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ENVIRONMENTAL IMPACT ASSESSMENT REPORT

TEN-T Priority Route Improvement Project, Donegal

Chapter 12: Air Quality

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EIAR

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List of Abbreviations

The following is a list of abbreviations used within this chapter of the Environmental Impact Assessment Report (EIAR).

List of Abbreviations	
A5 WTC	A5 Western Transport Corridor (Northern Ireland)
AADT	Annual Average Daily Traffic
APIS	Air Pollution Information System
AQA	Air Quality Assessment
AQG	Air Quality Guidelines
AQLV	Air Quality Limit Value
ARN	Affected Road Network
ASSI	Area of Special Scientific Interest
BEV	Battery Electric Vehicle
CAFÉ Directive	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 (as amended) (known as the CAFE Directive)
CAP	Climate Action Plan
CLRTAP	Convention on Long Range Transboundary Air Pollution
CSO	Central Statistics Office
DAERA	Department of Agriculture, Environment and Rural Affairs
DECC	Department of Energy, Climate, and Communications
DEFRA	Department for Environment, Food & Rural Affairs
DHPLG	Department of Housing, Planning and Local Government
DM	Do-Minimum
DMP	Dust Management Plan
DMRB	Design Manual for Roads and Bridges
DS	Do-Something
EEA	European Environment Agency
EFT	Emissions Factors Toolkit
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EOP	Environmental Operating Plan
EPA	Environmental Protection Agency
EV	Electric Vehicle
GHG	Greenhouse Gas(es)
GIS	Geographical Information System
HDV	Heavy Duty Vehicle
HEV	Hybrid Electric Vehicle
HGV	Heavy Goods Vehicle
IAQM	Institute of Air Quality Management
ICE	Internal Combustion Engine
IEEM	Institute of Ecology and Environmental Management
IPC	Integrated Pollution Control
IPCC	Intergovernmental Panel on Climate Change
LGV	Light Good Vehicle
NEC	National Emissions Ceiling
NH_3	Ammonia
NMU	Non-Motorised User
NMVOC	Non-Methane Volatile Organic Compounds

List of Abbreviations

NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NPWS	National Parks and Wildlife Service
PHEV	Plug-in Hybrid Electric Vehicles
PM_{10}	Particulate Matter < 10 microns
$PM_{2.5}$	Particulate Matter < 2.5 microns
pNHA	proposed Natural Heritage Area
REM	Road Emissions Model
SAC	Special Area of Conservation
SPA	Special Protection Area
TEN-T	Trans European Network - Transportation
TII	Transport Infrastructure Ireland
TMP	Traffic Management Plan
VDI	Verein Deutscher Ingenieure (German standard)
WHO	World Health Organisation
WWDA	Wastewater Discharge Authorisation

12 AIR QUALITY

12.1 Introduction

This chapter of the EIAR assesses the potential air quality impacts that the proposed TEN-T Priority Route Improvement Project, Donegal (hereafter the 'Proposed Development' or the 'Project') may have on the receiving environment during both the construction and operational phases. This chapter should be read in conjunction with Chapter 4: Project Description and the following topic-specific chapters:

- Chapter 4: Project Description
- Chapter 6 – Traffic and Transport
- Chapter 7 – Population
- Chapter 8 – Human Health
- Chapter 9A and 9B – Biodiversity
- Chapter 13 – Climate
- Chapter 15 – Material Assets: Non-agricultural

Potential effects to air quality may arise during the construction phase, such as from the generation of construction dusts and construction traffic. The construction activities have been examined to identify those that have the potential for air emissions. During the operational phase, the Proposed Development will give rise to potential emissions impacts arising from changes in the volumes, locations and traffic mix of vehicles using the Proposed Development. Each of these potential sources has been identified, and emissions and impacts have been evaluated using standard procedures as described in Section 12.4 below. Section 12.6 then sets out the results of this evaluation and the likely impacts of the Proposed Development in the absence of mitigation. The mitigation measures required to avoid, prevent or reduce and, if possible, offset likely significant effects, where necessary, are discussed in Section 12.7.

12.2 Competent Experts

Paul Chadwick is the Director of Sustainability in RPS with over 25 years' experience. Paul specialises in the fields of air quality and climate and risk assessment. He has considerable experience, both academic and professional, in ambient air quality and a wide range of atmospheric pollutants. As a result of two years research in atmospheric chemistry, he has an in-depth knowledge of the chemical and physical transformations associated with local and regional air pollution and climate change. Paul also specialises in risk assessments and the identification and quantification of risks on projects.

Dr Clare Noone is a Senior Scientist in RPS, with over 17 years' experience working in the fields of air quality and climate change and related policy. Clare holds a PhD in Atmospheric Physics from the Centre for Climate and Air Pollution Studies, School of Physics, University of Galway, and a BSc in Physics from the University of Galway. Clare is a lead author of Ireland's first 5-Year Assessment Report (ICCA) Climate Research and is currently a series editor for one of Palgrave's long-established book series Energy, Climate and the Environment. Clare was an external expert reviewer of the IPCC AR6 Synthesis Report and is currently an external reviewer of IPCC AR7 Special report on Cities and Climate Change and AR7 Special report on Short Lived Climate Forcers.

12.3 Legislation, Policy and Guidance

The key legislation and guidance referenced in the preparation of the EIAR is outlined in Chapter 1: Introduction. Specific to air quality, the relevant legislation, policy, and guidance that has informed the assessment is described in the following sections.

12.3.1 Legislative Context

Directive (EU) 2024/2881 aims to enhance air quality across Europe by establishing a more ambitious regulatory framework than that which currently applies through the CAFÉ Directive (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, as amended). Key provisions of the 2024 Directive include:

- Tighter pollutant limits to protect human health and ecosystems.
- Enhanced monitoring requirements to ensure compliance with air quality standards.
- Stronger citizens' rights regarding air quality information and participation in decision-making processes.

The Directive is part of the EU's commitment to achieving 'zero air pollution' by 2050. Limit values for the protection of health for Directive (EU) 2024/2881 are also much stricter than those in the CAFÉ Directive and these new limits, which will take effect from 11th December 2026 (currently being transposed into Irish Law and legally must be in place by December 2026) and 1st January 2030, are shown below in Table 12-1 and Table 12-2, respectively.

Table 12-1: Limit values for the protection of human health to be attained by 11 December 2026

Pollutant	Averaging period	Limit Value	Notes
$PM_{2.5}$	Calendar year	25 µg/m^3	
PM_{10}	1 day	50 µg/m^3	not to be exceeded more than 35 times per calendar year
	Calendar year	40 µg/m^3	
Nitrogen dioxide (NO_2)	1 hour	200 µg/m^3	not to be exceeded more than 18 times per calendar year
	Calendar year	40 µg/m^3	
Sulphur dioxide (SO_2)	1 hour	350 µg/m^3	not to be exceeded more than 24 times per calendar year
	1 day	125 µg/m^3	not to be exceeded more than 3 times per calendar year
Benzene	Calendar year	5 µg/m^3	
Carbon monoxide (CO)	Maximum daily 8-hour mean	10 mg/m^3	
Lead (Pb)	Calendar year	0.5 µg/m^3	

Table 12-2: Limit values for the protection of human health to be attained by 1 January 2030

Pollutant	Averaging period	Limit Value	Notes
$PM_{2.5}$	1 day	25 µg/m^3	not to be exceeded more than 18 times per calendar year
	Calendar year	10 µg/m^3	
PM_{10}	1 day	45 µg/m^3	not to be exceeded more than 18 times per calendar year
	Calendar year	20 µg/m^3	
Nitrogen dioxide (NO_2)	1 hour	200 µg/m^3	not to be exceeded more than 3 times per calendar year
	1 day	50 µg/m^3	not to be exceeded more than 18 times per calendar year
	Calendar year	20 µg/m^3	
Sulphur dioxide (SO_2)	1 hour	350 µg/m^3	not to be exceeded more than 3 times per calendar year
	1 day	50 µg/m^3	not to be exceeded more than 18 times per calendar year
	Calendar year	20 µg/m^3	
Benzene	Calendar year	3.4 µg/m^3	
Carbon monoxide (CO)	Maximum daily 8-hour mean	10 mg/m^3	
	1 day	4 mg/m^3	not to be exceeded more than 18 times per calendar year
Lead (Pb)	Calendar year	0.5 µg/m^3	
Arsenic (As)	Calendar year	6.0 ng/m^3	
Cadmium (Cd)	Calendar year	5.0 ng/m^3	

Pollutant	Averaging period	Limit Value	Notes
Nickel (Ni)	Calendar year	20 ng/m^3	
Benzo(a)pyrene	Calendar year	1.0 ng/m^3	

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 Directive (as amended) then sets out new reduction commitments which apply from 2020 to 2029, and from 2030 onward s as shown in Table 12-3. The European Union (National Emission Ceilings) Regulations (Amendment) 2024 updates the reporting requirements for emissions and projections as referred to in Article (2).

Table 12-3: National Emission Reduction Commitments

Pollutant	2025 Base Year (kilotonnes)	National Emission Reduction commitment for 2020-2029 (% 2025 levels)	National Emission Reduction commitment for 2030 (% 2025 levels)
SO_2	72.81	65%	85%
NO_x	134.14	49%	69%
NMVOC*	77.1	25%	32%
NH_3	120.15	1%	5%
$PM_{2.5}$	18.72	18%	41%

* non-methane volatile organic compounds.

12.3.2 Policy

12.3.2.1 European 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 2030 targets of this plan that are relevant to this assessment are listed as follows:

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

12.3.2.2 National Policy

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 in April 2023 by the Department of the Environment, Climate and Communications (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.
- The Clean Air Strategy for Ireland also commits more stringent legal limits for ambient air quality and achieving the WHO guideline values by 2040.

12.3.2.3 Local Policy

The County Donegal Development Plan 2024-2030, as varied, notes that one of the benefits of the TEN-T Priority Route Improvement Project includes reducing air pollution caused by congestive queuing. Donegal County Council has monitoring and enforcement responsibilities and powers under a range of air quality legislation, including:

- The Air Pollution Act 1987 (Solid Fuels) Regulations 2022 (S.I. No. 529 of 2022) (as amended).
- The Waste Management (Prohibition of Waste Disposal by Burning) Regulations 2009 (S.I. No. 286 of 2009) (as amended).
- The European Union (Paints, Varnishes, Vehicle Refinishing Products and Activities) Regulations 2012 (S.I. No. 564 of 2012) (as amended).
- The European Union (Installations and Activities Using Organic Solvents) Regulations 2012 (S.I. No. 565 of 2012) (as amended).
- The Air Pollution Act 1987 (Petroleum Vapour Emissions) Regulations 1997 (S.I. No. 375 of 1997).
- The Air Pollution Act 1987 (as amended).

12.3.3 Guidance

The assessment has been prepared in accordance with the following TII guideline documents:

- TII Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document PE-ENV-01106 (December 2025) (TII, 2025a).
- TII Air Quality Assessment of Proposed National Roads - Standard PE-ENV-01107 (December 2025) (TII, 2025b).
- TII Road Emissions Model (REM): Model Development Report GE-ENV-01107 (May 2025) (TII, 2025c).

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. Version 2.2.
- Technical Instructions on Air Quality Control – TA Luft, German Federal Ministry for Environment, Nature Conservation and Nuclear Safety, (July 2002).

The WHO Guidelines are particularly pertinent to the statutory limits for the protection of human health. The 2021 Air Quality Guidelines (AQG) and interim targets recommended by the WHO are presented below in Table 12-4. These guidelines are not legally binding; however, they do provide WHO Member States with an evidence-informed tool 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. Predicted concentrations have been compared to the relevant statutory limit values and the WHO guidelines for the protection of human health.

Table 12-4: WHO guidelines for the protection of human health

Pollutant	Averaging Time	Interim Target				AQG
		1	2	3	4	
$PM_{2.5}$ (µg/m^3)	Annual	35	25	15	10	5
	24-hour	75	50	37.5	25	15
PM_{10} (µg/m^3)	Annual	70	50	30	20	15
	24-hour	150	100	75	50	45
O_3 (µg/m^3)	Annual	100	70	-	-	60
	24-hour	160	120	-	-	100
NO_2 (µg/m^3)	Annual	40	30	20	-	10
	24-hour	120	50	-	-	25
SO_2 (µg/m^3)	24-hour	125	50	-	-	40
CO (mg/m^3)	24-hour	7	-	-	-	4

12.4 Methodology

12.4.1 Assessment Criteria and Significance

The TII Guideline (TII, 2025a) states that determining the significance of air quality effects during the construction phase is based on the latest IAQM guidance (IAQM 2024). In the IAQM approach, dust risk is assessed based on the sensitivity of the area versus the dust emission magnitude for key construction operations such as demolition, earthworks, construction and track-out. Risks are identified as high, medium and low and this is used to assign the appropriate level of mitigation. While IAQM 2024 does not assign EIA significance to these risk levels, professional judgment has been applied for determining significance for this project in the format presented in Table 12-5.

Table 12-5: Significance of Construction Dust Impact

Risk Level	Description
High Risk	High risk on human health and the environment from construction dust, with an equivalent substantial adverse impact which is significant in EIA terms.
Medium Risk	Medium risk on human health and the environment from construction dust, with an equivalent moderate adverse impact which is significant in EIA terms.
Low Risk	Low risk of dust impact on human health and the environment, with an equivalent slight adverse impact which is not significant in EIA terms.

In terms of operation phase impact from road traffic emissions, the TII Guideline (TII, 2025b) states that the magnitude of change should be used to describe the quality of the effect as positive/beneficial, negative or neutral using the criteria in Table 12-6. In addition, the impact descriptors in Table 12-7 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. Note that the Guidelines require that the results of the assessment are compared against the 2030 standards to determine if the effect of a proposed

scheme will be significant for air quality. The legally binding AQLVs are described in Section 12.3.1 and alert thresholds for concentrations of certain pollutants in ambient air, to prevent or reduce harmful effects on human health and the environment. 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).

Table 12-6: TII Quality of Effect Criteria

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 scheme annual mean concentration is 75% or less of the standard; or • 1% or less where the opening year, without the proposed scheme 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 12-7: TII Impact Descriptors

Long term average concentration at receptor in assessment year	% Change in concentration relative to 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

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 Guideline is summarised in Table 12-8, which is largely based around the critical loads for nitrogen. In terms of critical loads, for Ammonia (NH_3) the lower critical load of 1 µg/m^3 and Upper critical load of 3 µg/m^3 are applied to this assessment. In terms of NOx, the upper/lower critical load of 30 µg/m^3 is applied.

Table 12-8: TII Assessment Criteria for Sensitive Designated Habitats

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.

12.4.2 Study Area and Zone of Influence

The IAQM 2024 Guidance states that a dust assessment is typically required for assessing construction impact including dust soiling effects, where there is:

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

To ensure a robust and conservative assessment, the Zone of Influence (ZoI) for the construction phase dust impacts is set at 250 metres. In terms of road traffic during the construction and operational phase, the TII Guidelines (TII, 2025b) state that 200 metres represents the distance within which detectable impacts of a road might be detected.

Again, for the purposes of a robust and conservative assessment an operational ZoI for air quality impacts arising from road traffic is set at 250 metres from the centreline of the Proposed Development. Given the location of the Proposed Development, there is scope for transboundary impact in Northern Ireland, and the Study Area and ZoI extend into Northern Ireland for some aspects of Section 3.

12.4.3 Sources of Information

The baseline ambient air quality environment has been assessed based on a desk study of publicly available published data sources. The baseline ambient monitoring surveys have been taken from data and monitoring undertaken in the area by the Environmental Protection Agency (EPA). Air quality standards are set out in EU and Irish legislation. The EPA monitors various air pollutants in Ireland to determine compliance with these standards. A desk-based air quality assessment was carried out following TII's Guidelines (TII, 2025a and TII, 2025b), which state that wherever possible use should be made of existing quality assured air quality data such as that undertaken by the EPA. Air quality monitoring programmes have been undertaken in recent years by the EPA. The AQ TII Standard (PE-ENV-01107) is for National Roads, the Guidance or overarching technical document (OTD) (PE-ENV-01106) is for other specified infrastructure. The OTD also gives further explanation and background to the standard so both can be used for a national road project.

The most recent EPA Annual Air Quality in Ireland reports (EPA, 2025), detail the range and scope of monitoring undertaken throughout Ireland and data from these reports is referenced to inform the baseline air quality for this assessment. Table 12-9 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 https://airquality.ie/. A review of potentially sensitive ecological areas has also been conducted using the National Parks and Wildlife Service (NPWS) online mapping services.

The air quality monitoring data from the Department for Agriculture, Environment and Rural Affairs (DAERA, 2025) air monitoring station in Northern Ireland is also used as a reference. The UK Air Pollution Information System (APIS, 2025) was used for the ecology assessment.

Table 12-9: Summary of Key Desktop Reports

Title	Source	Year	Author
Air Quality in Ireland 2024	EPA	2025	EPA
Air Quality in Ireland 2023	EPA	2024	EPA
Air Quality in Ireland 2022	EPA	2023	EPA
Air Quality in Ireland 2021	EPA	2022	EPA
Air Quality in Ireland 2020 – Indicators of Air Quality	EPA	2021	EPA
Ireland's Air Pollutant Emissions 2019 (1990-2030)	EPA	2021	EPA
Air Quality in Ireland 2019 – Indicators of Air Quality	EPA	2020	EPA
Air Quality Report 2019 - Supplemental information	EPA	2020	EPA
Air Quality in Ireland 2018 – Indicators of Air Quality	EPA	2019	EPA
Air Quality Report 2018 - Supplemental information	EPA	2019	EPA
Air Quality in Ireland 2017 – Indicators of Air Quality	EPA	2018	EPA
Air Quality Report 2017 - Supplemental information	EPA	2018	EPA

12.4.4 Key Parameters for Assessment

The following aspects were considered in the assessment of potential effects of the Proposed Development on air quality:

Construction Phase

- Fugitive dust emissions at the sites and compounds during ground investigations, demolitions, excavations, construction and track-out of the Proposed Development.
- Plant emissions from diesel use on mobile and fixed plant engaged in the construction phase.
- Road traffic emissions from transport of personnel and materials to and from site for construction activities.

Operational Phase

- The impact of road traffic emissions associated with traffic volumes using the Proposed Development on human health once operational – this parameter is assessed at national level, within the wider area and also at local level for individual properties.
- The impact of road traffic emissions of operational traffic on sensitive ecosystems has also been considered.
- The impact of active travel infrastructure on human health.

12.4.5 Construction Dust

Construction dust is assessed in accordance with the procedures outlined in the 'Guidance on the assessment of dust from demolition and construction' (IAQM, 2024) as recommended in the TII Guidelines. The criteria for appraisal of the magnitude of dust emissions is reviewed for each site compound or area 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 as per IAQM.

During the construction phase, the focus is on air quality sensitive receptors adjacent to dust generating activities or roads impacted due to construction activities. Dust generation rates depend on the site activity, particle size, the moisture content of the material and weather conditions. Dust emissions are dramatically reduced where rainfall has occurred due to the cohesion created between dust particles and water and the removal of suspended dust from the air.

Following from a US EPA report (2006) it is typical to assume no dust is generated under 'wet day' conditions where rainfall greater than 0.2 mm has fallen. Rain also assists in removing dust from the atmosphere through washout.

The 30-year average rainfall (1991 – 2020) from Malin Head, the closest weather station to the Proposed Development with available data, shows that on average 245.5 days per annum (67%) will experience rainfall greater than 0.2 mm. Wind can lift particles up into the air and transport the dust downwind as well as drying out the surface. Therefore, the worst dust deposition conditions typically occur during dry conditions with strong winds.

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 Development, 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 (2024). The risk of potential for dust impacts with respect to dust soiling, 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 as detailed in Section 12.6.

Earthworks will primarily involve excavating material, haulage, tipping and stockpiling. This may also involve levelling the site and landscaping. Dust emission magnitude from earthworks can be classified as small, medium or large per IAQM guidelines and are described as follows and in Table 12-10:

- Large: Total site area > 110,000 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 18,000 m^2 to 110,000 m^2, moderately dusty soil type (e.g. silt), 5 to 10 heavy earth moving vehicles active at any one time, formation of bunds 4 m to 8 m in height, total material moved 20,000 to 100,000 tonnes.
- Small: Total site area < 18000 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 12-10: Risk of Dust Impacts – Earthworks

Sensitivity of Area	Magnitude of Dust Emissions		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
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 from Track-out can be classified as small, medium or large per IAQM guidelines and are described as follows (Table 12-11):

- 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: 20 to 50 HGV (> 3.5 t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 to 100 m.
- Small: < 20 HGV (> 3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length < 50 m.

Table 12-11: Risk of Dust Impacts – Track Out

Sensitivity of Area	Magnitude of Dust Emissions		
	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 can be classified as small, medium or large per IAQM guidelines and are described as follows (Table 12-12):

- Large: Total building volume > 175,000 m^3, on-site concrete batching, sandblasting;
- Medium: Total building volume 12,000 m^3 to 75,000 m^3, potentially dusty construction material (e.g. concrete), on-site concrete batching.
- Small: Total building volume < 12,000 m^3, construction material with low potential for dust release.

Table 12-12: Risk of Dust Impacts – Construction

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

Demolition dust emission magnitude from demolition can be classified as small, medium or large and are described as follows and in Table 12-13.

- Large: Total building volume >75,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20 m above ground level.
- Medium: Total building volume 12,000 m^3–75,000 m^3, potentially dusty construction material, demolition activities 10 m to 20 m above ground level.
- Small: Total building volume <12,000 m^3, construction material with low potential for dust release, demolition activities <10 m above ground, demolition occurring during wetter months.

Table 12-13: Risk of Dust Impacts – Demolition

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

12.4.6 Construction Plant

The list of estimated plant assumed for the construction phase have been compiled in collaboration with the design team and the noise and vibration team (refer Section 14.6 of Chapter 14: Noise and Vibration). 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 16.00 hours on Saturdays (approximately 68 hours per week) and the total fuel use is assumed at 68 hours per week for the duration of the 60-month 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. Emissions to atmosphere from this diesel combustion have been quantified using the European Environment Agency EMEP/EEA air pollutant emission inventory guidebook 2019 (EEA, 2019) - specifically, section 1.A.4 on non-road mobile machinery has been employed to define the potential emissions of the key parameters.

12.4.7 Construction Traffic

Construction traffic data has been compiled from Chapter 6: Traffic & Transportation. Air Quality emissions arising from construction traffic on the public roads are quantified using the TII Road Emissions Model (REM). This is described in greater detail in Section 12.4.8.

12.4.8 Operation Phase Road Traffic Impact on Human Health

Road traffic data has been supplied (refer Section 6.4 of Chapter 6: Traffic and Transport) that has been used to quantify the air quality generated from road traffic arising from the Proposed Development. Traffic data has been supplied for all road links in the traffic study area for all future year scenarios both for Do-Minimum and Do-Something options. The traffic study area is divided into three project sections, Section 1: N15/N13 Ballybofey / Stranorlar Urban Region, Section 2: N56/N13 Letterkenny to Manorcunningham and Section 3: N14 Manorcunningham to Lifford / Strabane / A5 Link and is further documented in Chapter 6: Traffic and Transportation Assessment of the EIAR.

The results from the traffic modelling show that the predicted increase in total kilometres travelled under the Do-Something scenario with the Proposed Development in operation is minimal (less than 1%) relative to the Do-Minimum current network. These results indicate that the Proposed Development will not lead to any significant increase or decrease in traffic on the road network but will redistribute traffic around the network through reducing congestion (such as in the town centres of Ballybofey, Stranorlar and the roads into Letterkenny) on a more efficient system with no net change in impact over the Do-Minimum impact. The following scenarios are assessed in this analysis:

- Opening Year 2032 Do-Minimum and Do-Something (both including and excluding the A5 Western Transport Corridor (A5 WTC) road in Northern Ireland).
- Design Year 2047 Do-Minimum and Do-Something (both including and excluding the A5 WTC road in Northern Ireland).

Traffic data has been compiled from Chapter 6: Traffic & Transportation. Air Quality emissions arising from changes to traffic patterns are quantified using the TII Road Emissions Model (REM). The REM calculates road transport emissions integrating traffic volumes/ speeds for light goods vehicles (LGV) and heavy goods vehicles (HGV) on the national road network with Irish fleet composition information.

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-electric vehicles (HEV), battery-electric vehicles (BEV), and alternative fuelled vehicles. As the speed of this transition to lower emissions vehicles may be accelerated depending on policy interventions, the results are generated for separate Fleet Database 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 175,000 passenger car EV and PHEVs by 2025 and 840,000 passenger car EV and PHEVs by 2030.
- An intermediate case calculated by AECOM using linear extrapolation to a central value between BaU and CAP for each vehicle sub-classification.
- CAP & 2035 ICE Sales ban scenario based on alignment with the EU policy to end the sales of new ICE, including HEV and PHEV, by 2035.

TII Guidance GE-ENV-01107, (TII, 2025b) recommends a mix of the above scenarios including the CAP fleet projection for cars, BaU high ambition scenario for LGVs and the EU Target for HGVs. The guidance states that this combination represents a realistic worst-case scenario for the purposes of assessing impact from road traffic.

It is noted that in December 2025, the EU signalled that the laws to ban the sale of internal combustion engine (ICE) vehicles by 2035 will be dropped in favour of more flexible rules to achieve a reduction in carbon dioxide emissions from cars. It should be noted that the analysis in this chapter is not impacted by this recent policy change as the scenarios presented are based on levels of CAP implementation and targets (e.g. 30% battery EV share of total passenger car fleet) rather than reliance on an ICE sales ban.

12.4.9 Operation Phase Road Traffic Impact on Sensitive Ecosystems

In addition to the TII Guideline PE-ENV-01106 (TII, 2025a) and PE-ENV-01107 (TII, 2025b), the Air Pollution Information System (APIS, 2025) has been employed to assess the impact of road traffic on ecological receptors. The Proposed Development has the following designated ecological sites within the zone of influence:

- River Finn Special Area of Conservation, Site Code (2301).
- Lough Swilly Special Area of Conservation (Site Code 2287).
- Lough Swilly Special Protection Area (Site Code 4075).
- River Foyle and Tributaries Special Area of Conservation (Site Code UK0030320).
- River Foyle and Tributaries Area of Special Scientific Interest (ASSI). Only Section 2, and a small part of Section 3 intersect the pNHA. Section 1 was not mapped as the closest NHA was 2km away.

The 'Review and revision of empirical critical loads of nitrogen for Europe' (German Environment Agency, 2022) provides a critical load for a variety of habitats of relevance to these sites as follows:

- **Coastal Habitats** such as moist and wet dune slacks with a critical load of the range 5-15 kg/ha/year.
- **Forest Habitats** such as broadleaved deciduous forest with a critical load of the range 10-15 kg/ha/year.

The following critical loads have been applied for comparison, however, the site-specific critical loads for NO_x and NH_3 have been considered for the ecological receptors in the Chapter 9A and Chapter 9B: Biodiversity, as relevant.

- NO_x: Upper/Lower critical load 30 µg/m^3
- NH_3: Lower/Upper critical load 1 µg/m^3 / 3 µg/m^3

Where pollutant concentrations are sufficiently below the standards (taken to be <90% of the standard) the assessment of NO_x and N deposition is based on the methodology set out in DMRB LA105 (Highways England, 2019) and the TII guidance (TII, 2025a) which is based on the methodology set out in DMRB LA105 (Highways England, 2019). A worked example of the steps involved in the calculation of NOx, NH_3, N deposition and acid deposition is provided in the TII Guidelines PE-ENV-01107 (TII, 2025b).

12.4.10 Data Limitations

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

12.4.11 Consultation

No specific agencies were consulted as part of the development of this chapter of the EIAR, but all agencies contacted as part of General Consultations in relation to the Proposed Development were free to comment and/or make recommendations regarding this Chapter in their responses and any responses were considered in the preparation of the Chapter.

12.5 Description of Existing Environment (Baseline Scenario)

12.5.1 Baseline Assessment

As more fully described in Chapter 4: Project Description, the Proposed Development consists of the following sections of road network in Donegal:

- Section 1 – N15/N13 Ballybofey/ Stranorlar Urban Region
- Section 2 – N56/N13 Letterkenny to Manorcunningham
- Section 3 – N14 Manorcunningham to Lifford/Strabane/A5 Link

In terms of transport infrastructure, there is no rail infrastructure within County Donegal. The nearest rail heads are in Sligo and Derry (NI); neither have freight facilities. Air and sea do not provide a realistic alternative to the established road network for Donegal. Currently, in County Donegal road-based transport is the only viable option. There are no formal facilities for park and share to carpool or for locations to shift from car to public transport or active travel.

There are currently no significant off-road active travel facilities in Donegal on the primary access routes. Existing pedestrian and cycling facilities are confined to within the urban and semi-urban sections, and in most cases is footpath only, and this is not always continuous. Such areas, while segregated, are shared with strategic, regional and local traffic. Traffic congestion leads to an unattractive and unsafe environment for pedestrians and cyclists.

Currently, except for limited new sections within Letterkenny (Four Lane Road) and Lifford (Northwest Greenway), there are no dedicated cycling facilities within existing town centres. Most of the existing rural road network has no hard shoulder and limited verge. Therefore, pedestrian and cyclist use is generally shared with high-speed vehicular traffic. This unsafe condition has resulted in a poor accident record among NMUs, including fatalities. The lack of off-road active travel facilities does not provide for a safe and secure environment for non-motorised users, limiting options for sustainable travel and modal choice.

Section 1 and Section 3 of the Proposed Development fall within the EPA air quality Zone D which covers rural Ireland. These rural areas generally have the lowest background air quality in Ireland as these are located away from large towns and cities where residential heating and traffic sources lead to increased pollution levels. Section 2 falls within the EPA air quality Zone C due to the proximity of the Proposed Development to the town of Letterkenny with the higher anticipated background pollution in the town associated with space heating and traffic.

The EPA monitors pollutant levels for all pollutants listed in S.I. 739/2022 on a continuous basis at a series of monitoring stations around the country. The air quality in the area is based on the results from EPA Air Monitoring Stations and from the Department for Agriculture, Environment and Rural Affairs (DAERA) air monitoring station in Northern Ireland. In particular, the EPA have a monitoring station located on High Road, Letterkenny (Station 24) and DAERA in Northern Ireland operates an air quality monitor in Strabane (Springhill Park) and Derry Rosemount.

12.5.1.1 National Air Quality

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 (NEC). The EPA data for the period 1990-2030 (EPA, 2025) is summarised in Table 12-14.

The five air pollutants for which emission reduction commitments are set affect the environment and human health in different ways. SO_2, NO_x and NH_3 are primarily associated with acid deposition leading to toxicity of soils and waters. Ammonia is also responsible for secondary particulate matter formation and nitrogen oxides are precursors to tropospheric (ground level) ozone formation. Fine particulate matter, tropospheric ozone, NO_x and NMVOCs directly impact human health, especially in higher concentrations in urban areas and have, in general, been decreasing since 1990, see Figure 12.1. The European Environment Agency (EEA) estimates that in excess of 1,600 premature deaths in Ireland annually are due to air pollution from causes including cardiovascular disease and respiratory illnesses (EPA, 2024).

The EPA's annual Air Quality in Ireland Report provides more information on air quality in Ireland. The National Emission Reduction Commitments Directive (Directive (EU) 2016/2284) on the reduction of national emissions of certain atmospheric pollutants, harmonises the reporting obligations to the European Union under the CLRTAP and details emission reduction commitments for the above-mentioned air pollutants for 2020 and 2030. The findings of the EPA's assessment of Ireland's air pollutant emissions for 2023 show that:

- Ireland complied with the SO_2, NO_x, NH_3 and $PM_{2.5}$ emission reduction commitments for 2023 (as summarised in Table 12-14).
- Ireland is in compliance with its emission reduction commitments for NMVOC for 2023 but only with the application of a flexibility permitted under the NEC Directive. When this flexibility is applied, adjusted NMVOC emissions have reduced by 41% compared to the required 25% emission reduction commitment.

Table 12-14: Emissions of key National Emission Reduction Commitments Pollutants 1990-2023 (kilotonnes)[1]

Year	SO_2	NO_X	NMVOC	NH_3	$PM_{2.5}$
1990	184.77	174.27	161.79	128.98	28.786
1991	184.31	174.85	160.83	129.57	28.539
1992	171.64	182.64	155.82	132.60	25.109
1993	162.73	174.76	152.40	130.75	24.761
1994	177.38	171.88	147.61	131.00	22.697
1995	163.46	169.95	145.22	131.13	21.359
1996	150.62	174.46	145.93	134.61	21.938
1997	168.87	164.74	141.04	136.14	20.084
1998	178.91	168.73	141.61	139.98	21.140
1999	161.11	166.95	131.90	137.15	18.192
2000	144.28	165.14	124.71	130.01	18.421
2001	142.29	165.53	124.56	128.28	18.382
2002	106.65	157.44	124.13	127.66	17.628

[1] Ireland's Air Pollutant Emissions Appendix: Emissions of key NEC Directive Air Pollutants 1990-2023.

Year	SO_2	NO_X	NMVOC	NH_3	$PM_{2.5}$
2003	82.839	158.873	122.631	127.283	17.598
2004	73.482	162.057	121.932	125.216	17.868
2005	74.253	165.639	119.92	123.79	18.646
2006	61.993	160.484	117.436	121.01	18.158
2007	56.134	155.335	118.745	118.4	17.558
2008	46.546	145.447	117.19	118.162	17.433
2009	33.339	121.559	115.033	119.025	16.575
2010	27.417	115.177	111.952	119.41	15.714
2011	25.454	103.581	109.01	115.135	13.884
2012	24.098	105.671	109.163	114.754	13.807
2013	24.115	106.599	110.964	115.487	14.172
2014	18.122	105.47	108.556	118.085	13.626
2015	16.583	105.456	110.103	120.926	14.001
2016	15.925	107.627	111.948	126.165	14.057
2017	15.195	106.964	115.429	129.488	12.926
2018	14.294	107.634	113.931	130.429	13.325
2019	11.322	99.714	114.801	128.056	12.324
2020	11.029	93.526	112.105	124.705	12.419
2021	12.948	95.411	111.676	122.651	12.03
2022	9.355	91.158	110.234	121.316	10.509
2023	7.36	84.420	105.689	116.361	9.308

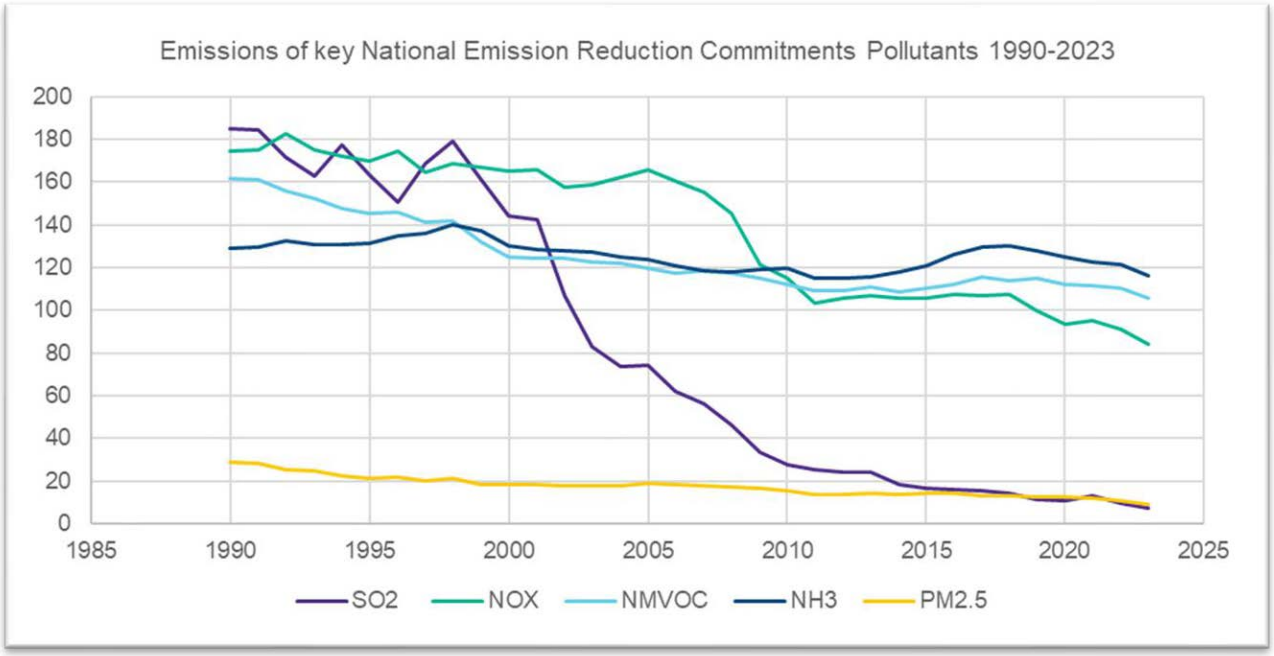

Figure 12.1: Emissions of key National Emission Reduction Commitments Pollutants 1990-2023 (kilotonnes)

12.5.1.2 Section 1

The mainline for Section 1 of the Proposed Development commences on the N15 at Kilroghery and bypasses the towns of Ballybofey and Stranorlar to the northwest before rejoining the N13 at the Cloghroe River bridge. The area of Section 1 is largely rural with the exception of the combined towns of Ballybofey and Stranorlar (population 5,046 in 2022).

Existing sources of pollution within the area covered by Section 1 include the following:

- Road traffic emissions on the national roads (N13 and N15), the regional roads (R252 and R236) and the wider local road network. Traffic on these roads will emit combustion gases and particulates and the extent of pollution generated is largely dependent on the volume, speed and fraction of HGVs on these roads.

- Space heating for residential, commercial and other properties is also a significant source of air pollution in Ireland. Combustion of natural gas, oil, coal, peat and wood to heat properties generates combustion gases and particulates and the higher pollution sources are the solid fuel systems which have particular implication for particulate matter in the atmosphere.

- Agriculture also represents a significant source of pollution outside of the town with plant emissions, odours, dusts and ammonia all generated by agriculture albeit at generally low levels and with seasonal variations.

- Glenmore Generation Limited (IE Licence Register No. P1004-02) located at Aghaveagh circa 5 km to the west of Ballybofey is licensed by the EPA for the acceptance, storage and treatment of biodegradable waste and other feedstocks, and for the use of biogas in a combined heat and power plant to produce renewable electricity. This licence authorises the acceptance of 90,000 tonnes of non-hazardous biodegradable waste and other feedstock per annum for anaerobic digestion. This plant includes a 17.5 m high exhaust stack from the combined heat and power unit emitting combustion gases (including NO_x) and particulates (PM). In addition, the plant also includes an emission stack from the plants odour control system.

- There is one other recorded EPA licenced facility within the area, McCool's Sawmills Limited (IPC Licence Register No. P0318-01), located at Drumboe Lower, Stranorlar. However, this licence has been surrendered, and the facility no longer operates under the licence.

- Ballybofey-Stranorlar urban wastewater treatment plant is located in the centre of the town and regulated by the EPA (WWDA Ref. D0120-01) for a population equivalent of 6,021 P.E. Urban waste water treatment plants have potential to generate odours where plants malfunction and/or operate at reduced capacity.

- There are no major industrial sources located within the area, but a number of smaller commercial and manufacturing operations are situated around the town.

- There are no quarries or waste sites located in the general area.

12.5.1.3 Section 2

Section 2 commences from the N13 at Listellian, southeast of Letterkenny, and proceeds to the north-east of the existing N13 alignment where it meets the existing N13 Dual Carriageway at Dromore. From here, the Proposed Development consists largely of an online upgrade of the existing road, including grade separated junction, in an easterly direction to the roundabout with the N14 at Pluck Roundabout. A number of slip roads and a second direct access from the N13 to the N56 at Ballyraine, including the River Swilly Bridge, are also included in the Proposed Development.

The area for the Proposed Development lies to the southeast and east of the town of Letterkenny which has a population of 22,549 (CSO, 2022).

Existing sources of pollution within the area covered by Section 2 include the following:

- Road traffic emissions on the national roads (N13, N14, N56), the regional roads (R245 and R250) and the wider local road network. Traffic on these roads will emit combustion gases and particulates and the extent of pollution generated is largely dependent on the volume, speed and fraction of HGVs on these roads. Emissions are higher under slower or stop/start conditions and therefore the highest levels of pollution would be expected within Letterkenny, in particular at major junctions where queuing is more frequent.

- Space heating for residential, commercial and other properties is also a significant source of air pollution in Ireland. Combustion of natural gas, oil, coal, peat and wood to heat properties generates combustion gases and particulates and the higher pollution sources are the solid fuel systems which have particular implications for particulate matter in the atmosphere. With a population of over 20,000, the wider town of Letterkenny would represent a significant source of this pollution.

- Agriculture also represents a significant source of pollution to the south of the town with plant emissions, dusts and ammonia all generated by agriculture with seasonal variations.

- There is one recorded EPA licenced facility within the area, Unifi Texture Yarns Europe Limited (IE Licence Register No. P0235-01), located at Ballyraine. However, this licence has been surrendered, and the facility no longer operates under the licence.

- Letterkenny urban wastewater treatment plant is located in the centre of the town and regulated by the EPA (WWDA Ref. D0009-01) for a population equivalent of 23,271 P.E. Urban wastewater treatment plants have potential to generate odours where plants malfunction and/or operate at reduced capacity.

- There are no major industrial sources located within the area, but a number of smaller commercial and manufacturing operations are situated around the town.

- There are no quarries or waste sites located in the general area.

12.5.1.4 Section 3

The mainline for Section 3 of the Proposed Development commences at the eastern end of Section 2 at the Pluck Roundabout between the N13 and N14. It then runs in a corridor largely parallel to the existing N14 toward Lifford. Near Lifford, the Proposed Development proceeds south of the town to meet the existing N15. At this point a roundabout (N14/N15 Lifford Junction) will be constructed and the N14/N15 to A5 Link will be constructed that crosses the River Finn to the border with Northern Ireland. At the border, the N14/N15 to A5 Link will connect to a proposed Trunk Road T3 that in turn connects to the proposed Section 1 of the A5 WTC, both to be pursued by the Northern Ireland Department for Infrastructure. The area of Section 3 is largely rural with the exception of the town of Lifford (population 1,613 in 2022) and Strabane within Northern Ireland (population 13,147 in 2011).

Existing sources of pollution within the area covered by Section 3 include the following:

- Road traffic emissions on the national roads (N13 and N14), the UK A-roads (A5 and A38), the regional roads (R236, R264 and R265) and the wider local road network. Traffic on these roads will emit combustion gases and particulates and the extent of pollution generated is largely dependent on the volume, speed and fraction of HGVs on these roads. Emissions are higher under slower or stop/start conditions and therefore the highest levels of pollution would be expected within the Lifford/Strabane area, in particular at major junctions where queuing is more frequent.

- Space heating for residential, commercial and other properties is also a significant source of air pollution.

- Agriculture also represents a significant source of pollution outside of the towns with plant emissions, odours, dusts and ammonia all generated by agriculture albeit at generally low levels and with seasonal variations.

- Lifford urban wastewater treatment plant is located in the centre of the town and regulated by the EPA (WWDA Ref. D0352-01) for a population equivalent of 1,969 P.E. Urban wastewater treatment plants have potential to generate odours where plants malfunction and/or operate at reduced capacity.

- There are no major industrial sources located within the area, but a number of smaller commercial and manufacturing operations are situated around the town.

- There are no quarries or waste sites located in the general area. The closest EPA registered landfill is the Churchtown Landfill (Ref. W0062-01) that is located 3 km south west of Lifford Town.

12.5.2 Air Quality

12.5.2.1 Oxides of Nitrogen

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). The EPA report that in Ireland, the main source of NO_2 is from road transport. As a secondary pollutant NO_2 is derived from atmospheric reactions of pollutants that are themselves, derived mainly from traffic sources.

The EPA does not routinely monitor NO_2 in Letterkenny so data from Kilkitt, Co Monaghan is applied as an indicator of typical rural background (Zone D) levels as shown in Table 12-15. The background levels of NO_2 in the ZoI outside the towns in Donegal would likely have levels similar to those presented for Kilkitt.

There is long term air quality monitoring data available from the Derry Rosemount Station in Northern Ireland (non-EPA station, monitoring by the DAERA) which is considered representative of an urban background or Zone C. This station is 25 km from Section 2 and 3, and 30 km from Section 1 and levels are considered presentative of background levels in Letterkenny and are shown in Table 12-15.

Concentrations of NO_2 over the period are summarised in Table 12-15. Results for Kilkitt and Derry Rosemount Station for the period 2018 to 2024 are well below the statutory limit for the protection of human health and from 2020 onwards are also below the WHO Guideline and the new limit to be imposed under the EU Directive from 1st January 2030. Note that the urban background levels at the Derry Rosemount Station in Northern Ireland were above the WHO guideline in 2019.

The 2024 annual average for the Derry Rosemount Station in Northern Ireland has been employed as the relevant background level for all three road sections in the assessment of future operational traffic impact to air quality.

Table 12-15: Trends in NO_2 Concentration

Station	Averaging Period	Distance to Development (km)	Year						
			2018	2019	2020	2021	2022	2023	2024
Kilkitt (Zone D)	Annual Mean NO_2 ($\mu g/m^3$)	Rural Background	4	5	2	3	2	2	3
Derry Rosemount	Annual Mean NO_2 ($\mu g/m^3$)	Section 1: 30km Section 2 & 3: 25km	10	11	8	9	8	8	8
Statutory Limit	Annual Mean NO_2 ($\mu g/m^3$)				40				
EU Directive 1st January 2030	**Annual Mean NO_2 ($\mu g/m^3$)**				**20**				
WHO Guideline	Annual Mean NO_2 ($\mu g/m^3$)				10				

12.5.2.2 Particulate Matter (PM_{10} and $PM_{2.5}$)

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.

Continuous PM_{10} and $PM_{2.5}$ monitoring is carried out by the EPA in Letterkenny. The EPA monitors air quality in Letterkenny, County Donegal, which is classified as Zone C—representing other cities and large towns in Ireland. The most northerly point in Section 1 is approximately 12 km south of the Letterkenny monitoring station. Section 2 commences just to the southeast of Letterkenny approximately 2 km from the EPA station. Section 3 begins at the Pluck Roundabout, just south of Manorcunningham, approximately 6 km east of the Letterkenny monitoring station.

Similarly, Zone D (rural) monitoring is undertaken by the EPA in Co. Donegal at the station in Malin Head which is over 25 km from the proposed alignments but is considered representative of the rural backgrounds outside the towns in Donegal.

In Northern Ireland, the DAERA carry out monitoring at Strabane Springhill Park. Strabane is classified as an urban monitoring station and is in close proximity to Section 3 which ends to the south of Lifford across the River Finn approximately 2 km west of the monitoring station. Section 1 is approximately 20 km southwest from the Strabane monitoring station, and Section 2 is approximately 17 km northwest from the Strabane monitoring station.

Data from these three stations is presented in Table 12-16 or PM_{10} and Table 12-17 for $PM_{2.5}$.

Results for PM_{10} for the period 2018 to 2024 are below the statutory limit for the protection of human health and the new limit to be imposed under the EU Directive from 1st January 2030. However, the levels are equal to or above the WHO Guideline (WHO, 2021) from 2018-2021 at the urban stations in Letterkenny and Strabane in 2018-2021.

Results for $PM_{2.5}$ in the Letterkenny station for the period 2018 to 2024 are above the statutory limit for the protection of human health, the new limit to be imposed under the EU Directive from 1st January 2030 and the WHO Guideline. The Strabane and Mail Head Stations are below the statutory limit for the protection of human health, the new limit to be imposed under the EU Directive from 1st January 2030 but not the WHO Guideline.

The 2024 annual averages (PM_{10} and $PM_{2.5}$) for the Strabane Station have been employed as the relevant Zone D (rural) background level for Sections 1 and 3 in the assessment of future operational traffic impact to air quality. The 2023 annual averages for the Letterkenny Station have been employed as the relevant Zone C (small urban) background level for Section 2 in the assessment of future operational traffic impact to air quality.

Table 12-16: Trends in PM_{10} Concentration

Station	Averaging Period	Distance to Development (km)	Year						
			2018	2019	2020	2021	2022	2023	2024
Malin Head (Zone D)	Annual Mean PM_{10} (µg/m^3)	Section 1: 40 km Section 2: 25 km Section 3: 30 km	-	-	-	-	-	13	13
Letterkenny (Zone C)	Annual Mean PM_{10} (µg/m^3)	Section 1: 12 km Section 2: 2 km Section 3: 6 km	-	17	15	15	14	13	-
Strabane Springhill Park	Annual Mean PM_{10} (µg/m^3)	Section 1: 20 km Section 2: 17 km Section 3: 2 km	15	17	15	14	12	12	10
Statutory Limit	Annual Mean PM_{10} (µg/m^3)					40			
EU Directive 1st January 2030	**Annual Mean PM_{10} (µg/m^3)**					**20**			
WHO Guideline	Annual Mean PM_{10} (µg/m^3)					15			

Table 12-17: Trends in $PM_{2.5}$ Concentration

Station	Averaging Period	Distance Development (km)	Year						
			2018	2019	2020	2021	2022	2023	2024
Malin Head (Zone D)	Annual Mean $PM_{2.5}$ (µg/m^3)	Section 1: 40 km Section 2: 25 km Section 3: 30 km						7	7
Letterkenny (Zone C)	Annual Mean $PM_{2.5}$ (µg/m^3)	Section 1: 12 km Section 2: 2 km Section 3: 6 km	-	13	11	11	11	10	-
Strabane Springhill Park	Annual Mean $PM_{2.5}$ (µg/m^3)	Section 1: 20 km Section 2: 17 km Section 3: 2 km	-	-	-	-	8	8	7
Statutory Limit	Annual Mean $PM_{2.5}$ (µg/m^3)					25			
EU Directive 1st January 2030	**Annual Mean $PM_{2.5}$ (µg/m^3)**					**10**			
WHO Guideline	Annual Mean $PM_{2.5}$ (µg/m^3)					5			

12.5.3 Sensitive Receptors

12.5.3.1 Section 1

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.

The data for the proposed Section 1 alignment indicates that a total of 334 properties are located within 100 m of the edge of the Proposed Development (152 properties are currently located within 100m of the existing road). The most sensitive receptors are residential dwellings where people are present for significant periods and thereby continuously exposed to any road traffic emissions. An analysis of the data was carried out to identify additional sensitive areas such as pre-schools, creches, primary schools, primary schools, secondary schools, third level institutions, places of worship and care homes.

In addition to the residential and human receptors, the following ecological receptors are noted in the area:

- River Finn SAC (Site Code: 002301) is traversed by the proposed alignment west of Ballybofey.
- Meenagarranroe Bog Natural Heritage Area (NHA) (Site Code: 002437) is 2 km southwest of Section 1.

Both human (refer Section 12.6.7) and ecological receptors (refer Section 12.6.8) are addressed further in this assessment.

12.5.3.2 Section 2

The data for the proposed Section 2 alignment indicates that a total of 383 properties are located within 100m of the edge of the Proposed Development (232 properties are currently located within 100m of the existing road). The most sensitive non-residential receptors in the wider area of the Section 2 alignment are listed in Table 12-18.

It is noted that St. Patrick's National School is located adjacent to the existing N13 south of Letterkenny and the school is currently exposed to traffic pollution from this existing route. The proposed alignment runs to the east of the school and at a greater distance from the school than the existing route and there is potentially a net beneficial impact for this school for air quality. In addition to the human receptors, the proposed Section 2 alignment will cross Lough Swilly SAC (Site Code: 002287).

Both human (refer Section 12.6.7) and ecological receptors (refer Section 12.6.8) are addressed further in this assessment.

Table 12-18: Sensitive Receptors at Section 2

Receptor Type	Receptor	Distance to Alignment (m)
Primary School	St Patrick's NS (Lurgybrack)	31
Third Level Institution	Donegal Training Centre	44
Nursing Home	Archview Lodge	10

12.5.3.3 Section 3

The data for the proposed Section 3 alignment indicates that a total of 255 properties are located within 100 m of the edge of the Proposed Development (123 properties are currently located within 100 m of the existing road). The most sensitive non-residential receptors in the wider area of the Section 3 alignment are listed in Table 12-19.

Busy Bee Playschool is located on the N15, approximately 150 m south of the roundabout in Lifford. The proposed route joins the N15 further south than the playschool, subsequently diverting traffic away from the sensitive area. The proposed route is a greater distance than the existing route, therefore, there is potentially a net beneficial impact for this playschool for air quality. In addition to the human receptors, the proposed Section 3 alignment will cross River Finn SAC (Site Code: 002301).

Both human (refer Section 12.6.7) and ecological receptors (refer Section 12.6.8) are addressed further in this assessment.

Table 12-19: Sensitive Receptors at Section 3

Receptor Type	Receptor	Distance to Alignment (m)
Primary School	St Patrick's NS (Murlog)	74
Place of Worship	St. Patrick's Church, Clonleigh Parish	57

12.5.3.4 All of the Proposed Development

The most sensitive non-residential receptors taking all three sections of the Proposed Development together are listed in Table 12-20.

Table 12-20: Sensitive Non-Residential Receptors in the Wider Area of the Proposed Development

Receptor Type	Receptor	Distance to Alignment (m)
Primary School	St Patrick's NS (Lurgybrack)	31
Third Level Institution	Donegal Training Centre	44
Nursing Home	Archview Lodge	10
Primary School	St Patrick's NS (Murlog)	74
Place of Worship	St. Patrick's Church, Clonleigh Parish	57

12.5.4 Evolution of the Environment in the Absence of the Proposed Development

Annex IV of the EIA Directive sets out the information required to be included in an EIAR. This includes:

'a description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge'.

In the event that the Proposed Development does not proceed, an assessment of the future baseline conditions has been carried out and is described within this section. The baseline air quality trends for the Donegal area and nationally in recent years show a static or very slight gradual decline for pollutants. These gradual decreases are based on the implementation of a series of national and EU driven policies and legislation on emissions from road traffic, industrial emissions and space heating.

As such, the 2023/2024 air quality baseline values for the area reported in Section 12.5.2, have been adjusted in accordance with Appendix C of the TII guidelines (TII, 2025a) to develop a projected baseline for the 2032 operational traffic scenario. These projected baselines for 2032 are adopted as backgrounds in the assessment of future operational traffic impact to air quality (Section 12.6.7).

The EPA air quality reports highlight the main challenges of reducing air pollution from key sources such as particulate matter emissions from solid fuel burning (e.g. peat, coal and wood) in the residential sector and NO_x emissions from vehicles in the transport sector.

The Clean Air Strategy was published by the Government in 2023, it provides a high-level strategic policy framework necessary to identify and promote the integrated measures across government policy that are required to reduce air pollution and promote cleaner ambient air, while delivering on wider national objectives.

The Climate Action Plan 2025 (CAP25) builds upon sector-specific emission limits and carbon budgets, committing to achieving a net zero carbon energy system objective through a combination of targets. The transport targets, while related to climate, will have resultant co-benefits for air quality if successfully implemented by reducing the direct emissions from road traffic vehicles. This reduction may be achieved through both modal shift and the electrification of the road traffic fleet. Ongoing reductions in tailpipe emissions for road traffic will also be delivered through the EU Auto Oil program which regulates a continual reduction in emissions per fleet vehicle in Ireland as newer Euro 6/VI vehicle, hybrids and electric vehicles (EV) replace older vehicles. This decrease may be somewhat offset by the increased number of vehicles in the fleet and/or a reduction in efficiency on the road network.

In short, there is a broad mix of EU and national policy, and legislation directed at reducing transport, industrial and space heating emissions to improve air quality. It is expected that national and ambient levels of air quality pollutants will decrease in future years with the successful implementation of the above policy and regulation.

12.6 Description of Likely Significant Effects

The following sections consider the potential impact of the Proposed Development on air quality during the construction and operational phases. The construction assessment considers potential impacts due to construction activities and traffic. The operational phase assesses the potential impact locally and regionally due to traffic emissions. This section also considers the ‘Do-Nothing’ scenario outlining the likely evolution thereof without the development.

The assessment is based on the following in relation to each section of the Proposed Development.

Section 1: The construction phase for Section 1 will last approximately 36 months. The construction may be broken down into three distinct parts:

- Part 1 – Mainline southern tie-in to the River Finn Crossing, including the Ballybofey Link Road.
- Part 2 – Mainline River Finn Crossing to the northern tie-in, including the proposed grade separated junction at Teevickmoy.
- Part 3 – N15 Primary Road Connector from the mainline to the tie-in with the N15 at Treanamullin.

Section 2: The construction phase for Section 2 will last approximately 36 months. The construction may be broken down into three distinct parts:

- Part 1 – Mainline southern tie-in to the River Swilly Crossing, including the links in the vicinity of Dry Arch Roundabout / Bonagee.
- Part 2 – Mainline River Swilly Crossing to the northern tie-in at Ballyraine.
- Part 3 – Realignment and improvement of the existing N13 Dual Carriageway between Dry Arch Roundabout and the interface with Section 3 at Pluck Roundabout, including the proposed grade separated junction at Trimragh.

Section 3: The construction phase for Section 3 will last approximately 36 months. The construction may be broken down into four distinct parts:

- Part 1 – N14 from the Section 2 interface just west of the N13/N14 Pluck Roundabout Junction to the proposed crossing of the Swilly Burn river.
- Part 2 – N14 from the proposed Swilly Burn river crossing to the proposed River Deele crossing.
- Part 3 – N14 from the proposed River Deele crossing to the N14/N15 Lifford Junction.
- Part 4 – N14/N15 to A5 Link including the River Finn Crossing to the border with Northern Ireland.

Entire Proposed Development: The whole project, i.e. Sections 1, 2 and 3, if constructed together are expected to have a combined construction phase of approximately 60 months. The construction will be broken down as per the sections outlined above.

12.6.1 Construction Dust

This section of the chapter provides an overview of the typical activities that have potential for dust impacts during the construction phase of the Proposed Development. The potential for dust emissions due to construction can vary substantially day to day and are strongly influenced by the level of activity, the specific operations, and the prevailing meteorological conditions. While each individual site compound will differ, the processes that have the potential for the generation of construction dust will be similar. The following operations are the main dust generating sources or activities:

- Vegetation clearance – removal of trees, hedgerows, grass and other soil covering.
- Demolition – detailed demolition plans will be required to minimise dust generation.
- Movement of trucks along paved public roads – potential of track-out of dust on vehicle tyres from construction sites or resuspension of dust.
- Movement of trucks along unpaved haul roads (this will only be relevant for a number of sites) – potential for resuspension of dust as vehicles move around the site.
- Extraction of material –movement of potentially dusty material which has the potential to generate dust.
- Stockpiling of material – stockpiles have the potential to generate dust due to dry material movement and wind erosion.

12.6.1.1 Step 1: Sensitivity of the Area to Dust

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 (IAQM, 2024). 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 (IAQM, 2024) and as reproduced in Table 12-21, Table 12-22 and Table 12-23.

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 12-21, the sensitivity of the area to dust soiling can be established.

Table 12-21: 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 (IAQM, 2024) 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 12-22. The annual mean background PM_{10} concentration was reviewed in Section 12.5.2.2. This found concentrations to be significantly less than 24 µg/m^3 and this band of sensitivity is applied throughout this assessment.

Table 12-22: 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 Proposed Development will traverse the River Finn SAC in Sections 1 and 3 and the River Swilly SAC in Section 2 which are classed as highly sensitive receptors. As shown in Table 12-23 the worst-case sensitivity of the area to ecological impacts is considered 'high' under this guidance without adequate mitigation.

Table 12-23: 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 12-24 and may be summarised as follows:

- All three area have more than 100 receptors within 50 metres triggering a 'high' sensitivity to dust soiling;
- All three sections have levels of PM_{10} below 24µg/m^3 but with more than 10 receptors within 20 metres so a 'low' health sensitivity is assigned; and
- All three sections have direct contact with a sensitive ecological site resulting in a 'high' sensitivity for ecological impact.

Table 12-24: Summary of Sensitivity of the Area to Dust

Location	Rationale for Sensitivity	Nuisance Sensitivity	Human Health Sensitivity	Ecology Sensitivity
Section 1	334 properties are located within 100m of the Proposed Development. River Finn SAC (Site Code: 002301) is traversed by the proposed alignment west of Ballybofey	High	Low	High
Section 2	383 properties are located within 100m of the proposed alignment. Section 2 alignment will cross Lough Swilly SAC (Site Code: 002287).	High	Low	High
Section 3	255 properties are located within 100m of the proposed alignment. Section 3 alignment will cross River Finn SAC (Site Code: 002301).	High	Low	High

12.6.1.2 Step 2: Magnitude of Dust Emissions

With excavation of approximately 7.4 million m^3 of earthworks proposed, and taking into consideration the factors outlined in Section 12.4.1, the magnitude of dust emissions for the dust generating activities are quantified as follows: earthworks is large; track-out is large; construction is medium ; and demolition is small. The magnitude of dust emissions is summarised in Table 12-25.

Table 12-25: Summary of Magnitude of Dust Emissions

Location	Description of Works	Earthworks	Track-out	Construction	Demolition
Section 1	The construction phase for Section 1 will last approximately 36 months. The construction may be broken down into three distinct parts: ➢ Part 1 – Mainline southern tie-in to the River Finn Crossing, including the Ballybofey Link Road. ➢ Part 2 – Mainline River Finn Crossing to the northern tie-in, including the proposed grade separated junction at Teevickmoy. ➢ Part 3 – N15 Primary Road Connector from the mainline to the tie-in with the N15 at Treanamullin.	Large	Large	Medium	Small
Section 2	The construction phase for Section 2 will last approximately 36 months. The construction may be broken down into three distinct parts: ➢ Part 1 – Mainline southern tie-in to the River Swilly Crossing, including the links in the vicinity of Dry Arch Roundabout / Bonagee. ➢ Part 2 – Mainline River Swilly Crossing to the northern tie-in at Ballyraine. ➢ Part 3 – Realignment and improvement of the existing N56 Dual Carriageway between Dry Arch Roundabout and the interface with Section 3 at Pluck Roundabout, including the proposed grade separated junction at Trimragh.	Large	Large	Medium	Small
Section 3	The construction phase for Section 3 will last approximately 36 months. The construction may be broken down into four distinct parts: ➢ Part 1 – Mainline northern tie-in at the interface with Section 2 to Swilly Burn River. ➢ Part 2 – Swilly Burn River to River Deele River. ➢ Part 3 – River Deele River to Lifford Junction. ➢ Part 4 – N14/N15 to A5 Link including the River Finn Crossing to the border with Northern Ireland.	Large	Large	Medium	Small
Whole Proposed Development	The whole project, i.e. Sections 1, 2 and 3, if constructed together are expected to have a combined construction phase of approximately 60 months. The construction will be broken down as per the sections outlined above.	Large	Large	Medium	Small

12.6.1.3 Step 3: Risk of Dust Impacts

For each activity - earthworks, track-out, construction, and demolition - the risk of dust impacts is determined using the assessment criteria from Table 12-10 through Table 12-13. The risks for each activity are therefore derived using the sensitivities and magnitudes as set out above and are summarised for each activity in the Table 12-26. The overall risk of dust impacts arising from the Proposed Development are summarised in Table 12-27.

Table 12-26: Summary of Dust Risk per Activity

Location	Dust Nuisance Risk	Human Health Risk	Sensitive Ecology Risk
Earthworks Risk			
Section 1	High	Low	High
Section 2	High	Low	High
Section 3	High	Low	High
Whole Project	**High**	**Low**	**High**
Track Out Risk			
Section 1	High	Low	High
Section 2	High	Low	High
Section 3	High	Low	High
Whole Project	**High**	**Low**	**High**
Construction Risk			
Section 1	Medium	Low	Medium
Section 2	Medium	Low	Medium
Section 3	Medium	Low	Medium
Whole Project	**Medium**	**Low**	**Medium**
Demolition Risk			
Section 1	Low	Negligible	Low
Section 2	Low	Negligible	Low
Section 3	Low	Negligible	Low
Whole Project	**Low**	**Negligible**	**Low**

Table 12-27: Summary Overall Dust Impact Risk to Define Site-Specific Mitigation

Location	Description of Works	Worst Case Risk
Section 1	The construction phase for Section 1 will last approximately 36 months. The construction may be broken down into three distinct parts: ➢ Part 1 – Mainline southern tie-in to the River Finn Crossing, including the Ballybofey Link Road. ➢ Part 2 – Mainline River Finn Crossing to the northern tie-in, including the proposed grade separated junction at Teevickmoy. ➢ Part 3 – N15 Primary Road Connector from the mainline to the tie-in with the N15 at Treanamullin.	High
Section 2	The construction phase for Section 2 will last approximately 36 months. The construction may be broken down into three distinct parts: ➢ Part 1 – Mainline southern tie-in to the River Swilly Crossing, including the links in the vicinity of Dry Arch Roundabout / Bonagee. ➢ Part 2 – Mainline River Swilly Crossing to the northern tie-in at Ballyraine. ➢ Part 3 – Realignment and improvement of the existing N56 Dual Carriageway between Dry Arch Roundabout and the interface with Section 3 at Pluck Roundabout, including the proposed grade separated junction at Trimragh.	High
Section 3	The construction phase for Section 3 will last approximately 36 months. The construction may be broken down into four distinct parts: ➢ Part 1 – Mainline northern tie-in at the interface with Section 2 to Swilly Burn River. ➢ Part 2 – Swilly Burn River to River Deele River. ➢ Part 3 – River Deele River to Lifford Junction. ➢ Part 4 – N14/N15 to A5 Link including the River Finn Crossing to the border with Northern Ireland	High
Whole Proposed Development	The whole project, i.e. Sections 1, 2 and 3, if constructed together are expected to have a combined construction phase of approximately 60 months. The construction will be broken down as per the sections outlined above.	High

The magnitude of risk determined is used to prescribe the level of site-specific mitigation required for each activity to prevent significant impacts occurring. The impacts associated with construction phase dust emissions are considered to pose a High risk for each section of the Proposed Development and the Proposed Development as a whole. Therefore, in the absence of dust mitigation this impact represents a **short term moderate adverse impact** (refer Table 12-5). To mitigate this risk a series of dust minimisation measures are listed in Section 12.7.1.

12.6.2 Construction Traffic

Information on construction traffic is available in Chapter 4: Project Description and Chapter 6: Traffic & Transportation. The traffic assessment notes that existing traffic movements on the local and regional road network will generally not be restricted by the proposed construction works. The Proposed Development will ensure the minimum possible disturbance to local residents and existing traffic.

All traffic to the site will only be through designated access points which are shown on drawings in Volume D: Book of Drawings (Permitted Haulage Routes). The location of proposed construction compounds, internal and external haulage routes are also shown on the drawings.

Most earthworks movements will be carried out using internal haul roads. There is no planned haulage of material between sections of the Proposed Development. Truck movements are only required on public roads where the material balance for the section requires material to be hauled at a stage of the construction where internal haulage is not feasible, e.g., prior to the construction of the bridge at Ballybofey.

The most significant truck movements on public roads are the materials required for the embankment south of the River Finn at Ballybofey in Section 1 of the Proposed Development and the materials required for the embankments east of the River Swilly crossing in Section 2 of the Proposed Development. No significant earthworks haulage is required on public roads in Section 3 of the Proposed Development.

The TII Guidelines (TII 2025b) require that construction phase traffic data is screened against the following criteria based on the changes between the DS traffic (i.e., with construction) compared to the DM traffic:

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

Given the distributed nature of the Proposed Development and the number of compounds and access points, routine traffic of construction workers and material deliveries will not increase the Annual Average Daily Traffic (AADT) on any of the public roads accessing the site by more than 1,000 AADT as per TII guidelines, (TII, 2025b). Similarly, the number of heavy-duty vehicle (HDV, vehicles greater than 3.5 tonnes, including buses and coaches) flows on any of the public roads accessing the site will not change by 200 AADT as per TII guidelines (TII, 2025b) or more.

As such, the construction traffic will not give rise to any significant impacts to air quality, and the predicted impact will be **short term slight adverse impact** which is not significant in EIA terms.

12.6.3 Construction Plant

The total estimated plant employed for each phase of construction is aligned with that assessed in Chapter 14: Noise and Vibration. Industry standards for fuel type and consumption for each item of mobile and fixed plant were applied to determine fuel use and durations were derived from the programme to determine total fuel us per phase. Fuel use throughout is assumed to be diesel fuel and the total estimated use for the duration of the works is 1,826 m^3.

The figures shown in Table 12-28 represent the total emissions to atmosphere for the duration of the construction phase from diesel use across all aspects of the construction phase. A 10% blend for petrol and a 20% blend for diesel at the pumps by 2030 is assumed. The diesel blend rate of 20% by 2030 has moved from planned (WAM) to implemented (WEM) measures.

Table 12-28: Construction Plant Emissions

Pollutant	Total Emissions (tonnes)	Fraction of Ireland's National Emissions Ceiling for 2030 (%)
Non-Methane Volatile Organic Compounds	5	0.01%
Oxides of Nitrogen (NO_x)	51	0.12%
Particulate Matter PM_{10}	3	NA
Particulate Matter $PM_{2.5}$	3	0.03%
Total Suspended Particulates	3	NA

When the results of the construction phase are compared to the National Emissions Ceilings (where ceilings exist for pollutants), the levels are of the order of 0.01 to 0.12%. 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 to be a **short term slight adverse impact** to air quality, which is not significant in EIA terms.

12.6.4 Transboundary Construction Impacts

Given the location of the Proposed Development, there is scope for transboundary impact in Northern Ireland and the Study Area and ZoI extend into Northern Ireland for some aspects of Section 3.

Construction dust impacts from the Section 3 works have potential for dust dispersion into Northern Ireland with potential for adverse impact.

- **Human receptors** - 250 metres of the boundary of the site or 50 metres of the route used by construction vehicles on the public highway, up to 250 metres from the site entrance(s).
- **Ecological receptors** - 50 metres of the boundary of the site or 50 metres of the route used by construction vehicles on the public highway, up to 250 metres from the site entrance(s).

The greatest potential for transboundary dust impact is during the construction of the proposed N14/N15 to A5 Link as part of the Proposed Development and its connection to a proposed Trunk Road T3 and A5 WTC in Northern Ireland, with construction works taking place simultaneously.

There is potential for cumulative unmitigated dust impact on the residents in Strabane during the construction of Section 3 and the N14/N15 to A5 link of the Proposed Development that may potentially be a short term substantial adverse impact requiring mitigation if the works occur at the same time within the local area (i.e. 500m, 250m from each site).

The impacts to the River Finn SAC are analogous to those reported earlier for the construction of the overbridge at Section 3. These are also classed as substantial adverse impact requiring mitigation.

12.6.5 Operational Traffic Regional Impacts

In terms of road traffic changes during the operation phase, a detailed analysis was carried out to assess the effect of the Proposed Development on total emissions to atmosphere. The regional air quality for the Proposed Development in the 2032 and 2047 Do Minimum (DM) and Do Something (DS) scenarios was assessed using the TII REM model. The results are summarised in Table 12-29.

Table 12-29: Regional Impact of Changes to Traffic Patterns as a result of Proposed Development

Scenario	Total NO_x (t/year)	Total PM_{10} (t/year)	Total $PM_{2.5}$ (t/year)
2032 Do Minimum (without A5)	341	104	58
2032 Do Something (without A5)	345	103	57
Potential Percentage change from the Do Minimum and the Do something	1%	-1%	-2%
2032 Do Minimum (with A5)	342	103	57
2032 Do Something (with A5)	344	101	56
Potential Percentage change from the Do Minimum and the Do something	1%	-2%	-2%
2047 Do Minimum (without A5)	30	112	62
2047 Do Something (without A5)	30	111	62
Potential Percentage change from the Do Minimum and the Do something	0%	-1%	0%
2047 Do Minimum (with A5)	30	110	62
2047 Do Something (with A5)	30	109	61
Potential Percentage change from the Do Minimum and the Do something	1%	1%	1%

When comparing the DM to the DS scenarios in 2032 and 2047 (both with and without the N14/N15 to A5 Link, Trunk Road T3 and the A5 WTC), the results show negligible change in total annual emissions of NOx, PM_{10} and $PM_{2.5}$ (of the order of 2% or less). These results indicate that the Proposed Development will not lead to any significant increase or decrease in traffic emissions on the road network but will redistribute traffic around the network through reducing congestion on a more efficient system with no net change in impact over the Do-Minimum impact.

As a consequence, there is no net significant change in total traffic emissions with the Proposed Development in operation relative to the emissions associated with the current road network. With these factors considered, the net impact on regional air quality of the operational phase traffic emissions is classified as **neutral** in the long term.

12.6.6 Active Travel and Modal Shift Emissions

As outlined in Section 4.5.4 of Chapter 4, the Proposed Development includes and promotes active travel and responds to the need to promote physical and mental health benefits, and to encourage a modal shift towards cycling and walking modes of transport in the area. To achieve a reduction in traffic emissions, this promotion of health benefits, dedicated shared pedestrian/ cycling facilities are provided as part of the Proposed Development.

Section 1

The active travel networks included throughout Section 1 include 21 km of shared pedestrian / cycle facilities. These facilities include pedestrian / cycle paths located adjacent to and remote from the proposed mainlines, connections to the local road network and connections to local amenity areas and areas of interest, including park and share / cycle facilities. The active travel network has been designed to provide an amenity facility for leisure use, enhance local access to other amenities (such as football pitches, woodland walks) through active travel and maintain local connectivity through use of active travel.

In addition to the mainline shared cycleway/footway, Section 1 also includes active travel facilities in the following locations:

- Connection to existing active travel network at existing N15 (Dooish) at Ch 0+000 m.
- Connection to existing active travel network at existing N15 (Cappry) at Ch 0+225 m.
- Connection to existing Cappry Rovers Football Club at Ch 1+000 m.
- Connection to existing active travel network at Ballybofey at Ch 1+900 m.
- Connection into existing and proposed woodland facilities at Holywell and Drumboe Woods at Ch 3+275.
- Connection to existing active travel network at Drumboe lower at Ch 3+900 m.
- Connection to existing active travel network at Dunwiley at Ch 4+500 m.
- Connection to facilitate access to Dunwiley ring Fort at Ch 4+900 m.
- Park and Share / Cycle facilities at Ch 1+100 m, 1+750 m and 8+550 m.
- Connection to existing community along the existing N13 (downgraded) at Meenavoy at Ch 8+550 m.

Section 2

Active travel networks included throughout Section 2 include 16 km of shared pedestrian / cycle facilities. In addition to the mainline shared cycleway/footway, Section 2 also includes active travel facilities in the following locations:

- Connection to St. Patrick's National School at Ch 0+850.
- Connection to existing community at Cullion Road at Ch. 0+550 m.
- Connection to the existing community along the existing N13 Lurgybrack section, also includes a second connection to St Patrick's School.
- Connection to existing Donegal cycle route at Dromore at Ch 2+300 m.
- Connection to an old inactive rail bed and potential future greenway at Dromore.
- Connection to the existing active travel facilities along the N56 Four Lane Road at Dry Arch roundabout.
- Connection to the existing active travel segregated facilities at Ballyraine junction.
- Connection with a proposed Park and Share / Cycle facility and proposed bus stop adjacent to the Dry Arch Roundabout at Ch 0+200 m.
- Connection from Dromore to N13/N14 Pluck Roundabout along the local road network linking communities from Ch 0+000m to 3+650 m.

Section 3

The active travel networks included throughout Section 3 include 26 km of shared pedestrian / cycle facilities. In addition to the mainline shared cycleway/footway, Section 3 also includes Non-Motorised User (NMU) facilities as part of the cross section in the following locations:

- Ballindrait Link Road Type 2 single carriageway cross-section, which connects the R264 to the existing N14 at Rossgeir.
- A connection from the mainline at Croaghan Hill to Murlough, connecting to the existing R264 near Murlough Chapel and the termination point for the Northwest Greenway Route 3.
- Park and share / cycle facilities at Ch 0+100, 7+600, 14+000 and 17+500.
- Connection to the existing local road network at approximate Ch 2+200 which will facilitate any future greenway project along the disused railway line. An underpass is also being provided where the mainline crosses the disused railway line.
- Numerous connections to the local road network.

Overall

An assessment of active mode impacts associated with physical cycling and pedestrian infrastructure was undertaken to support the Preliminary Business Case published in July 2024. An estimated 688 daily cycling trips and an estimated 7,236 pedestrian daily trips have been forecasted based on the analysis undertaken. Table 12-30 shows the estimated daily cycling and pedestrian trips across each of the journey purposes and illustrates that leisure and tourism account for a significant number. On the basis that the commuting and education trips may arise as a result of modal shift, these journeys will lead to a total annual number of trips of 45,050 for cycling and 518,660 trips for pedestrian trips (based on a 180 day education calendar and a 250 day work calendar).

In addition, the Proposed Development includes for park and share/ cycle facilities at designated locations to form hubs at which motorists can park their own car and car share with other motorists to complete an ongoing journey or park their car while they utilise the active travel facilities for commuting, exercise or amenity usage. Cumulatively, the Proposed Development proposes the installation of 63 km of shared pedestrian / cycle facilities within the county.

Table 12-30: Future Daily Cycling and Pedestrians Trips by Journey Purpose and associated Emission Reductions

Journey Purpose	Daily Cycling Trips	Daily Pedestrian Trips
Commuting	137	1,112
Education	60	1,337
Domestic Leisure	304	2,468
Tourism (including domestic and overseas)	183	2,236
Total Daily Trips	**688**	**7,153**
Total Annual Trips (Commuting and Education)	**45,050**	**518,660**

Charging facilities for electric vehicles will also be provided at the park and share/ cycle facilities which will also support the national electrification of the fleet including the delivery of the following national targets for private vehicles. Charging facilities for electric vehicles will also be provided which will support the DoT's Electric Vehicles Charging Infrastructure Strategy 2022-2025.

- Battery EV share of total passenger car fleet (30%)
- EV share of new registrations (100%)
- 845,000 Private EVs

The Proposed Development is also designed to integrate with the public transport network to support to modal shift away from private cars to public transport. For example, the proposed bus stop adjacent to the Dry Arch Roundabout at Ch 0+200m in Section 2. The other rural mobility proposals for Donegal, which would be supported by the Proposed Development, include the following:

- Enhanced interurban bus services between Letterkenny, Derry and Strabane along a portion of the N13/N14.
- Improved interurban bus services from Donegal, Letterkenny, and Derry to Dublin, Galway and the south.
- New local bus services from Greencastle to Letterkenny along a portion of the N13.

In summary, the 63 km active travel and modal shift aspects of the Proposed Development are predicted to have a **long term beneficial impact** on air quality which is considered significant in EIA terms.

12.6.7 Operational Traffic Local Impacts on Human Receptors

Notwithstanding the positive impacts of active travel, the proposed revisions to the junction layouts may also have implications for local receptors such as residential properties, schools and care homes. For properties adjacent to the current alignments there is potential for beneficial air quality impact by moving the traffic further from these properties and reducing congestion. For properties close to the proposed alignment (in particular less than 20m) there is potential for adverse air quality effect.

The parameters assessed were NO_2, PM_{10} and $PM_{2.5}$. These are the pollutants of most concern with regard to road traffic emissions and the air quality standards. Ireland's Air Pollutant Emissions 1990-2030 report. (EPA, 2025) shows that in Ireland, the main source of NO_2 is from road transport and PM_{10} is largely from traffic emissions.

Using the TII Guidelines (TII, 2025b) pollutant concentrations with the Proposed Development in operation were assessed at the sensitive receptors located within bands out to 100 m of each section of the Project. Table 12-31 outlines these sensitive receptors for each individual section of the Proposed Development within 100 m of the road (note that the ZoI for traffic impact is 200 m, but this assessment focuses on the properties closest to the traffic that will experience the greatest impact). Note that the counts include the entire road network and the properties listed for the existing alignment are also included in the counts for the proposed alignment.

Table 12-31: Sensitive Receptors within 100 m of the Road Alignment

Section	Section 1: N15 Ballybofey –Stranorlar Urban Region Road	Section 2: N56/N13 Letterkenny to Manorcunningham	Section 3: N14 Manorcunningham to Lifford/Strabane/A5
Existing Alignment			
0-10m	3	0	0
10-20m	12	4	16
20-30m	16	32	20
30-40m	21	30	13
40-50m	19	40	9
50-100m	81	126	65
Total	**152**	**232**	**123**
Proposed Alignment			
0-10m	21	25	12
10-20m	41	51	28
20-30m	48	67	32
30-40m	38	51	23
40-50m	31	50	16
50-100m	155	139	146
Overall:	**334**	**383**	**257**

12.6.7.1 Section 1

The volume, nature and frequency of operational traffic may have potential beneficial impact along the existing alignment or for adverse impact to air quality for the properties along the proposed route. The following receptors with respect to the alignment, which are located along the current and proposed alignments have been assessed, as they are most likely to be impacted:

- R1: Goland – A single residential property northwest of Kilcroghery located at the south of the proposed Section 1, adjacent to the exiting N15. Under the DM scenario, this property is impacted by the existing N15, whereas under the DS scenario the distance from the main alignment will increase reducing the air quality impact.
- R2: South of Ironworks – A row of three houses located on the R252 regional road in the southern section of Section 1. Under the DM scenario, these properties are currently impacted by the existing R252, whereas under the DS scenario, there will be additional impact from the proposed N15 alignment.
- R3: Drumboe – A set of cottages situated on a series of local roads approximately 1 km east of Stranorlar. Under the DM scenario, these cottages will continue to be served by the existing local roads, whereas under the DS scenario, these cottages will be closer to the Proposed Development.
- R4: Teevickmoy – A single residential property located approximately 0.8 km from the existing N13 in Tircallan. Under the DM scenario, this cottage will continue to be served by the existing local roads, whereas under the DS scenario, this cottage will be closer to the Proposed Development.
- R5: Meenavoy – A row of residential properties located in the northern section of Section 1 on a local road adjacent to the N13. Under the DM scenario, these properties are currently impacted by the existing N13 (at 21m distance), whereas under the DS scenario, the properties will continue to be impacted by the proposed N13 but from a greater distance (78m) reducing the impact from traffic emissions.
- R6: Tircallan – Two residential properties and Magee's Farm currently situated adjacent to the existing N13. Under the DM scenario, these properties are impacted by the N13, whereas under the DS scenario, the distance from the main alignment will increase, reducing the air quality impact.
- R7: Ballybofey – Main Street Ballybofey is located on the N15 national road and includes a mix of commercial and residential properties. The implementation of the Proposed Development will divert traffic away from the town, subsequently improving air quality.

In short, receptors R2 to R4 represent the 47 additional properties that will be closer (within 20m) to the proposed alignment while receptors R1 and R5 to R7 represent the properties close to the existing alignment in Stranorlar and Ballybofey. The results of the analyses for these receptors are presented in Table 12-32.

The results of the analysis indicate that the levels of NO_2. PM_{10} and $PM_{2.5}$ for Section 1 receptors will remain below the limits for the protection of human health to be imposed by the EU Directive on the 1st January 2030.

The results indicate that for receptors R2 to R4 with the proposed alignment in operation, the ambient air quality exposure increases at these 47 properties as a result of the increased proximity to a major road network. Using the TII assessment criteria in Section 12.4.1 (TII, 2025b), this equates to **neutral to moderate adverse** air quality impact at receptors R2 to R4 representing 47 properties.

Conversely, the impact at receptors R1 and R5 to R7 shows a net decrease in exposure to air pollution Using the TII assessment criteria in Section 12.4.1 (TII, 2025b), this equates to a **neutral to moderate beneficial** air quality impact at receptors R1, R5 to R7.

In summary, of the 47 properties close to the proposed alignment, 44 are predicted to experience a **neutral to slight adverse** air quality impact, which is not significant in EIA terms. Three properties located on the R252 regional road will experience a **moderate adverse** air quality impact, which is significant in EIA terms. Conversely, the properties along the existing alignment will experience a **neutral to moderate beneficial** air quality impact as a result of diverting the traffic away from the higher density area of Ballybofey and Stranorlar.

Table 12-32: Local Impact to Air Quality as a Result of Operational Traffic for Section 1

Property Group	Scenarios	Annual Average		
		NO_2 (µg/m^3)	PM_{10} (µg/m^3)	$PM_{2.5}$ (µg/m^3)
2032 Adjusted Background		6.1	9.1	6.1
R1	2032 DM	8.3	12.3	7.8
	2032 DS	6.4	9.6	6.3
	2032 Change (DS-DM)	-2.0	-2.7	-1.5
	% Change relative to AQLV	-10%	-14%	-15%
	Impact Rating	**Slight Beneficial**	**Moderate Beneficial**	**Moderate Beneficial**
R2	2032 DM	6.1	9.1	6.1
	2032 DS	7.3	11.3	7.2
	2032 Change (DS-DM)	1.2	2.1	1.2
	% Change relative to AQLV	6%	11%	12%
	Impact Rating	**Sight Adverse**	**Moderate Adverse**	**Moderate Adverse**
R3	2032 DM	6.1	9.1	6.1
	2032 DS	6.9	10.6	6.8
	2032 Change (DS-DM)	0.8	1.4	0.8
	% Change relative to AQLV	4%	7%	8%
	Impact Rating	**Neutral**	**Slight Adverse**	**Slight Adverse**
R4	2032 DM	6.1	9.1	6.1
	2032 DS	7.7	12.0	7.6
	2032 Change (DS-DM)	1.7	2.8	1.6
	% Change relative to AQLV	8%	14%	16%
	Impact Rating	**Slight Adverse**	**Moderate Adverse**	**Moderate Adverse**
R5	2032 DM	6.9	10.7	6.9
	2032 DS	6.3	9.6	6.3
	2032 Change (DS-DM)	-0.5	-1.1	-0.6
	% Change relative to AQLV	-3%	-5%	-6%
	Impact Rating	**Neutral**	**Neutral**	**Slight Beneficial**
R6	2032 DM	7.0	10.8	7.0
	2032 DS	6.3	9.6	6.3
	2032 Change (DS-DM)	-0.7	-1.2	-0.7
	% Change relative to AQLV	-3%	-6%	-7%
	Impact Rating	**Neutral**	**Slight Beneficial**	**Slight Beneficial**
R7	2032 DM	8.3	12.4	7.8
	2032 DS	6.4	9.6	6.3
	2032 Change (DS-DM)	-2.0	-2.8	-1.5
	% Change relative to AQLV	-10%	-14%	-15%
	Impact Rating	**Slight Beneficial**	**Moderate Beneficial**	**Moderate Beneficial**
EU Directive 1st January 2030 (AQLV)		**20**	**20**	**10**

12.6.7.2 Section 2

The following receptors have been assessed:

- R1: St. Patrick's National School – A school adjacent to the existing N13, this sensitive receptor also has residential properties located adjacent to the site. The existing N13 will be closed adjacent to the school once the Proposed Development is operational reducing the exposure to traffic impact.
- R2: Drumany – A residential property and farm located on the L-5784 which is adjacent to the existing N13. The Proposed Development will be closer to the property than the existing N13, therefore, the potential exposure to air pollution will be higher.
- R3: Rossbracken (N13 east) – A group of residential properties located adjacent to the existing N13 in the east. This receptor is used to assess the impact of the predicted increase of traffic associated with the Proposed Development in Section 2 joining Section 3.
- R4: Letterkenny Christian Fellowship – The place of worship is currently located on the L-11142 local road which is adjacent to the existing N14. The Proposed Development will include an additional road to the north of this site.
- R5: Archview Lodge Nursing Home – The nursing home is located to the south of the N13, the property can be accessed from the L-1114 local road. The Proposed Development will divert operational traffic away from the property reducing potential exposure to pollution from road traffic.
- R6: Ballyraine National School – The school is located to the west of the N56. The school is accessed from the R940 Ramelton Road, west of the first roundabout to the north of the N56. The Proposed Development will reduce traffic concentrations on the N56 adjacent to the school.

In short, receptors R2 and R3 represent the 72 additional properties that will be closer (less than 20m) to the proposed alignment while receptors R1, R4, R5 to R6 represent the properties along the existing alignment and on the current network in the south of Letterkenny. The results of the analyses for these receptors are presented in Table 12-33.

The results of the analysis indicate that the levels of NO_2 and PM_{10} for Section 2 receptors will remain below the limits for the protection of human health to be imposed by the EU Directive on the 1st January 2030. However, the $PM_{2.5}$ levels are predicted to be above the 1st January 2030 limits for certain properties (R5 and R6).

The results indicate that for the single receptor, R2, where the impacts are highest, the increase in $PM_{2.5}$ concentration will result in a **substantial adverse** impact for this property. Using the TII assessment criteria in Section 12.4.1 (TII, 2005b), for all other 71 properties within 20m of the proposed alignment, the predicted impact will be **slight adverse to neutral**.

Conversely, the impact at receptors R1 (St. Patrick's National School), R4, R5 and R6 (Ballyraine National School) show a net decrease in exposure to air pollution and these impacts range from **neutral to moderate beneficial.**

In summary, of the 72 properties located close to the proposed alignment, 71 are predicted to experience a **neutral to slight adverse impact** to air quality, which is not significant in EIA terms. One A residential property and farm located on the L-5784 (R2) will experience a **substantial adverse impact**, which is significant in EIA terms. Conversely, the properties along the existing alignment will experience a **neutral to moderate beneficial impact** to air quality as a result of diverting the traffic away from the higher density area of Letterkenny.

Table 12-33: Local Impact to Air Quality as a Result of Operational Traffic for Section 2

Property Group	Scenarios	Annual Average		
		NO_2 (µg/m^3)	PM_{10} (µg/m^3)	$PM_{2.5}$ (µg/m^3)
2032 Adjusted Background		6.5	11.9	8.7
R1	2032 DM	7.7	14.3	10.0
	2032 DS	7.1	13.0	9.3
	2032 Change (DS-DM)	-0.6	-1.3	-0.7
	% Change Relative to AQLV	-3%	-6%	-7%
	Impact Rating	**Neutral**	**Slight Beneficial**	**Moderate Beneficial**
R2	2032 DM	6.5	11.9	8.7
	2032 DS	7.7	13.9	9.8
	2032 Change (DS-DM)	1.2	2.1	1.1
	% Change Relative to AQLV	6%	10%	11%
	Impact Rating	**Slight Adverse**	**Slight Adverse**	**Substantial Adverse**
R3	2032 DM	7.5	13.7	9.7
	2032 DS	7.5	13.8	9.7
	2032 Change (DS-DM)	0.0	0.0	0.0
	% Change Relative to AQLV	0%	0%	0%
	Impact Rating	**Neutral**	**Neutral**	**Neutral**
R4	2032 DM	7.0	12.9	9.2
	2032 DS	6.9	12.7	9.1
	2032 Change (DS-DM)	-0.1	-0.2	-0.1
	% Change Relative to AQLV	0%	-1%	-1%
	Impact Rating	**Neutral**	**Neutral**	**Slight Beneficial**
R5	2032 DM	8.0	14.8	10.3
	2032 DS	8.0	14.8	10.3
	2032 Change (DS-DM)	0.0	0.0	0.0
	% Change Relative to AQLV	0%	0%	0%
	Impact Rating	**Neutral**	**Neutral**	**Neutral**
R6	2032 DM	8.2	15.0	10.4
	2032 DS	7.8	14.2	10.0
	2032 Change (DS-DM)	-0.4	-0.7	-0.4
	% Change Relative to AQLV	-2%	-4%	-4%
	Impact Rating	**Neutral**	**Neutral**	**Moderate Beneficial**
EU Directive 1st January 2030 (AQLV)		**20**	**20**	**10**

12.6.7.2 Section 3

The following receptors have been assessed:

- R1: Mondooey Lower – A group of residential properties along the L-5574 local road which is adjacent to the existing N14. The Proposed Development will be approximately 65m southwest of one of the properties which will move the alignment closer to these properties potentially increasing exposure to traffic pollution.
- R2: R236 intersection – A group of three residential properties are located at the junction of the N14 and R236. The Proposed Development will divert traffic from the existing N14 and R236 by moving the road to the east and improving the R236 thereby reducing the exposure of these properties to traffic emissions.
- R3: Tullyrap/Feddyglass – A group of residential properties currently located adjacent to the existing N14 in the Tullyrap and Feddyglass townlands. The Proposed Development will divert traffic away from these properties thereby reducing the exposure of these properties to traffic emissions.
- R4: Murough - St. Patricks National School, St. Patrick's church and multiple residential properties are located on the R264 regional road at the junction with the existing N14. The proposed alignment will move further away from these receptors reducing the exposure to traffic pollution.
- R5: Beachwood Grove – Beachwood Grove is a residential estate located adjacent to the existing N15. The Proposed Development will join the N15 to the northeast of Beachwood Grove which will move the alignment closer to these properties potentially increasing exposure to traffic pollution.
- R6: Lifford National School- A National School located on the existing N15. Traffic movement will decrease adjacent to the school following the implementation of the Proposed Development.

In short, receptors R1 and R5 represent the 24 properties that will be closer (less than 20m) to the proposed alignment while receptors R2, R3, R4 and R6 represent the properties along the existing alignment. The results of the analyses for these receptors are presented in Table 12-34 (including the N14/N15 to A5 Link).

The results of the analysis indicate that the levels of NO_2, PM_{10} and $PM_{2.5}$ for Section 3 receptors will remain below the limits for the protection of human health to be imposed by the EU Directive on the 1st January 2030.

The results indicate that for receptors R1 and R5 the current levels of exposure to air quality are low and only marginally above background given the more rural nature of the locations. With the proposed alignment in operation the ambient air quality exposure increases at the 24 properties as a result of the increased proximity to a major road network. Using the TII assessment criteria in Section 12.4.1 (TII, 2025b), this equates to a **neutral to slight adverse** impact, which is not significant in EIA terms.

Conversely, the impact at receptors R2, R3, R4 and R6 representing the properties along the existing alignment show a net decrease in exposure to air pollution. These decreases classed as **neutral to slight beneficial** given the low background levels, which is not significant in EIA terms.

In summary, all properties along the proposed alignment are predicted to experience a **slight beneficial to slight adverse** impact to air quality, which is not significant in EIA terms.

Table 12-34: Local Impact to Air Quality as a Result of Operational Traffic for Section 3

Property Group	Scenarios	Annual Average		
		NO_2 (µg/m^3)	PM_{10} (µg/m^3)	$PM_{2.5}$ (µg/m^3)
2032 Adjusted Background		6.1	9.1	6.1
R1	2032 DM	6.1	9.1	6.1
	2032 DS	6.7	10.2	6.6
	2032Change (DS-DM)	0.6	1.0	0.6
	% Change Relative to AQLV	3%	5%	6%
	Impact Rating	**Neutral**	**Neutral**	**Slight Adverse**
R2	2032 DM	6.7	10.4	6.8
	2032 DS	6.2	9.3	6.1
	2032Change (DS-DM)	-0.6	-1.2	-0.6
	% Change Relative to AQLV	-3%	-6%	-6%
	Impact Rating	**Neutral**	**Slight Beneficial**	**Slight Beneficial**
R3	2032 DM	6.5	9.9	6.5
	2032 DS	6.1	9.2	6.1
	2032Change (DS-DM)	-0.4	-0.7	-0.4
	% Change Relative to AQLV	-2%	-3%	-4%
	Impact Rating	**Neutral**	**Neutral**	**Neutral**
R4	2032 DM	6.6	10.2	6.7
	2032 DS	6.3	9.6	6.3
	2032Change (DS-DM)	-0.3	-0.6	-0.3
	% Change Relative to AQLV	-2%	-3%	-3%
	Impact Rating	**Neutral**	**Neutral**	**Neutral**
R5	2032 DM	6.5	10.0	6.5
	2032 DS	6.6	10.2	6.6
	2032Change (DS-DM)	0.1	0.2	0.1
	% Change Relative to AQLV	1%	1%	1%
	Impact Rating	**Neutral**	**Neutral**	**Neutral**
R6	2032 DM	6.5	10.0	6.5
	2032 DS	6.4	9.7	6.4
	2032Change (DS-DM)	-0.1	-0.3	-0.2
	% Change Relative to AQLV	-1%	-1%	-2%
	Impact Rating	**Neutral**	**Neutral**	**Neutral**
EU Directive 1st January 2030 (AQLV)		20	20	10

12.6.7.3 Entire Proposed Development

For the properties (including schools and other sensitive receptors) that are located within 100m of the existing alignment there will be a net reduction in pollution as a result of the alignment moving away from higher density areas such as Letterkenny, Stranorlar and Ballybofey. Residents and occupants of these properties will experience a net reduction in exposure to traffic pollution that will range in scale from **neutral to substantial beneficial** impact to air quality.

For the properties that are located along the proposed alignment, there will be a net increase in exposure to air pollution from road traffic. Residents and occupants of these properties will experience a net increase in exposure to traffic pollution that will range in scale from **neutral to moderate adverse** impact to air quality with **substantial adverse** impact for one property.

12.6.8 Operational Traffic Local Impacts on Ecological Receptors

Section 1 of the Proposed Development crosses a section of the River Finn SAC (Site Code: 002301).

Section 2 of the Proposed Development crosses the River Swilly Estuary SAC (Site Code: 00287) and is located near the Lough Swilly Special Protection Areas (SPA) and Lough Swilly including Big Isle, Blanket Nook proposed Natural Heritage Area (pNHA) (Site Code: 000166).

Section 3 of the Proposed Development intersects the River Finn SAC (Site Code: 002301) at the River Finn/River Foyle between Lifford (Republic of Ireland) and Strabane (Northern Ireland). The River Foyle and Tributaries SAC (UK Site Code: UK0030320) in Northern Ireland includes the stretch of the River Finn from near Clady (N.I.) to the confluence with the River Mourne at Strabane (N.I.).

The Section 3 route is also close to the Lough Swilly SAC and Lough Swilly including Big Isle, Blanket Nook pNHA which are both located west of Pluck Roundabout in Section 2.

Given the ecological sensitivity near each individual Section (Section 1, 2 and 3), a nitrogen deposition and ammonia assessment has been carried out as per the TII Guidelines using the following backgrounds:

- The APIS background concentrations at the closest point was 1.6 µg/m^3 for NH_3.
- A conservative 8-12 µg/m^3 baseline for NO_2 was assumed.

'NH_3 Emission Rate' refers to the emission rate of NH_3 as g/km/s, which has been calculated for the relevant link separately from the REM tool. TII guidance, Air Quality Assessment of Specified Infrastructure Projects - Overarching Technical Document. Average rates: Studies show average NH_3 emissions in the range of (15mg/km) for gasoline vehicles and (7mg/km) for diesel vehicles under specific test conditions.

Emission rates were calculated using the CREAM V2 tool. CREAM V2 has been created to calculate ammonia from road traffic emissions. Fleet calculations are based on those used within Defra's Emissions Factors Toolkit (EFT) V12. An additional input option for % cold starts has been included in this version.

The Following assumptions were made:

- Traffic format: Basic Split
- Selected Area: Northern Ireland
- Year: 2032/2047
- Road type: Rural

Table 12-35 presents the predictions of nitrogen deposition at sensitive ecosystem at the closest point to the road for each section of the Proposed Development.

Table 12-35: Predictions of Nitrogen Deposition at Sensitive Ecosystems in 2032 and 2047 (with N14/N15 to A5 Link and including baseline)

Section	Ecosystem	2032 DM (µg/m^3)	2032 DS (µg/m^3)	2047 DM (µg/m^3)	2047 DS (µg/m^3)
Section 1	River Finn SAC	15.71	15.36	12.59	12.40
Section 2	Lough Swilly SAC and SPA	15.55	18.37	12.47	12.58
Section 3	River Finn SAC	15.76	17.10	12.51	12.52

Table 12-36 presents the analogous predictions of NH_3 deposition at sensitive ecosystem for each section of the Proposed Development. These results include the relevant backgrounds derived from APIS which provides background concentrations at closest point of 1.6µg/m^3 for NH_3, 12µg/m^3 for NO_x and 5-10 kg/ha/yr for nitrogen deposition. All NO_X levels are compared to the critical level of 30µg/m^3. The TII Guidelines recommend that total ammonia concentrations should be compared to the critical level of 3 µg/m^3 (IAQM, 2020).

Table 12-36: Predictions of NH_3 Deposition at Sensitive Ecosystems in 2032 and 2047 (with N14/N15 to A5 Link and including baseline)

Section	Ecosystem	2032 DM (µg/m^3)	2032 DS (µg/m^3)	2047 DM (µg/m^3)	2047 DS (µg/m^3)
Section 1	River Finn SAC	2.48	2.45	2.40	2.42
Section 2	Lough Swilly SAC and SPA	2.64	3.29	2.21	2.21
Section 3	River Finn SAC	2.90	2.96	2.77	2.94

For Section 1, the slight decrease in impact between the DM and the DS is as a result of the increase in predicted speed of traffic on the DS route. All levels are below the annual NO_x limit for vegetation (30µg/m^3) and the critical levels for NH_3 (3µg/m^3) for all scenarios.

For Section 3, there is a marginal increase in N deposition with the DS scenario over the DM. However, these levels are below the annual NO_x limit for vegetation (30 µg/m^3) and the critical levels for NH_3 (lower limit 1µg/m^3, and upper limit of 3µg/m^3) for all scenarios.

As per the criteria in Table 12-8, the impacts of the air quality changes on sensitive habitats in Sections 1 and 3 are considered **not significant**.

For Section 2, there is a slight increase in DS relative to DM as a result of the increase in predicted traffic on the route. All levels are below the annual NO_x limit for vegetation (30µg/m^3) and the critical levels for NH_3 (3µg/m^3) for all scenarios with the exception of the 2032 DS scenario. As such, a more detailed evaluation of nitrogen and acid deposition is undertaken for this and the results are shown in Table 12-37.

The outputs of this assessment, including nitrogen and acid deposition, have been discussed with the project biodiversity practitioners and the impacts have been considered within EIAR Biodiversity Chapter 9A and Chapter 9B. Impacts of the Proposed Development were assessed and are not considered significant as there are no habitats that are lichen or bryophyte sensitive along the scheme.

In accordance with the EPA Guidelines (EPA, 2022) the ecological impacts associated with the operation phase traffic emissions on sensitive ecosystems at Section 2 are considered **slight adverse**, which is not significant in EIA terms.

Table 12-37: Impacts at Key Ecological Receptors (2032)

Scenario	Predicted Ground Level NH_3 Concentration (including background) µg/m^3	Predicted Ground Level NO_x Concentration (including background) µg/m^3	Total Nitrogen Deposition N/ha/yr	Total Acid Deposition keq/ha/yr
Section 1				
DM 2032	2.48	15.71	15.09	1.05
DS 2032	2.45	15.36	14.89	1.04
Difference	0.03	0.35	0.2	0.01
Change relative to lower critical load (%) 2032	3%	1.16%	Considered in the EIAR Biodiversity Chapter Report by the Project Ecologist.	N/A
Change relative to upper critical load (%) 2032	1%	1.16%	Considered in the EIAR Biodiversity Chapter Report by the Project Ecologist.	N/A
Section 2				
DM 2032	2.64	15.55	15.91	1.14
DS 2032	3.29	18.37	19.68	1.41
Difference	0.65	2.82	3.77	0.27
Change relative to lower critical load (%) 2032	65%	9.4%	Considered in the EIAR Biodiversity Chapter Report by the Project Ecologist.	N/A
Change relative to upper critical load (%) 2032	25%	9.4%	Considered in the EIAR Biodiversity Chapter Report by the Project Ecologist.	N/A
Section 3				
DM 2032	2.9	11.78	16.73	1.17
DS 2032	2.98	13.1	16.2	1.13
Difference	0.06	1.32	0.46	0.04
Change relative to lower critical load (%) 2032	6%	4.4%	Considered in the EIAR Biodiversity Chapter Report by the Project Ecologist.	N/A
Change relative to upper critical load (%) 2032	2%	4.4%	Considered in the EIAR Biodiversity Chapter Report by the Project Ecologist.	N/A

12.6.9 Transboundary Operational Impacts

In terms of impacts to human health from operational traffic, the modelling of local scale emissions in Section 3 also considered residential and other human receptors east of the border in the area around Strabane. As with the other properties in Section 3, all properties located close to the proposed alignment in Strabane are predicted to experience a **neutral** impact to air quality, which is not significant in EIA terms. The potential for transboundary impact on the River Finn SAC has been assessed in Section 12.6.8 and the impact of the air quality changes on sensitive habitats in Section 3 is considered **not significant**.

12.7 Mitigation Measures

12.7.1 Construction Phase Mitigation Measures

The mitigation measures have been divided into general measures applicable to all sites and measures applicable specifically to demolition, earthworks, construction and track-out. As per IAQM guidelines (IAQM, 2024), Table 12-38 outlines the mitigation measures for high-risk operations which will be mandatory on this project. The potential for dust to be emitted depends on the type of construction activity being carried out in conjunction with environmental factors including levels of rainfall, wind speeds and wind direction. The potential for impact from dust depends on the distance to potentially sensitive locations and whether the wind can carry the dust to these locations. It is recommended that a 3-month baseline be established prior to any construction commencing.

Table 12-38: Construction Phase Mitigation Measures

Mitigation Measure
1. Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
2. Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
3. Display the head or regional office contact information.
4. Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include monitoring of dust deposition, dust flux, real time PM_{10} continuous monitoring and/or visual inspections.
Site Management
5. 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.
6. Make the complaints log available to the local authority when asked.
7. Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book.
8. Hold regular liaison meetings with other high risk construction sites within 250 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.
Monitoring
9. Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary.
10. Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
11. Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
12. Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
Preparing and maintaining the site
13. Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
14. Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.

Mitigation Measure
15. Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period.
16. Avoid site runoff of water or mud.
17. Keep site fencing, barriers and scaffolding clean using wet methods.
18. Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below.
19. Cover, seed or fence stockpiles to prevent wind whipping.
Operating vehicle/machinery and sustainable travel
20. Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable.
21. Ensure all vehicles switch off engines when stationary - no idling vehicles.
22. Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
23. Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
24. Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
25. Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
Operations
26. 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.
27. Ensure an adequate water supply on the site for effective dust/particulate matter suppression/ mitigation, using non-potable water where possible and appropriate
28. Use enclosed chutes and conveyors and covered skips.
29. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
30. Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste management
31. Avoid bonfires and burning of waste materials.
Demolition
32. Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
33. Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.
34. Avoid explosive blasting, using appropriate manual or mechanical alternatives.
35. Bag and remove any biological debris or damp down such material before demolition.
Earthworks
36. Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
37. Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
38. Only remove the cover in small areas during work and not all at once.
Construction

Mitigation Measure
39. Avoid scabbling (roughening of concrete surfaces) if possible.
40. 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.
41. Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
42. For smaller supplies of fine power materials (e.g. cements, limes, etc) ensure bags are sealed after use and stored appropriately to prevent dust.

12.7.1.1 Construction Traffic

Traffic management is summarised in Chapter 4: Project Description. The following additional mitigation is proposed in relation to construction traffic management for the Proposed Development:

- The Construction Traffic Management Plan (TMP) included as Appendix C4.02 in Volume C: Technical Appendices as part of this EIAR will be further developed by the appointed Contractor in advance of the works commencing on-site. The updated TMP will include the Contractor's additional measures to minimise congestion and queuing, reduce distances of deliveries and eliminate unnecessary loads in line with their programming and execution of the works.
- The use of a designated delivery route for all materials to/from the site for all drivers.
- All vehicles will be suitably maintained to ensure that emissions of engine generated pollutants are kept to a minimum and idling of equipment to be prohibited.
- For electricity generation at site compounds, an electric grid connection will be employed as default or the use of hydrogen generators or electrified plant will be used instead of traditional diesel generators. The committed mitigation measures will be tracked through a Project Carbon Management Plan (PCMP) which will be developed in accordance with PAS 2080 (Carbon Management in Infrastructure). The PCMP is used to monitor and report on the above committed carbon management measures and all other climate measures adopted during the design, procurement and construction phases. Contractors will be obliged to provide a PCMP as part of the tendering for the project and will be evaluated on the commitments for further carbon reductions.

12.7.2 Operational Phase Mitigation Measures

Road traffic emissions will reduce over time through EU legislation driven improvements in fuel and engine technology resulting in gradually reducing emissions per vehicle profile. The collection of EU Directives, known as the Auto Oil Programme, have outlined improved emission criteria which manufacturers are required to achieve from vehicles produced in the past and in future years. This is a trend which has been in operation for many years and is destined to continue in future years for both cars and heavy goods vehicles.

No project specific mitigation measures have been identified for the operational phase of the project. The free flow of traffic on the Proposed Development will allow for the generation of lower concentrations of traffic related pollutants due to more steady speed driving.

12.7.3 Predicted Residual Impacts

Residual impacts are assessed for the construction and operational phases of the Proposed Development as described below.

The pre-mitigation impacts associated with construction phase dust emissions are considered to pose a high risk for each section of the Proposed Development and the Proposed Development as a whole. Therefore, a suite of best practice dust mitigation has been mandated in Section 12.7.1 of this chapter. With the successful implementation of the mitigation by the contractor and associated monitoring (refer Section 12.7.3.2), the residual impact is reduced to a **'short term slight adverse impact'**, which is not significant in EIA terms.

Given the distributed nature of the Proposed Development and the number of compounds and access points, routine traffic of construction workers and material deliveries will not result in a significant increase on the public roads accessing the site. As such, construction traffic will not give rise to any significant impacts to air quality, and the predicted impact will be **'short term slight adverse impact'** which is not significant in EIA terms.

When the results of the total emissions associated with plant use during the construction phase are compared to the National Emissions Ceilings the levels are of minor significance as they are only a fraction of a % of the limit. As such, the emissions from diesel/fuel use during the construction phase are considered to be a '**short term slight adverse'** impact to air quality, which is not significant in EIA terms.

When comparing the total road traffic emissions associated with the operation of the Proposed Development versus current alignment in future years, there is no net significant change in total traffic emissions. These results indicate that the Proposed Development will not lead to any significant increase or decrease in traffic emissions on the road network but will redistribute traffic around the network through reducing congestion on a more efficient system with no net change in impact over the Do-Minimum impact. With these factors considered, the net impact on regional air quality of the operational phase traffic emissions is classed as a **'long term neutral'** impact to air quality, which is not significant in EIA terms.

The Proposed Development includes for active travel including 63 km of shared pedestrian / cycle facilities as well as park and share/ cycle facilities at designated locations. The active travel and modal shift aspects of the Proposed Development are predicted to have a '**long term beneficial**' impact on air quality which is considered significant in EIA terms.

For the properties (including schools and other sensitive receptors) that are located within 100m of the existing alignment there will be a net reduction in pollution as a result of the alignment moving away from higher density areas such as Letterkenny, Stranorlar and Ballybofey. Residents and occupants of these properties will experience a net reduction in exposure to traffic pollution that will range in scale from **neutral to moderate beneficial** impact to air quality.

For the properties that are located along the proposed alignment, there will be a net increase in exposure to air pollution from road traffic. The majority of residents and occupants of these properties will experience an impact that will range in scale from a '**long term neutral to slight adverse**' impact to air quality. One property will experience a '**long term substantial adverse**' impact and a further three properties will experience a '**long term moderate adverse**' impact.

The assessment of nitrogen and acid deposition on sensitive ecosystems have been discussed with the project biodiversity practitioners and the impacts of the air quality changes on sensitive habitats in Sections 1, 2 and 3 are considered '**long term slight adverse'**, which is not significant in EIA terms.

12.7.3.1 Transboundary

There is potential for cumulative dust impact on the residents in Strabane and the River Finn SAC (Ireland)/ River Foyle and Tributaries SAC (Northern Ireland) during the construction of Section 3 and the N14/N15 to A5 Link. With the prescribed dust mitigation, this impact is a **'short term slight adverse'** impact. In terms of impacts to human health from operational traffic, the modelling of local scale emissions in Section 3 also considered residential and other human receptors east of the border in the area around Strabane.

As with the other properties in Section 3, all properties located close to the proposed alignment in Strabane are predicted to experience a '**long term neutral'** impact to air quality, which is not significant in EIA terms.

The potential for transboundary impact on the River Finn SAC is considered **not significant** or in EIA terms, slight adverse.

12.7.3.2 Dust Monitoring

A Dust Management Plan (DMP) will be prepared by the Contractor including the mitigation and monitoring measures contained in this Chapter. The DMP will include details of a dust monitoring regime using standard Bergerhoff gauges (to VDI standard) at a series of locations that have been identified based on potential risk

of dust nuisance. A minimum of four monitoring locations will be established on each of Section 1, 2 and 3. The contractor will be required to maintain monthly dust levels below the guideline of 350 mg/m^2/day (for non-hazardous dusts) as an annual average at sensitive receptors.

The project monitoring commitments are outlined in Table 12-39. The monitoring schedule will include the construction works taking place, potential off-site sources and meteorological conditions.

Table 12-39: Project Monitoring Commitments

Area	Monitoring commitment
Areas adjacent to the construction compounds which are potentially at risk of dust nuisance.	Monthly monitoring to be conducted during the construction phase at a minimum of three locations surrounding each construction compound in each of Section 1, 2 and 3.
Residential properties within 50 m of the Proposed development (e.g. Section 1: Receptor 3)	Location to be monitored one month per year during the operation phase.

12.8 Conclusion

The significance of the effect upon air quality is determined by correlating the magnitude of the impact and the sensitivity of the receptor. For the purposes of this assessment, any effects with a significance level of slight or less have been concluded to be not significant in terms of the EIA.

A summary of the potential environmental effects, mitigation and monitoring discussed in this air quality chapter are summarised in Table 12-40.

Table 12-40: Project Impact Summary

Description of impact	Measures adopted as part of the project	Magnitude of impact	Sensitivity of receptor	Significance of effect	Mitigation measures	Residual effect	Proposed monitoring
Construction Dust	Large construction sites, with high use of haul routes	High	High	Short term Moderate Adverse	Implementation of the EOP.	Short term Slight Adverse	Monthly dust monitoring during construction (one month monitoring baseline pre-construction)
Construction Traffic	Large construction sites, with high use of haul routes	Negligible	Medium	Short term Slight Adverse	Implementation of the Traffic Management Plan.	Short term Slight Adverse	No monitoring proposed.
Construction Plant	Large construction sites, with high use of haul routes	Low	Medium	Short term Slight Adverse	Implementation of the EOP.	Short term Slight Adverse	No monitoring proposed.
Operational Traffic Impacts on Emissions Ceilings	Predicted operational traffic of the Proposed Development	Low	Medium	Long term Neutral	No project specific mitigation measures have been identified	Long term Neutral	No monitoring proposed.
Operational Active Travel and Modal Shift Emissions	Predicted operational traffic of the Proposed Development	Low	High	Long term Beneficial	No project specific mitigation measures have been identified	Long term Beneficial	No monitoring proposed.
Operational Traffic Impacts on the Local Receptors	Predicted operational traffic of the Proposed Development	Low	High	Long term Slight Adverse to Moderate Beneficial Long term Moderate Adverse (3 properties) Long term Substantial Adverse (1 property)	No project specific mitigation measures have been identified.	Long term Slight Adverse to Moderate Beneficial Long term Moderate Adverse (3 properties) Long term Substantial Adverse (1 property)	No monitoring proposed.
Operational Traffic Impacts on Sensitive Ecosystems	Predicted operational traffic of the Proposed Development	Low	High	Long term Slight Adverse	No project specific mitigation measures have been identified.	Long term Slight Adverse	No monitoring proposed.

12.9 References

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