 10.3 and represent the main assessment criteria for the operational phase of the proposed project.

The CAFE Directive and the Air Quality Standards Regulations specify limit values in ambient air for sulphur dioxide (SO_2), lead (Pb), benzene (C_6H_6), particulate matter (PM_{10} and $PM_{2.5}$), carbon monoxide (CO), nitrogen dioxide (NO_2) and oxides of nitrogen (NO_x). These limits are mainly for the protection of human health and are largely based on review of epidemiological studies on the health impacts of these pollutants. In addition, there are limits that apply to the protection of the wider environment (ecosystems and vegetation).

Table 10.3 Limits as Specified in Air Quality Standards Regulations 2011 (S.I. 180 of 2011)

Pollutant	Criteria	Value
Nitrogen Dioxide	Hourly limit for protection of human health - not to be exceeded more than 18 times per year	200 µg/m^3 NO2
	Annual limit for protection of human health	40 µg/m^3 NO2
	Annual limit for protection of vegetation	30 µg/m^3 NO + NO2
Benzene	Annual limit for protection of human health	5 µg/m^3
Carbon Monoxide	Maximum daily 8-hour running mean	10 mg/m^3
Lead	Annual limit for protection of human health	0.5 µg/m^3
Sulphur Dioxide	Hourly limit for protection of human health - not to be exceeded more than 24 times per year	350 µg/m^3
	Daily limit for protection of human health - not to be exceeded more than 3 times per year	125 µg/m^3
	Annual limit for protection of vegetation	20 µg/m^3
Particulate Matter PM10	24-hour limit for protection of human health - not to be exceeded more than 35 times per year	50 µg/m^3 PM10
	Annual limit for protection of human health	40 µg/m^3 PM10
Particulate Matter PM2.5	Annual target value for the protection of human health	20 µg/m^3 PM2.5

In addition to the statutory limits for the protection of human health listed in Air Quality Standards Regulations (S.I. No. 180/2011), as amended, the WHO has published a set of air quality guidelines to offer quantitative health-based recommendations for air quality management. The WHO Guidelines are based on reducing the risk to human health and in some cases the levels differ from the EU regulatory limits as these limits are based on balancing health risks with technological feasibility, economic considerations and various other political and social factors in the EU.

The most recent publication from the WHO was in 2021 and the WHO-recommended air quality guidelines (AQG) and interim targets are presented in Table 10.4. These guidelines are not legally binding standards; however, they do provide WHO Member States with an evidence-informed tool that they can use to inform legislation and policy. The levels are presented as an ultimate guideline as well as a series of interim targets which are proposed as incremental steps in a progressive reduction of air pollution and are intended for use in areas where pollution is high. It is notable that the AQG recommended by the WHO are significantly lower than the Air Quality Standards Regulations (S.I. No. 180/2011, as amended) for key traffic pollutants such as NO_2 and PM_{10}.

In October 2022, the EC proposed to revise the Ambient Air Quality Directives (Table 10.3) to align more closely with the recommendations of the World Health Organization (Table 10.4). As such, this assessment employs the WHO guidelines as the appropriate assessment criteria for the protection of human health.

Table 10.4 WHO Recommended Air Quality Guideline (AQG) levels and interim targets (2021)

Pollutant	Averaging Time	Interim Target				AQG
		1	2	3	4	
PM2.5 (µg/m^3)	Annual	35	25	15	10	**5**
	24-hour	75	50	37.5	25	**15**
PM10 (µg/m^3)	Annual	70	50	30	20	**15**
	24-hour	150	100	75	50	**45**
O3 (µg/m^3)	Annual	100	70	–	–	**60**
	24-hour	160	120	-	–	**100**
NO2 (µg/m^3)	Annual	40	30	20	–	**10**
	24-hour	120	50	–	–	**25**
SO2 (µg/m^3)	24-hour	125	50	–	–	**40**
CO (mg/m^3)	24-hour	7	–	–	–	**4**

10.3.4.2 Combustion Gases / Particulates and National Air Quality Limits

Ireland is a party to the Convention on Long Range Transboundary Air Pollution (CLRTAP) under which certain transboundary air pollutants are controlled. For EU Member States, implementation of the Gothenburg Protocol (a daughter protocol of the CLRTAP) is achieved through limits set out in the National Emissions Ceilings Directive 2001/81/EC (NECD) which has been amended by Directive 2016/2284/EU. The NECD sets national emission ceilings for key pollutants including particulate matter (PM10 and PM2.5), sulphur dioxide (SO2), nitrogen oxides (NOx), ammonia (NH3) and Volatile Organic Compounds (VOCs). The aim of the Directive is to cut the negative impacts of air pollution on human health by almost half by 2030. Reducing levels of illness, including respiratory and cardiovascular diseases and premature death is the main priority.

Ireland's emissions ceilings under the first NEC Directive applied until December 2019 with reference to 2005 as the base year. Article 4(1) and Annex II of the revised directive then sets out new reduction commitments which apply from 2020 to 2029, and from 2030 onwards as shown in Table 10.5.

Table 10.5 Ireland's National Emissions Ceiling Directive 2020 and 2030 Targets

Pollutant	2010-20 Targets under 2001/81/EC (kilotonnes)	Targets under 2016/2284/EU (kilotonnes)	
		2020	2030
SO2	42	25.574	10.960
NOx	65	66.836	40.626
NMVOC	55	56.335	51.077
NH3	116	112.066	107.539
PM2.5	*N/A*	15.606	11.229

10.3.4.3 Impact Assessment Criteria for Human Receptors

The TII Guidance (PE-ENV-01106) states that the magnitude of change should be used to describe the quality of the effect as positive, negative or neutral using the criteria in Table 10.6. In addition, the impact descriptors in Table 10.7 should be used to describe the impact at each receptor location, which takes into consideration the percentage change in concentration relative to the air quality standards of the pollutant. As noted, this assessment uses the WHO guidelines (Table 10.6) rather than the statutory limits as the relevant AQLV.

Table 10.6 TII Quality of Effect Criteria (TII, 2022a)

Quality of Effect	Description
Positive Effect	Where there is a decrease in annual mean concentration at a receptor which does not constitute a neutral effect.
Neutral Effect	Where there is a change in concentration at a receptor of: • 5% or less where the opening year, without the proposed project annual mean concentration is 75% or less of the standard; or • 1% or less where the opening year, without the proposed project annual mean concentration is 94% or less of the standard.
Negative Effect	Where there is an increase in annual mean concentration at a receptor which does not constitute a neutral effect.

Table 10.7 TII Impact Descriptors (TII, 2022a)

Long term average concentration at receptor in assessment year	% Change in concentration relative to Air Quality Standard Value (AQLV)			
	1	2-5	6-10	>10
75% or less of AQLV	Neutral	Neutral	Slight	Moderate
76 – 94% of AQLV	Neutral	Slight	Moderate	Moderate
95 – 102% of AQLV	Slight	Moderate	Moderate	Substantial
103 – 109% of AQLV	Moderate	Moderate	Substantial	Substantial
110% or more of AQLV	Moderate	Substantial	Substantial	Substantial

10.3.4.4 Impact Assessment Criteria for Ecological Receptors

The impact of nitrogen deposition is also considered in the assessment at ecologically sensitive areas such as European or nationally designated sites. The relevant assessment criteria employed in the TII guidance is summarised in Table 10.8, which is largely based around the critical loads for nitrogen.

For nutrient nitrogen critical loads are based on empirical evidence, mainly observations from experiments and targeted gradient studies. These empirical critical loads are assigned to habitat classes of the European Nature Information System (EUNIS) to enable consistency of habitat terminology and understanding across Europe. In order to assign the relevant critical load to Annex I features, ASSI habitat features, or habitats of Annex II/SPA features, habitat correspondence tables are used to determine the relationship between the EUNIS classes for which nitrogen critical loads are set and the interest features.

Critical loads of acidity are based on soil and habitat types. They are set for six broad habitats; acid grassland, calcareous grassland, dwarf shrub heath, bogs, montane, unmanaged coniferous and broadleaved woodland.

Critical Levels for air pollutants are not habitat specific and have been set to cover broad vegetation types (e.g. forest arable, semi-natural), often with critical values set for sensitive lichens and bryophytes. They have been derived from experiments and observation that show varied effects on vegetation including visible injury symptoms of exposure and species composition changes in semi-natural vegetation.

Ecological receptors can be affected by deposition of air pollutants such as nitrogen oxides and sulphur dioxide. The nearest sensitive ecological sites to the proposed project are the Grand Canal pNHA (Site Code 2104), the Royal Canal pNHA (Site Code 2103) and South Dublin Bay and River Tolka Estuary SPA (Site Code 4024).

The potential for impact has been assessed as an interaction with the project ecologist (refer to Chapter 7 of this EIAR and the NIS, that latter of which is available under separate cover as part of the planning documentation).

Table 10.8 TII Assessment Criteria for Sensitive Designated Habitats (TII, 2022a)

Description of Results	Significance
Total N deposition and acid deposition are more than 1% of the critical load	Discuss further with project biodiversity practitioners
The total N deposition and acid deposition are less than 1% of the critical load.	Not significant

10.3.4.5 Construction Dust

The concern from a health perspective is focused on particles of dust which are less than 10 microns and the EU ambient air quality standards outlined in Section 10.3.4.1 have set ambient air quality limit values for PM_{10} and $PM_{2.5}$ for protection of human health. Larger dust particles can give rise to dust that causes a nuisance, in Ireland there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development.

With regard to dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/(m^2/day) averaged over a one year period at any receptors outside the site boundary. Recommendations from the Department of the Environment, Health & Local Government (DOEHLG, 2004) apply the Bergerhoff limit of 350 mg/(m^2/day) to the site boundary of quarries. This limit value can be implemented with regard to dust impacts from construction of the project.

Construction dust has the potential to cause local impacts through dust nuisance at the nearest sensitive receptors and also to sensitive ecosystems. The potential for dust generation from the construction activities associated with the Project will be assessed on the basis of a review of the proposed methodologies and the proximity of these activities to sensitive receptors. Construction activities such as stone importation, excavation, earth moving and backfilling may generate quantities of dust, particularly in dry weather conditions. The extent of any dust generation depends on the nature of the dust (soils, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction.

A risk assessment of dust emissions arising from construction activities was completed in accordance with the Institute of Air Quality Management – Guidance on the Assessment of Dust from Demolition and Construction 2024 (IAQM, 2024). As outlined in IAQM (2024), an assessment for the potential impact of dust associated with the construction phase is required when there is:

- A receptor within 350m of the boundary of the Site; and/or 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the Site entrance(s); and
- An ecological receptor is within 50m of the boundary of the Site and/or 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the Site entrance(s).

Sensitivity to dust depends on the duration of the dust deposition, the dust generating activity, and the nature of the deposit. Therefore, a higher tolerance of dust deposition is likely to be shown if only short periods of dust deposition are expected and the dust generating activity is either expected to stop or move on. Due to the scale of the proposed project, construction sites are likely to be in operation for extended periods and therefore detailed consideration of potential dust impacts and how to mitigate impacts is required.

The criteria for appraisal of the magnitude of dust emissions is reviewed for each site compound area in the tables below under the headings of demolition, earthworks, construction and track-out based on a series of criteria set out by the IAQM. The risk of potential for dust impacts with respect to dust nuisance, human health and ecology are a function of magnitude of the dust generation at each construction site in combination with the sensitivity of the surrounding area.

Demolition

Dust emission magnitude (Table 10.9) from demolition can be classified as small, medium or large and are described as follows:

- **Large:** Total building volume > 50,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities > 20m above ground level;
- **Medium:** Total building volume 20,000m^3 – 50,000 m^3, potentially dusty construction material, demolition activities 10 m – 20 m above ground level; and
- **Small:** Total building volume 20,000 m^3, construction material with low potential for dust release, demolition activities < 10 m above ground, demolition occurring during wetter months.

Table 10.9 Risk of Dust Impacts – Demolition

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Earthworks

Earthworks will primarily involve excavating material, haulage, tipping and stockpiling. This may also involve levelling the site and landscaping. Dust emission magnitude (Table 10.10) from earthworks can be classified as small, medium or large and are described as follows:

- **Large:** Total site area > 10,000 m^2, potentially dusty soil type (e.g. clay which will be prone to suspension when dry due to small particle size), > 10 heavy earth moving vehicles active at any one time, formation of bunds > 8 m in height, total material moved > 100,000 tonnes;
- **Medium:** Total site area 2,500 m^2 – 10,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4m–8m in height, total material moved 20,000 – 100,000 tonnes; and

- **Small:** Total site area < 2,500 m^2, soil type with large grain size (e.g. sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 4 m in height, total material moved < 20,000 tonnes, earthworks during wetter months.

Table 10.10 Risk of Dust Impacts – Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Construction

Dust emission magnitudes (Table 10.11) from construction can be classified as small, medium or large and are described as follows:

- **Large:** Total building volume > 100,000 m^3, on-site concrete batching, sandblasting;
- **Medium:** Total building volume 25,000 m^3 – 100,000 m^3, potentially dusty construction material (e.g. concrete), on-site concrete batching; and
- **Small:** Total building volume < 25,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

Table 10.11 Risk of Dust Impacts – Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

Track-out

Factors which determine the dust emission magnitude are vehicle size, vehicle speed, vehicle numbers, geology and duration. Track-out refers to the dirt, mud, or other debris tracked or carried onto the public road network on the wheels of vehicles exiting construction sites. Dust emission magnitude (Table 10.12) from Track-out can be classified as small, medium or large and are described as follows:

- **Large:** > 50 HGV (> 3.5 t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length > 100 m;
- **Medium:** 10 - 50 HGV (> 3.5 t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 – 100 m; and,
- **Small:** < 10 HGV (> 3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length < 50 m.

Table 10.12 Risk of Dust Impacts – Track Out

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

10.3.5 Data Limitations

This Chapter of the EIAR has been based upon the best available information and prepared in accordance with current best practice and relevant guidelines. There were no other technical difficulties or otherwise encountered in the preparation of this chapter of the EIAR.

10.4 Baseline Conditions

10.4.1 Current Baseline Environment

The EPA prepares annual reports on the national emissions to comply with the annual reporting requirements of the Convention on Long Range Transboundary Air Pollution (CLRTAP) and the National Emissions Ceiling Directive (NECD). The 2021 report (Ireland's Air Pollutant Emissions 1990-2030, EPA, 2021b) has been referenced to establish the national baseline of these pollutants which are summarised in Table 10.13. Note that the pollutants of relevance to this assessment are those that may be derived from road traffic emissions i.e. NO_x, $PM_{2.5}$ and non-methane volatile organic compounds (NMVOCs). While sulphur dioxide (SO_2) and ammonia (NH_3) are measured in the baseline, these are not derived from road traffic and are not discussed further in this analysis.

Table 10.13 Ireland's National Emissions Ceiling Directive 2020 and 2030 Targets

Pollutant	2010-20 Targets under 2001/81/EC (kilotonnes)	Emissions Trends (kilotonnes)						Targets under 2016/2284/EU (kilotonnes)	
		2014	2015	2016	2017	2018	2019	2020	2030
SO2	**42**	17.591	15.891	14.444	14.987	14.622	10.874	**25.574**	**10.960**
NOx	**65**	108.199	107.468	110.176	108.167	107.954	98.031	**66.836**	**40.626**
NMVOC	**55**	108.013	108.543	109.798	114.852	115.094	113.747	**56.335**	**51.077**
NH3	**116**	114.238	119.525	124.819	128.635	135.214	125.404	**112.066**	**107.539**
PM2.5	***N/A***	13.848	13.818	13.094	12.989	13.561	11.790	**15.606**	**11.229**

Emissions of NOx contribute to acidification of soils and surface waters, tropospheric ozone formation and nitrogen saturation in terrestrial ecosystems. Road transport is the primary source (40.6%) in Ireland. NOx emissions have been consistently above the NEC, reflective of Ireland's ongoing challenge in complying with the ceiling. Progress in reducing emissions has been difficult, even with the large reductions in emissions from power stations in recent years.

NMVOCs are emitted as gases by a wide array of products including paints, paint strippers, glues, cleaning agents and adhesives. These compounds also arise as a product of incomplete combustion of fuels and, as such, are a component of vehicle exhaust emissions. They also arise from the storage of animal manures and

fertilisers in agriculture, and from the food and drink industry. NMVOCs contribute to the formation of ground level (tropospheric) ozone, with some species such as benzene and 1,3 butadiene being directly hazardous to human health. Transport emissions account for 4.9% of national total emissions of NMVOCs, arising mainly from exhaust and fugitive releases from gasoline vehicles.

Particulate matter (PM) is ubiquitous and there are many sources of dust including vehicle exhausts, surfaces such as soils and roads, industry emissions, construction activities as well as formation from reactions between different pollutant gases. PM_{10} (dust particles with a diameter less than 10 µg) is small enough to be inhaled into the lungs however fine particulate matter ($PM_{2.5}$, diameter less than 2.5 µg) is considered a better measure of anthropogenic sources of particulate matter. The main sources in Ireland are fossil fuel combustion in the commercial and residential sectors (54.9% of the national total), with the transport sector contributing 13.8%.

NH_3 emissions are associated with acid deposition/rain and the formation of secondary PM. The agriculture sector accounts for virtually all (99.4%) of NH_3 emissions in Ireland. Grasslands ultimately receive the bulk of the 42 million tonnes (Mt) of animal manures (equivalent to 539,000 tonnes of nitrogen) produced annually in Ireland along with nitrogen fertilisers which amounted to 365,989 tonnes (as nutrient nitrogen). A proportion of the nitrogen in these inputs is volatilised into the air as NH_3.

10.4.2 Ambient Air Quality

Under the Clean Air for Europe Directive (2008/50/EC), EU member states must designate ‘zones’ for the purpose of managing air quality. Ireland designated four zones in the Air Quality Standards Regulations (S. I. No. 180 of 2011), as amended. 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 four zones and the main areas in each zone are defined as:

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

The 3FM Project is located on the Poolbeg Peninsula in the jurisdiction of Dublin City Council therefore the site lies within EPA Air Quality Zone A (Dublin Conurbation). The EPA air quality monitoring network for Zone A has been reviewed and suitable representative data is presented to identify the background air quality in the area of the 3FM Project.

10.4.3 National Monitoring Data

10.4.3.1 Nitrogen Dioxide (NO_2)

Nitrogen Dioxide (NO_2) is classed as both a primary and a secondary pollutant. As a primary pollutant NO_2 is emitted from all combustion processes (such as a gas/oil fired boiler or a car engine). As a secondary pollutant

NO_2 is derived from atmospheric reactions of pollutants that are themselves, derived mainly from traffic sources. The results of the EPA Dublin network monitoring for the period 2005 to 2021 are presented in Table 10.14. The average results indicate compliance with the limits for the protection of human health (Table 10.4) with the trend indicating a generally reducing ambient level over the last fifteen years in Dublin. This compliance level is to some extent a result of Ireland's location in Western Europe where there is a strong prevailing westerly wind, high rainfall levels and low sunshine levels that allows for the rapid dispersion of pollutants and generally good air quality. In addition, at EU level there is legislation driven improvements to vehicles in terms of both engine performance and fuel specification (known as the Auto Oil Program) which has also helped in the reduction in pollutants over the past fifteen years.

Table 10.14 Results of NO_2 and NO_x monitoring carried out by the EPA in Zone A

Year	Zone A Dublin Background Annual Mean NO_2 ($\mu g/m^3$)	Zone A Dublin Traffic Annual Mean NO_2 ($\mu g/m^3$)
2005	-	33
2006	22	35
2007	19	34
2008	17	34
2009	17	**45**
2010	18	35
2011	20	34
2012	21	29
2013	19	31
2014	17	31
2015	31	18
2016	20	37
2017	27	27
2018	20	27
2019	22	**43**
2020	13	30
2021	14	33
Limit	**40 $\mu g/m^3$ (Annual Limit for Protection of Human Health)**	**40 $\mu g/m^3$ (Annual Limit for Protection of Human Health)**
WHO Air Quality Guideline (AQG)	**10 $\mu g/m^3$**	**10 $\mu g/m^3$**

10.4.3.2 Particulate Matter

Particulate Matter (PM_{10} and $PM_{2.5}$) may be emitted as a primary pollutant from road vehicle exhausts as well as from the combustion of solid fuels (coal, peat, wood) and the EPA report that the main source (especially of the smaller and more dangerous $PM_{2.5}$ particles) is solid fuel burning for home heating. In rural areas, sources will include solid fuel burning for space heating, road traffic, agricultural activities and natural

processes such as sea salt aerosol. PM may also be formed as secondary pollutants from the condensation or reaction of chemical vapours in the atmosphere.

The PM_{10} data shows levels in the range of 10-15µg/m^3 with an average of 14µg/m^3 (Table 10.15). These levels are largely stable in recent years and while well below the limit for the protection of human health, levels fluctuate above and below the WHO Guideline in the period 2015 to 2019. Similarly, PM2.5 data is largely stable, well below the limit but in this case consistently above the WHO Guideline.

Table 10.15 Results of PM_{10} and $PM_{2.5}$ monitoring carried out by the EPA in Zone A

Year	Zone A Dublin Background Annual Mean PM_{10} (µg/m^3)	Zone A Dublin Background Annual Mean PM_{10} (µg/m^3)
2005	12	-
2006	14	-
2007	12	-
2008	11	-
2009	10	10
2010	11	12
2011	12	11
2012	11	11
2013	14	11
2014	14	9
2015	15	9
2016	15	9
2017	13	8
2018	15	8
2019	15	9
2020	11	7
2021	12	8
Limit	**40 µg/m^3 (Annual Limit for Protection of Human Health)**	**20 µg/m^3 (Annual Limit for Protection of Human Health)**
WHO Air Quality Guideline (AQG)	**15 µg/m^3**	**10 µg/m^3**

10.4.4 Scheme Specific Monitoring

Air monitoring has been undertaken from 2014 in the Dublin Port area. Appendix 10.1 presents the air quality monitoring results in full for each of the years and also includes location mapping showing monitoring positions. A summary of the latest report (monitoring results for 2023) is presented in this section for convenience and to allow a focus on the most salient data and discussion on results and levels.

10.4.4.1 Year 2023 High Level Summary Report – Air Quality Study in Dublin Port and Environs, February 2024.

Air monitoring data from 22 monitoring stations located in the Dublin Port area over a period of 12 monitoring event were assessed against legislative limits and target values for the protection of human health and

vegetation. Monitoring was carried out for NO_2 and SO_2 at 22 locations over 12 monitoring events in Year 2023. Monitoring for PM_{10} and $PM_{2.5}$ was carried out at two locations over two monitoring events while monitoring for Benzene, Toluene, Ethyl Benzene, Xylene isomers (BTEX) and Ammonia was carried at seven locations over four monitoring events in Year 2023. Total depositional dust was carried out at four locations over two monitoring events while Lead monitoring was carried out at three locations over three monitoring events in Year 2023.

Previous monitoring in Years 2014 to 2022 was carried out at between seven and 22 monitoring stations for NO_2 and SO_2, while in Years 2017 to 2022, monitoring was carried out at seven monitoring stations for BTEX and Ammonia.

Dublin Port Company Ltd has undertaken a programme of baseline air monitoring throughout the port area and its environs in 2009, 2011, 2014/2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022 and 2023. They will continue this monitoring till Year end 2026. The monitoring carried out during this time period indicated that levels of SO_2 were in compliance with the legislative limit values for SO_2. In general, there were breaches in the limit values for NO2 at a number of the monitoring stations over different monitoring events in 2023. In terms of Total dispositional dust, there were also a number of breaches at a number of monitoring locations in the nuisance limit value for total depositional dust. The monitoring levels of $PM_{10/2.5}$ and Lead were in general compliant with legislative limit values.

In 2019, Odour Monitoring Ireland Ltd (OMI Ltd) were requested to continue the program of monitoring carried out in previous years in order to further study the air quality in the Dublin Port area. Monitoring was carried out at 22 individual monitoring stations over nine events across the port footprint area and boundary. This was further extended to include 12 events across the port foot print area and boundary, thereby providing monthly data over the 22 individual monitoring stations.

Baseline air monitoring was undertaken using Nitrogen dioxide (NO_2), Sulphur dioxide (SO_2), Benzene, Toluene, Ethylbenzene, Xylene isomers (BTEX), Ammonia, Total depositional dust, $PM_{10/2.5}$ and Lead using passive diffusion tubes, Bergerhoff gauges, $PM_{10/2.5}$ continuous particulate monitor and gravimetric samplers to assess compliance with relevant air quality standards and guidelines.

With regards to NO2 monitoring, there were a number of breaches in the EU annual average limit value (i.e. 26 individual stations) over a number of monitoring stations over the 12 monitoring events in Year 2023. When data was averaged over the 12 individual monitoring events for each of the 22 monitoring stations a total of zero stations exceeded the annual limit value of 40µg/m^3. For Event eight Year 2022, there were 33 individual breaches in the EU annual average limit value across the individual monitoring stations. When data was averaged over the 12 individual monitoring events for each of the 22 monitoring stations a total of two stations exceeded the annual limit value of 40µg/m3. For Event seven Year 2021, there were 22 individual breaches in the EU annual average limit value across the individual monitoring stations. For Event six Year 2020, there were 16 individual breaches across the individual monitoring stations. When data from Event nine Year 2023 is compared with Events one to eight, there are net overall improvements in air quality within the Port area. In addition, it shall be noted that since Event seven Year 2021, ambient air monitoring has been carried out at residential non-port areas which are defined by Locations A21 and A22. Typically these locations have ranged from 17.24 µg/m^3 to 23.19 µg/m^3. This is less than 58% of the ambient air limit value of 40 µg/m^3. On a percentage range, in Event 9 Year 2023, 9.85% of individual stations breached the EU limit values. It is evident

from the data that air quality in the Dublin Port environs have markedly improved from the commencement of monitoring in Year 2014/2015. It is also evidential that air quality outside the Dublin Port environs is relatively good with ambient air concentration values ranging from 17.24 µg/m^3 to 23.19 µg/m^3 in Years 2021, 2022 and 2023.

With regards to SO_2 monitoring, the monitoring results gathered during Event nine, Year 2023, no levels of SO_2 above the EU limit value were recorded at any of the 22 monitoring stations over the 12 monitoring events. With regards to Event eight, Year 2022, no levels of SO_2 above the EU limit value were recorded at any of the 22 monitoring stations over the 12 monitoring events. With regards to the monitoring results gather during Event seven, Year 2021, no levels of SO_2 above the EU limit value were recorded at any of the 22 monitoring stations over the nine monitoring events. With respect to the monitoring results gathered during Event sex, Year 2020, no levels of SO_2 above the EU limit value were recorded at any of the 18 monitoring stations over the six monitoring events. The maximum average SO_2 value recorded for each of the 22 monitoring locations over the 12 monitoring events was 5.16 µg/m^3 at location A6. With regards to the comparison between Event one Year 2014/2015, Event two Year 2016, Event three Year 2017, Event four Year 2018, Event five Year 2019, Event six Year 2020, Event seven Year 2021, Event eight Year 2022 and Event nine Year 2023 SO_2 monitoring data, monitoring data collected during Event nine Year 2023 were similar in concentration levels across the Dublin Port monitoring area in comparison to Event one Year 2014/2015, Event two Year 2016, Event three Year 2017, Event four Year 2018, Event five Year 2019, Event six Year 2020, Event seven Year 2021 and Event eight Year 2022. All monitoring stations during Event nine Year 2023 were well in compliance with the statutory limit value of 20 µg/m^3 with the highest value recorded only 72.05% of the limit value.

With regards to Benzene, Toluene, Ethylbenzene and Xylene isomers (BTEX), monitoring was carried out at seven locations for four rounds R1, R3, R4 and R8 in Year 2023. The results of the monitoring indicate that during monitoring, all concentration values of BTEX were low. With regards to Benzene, measured average concentrations were similar in Event nine Year 2023 in comparison to Event eight Year 2022. All monitoring stations during Event nine Year 2023 were well in compliance with the statutory limit value of 5.0 µg/m^3 with the highest value recorded only 23.4% of the limit value. Concentrations of Toluene, Ethylbenzene and Xylene isomers were well within their respective limit for the protection of human health.

With regards to Ammonia, measured average concentrations were higher in Event nine Year 2023 in comparison to Event eight Year 2022. All monitoring station breached the guideline limit value of 3.0 µg/m^3 for Event nine Year 2023. Ammonia contributions from catalytic converters, refrigeration and wastewater treatment could be considered potential sources. Although there is no legislative limit value for Ammonia, it is recommended that concentration values should remain below 3 µg/m^3 for the protection of higher plants. The limit value is based on a nitrogen deposition limit value of less than 5.192 kgN/ha/yr. Twenty-two individual monitoring stations out of twenty-eight monitoring stations exceeded this limit value over the four monitoring events but it should be noted that monitoring was performed in the Dublin Port area and not directly in an area of special conservation (i.e. SAC, NHA, etc.). An average concentration value of 5.32 µg/m^3 was measured at location A17 which would be considered the closest location to a sensitive habitat.

With regards to $PM_{10/2.5}$ monitoring, no breaches for $PM_{10/2.5}$ occurred at the two monitoring stations D5 and D6. Monitoring was carried out over a period of three months at monitoring station D5 and D6 during two monitoring

rounds in Event nine Year 2023. The results indicate that the levels of PM_{10} and $PM_{2.5}$ are in compliance with the legislative limit values.

With regards to total depositional dust monitoring, this was carried out at four monitoring stations (D1 to D4) over four monitoring rounds R2, R4, R8 and R10. The results indicated that nuisance dust levels were below the Irish EPA recommended limit value but above the UKEPA recommended limit value of 200 mg/m^2/day for 13 individual events to minimise nuisance soiling. This is similar to Event eight Year 2022 monitoring program.

With regards to Lead monitoring, no breaches for Lead occurred at any monitoring stations D1, D2 and D6. Monitoring was carried out over three monitoring rounds at monitoring station D1, D2 and D6. The results indicate that the levels of Lead are well in compliance with the legislative limit values of 0.50 µg/m^3.

10.4.5 Sensitive Receptors

There are sensitive receptors (houses, commercial operations) located in the area and these receptors vary in distance from the proposed project. There is a potential that receptors may experience a change in air quality and the extent of these changes in air quality is identified in this assessment.

The nearest sensitive residential receptors to the south of the proposed project are the residential dwellings on York Road, Pigeon House Road, Ringsend Park and Pembroke Cottages.

Ecological receptors can be affected by deposition of air pollutants such as nitrogen oxides and sulphur dioxide. The nearest sensitive ecological sites to the proposed project are the Grand Canal pNHA (Site Code 2104), the Royal Canal pNHA (Site Code 2103) and South Dublin Bay and River Tolka Estuary SPA (Site Code 4024).

The TII Guidelines state that sensitive receptor locations include residential housing, schools, hospitals, places of worship, sports centres and shopping areas i.e. locations where members of the public are likely to be regularly present. Appendix 10.2 details sensitive receptor locations used the air quality assessment for the construction and operational phases.

10.4.6 Existing Sources of Emissions to Air in the Dublin Port Area

The main existing sources of pollution to air quality in the area around Dublin Port are from road traffic, rail traffic, shipping traffic, space heating, industrial emissions and fugitive emissions from fuel/gas storage.

The road network around Dublin Port is centred on the East Wall Road (R131) which connects the East Link Toll Bridge to the south with the Dublin Port Tunnel to the north and forms the western boundary of the port. This road is heavily trafficked, especially at peak times. In addition to this regional road there is a network of internal roads within Dublin Port Estate including the Alexandra Road, the Tolka Quay Road and the Promenade Road which mainly serve HGVs entering and leaving the port.

Irish Rail operates the rail line which runs along Alexandra Road with a number of spurs off this main line. Trains are diesel fired with some localised emissions.

Port operations including shipping emissions (both docked emissions and at sea emissions) and land operations (cranes, trucks, etc.) also give rise to combustion emissions. These emissions are dependent on the fuel

employed, the size of the vessel and the duration of the operations. There are also numerous facilities located in Dublin Port that are licensed by the EPA.

As the Dublin conurbation is subject to a ban on smoky coal under the Air Pollution Act, 1987 (Marketing, Sale and Distribution of Fuels) Regulations (1998-2011), the space heating in the area (both residential and commercial) will be based on gas, oil, biomass and non-bituminous coals. Consequently, the levels from space heating in the area are not elevated.

10.5 Assessment of Air Quality Effects

10.5.1 Construction Phase

10.5.1.1 Construction Dust Assessment

A complete IAQM dust assessment is set out in Appendix 10.3. A summary of that assessment is set out in this section for convenience. An appraisal has been carried out to assess sensitivity of receptors to dust soiling, health impacts and ecological impacts due to the construction phase in accordance with the IAQM Guidance. This appraisal reviews the sensitivity of the site's location with respect to dust nuisance, human health and ecological impacts and then calculates a risk of impact using the magnitude of site activities. Receptor sensitivity can be described as follows with respect to nuisance dust as per the IAQM Guidance:

- High sensitivity receptor with respect to dust nuisance – surrounding land where:
  - Users can reasonably expect enjoyment of a high level of amenity;
  - The appearance, aesthetics or value of their property would be diminished by soiling;
  - The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land; or
  - Examples include dwellings, museums and other culturally important collections, medium and long-term car parks.
- Medium sensitivity receptor with respect to dust nuisance – surrounding land where:
  - Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home;
  - The appearance, aesthetics or value of their property could be diminished by soiling;
  - The people or property would not reasonably be expected to be present continuously or regularly for extended periods as part of the normal pattern of use of the land; or
  - Indicative examples include parks and places of work.
- Low sensitivity receptor with respect to dust nuisance – surrounding land where:
  - The enjoyment of amenity would not reasonably be expected;
  - Property would not reasonably be expected to be diminished in appearance, aesthetics, or value by soiling;

  - There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land; or
  - Indicative examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short term car parks and roads.

Receptor sensitivity can be described as follows with respect to human health as per the IAQM Guidance:

- High sensitivity receptor with respect to human health – surrounding land where:
  - Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (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); or
  - 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.
- Medium sensitivity receptor with respect to human health – surrounding land where:
  - Locations where the people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, relevant location would be one where individuals may be exposed for eight hours or more in a day); or
  - Indicative examples include office and shop workers but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.
- Low sensitivity receptor with respect to human health – surrounding land where:
  - Locations where human exposure is transient; or
  - Indicative examples include public footpaths, playing fields, parks, and shopping streets.

Receptor sensitivity can be described as follows with respect to ecology as per the IAQM Guidance:

- High sensitivity receptor with respect to ecology – surrounding land where:
  - Locations with an international or national designation and the designated features may be affected by dust soiling; or
  - Indicative examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
- Medium sensitivity receptor with respect to ecology – surrounding land where:
  - Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or
  - Indicative example is a European or nationally designated site with dust sensitive features.
- Low sensitivity receptor with respect to ecology – surrounding land where:
  - Locations with a local designation where the features may be affected by dust deposition; or

– Indicative example is a local Nature Reserve with dust sensitive features.

Prior to assessing the impact from dust emissions, the sensitivity of the area must be established using the headings:

- Dust Soiling Effects on People and Property;
- Human Health Impacts; and
- Ecological Impacts.

The sensitivity of the area is considered as per the criteria outlined in the IAQM Guidance and as reproduced in Table 10.16, Table 10.17 and Table 10.18.

In terms of the sensitivity of the area to dust soiling effects on people and property, the receptor sensitivity, number of receptors and their distance from the source are considered. Using these criteria as outlined in Table 10.16, the sensitivity of the area to dust soiling can be established.

Table 10.16 Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	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

The IAQM Guidance also outlines the criteria for assessing the human health impact from PM_{10} emissions from construction activities based on the current annual mean PM_{10} concentrations, receptor sensitivity and the number of receptors effected as per Table 10.17. The annual mean background PM_{10} concentration was reviewed in Section 10.3.3. This found concentrations to be significantly less than 24 $\mu g/m^3$ (Table 10.17) and this band of sensitivity is applied throughout this assessment.

Table 10.17 Sensitivity of the Area to Human Health Impacts

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

Dust deposition impacts on ecology can occur due to chemical or physical effects. This includes reduction in photosynthesis due to smothering from dust on the plants and chemical changes such as acidity to soils. Often impacts will be reversible once the works are completed and dust deposition ceases. The nearest sensitive ecological sites to the proposed project are the Grand Canal pNHA (Site Code 2104), the Royal Canal pNHA (Site Code 2103) and South Dublin Bay and River Tolka Estuary SPA (Site Code 4024). As shown in Table 10.18 the worst-case sensitivity of the area to ecological impacts is considered 'high' under this guidance without adequate mitigation.

Table 10.18 Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

An overall summary of the baseline area for construction to dust nuisance, human health and ecological impacts is shown in Table 10.19.

Table 10.19 Overall summary of the baseline area for construction to dust nuisance, human health and ecological impacts

Location	Description of Works	Nuisance Sensitivity	Human Health Sensitivity	Ecology Sensitivity
1. SPAR	A new road called the Southern Port Access Route (SPAR) to link the north and south port areas, taking Heavy Goods Vehicles (HGVs) from the Port off the public road, via a new bridge across the River Liffey, immediately east of the Tom Clarke Bridge. This will give pedestrians, cyclists and public transport users a less congested route for active travel across the city.	High	Medium	Low
1. New Lo-Lo container terminal	The construction of a new Lo-Lo container terminal: a. Terminal located in front of the ESB's Poolbeg Generating Station. b. Container Transit Storage Yard located on Port owned land on the Poolbeg Peninsula. The new Lo-Lo container terminal will provide 650m of deep berthage, dredged to a depth of -13.0m CD (Chart Datum), with a cargo handling area which will enable DPC to provide the capacity needed to deliver the Dublin Port Masterplan 2040 and to accommodate the larger vessels coming directly to Dublin Port from Continental Europe. In turn, it will free up the area currently operated by Marine Terminals Ltd (MTL) for a new Ro-Ro unaccompanied freight terminal, allowing a more efficient use of the space.	Medium	Low	Low
2. Redevelopment of the existing container terminal	The redevelopment of the existing container terminal, currently operated by MTL, to create a new Ro-Ro unaccompanied freight terminal in its place.	Medium	Low	Low
3. Ship turning circle	Creation of a 325m diameter ship turning circle in front of Pigeon House Harbour, dredged to a depth of 10.0m CD.	Low	Low	Medium
4. New public amenities	Development of new public amenities on the Poolbeg Peninsula to provide community gain: a. A sailing, rowing and maritime campus (Maritime Village) adjacent to the existing Poolbeg Yacht Club. b. Port Park as a buffer between the Port and the Pembroke at Dublin Four development (Glass Bottle site). c. Cycle paths and pedestrian routes throughout the Poolbeg Peninsula.	Medium	Low	Medium
The proposed 3FM Project is located mainly within the Southern Lands of Dublin Port, within the Poolbeg Peninsula, Dublin City. Key elements are highlighted in this table.				

It is important to note at the outset that one of the principal factors affecting dust generation and dust deposition relates to moisture content. Moisture increases the mass of a dust particle meaning particles are less friable and hence, less prone to dust dispersion. In most construction projects, the principal means of dust suppression is through maintaining a high moisture level on dust particles. In the case of the proposed works at Dublin Port, all dredged material will inherently have high moisture content and hence a lower risk of dust impact.

The proposed construction phase is a presented in Chapter 5 of this EIAR and includes details of the main tasks and durations. In summary, the following are the main activities with relevance to air quality and dust impact:

Demolition of Poolbeg Oil Jetty, the Poolbeg Yacht & Boat Club, Marina and Stella Maris Rowing Club, existing Sludge Jetty, demolition of a number of other existing structures, partial demolition, or breaking out, of existing concrete and bituminous surfacing, demolition associated with Berth 41, demolition associated with the SPAR, demolition works to facilitate the construction of the linkspan infrastructure,

Dredging of sediments from the navigation channel which will be disposed of at sea under permit from the EPA.

The dredging operations are considered very low risk for dust impacts given that this material will have very high moisture content (circa 50% by weight). This is also the case for the transport of this material. As such, these operations are considered to have negligible dust impacts and are not considered further in this assessment.

The area of the construction site of the 3FM Project is categorised as “major” and hence, as per the TII Guidelines, any receptor within 100 metres of the site has the potential for adverse effects from construction dusts. Given the nature of the port and the distance to and sensitive receptors, there are some properties located within this impact zone, namely those in close proximity to the proposed SPAR development at Pigeon House Road and York Road.

10.5.1.2 Construction Plant Emissions

Fuel efficiency data has been collated from plant specifications and industry standards. Normal working times will be 07.00 to 19.00 hours Monday to Friday and 08.00 to 13:00 hours on Saturdays and the total fuel use is assumed at 65 hours per week for the duration of the phase of works. Note that this is highly conservative as plant operation is more typically intermittent, but a conservative approach is adopted in line with the precautionary principle. Fuel use throughout is assumed to be diesel fuel and the total estimated use for the duration of the works is ~2,500 m^3.

Emissions to atmosphere from this diesel combustion have been quantified using the European Environment Agency EMEP/EEA air pollutant emission inventory guidebook 2019. Specifically, Section 1.A.4 on non-road mobile machinery has been employed to define the potential emissions and the results of this analysis are shown in Table 10.20. These figures represent the total emissions for the duration of the construction phase from diesel use across all aspects of the construction phase.

Table 10.20 Construction Plant Emissions

Pollutant	Total Emissions (tonnes)	Fraction of Irelands National Emissions Ceiling for 2030 (%)
Ammonia	0.01	0.00%
Non-Methane Volatile Organic Compounds	6.31	0.01%
Oxides of Nitrogen (NO_X)	60.99	0.15%
Particulate Matter PM_{10}	3.93	NA

When the results of the construction phase are compared to the National Emissions Ceilings in Table 10.5 (where ceilings exist for pollutants), the levels are negligible for ammonia and of the order of 0.01 to 0.15% for other pollutants. Oxides of Nitrogen represent the highest fraction of any pollutant but the levels are of minor significance when compared to the emissions ceilings. As such, the emissions from diesel use during the construction phase are considered a minor adverse in the short term.

10.5.1.3 Construction Traffic Emissions

Effects during demolition and construction can often be more significant than those that arise during the operational life of a project. For the construction phase it is important to define the physical characteristics of the whole project, including, where relevant, demolition works, the land-use requirements during construction and operation as well as other works that are integral to the project. Dust emissions can lead to elevated PM_{10} and $PM_{2.5}$ concentrations and may also cause dust soiling. The significance of impacts due to vehicle emissions during the construction phase will be dependent on the number of additional vehicle movements, the proportion of HGVs and the proximity of sensitive receptors to site access routes. It is not likely that construction traffic would lead to a significant change (>10%) in Average Annual Daily Traffic (AADT) flows near to sensitive receptors, then concentrations of nitrogen dioxide, PM_{10} and $PM_{2.5}$ will be predicted.

Construction traffic will arrive and depart the port via the national road network (M1, East Wall Road, etc.). All HGV movements will be in compliance with the Dublin City Council HGV Management Strategy. Within the North Port Estate, traffic will be routed through the existing road network to reach the 3FM Project application boundary. Traffic within the proposed site will be diverted in a phased manner to ensure the existing facilities at Terminal 1 and Terminal 2 remain operational with minimal impact.

The Sequencing Programme for the 3FM Project has been used to determine the future construction traffic on the road network. Staffing levels are also presented. The predicted daily flows split per quarter over the duration of the project are presented in Chapter 5.

An indicative Construction Programme for the 3FM Project (as shown in Chapter 5) has been used to determine the anticipated construction traffic on the road network. The peak HGV traffic volume will occur Q3 2030. There will be an average daily traffic over this period of 57 HGV movements per day, based on a five-day working week. The peak week within the proposed construction stage will be Q4 2030 where on average there will be 81 HGV movements per day. This would incorporate a peak of 17 HGV movements each way per hour between 7am and 8am. Both the DMRB and the NRA Guidelines state that air quality impacts from changes in road traffic volumes may be significant and should be assessed where the traffic volumes show an increase or decrease in traffic emissions of 5-10% or more. The traffic analysis indicates that current traffic volumes on the East Wall Road are 15,622 AADT and hence the 81 traffic movements equates to circa 1% of the East Wall

Road volumes. In this regard, employing the DMRB/TII criteria the construction traffic volumes will not be significant and the resultant air quality impact from construction traffic is “negligible”.

10.5.1.4 Construction Odour

There is a relatively low potential for odour generation and nuisance to occur during the construction phase. Hydrogen sulphide (H_2S) is one of the key odour compounds that can cause odour nuisance impacts. H_2S is a colourless, flammable, extremely hazardous gas with a "rotten egg" odour. It occurs naturally in crude petroleum and natural gas. In addition, H_2S is produced by bacterial breakdown of organic materials and may be released during dredging works if there is organic material disturbed.

The potential exists where decayed organic material has the potential to release sulphurous compounds (such as H_2S) or where solvent contamination is uncovered.

Both of these sources will potentially be released under water during the dredging operations. Low levels or organic solvents are predicted in the dredged material and any vapour released will quickly condense into the liquid phase and either dissolve in the water (such as water soluble solvents such as alcohols) or form a residue on the water surface where not water soluble (such as aromatics). In both cases the impact to air quality and climate is considered “negligible”.

10.5.2 Operational Phase

10.5.2.1 Potential Air Quality Impact of Operational Phase (National Impact)

Road traffic predictions with the proposed project in operation have been modelled and are summarised in Chapter 14. These predicted changes in traffic have been employed to estimate the future generation of transport related national air pollutants. The predicted emissions for operational traffic under the following scenarios are presented in Table 10.21:

- Do-Nothing i.e. opening year without the proposed project; and
- Do-Something i.e. opening year with the proposed project.

The results of both scenarios are presented for each of the three REM scenarios depending on climate policy intervention. Like the Do-Minimum Scenario (Table 10.21) the CAP Scenario is only marginally (2%) below the BaU scenario in 2026 but more significantly lower (15%) in 2026 with greater time for CAP implementation.

When the Do-Something predictions for each scenario in each year are compared with the corresponding Do-Minimum scenarios (Table 1021) there is negligible change in total emissions. These results suggest that the Proposed project will not increase or decrease traffic on the road network but will redistribute traffic around the network with no net change in impact over the Do-Minimum impact.

Employing the significance criteria in set out in this report, this is considered a neutral impact to national air quality.

Table 10.21 Predicted Annual Pollutant Emissions from Road Transport from the Proposed Scheme

Pollutant	Scenario	BaU Scenario (tonnes)	Intermediate Scenario (tonnes)	CAP Scenario (tonnes)
Oxides of Nitrogen (NOx)	Do-Something	1,945	1,916	1,854
	Change relative to DM (%)	**0%**	**0%**	**0%**
Particulate Matter PM_{10}	Do-Something	186	186	186
	Change relative to DM (%)	**0%**	**0%**	**0%**
	Do-Something	215	213	211
	Change relative to DM (%)	**0%**	**0%**	**0%**
Particulate Matter $PM_{2.5}$	Do-Something	110	110	109
	Change relative to DM (%)	**0%**	**0%**	**0%**
	Do-Something	125	122	121
	Change relative to DM (%)	**0%**	**0%**	**0%**

10.5.2.2 National Air Quality Impact

The national impact of the proposed project on emissions of NO_X and VOCs has been assessed using the procedures of TII and the UK Department for Environment, Food and Rural Affairs (DEFRA). The results (see Table 10.22) show that the likely impact of the proposed project on Ireland's obligations under the targets set out by Directive EU 2016/2284 "On the reduction of national emissions of certain atmospheric pollutants and amending Directive 2003/35/EC" are imperceptible and long-term. For the post development year, the predicted impact of the changes in AADT is to increase NOx levels by 0.25% of the NOx emissions ceiling and increase VOC levels by 0.14% of the VOC emissions ceiling to be complied with in 2020. Therefore, the likely overall magnitude of the changes on air quality in the operational stage is imperceptible, long-term and not significant.

Table 10.22 Regional Air Quality

Regional Air Quality	VOC (kg/annum)	NOx (kg/annum)
Scenario – Do Nothing	570	900
Scenario – Do Something	650	1025
Impact (%)	0.00014	0.00034

Full modelled outputs are presented in Appendix 10.2.

10.5.2.3 Local air quality assessment & Human Health

Levels of traffic-derived air pollutants for the development will not exceed the ambient air quality standards either with or without the proposed project in place. Using the assessment criteria outlined in this chapter, the impact of the development in terms of PM_{10}, $PM_{2.5}$, NO_2 and benzene is negligible, long-term, negative and imperceptible. Full modelled outputs are presented in Appendix 10.2.

Air dispersion modelling of operational traffic emissions was undertaken to assess the impact of the development with reference to EU ambient air quality standards which are based on the protection of human health. As demonstrated by the modelling results, emissions as a result of the proposed project are compliant with all national and EU ambient air quality limit values and, therefore, will not result in a significant impact on human health. Remedial measures will be undertaken during the construction phase of the proposed project to remove asbestos containing materials and therefore there is no impact to human health predicted for the operational phase.

10.5.2.4 Sensitive designated habitats

The impact of NO_X (i.e. NO and NO_2) emissions resulting from the traffic associated with the proposed project at the designated sites was assessed. Ambient NO_X concentrations were predicted for the post development year along a transect of up to 200m. The road contribution to dry deposition along the transect is also given and was calculated using the methodology of TII. The predicted annual average NO_X level in the South Dublin Bay SAC adjacent to the proposed project is below the limit value of 30µg/m^3 for the "Do Something" scenario with the proposed project in place with NO_X concentrations reaching 57% of this limit, including background levels.

The impact of the proposed project can be assessed relative to "Do Nothing" levels, the impact of the proposed project leads to an increase in NO_X concentrations of at most 0.58µg/m^3 within the South Dublin Bay SAC and by 0.39µg/m3 within the North Dublin Bay SAC. Appendix 9 of the TII guidelines state that where the scheme or development is expected to cause an increase of more than 2µg/m^3 and the predicted concentrations (including background) are close to, or exceed the standard, then the sensitivity of the habitat to NO_X should be assessed by the project ecologist. Concentrations are not predicted to increase by 2µg/m^3 or more and the predicted concentrations are well below the standard. Therefore, as such it was not necessary for the sensitivity of the habitat to NO_X to be assessed by an ecologist.

The contribution to the NO_2 dry deposition rate along the 200m transects within the SAC is also detailed in Appendix 10.2. The maximum increase in the NO_2 dry deposition rate is 0.032Kg(N)/ha/yr. The maximum increase in the NO_2 dry deposition rate within the SPA/pNHA is 0.021Kg(N)/ha/yr. In both cases this reaches only 0.1% of the critical load for marine habitats of 30 – 40Kg(N)/ha/yr.

10.5.2.5 Operational Phase – Shipping Emissions

The long-term development of the port has been mapped out by the Dublin Port Masterplan 2012-2040 which was published in February 2012 and then reviewed and updated in June 2018. Under the Masterplan, shipping volumes at the port are predicted to increase annually at an average annual growth rate of 3.3% from 2010 to 2040.

In addition to road transport, marine transport is also a potential source of GHG from the proposed project. It is acknowledged that as an island nation, the economy is reliant on the movement of goods to/from mainland Europe, Great Britain or other jurisdictions, through either air or marine transport.

While shipping is the low carbon option relative to aviation, shipping remains a source of GHG emissions from the current operations at Dublin Port. The 3FM project will facilitate an increase in both Roll On-Roll Off (Ro-Ro) and Lift On-Lift Off (Lo-Lo) freight at the port. The anticipated increases in the volume of this freight associated with the proposed project is summarised in Table 10.23. The results indicate a proposed 37% increase in the total throughput of material to be managed through the port.

Table 10.23 also presents the additional number of Ro-Ro and Lo-Lo vessels that will access the port as part of the project.

Table 10.23: Proposed Additional Throughput and Shipping Movements

	2010 '000 gross tonnes	2040 000' gross tonnes		AAGR
	Actual	Original	Revised	Revised
Ro-Ro	16,403	41,920	54,287	4.1%
Lo-Lo	6,317	10,480	15,270	3.0%
Bulk Liquid	4,009	4,000	4,000	0.0%
Bulk Solid	2,054	3,500	3,500	1.8%
Break Bulk	96	100	100	0.1%
Total tonnes	**28,879**	**60,000**	**77,157**	**3.3%**
Ro-Ro ('000 units)	701	1,737	2,249	4.0%
Lo-Lo ('000 units)	377	635	926	3.0%
Totals	**1,078**	**2,372**	**3,174**	**3.7%**
Lo-Lo ('000 TEU)	641	1,080	1,574	3.0%

In 2023 there were 7,300 ships which visited Dublin Port. The 10 additional ships per week by 2040 represents a 7% increase from the 2023 baseline. Shipping emissions associated with the current and proposed project have been quantified using the emission factors presented in the 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories based on a default voyage. Table 10.24 provides the Do-Something projected GHG emissions generated from shipping at the port as the emissions associated with the proposed additional Ro-Ro and Lo-Lo services.

Table 10.24: Shipping Emissions for the Baseline (2022) and Do-Something Scenarios

Scenario	Total Emissions (kilotonnes CO_2e)
Baseline (2022)	4,503
Do-Something	4,880

Table 10.24 shows that the total GHG emissions from the proposed project will increase by 8%

It is important to note that these calculations are highly conservative and do not include any reduced emissions associated with engine and fuel type as mandated through policy such as the International Maritime Organisation ambition to reach net zero emissions from international shipping for 2050[2]. In addition, CAP24 requires the promotion of Renewable Fuel Use in Maritime Transport.

Given the existing legal requirements around fuel and emissions for shipping, the extent of emissions per vessel are gradually reducing and will continue to reduce in future years. As such, the analysis presented in Table 10.24 should be considered a conservative worst-case estimate.

Total shipping emissions are projected to increase by 8% relative to baseline. This increase does not include or any of the projected fuel and engine improvements anticipated under international maritime policy and the EU regulations.

[2] https://ec.europa.eu/commission/presscorner/detail/en/ip_23_3745

EU Directives are in force which relate to the content of sulphur in marine gas oil (EU Directive 93/12 and EU Directive 1999/32) and the content of sulphur in heavy fuel oil used in SECA (EU-Directive 2005/33).

The Marine Environment Protection Committee (MEPC) of IMO has approved amendments to Marpol Annex VI in October 2008 in order to strengthen the emission standards for NO_x and the sulphur contents of heavy fuel oil used by ship engines.

The current Marpol 73/78 Annex VI legislation on NO_x emissions, formulated by IMO (International Maritime Organisation) is relevant for diesel engines with a power output higher than 130kW, which are installed on a ship constructed on or after 1 January 2000 and diesel engines with a power output higher than 130kW which undergo major conversion on or after 1 January 2000.

The Marpol Annex VI, as amended by IMO in October 2008, considers a three tiered approach as follows:

- Tier I: diesel engines (> 130kW) installed on a ship constructed on or after 1 January 2000 and prior to 1 January 2011;
- Tier II: diesel engines (> 130kW) installed on a ship constructed on or after 1 January 2011;
- Tier III (1): diesel engines (> 130kW) installed on a ship constructed on or after 1 January 2016.

Given the existing legal requirements around fuel and emissions for shipping, the extent of emissions per vessel are gradually reducing and will continue to reduce in future years.

10.6 Mitigation Measures

To sufficiently ameliorate the likely air quality impact, a schedule of air control measures has been formulated for both construction and operational phases associated with the proposed 3FM Project.

10.6.1 Construction Phase

Mitigation measures are divided into general measures applicable to the entire project and measures applicable specifically to the defined construction activities (i.e. demolition, earthworks, construction and track-out). As the risk of dust impact on receptors from soiling has been identified to range from medium to high during the demolition stage specifically, the highest risk category should be applied when considering general mitigation measures (IAQM, 2024). A Dust Management Plan (DMP) will be prepared by the appointed contractor for the site and submitted to Dublin City Council for written agreement prior to commencement of construction. The DMP will at a minimum include the following mitigation measures listed below to minimise and manage potential dust emissions.

10.6.1.1 Communications

With respect to communications, the following will be implemented:

- Develop and implement a stakeholder communications plan that includes community engagement;
- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the Site Manager;

- Appropriate training will be provided to all staff to ensure that they are aware of and understand the dust control and other environmental control measures; and,
- Display the head or regional office contact information.

To be implemented before works commence on site and training given as appropriate by the appointed contractor.

10.6.1.2 Site Management

With respect to site management, the following will be implemented:

- Daily visual inspections of the site and site boundary for evidence of dust depositions will be made. A dust inspection of the site will be undertaken by a suitable person, trained and nominated by the site manager. Increase frequency of site inspections will be undertaken when activities with a high potential to produce dust are being carried out, such as earthworks activities, power tool use and during prolonged windy or dry condition;
- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;
- Make the complaints record available to the relevant regulatory authorities when asked;
- Record any exceptional incidents that cause dust and/or air emissions, either on or offsite, and the action taken to resolve the situation in an environmental log book;
- Avoid site runoff of water or mud;
- Use covered skips;
- No bonfires and burning of waste materials on site;
- It is recommended that passive monitoring - site boundary locations shall be completed for the duration earthworks (Bergerhoff method); and
- Keep surfaces such as site fencing and barriers clean using wet methods.

To be implemented during works as required by the appointed contractor.

10.6.1.3 Earthworks

Earthworks are planned as part of the project, including foundations (and associated excavation of soils and materials), creation of stockpiling and cut and fill areas. With respect to earthworks, the following will be implemented:

- Soil handling should be restricted during adverse weather conditions such as high winds or exceptionally dry spells – depending on outcome of walk over survey identifying any potential issues;
- Minimise drop heights from loading or handling equipment/materials and use fine water sprays on such equipment wherever appropriate;
- Dampening methods will be used where necessary; and

- Methods and equipment will be in place for immediate clean-up of spillages of dusty or potentially dusty materials.

To be implemented during earthworks by the appointed contractor.

10.6.1.4 Construction

With respect to construction, the following will be implemented:

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place;
- Ensure bulk cement and other fine powder materials are delivered in enclosed;
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust;
- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems; and
- Cleaning of hard stand areas by personnel only or if required mechanical road sweepers (with water suppressant fitted) to clean any site hard stand area.

To be implemented during construction period by the appointed contractor.

10.6.1.5 Vehicle Movement and Vehicle Emissions

As with any construction site, there are associated vehicle movement, emissions and plant use. With respect to vehicle movement and vehicle emissions, the following will be implemented:

- Implement a wheel washing system until earthworks are completed. Wheel wash system should have an adequate amount of hard surface between it and the site exit;
- Transportation of dusty/fine materials will be conducted in enclosed or sheeted vehicles;
- An onsite speed limit (to be displayed) will be implemented by the main contractor that will be appropriate to the types of construction plant utilised;
- Regular cleaning and maintenance of site roads as appropriate. Hard surface roads should be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic only;
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary;
- Ensure all vehicles switch off engines when stationary and not in immediate use - no idling vehicles (emissions to air controlled);
- All plant utilised should be regularly inspected (emissions to air controlled);
- Visual monitoring of plant will include: Ensuring no black smoke is emitted other than during ignition (emissions to air controlled);

- Ensuring exhaust emissions are maintained to comply with the appropriate manufacturers limits (emissions to air controlled);
- Vehicle exhausts will be directed away from the ground and other surfaces and preferably upwards to avoid road dust being re-suspended to the air.
- Avoid the use of diesel or petrol powered generators where possible, using mains electricity or battery powered items where practicable; and
- Impose and signpost a speed limit of 20 km/hr on sealed surfaces and 15 km/hr on unsealed surfaces.

To be implemented throughout by the appointed contractor.

10.6.1.6 Construction Plant

To reduce emissions from compounds and mobile plant the following mitigation is recommended:

- For electricity generation at the construction compounds, hydrogen generators or electrified plant shall be utilised over traditional diesel generators. This should also apply to lower powered mobile plant as appropriate;
- A regular maintenance schedule for all construction plant machinery shall be undertaken to maintain optimum machinery efficiency; and
- Engines will be turned off when machinery is not in use.

10.6.2 Operational Phase Traffic

Reduction of road traffic emissions is mainly driven by legislation and improved criteria focussed on improvements in fuel and engine technology which in tuns results in a gradually reducing emissions profile. This is a trend which has been in operation for many years and is projected to continue in future years for both cars and heavy goods vehicles. The introduction of the National Car Test (NCT) and Commercial Vehicle Roadworthiness Test. (CVRT) in Ireland has also helped to reduce transport emissions by ensuring that all vehicles on Irish roads over four years old undergo an emissions test.

No scheme specific mitigation measures have been identified but emissions of pollutants from road traffic will be controlled by either controlling the number of road users or by controlling the flow of traffic. For the majority of vehicle-generated pollutants, emissions rise as speed drops, although the opposite is true at very high speeds (i.e. speeds greater than 120km/h). Emissions also tend to be higher under stop-start conditions when compared with steady speed driving. The freer flow of HGV traffic on the proposed SPAR would allow for the generation of lower concentrations of traffic-related pollutants due to more steady speed driving.

10.6.3 Operational Phase Shipping Emissions

A number of EU Directives and the requirements of the Marpol Convention regulate the fuels and emissions employed in the shipping industry. These requirements will remain in practice throughout the operation of the 3FM Project and may be replaced with more stringent emission limits.

In addition to the international mitigation implemented by Marpol, DPC has proposed port-specific mitigation with a view to reducing emissions while vessels are berthed at the port. DPC propose to provide shore to ship. This will facilitate powering of the berthed vessels by the national grid which will allow the vessel to turn off their main and auxiliary engines for the duration of berthing. This reduces direct emissions from the ships while in port and at the closest point to the sensitive human receptors in the area.

10.7 Residual Effects

10.7.1 Construction Phase

When the dust minimisation measures detailed in the mitigation section of this chapter are implemented, fugitive emissions of dust from the site are not predicted to be significant and pose no nuisance, human health or ecological risk to nearby receptors. Thus, there will be no residual construction phase dust impacts. The assessment of construction phase traffic emissions has found negligible air quality impacts from traffic disruption caused by construction traffic. The construction phase of the assessment identifies a negligible impact on air quality in the vicinity of the proposed project. Therefore, overall it is considered that the residual effects are overall short-term and not significant.

The residual odour impact of the prosed the dredging operations is considered “negligible”. Once the measures proposed in the Odour Management Plan are implemented during this operation.

10.7.2 Operational Phase

The proposed project will lead to a net ‘Positive’ long term air quality impact for properties along Pigeon House Road and York Road that are currently located within 50 metres of the existing R131. For properties on the R131 due to the proposed SPAR offsetting HGV flows further from the facades of the properties. Overall, the potential impact to air quality ranges from ‘Negligible’ for all receptors and pollutants.

10.8 Cumulative Impacts

Should the construction phase of the proposed project coincide with the construction of any other proposed or permitted developments within 350m of the site then there is the potential for cumulative dust impacts to the nearby sensitive receptors. The dust mitigation measures outlined in Appendix 10.3 of this EIAR should be applied throughout the construction phase of the proposed project, with similar mitigation measures applied for other proposed or permitted developments which will avoid significant cumulative impacts on air quality. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality and climate associated with the construction phase of the proposed project are deemed short-term and not significant. If additional residential or commercial developments are proposed in the future in the vicinity of the proposed project, this has the potential to add further additional vehicles to the local road network. However, due to the location of the proposed project and as the traffic impact for the proposed project has an imperceptible impact on air quality, it is unlikely that other future developments of similar scale would give rise to a significant impact during the

construction and operational stages of those projects. Future projects of a large scale would need to conduct an EIA to ensure that no significant impacts on air quality will occur as a result of those developments.

10.9 Monitoring

10.9.1 Construction Dust

Monthly monitoring of dust deposition levels shall be undertaken by the contractor for the duration of construction for comparison with the guideline of 350mg/m2/day (for non-hazardous dusts). This monitoring shall be carried out at a minimum of four locations at each working area (when active) and further monitoring locations at sensitive receptors around the proposed works. The additional locations will be at any residential receptor area within 100m of the proposed works areas.

Where dust levels are measured to be above the guideline of 350mg/m2/day, the mitigation measures in the area shall be reviewed and improved to ensure that dust deposition is reduced to below 350 mg/m2/day.

Should high dust levels continue to occur following these improvements, the contractor shall provide alternative mitigation measures and/or will modify the construction works taking place.

10.9.1 Construction Odour

In addition to construction dusts the CEMP also includes a draft Odour Management Plan (OMP) to mitigate the potential for odours from dredging operations. The draft OMP follows the guidance presented in the Environment Agency of England & Wales “Odour Management Guidance” (H4 Guidance, 2011). The odour monitoring and investigation aspects of the OMP follows the EPA “Odour Impact Assessment Guidance for EPA Licensed Sites” (Guidance Note AG5, 2021). The OMP includes measures designed to:

- 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 considers sources, releases and impacts of odour and use these to identify opportunities for odour management. The OMP includes for the periodic odour audit of the facility by a suitably qualified expert to identify all sources on site together with nature and scale of the odour release and associated construction details. In addition, the plan includes a procedure for complaint recording and investigation to ensure that all complaints received at the site are suitably addressed.

10.10 Summary and Conclusions

The current state of the environment in terms of baseline air quality has been determined from the data from the EPA monitoring Zone A (Dublin) network to determine compliance with relevant ambient air legislation. In addition to the EPA monitoring, DPC carry out a series of ambient air quality monitoring tests within the environs

of the port. This monitoring is employed in this assessment to demonstrate the spatial variation in the Port and in the wider Dublin area in conjunction with the data from the EPA network.

Results of the baseline monitoring indicates that recent levels in the Greater Dublin Area are well below the statutory limits for the protection of human health and also below the WHO guidelines for the protection of human health. It is noted that monitoring undertaken by DPC within the port t shows levels that are higher than the Greater Dublin Area average and, in some cases, levels exceed both the statutory limits and the WHO guidelines.

There are sensitive receptors (houses, commercial operations) located in the area and these receptors vary in distance from the proposed project. There is a potential that receptors may experience a change in air quality and the extent of these changes in air quality is identified in the air quality assessment. The nearest sensitive residential receptors to the south of the proposed project are the residential dwellings on York Road, Pigeon House Road, Ringsend Park and Pembroke Cottages circa 400m to the south of the 3FM Project application boundary.

The proposed construction operation will involve the movement of materials and reconfiguration of existing roadways, buildings and lands to create an additional three hectares of usable terminal. Additional infill material may be sourced offsite and transported via the newly configured access to the port. All dredged material will be barged to the dump site and will not travel by road. As the construction traffic volumes predicted with the 3FM Project are not considered significant relative to existing volumes, the resultant air quality impact from construction traffic is negligible.

The main potential odour from the construction stage relates to the potential for fugitive odours from the dredging operation. Despite the low risk of encountering odours, a series of odour mitigation measures have been presented to minimise the impact of this operation and to prevent any nuisance in the unlikely event that odours are encountered. The residual odour impact of the prosed the dredging operations is considered negligible.

The operational impacts of increased traffic emissions arising from the additional traffic on local roads, due to the development, have been assessed. It has been demonstrated that the proposed project will not cause any exceedances of the air quality objectives in locations where they are not already exceeded. Overall, the operational air quality impacts, following the application of the proposed mitigation are judged to be ‘not significant’.

The results of the modelling indicate that with the development, the predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations at existing receptors are below the relevant long and short-term AQS objectives. When the magnitude of change in annual-mean NO_2, PM_{10} and $PM_{2.5}$ concentrations is considered in the context of the absolute predictions, the air quality impacts of the development on existing receptors are categorised as ‘negligible’. Taking into account the geographical extent of the impacts predicted in this study, the overall impact of the development on the surrounding area as a whole is considered to be ‘negligible’, using the descriptors adopted for this assessment. The AQS objectives for NO_2, PM_{10} and $PM_{2.5}$ are likely to be met at the facades of the sensitive receptors.

On that basis, future and existing receptors should be exposed to acceptable air quality. Using professional judgement, the resulting air quality effect is considered to be ‘not significant’ overall.

Shipping emissions associated with the proposed project have been quantified based on the projected increases in shipping numbers at the port in 2040 both as a result of the 3FM Project and cumulatively for the Masterplan. Shipping emissions are predicted to generate a long term and permanent slight adverse impact for climate and air quality.