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9. AIR QUALITY

9.1 Introduction

MKO prepared the Air Quality Chapter of this Environmental Impact Assessment Report (EIAR) for the Proposed Development at Knocknacarra, Co. Galway.

This Chapter identifies, describes and assesses the potential significant direct and indirect effects on air quality arising from the construction and operational phases of the Proposed Development. Where required, appropriate mitigation measures to mitigate any identified significant effects to air quality are recommended. A full description of the Proposed Development is outlined in Chapter 4 of this EIAR.

9.1.1 Statement of Authority

This section of the EIAR has been prepared by Eileen Corley and reviewed by Tom Madden and Karen Mulryan, all MKO. Eileen Corley is an Environmental Scientist who has been working with MKO since September 2023. Eileen graduated from University of Galway and holds a BSc Environmental science where she focused her studies on environmental nature conservation and environmental legislation. Since taking up her position with MKO, Eileen has worked on Environmental Impact Assessment Screening Reports, Construction and Environmental Management Plan Reports, preparation of Environmental Impact Assessment Report Chapters, fee proposals for a wide range of projects such as wind energy, wastewater treatment plants, residential developments, quarries and QGIS mapping for a range of projects. Eileen is a graduate member of the Institute of Environmental Management and Assessment.

Tom Madden is a Project Environmental Scientist with MKO with over six years of experience in environmental consultancies. Tom holds B.Sc. (Hons) in Environmental Science from the University of Limerick. Prior to taking up his position with MKO in March 2022, Tom worked as an Environmental Consultant with Panther Environmental and held previous posts with Mulroy Environmental whilst being based in Dublin. Tom has specialist knowledge in environmental sampling (water, groundwater, dust and soil) and has experience in preparing an array of environmental reports such as Construction Environmental Management Plans, EIA Screenings, Decommissioning Plans and more. Since joining MKO, Tom has been involved on a significant range of energy infrastructure, commercial, housing and residential projects in addition to project managing quarry EIA planning applications through the statutory planning system, with more projects in the pipeline. Within MKO, Tom plays a large role in the management and confidence building of junior members of staff and works as part of a large multi-disciplinary team to produce EIA Reports. Tom is in the process of becoming a chartered member of CIWEM.

Karen is a Senior Environmental Scientist with MKO with over 10 years' experience in the consultancy sector. Karen holds a BA International in Archaeology from NUI Galway and a MSc in Archaeology from the University of Edinburgh. Karen's key strengths and areas of expertise are in project management, environmental impact assessment, site selection, feasibility assessment and client liaison. Karen has experience managing large scale renewable energy developments, specifically wind, solar and supporting grid infrastructure across Ireland as well as coordinating Environmental Assessments and site work for a wide range of developments such as flood relief schemes and energy storage in Ireland and the UK. Karen excels at people management, project coordination, report writing and oversight, stakeholder engagement and managing large multidisciplinary teams. Karen has a wide range of experience in the commercial sector including watching briefs on behalf of SouthEast Water England and ground works of a solar farms in the UK; field excavation and survey of Iron Age, Roman and Medieval sites in Ireland and the UK; and desk-based assessments and heritage walk over surveys. Karen holds memberships with the Chartered Institute for Archaeologists (ACIfA) and the Institute of Archaeologists of Ireland (IAI).

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9.1.2 Background

The Proposed Development comprises 133 no. residential units, open spaces and all other site related infrastructure on a 2.9 hectares (ha) site at Knocknacarra, Co. Galway.

The Proposed Development is a component of a larger residential development project (Proposed Project), which comprises 495 residential units and associated infrastructure, open space and all other site related infrastructure. A planning application for 362 no. residential units and associated infrastructure on lands immediately to the east of the Proposed Development site was submitted to Galway City Council (GCC) in October 2025 (Planning Reference Number: 25/60320). Permission was granted by GCC on the 9th of April 2026 and the application is currently under appeal with An Coimisiún Pleanála (ACP) under Planning Reference Number: ACP-324237-26). This development is referred to throughout this EIAR as LRD East and has been considered as part of the cumulative assessment.

A detailed description of the Proposed Development and the wider Proposed Project is provided in Chapter 1 and Chapter 4 of this EIAR.

Due to the non-industrial nature of the Proposed Development and the general character of the surrounding environment, air quality sampling was deemed to be unnecessary for this EIAR. It is expected that air quality in the existing environment is good, since there are no major sources of air pollution (e.g. heavy industry) in the vicinity of the site.

9.1.3 Limitations and Difficulties Encountered

No limitations or difficulties were encountered during the preparation of the Air Quality Chapter of the EIAR.

9.2 Air Quality Guidance and Legislation

9.2.1 Relevant Guidance

The Air Chapter of this EIAR has been completed in accordance with the EIA Directive 2011/92/EU as amended by Directive 2014/52/EU and having regard, where relevant, to guidance listed below.

- Transport Infrastructure Ireland (TII) (2025). Air Quality Assessment of Proposed National Roads – Standard (PE-ENV-01107). December 2025.[1]
- European Environment Agency (EEA) (2025). Air Quality Status Report 2025[2]
- European Environment Agency (EEA) (2024). Ireland – Air Pollution Country Fact Sheet 2024 [3].
- European Environment Agency (EEA) (2023). Air Quality in Europe 2023[4].
- Environmental Protection Agency (EPA) (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EIAR). June 2022[5]

[1] Transport Infrastructure Ireland (TII) (2022): *'Air Quality Assessment of Proposed National Roads – Standard PE-EN-01107'.* TII. Ireland. Available at: https://cdn.tii.ie/publications/PE-ENV-01107-01.pdf
[2] *Air Quality Status Report 2025 (EEA, 2025) https://www.eea.europa.eu/en/analysis/publications/air-quality-status-report-2025*
[3] *Ireland – air pollution country fact sheet 2024. Available at: Ireland – air pollution country fact sheet 2024 | European Environment Agency's home page*
[4] *Europe's air quality status 2023 (EEA, 2023). Available at: https://www.eea.europa.eu/en/analysis/publications/europes-air-quality-status-2023*
[5] Environmental Protection Agency (EPA) (2022): *'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'.* EPA. Ireland. Available at: https://www.epa.ie/publications/monitoring assessment/assessment/EIAR_Guidelines_2022_Web.pdf

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- European Commission (EC) (2017). Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report. 2017[6].
- Environmental Protection Agency (EPA) (2025). Air Quality in Ireland Report 2024[7].
- Environmental Protection Agency (EPA) (2021). Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects. 2021[8].
- Institute of Air Quality Management (IAQM) (2024). Guidance on the Assessment of Dust from Demolition and Construction. 2024[9].
- National Roads Authority / Transport Infrastructure Ireland (TII) (2009). Guidelines for Assessment of Ecological Impacts of National Road Schemes[10].
- Government of Ireland (2023). Clean Air Strategy for Ireland. 2023 [11].
- UK Highways Agency / National Highways (2024). Design Manual for Roads and Bridges (DMRB) – LA 105 Air Quality. Version 0.1.0, June 2024[12].
- World Health Organization (WHO) (2021). Global Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen Dioxide, Sulfur Dioxide and Carbon Monoxide. (Latest guideline update; supported by updated global standards database released 2025–2026)[13].
- Federal Government of Germany (2021). Technical Instructions on Air Quality Control (TA Luft)[14].
- European Environment Agency (EEA). Ireland – Air Pollution Country Fact Sheet 2024.

9.2.2 Relevant Legislation

In 1996, the Air Quality Framework Directive (on ambient air quality assessment and management) (96/62/EC) was published. This Directive was transposed into Irish law by the Environmental Protection Agency Act 1992 (Ambient Air Quality Assessment and Management) Regulations 1999 (S.I. No. 33 of 1999). The Directive was followed by four Daughter Directives, which set out limit values for specific pollutants:

- The first Daughter Directive (1999/30/EC) addresses sulphur dioxide, oxides of nitrogen, particulate matter and lead.
- The second Daughter Directive (2000/69/EC) addresses carbon monoxide and benzene. The first two Daughter Directives were transposed into Irish law by the Air Quality Standards Regulations 2002 (SI No. 271 of 2002).

[6] European Commission (EC) (2017): *'Guidance on the preparation of the Environmental Impact Assessment Report'. EC. Ireland. Available at: https://www.epa.ie/publications/monitoring–assessment/assessment/EIAR_Guidelines_2022_Web.pdf.*
[7] Environmental Protection Agency (EPA) (2024): *'Air Quality in Ireland Report 2024'.* EPA. Ireland. Available athttps://www.epa.ie/publications/monitoring–assessment/air/air-quality-in-ireland-2024.php
[8] Environmental Protection Agency (EPA) (2021): *'Best Practice Guidelines for the preparation of Resource & Waste Management Plans for Construction & Demolition Projects'.* EPA. Ireland. Available at: https://www.epa.ie/publications/circular-economy/resources/CDWasteGuidelines.pdf.
[9] The Institute of Air Quality Management (IAQM) (2024): *'Guidance on the Assessment of Dust from Demolition and Construction'.* IAQM. UK. Available at: https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf.
[10] Transport Infrastructure Ireland (TII) (2009): *'Guidelines for Assessment of Ecological Impacts of National Road Schemes'.* TII. Ireland. Available at: https://www.tii.ie/media/kzldoawo/guidelines-for-assessment-of-ecological-impacts-of-national-road-schemes.pdf.
[11] Government of Ireland (GOF) (2023): *'Clean Air Strategy for Ireland'.* GOF. Ireland. Available at: https://assets.gov.ie/static/documents/clean-air-strategy.pdf.
[12] UK Highways Agency (UKHA) (2024): *'Design Manual for Roads and Bridges'.* UKHA. UK. Available at: https://www.standardsforhighways.co.uk/search/html/25cefcd4-3464-4e41-8e4f-fffc155723ea?standard=DMRB
[13] World Health Organisation (WHO) (2021): *'Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen Dioxide, Sulfur Dioxide and Carbon Monoxide'.* WHO. Switzerland. Available at: https://iris.who.int/bitstream/handle/10665/345329/9789240034228-eng.pdf?sequence=1.
[14] Bundesministerium fuer Umwelt, Naturschutz und nukleare Sicherheit (2002): *'First General Administrative Regulation Pertaining the Federal Immission Control Act (Technical Instructions on Air Quality Control – TA Luft)'.* [english translation from Technische Anleitung zur Reinhaltung der Luft – TA Luft]. Gemeinsames Ministerialblatt. Germany. Available at: https://www.bmuv.de/fileadmin/Daten_BMU/Download_PDF/Luft/taluft_engl.pdf

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- The third Daughter Directive, Council Directive (2002/3/EC) relating to ozone was published in 2002 and was transposed into Irish law by the Ozone in Ambient Air Regulations 2004 (SI No. 53 of 2004).
- The fourth Daughter Directive (2004/107/EC), published in 2004, relates to polyaromatic hydrocarbons (PAHs), arsenic, nickel, cadmium and mercury in ambient air and was transposed into Irish law by the Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations, 2009 (S.I. No. 58 of 2009) (amended by SI No. 659 of 2016 - Air Quality Standards (Amendment) and Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air (Amendment) Regulations 2016.)

The Air Quality Framework Directive and the first three Daughter Directives were replaced by the Clean Air for Europe (CAFE) Directive (Directive 2008/50/EC on ambient air quality and cleaner air for Europe) (as amended by Directive EU 2015/1480) which encompasses the following elements:

- The merging of most of the existing legislation into a single Directive (except for the Fourth Daughter Directive) with no change to existing air quality objectives.
- New air quality objectives for $PM_{2.5}$ (fine particles) including the limit value and exposure concentration reduction target.
- The possibility to discount natural sources of pollution when assessing compliance against limit values.
- The possibility for time extensions of three years (for particulate matter PM_{10}) or up to five years (nitrogen dioxide, benzene) for complying with limit values, based on conditions and the assessment by the European Commission.

Table 9-1 below sets out the limit values of the CAFE Directive, as derived from the Air Quality Framework Daughter Directives. Limit values are presented in micrograms per cubic metre ($\mu g/m^3$). The notation PM_{10} is used to describe particulate matter or particles of ten micrometres or less in aerodynamic diameter. $PM_{2.5}$ represents particles measuring less than 2.5 micrometres in aerodynamic diameter.

The CAFE Directive was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) as amended by the Air Quality Standards (Amendments) and Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations, 2016 (S.I. 659 2016). The 2011 Regulations superseded the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and the Ambient Air Quality Assessment and Management Regulations 1999 (S.I. No. 33 of 1999). The Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) was revoked on 31 December 2022 and has been replaced by the Ambient Air Quality Standards Regulations 2022 (S.I. No. 739/2022).

On the 26th of October 2022 the EU Commission announced a proposed review of Air Quality Standards.[15] The proposed revision will set interim 2030 EU air quality standards, seeking to align more closely with WHO recommendations, while putting the EU on a trajectory to achieve zero pollution for air at the latest by 2050, in synergy with climate-neutrality efforts. The first review is proposed to take place by the end of 2028, with the objective of ensuring full alignment with WHO recommendations.

The Ambient Air Quality Standards Regulation (2022) made the provisions necessary for the implementation of Directive 2008/50/EC of the European Parliament and of the Council on ambient air quality and cleaner air for Europe (as amended), establishes the limit values and alert thresholds for concentrations of certain pollutants in ambient air, provides for the assessment of concentrations of certain pollutants in ambient air, provides for the maintenance of ambient air quality, and ensures that adequate information on concentrations of pollutants are made available to the public.

[15] *European Commission, Revision of the Ambient Air Quality Directives.* <https://environment.ec.europa.eu/topics/air/air-quality/revision-ambient-air-quality-directives_en>

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On 10th December 2024, Directive (EU) 2024/2881 on ambient air quality and cleaner air for Europe came into force. This directive recasts Directive 2008/50/EC (the CAFE Directive) and the fourth Daughter Directive (Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air) and incorporates them into a single directive. This recast directive sets out limit values, target values, average exposure reduction obligations, average exposure concentration objectives, critical levels, alert thresholds, information thresholds and long-term objectives. It sets out air quality provisions with the aim of achieving the objectives of the European Commission's Zero Pollution Action Plan, so that air pollution within the EU is progressively reduced to levels no longer considered harmful to health and natural ecosystems at the latest by 2050. The Directive 2024/2881 sets out new limit values that each member state must comply with by 2026 and 2030. At the time of writing Directive (EU) 2024/2881 has not yet been transposed into Irish law.

9.2.3 Air Quality Standards

The Ambient Air Quality Standards Regulations 2022 (S.I. No. 739/2022) remains aligned to the CAFÉ Directive and diverts to the CAFÉ Directive for the Limit values outlined in Table 9-1, the Assessment Thresholds in Table 9-2, the Ozone limits and Assessment Thresholds in Table 9-3 and Table 9-4 respectively.

Table 9-1 Limit values of the CAFE Directive 2008/50EC

Pollutant	Limit Value Objective	Averaging Period	Limit Value ($\mu g/m^3$)	Basis of Application of Limit Value	Attainment Date
Sulphur dioxide (SO_2)	Protection of Human Health	1 hour	350	Not to be exceeded more than 24 times in a calendar year	1st Jan 2005
Sulphur dioxide (SO_2)	Protection of human health	24 hours	125	Not to be exceeded more than 3 times in a calendar year	1st Jan 2005
Sulphur dioxide (SO_2)	Protection of vegetation	Calendar year	20	Annual mean	19th Jul 2001
Sulphur dioxide (SO_2)	Protection of vegetation	1st Oct to 31st Mar	20	Winter mean	19th Jul 2001
Nitrogen dioxide (NO_2)	Protection of human health	1 hour	200	Not to be exceeded more than 18 times in a calendar year	1st Jan 2010
Nitrogen dioxide (NO_2)	Protection of human health	Calendar year	40	Annual mean	1st Jan 2010

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Pollutant	Limit Value Objective	Averaging Period	Limit Value ($\mu g/m^3$)	Basis of Application of Limit Value	Attainment Date
Nitrogen monoxide (NO) and nitrogen dioxide (NO_2)	Protection of vegetation	Calendar year	30	Annual mean	19th Jul 2001-
Particulate matter 10 (PM_{10})	Protection of human health	24 hours	50	Not to be exceeded more than 35 times in a calendar year	1st Jan 2005
Particulate matter 10 (PM_{10})	Protection of human health	Calendar year	40	Annual mean	1st Jan 2005
Particulate matter 2.5 ($PM_{2.5}$) Stage 1	Protection of human health	Calendar year	25	Annual mean	1st Jan 2015
Particulate matter 2.5 ($PM_{2.5}$) Stage 2	Protection of human health	Calendar year	20	Annual mean	1st Jan 2020
Lead	Protection of human health	calendar year	0.5	Annual mean	1st Jan 2005
Carbon Monoxide	Protection of human health	8 hours	10,000	Not to be exceeded	1st Jan 2005
Benzene	Protection of human health	calendar year	5	Annual mean	1st Jan 2010

Table 9-2 Assessment Thresholds from the CAFE Directive 2008/50/EC

Pollutant	Limit Value Objective	Averaging Period	Limit Value ($\mu g/m^3$)	Basis of Application of Limit Value
Sulphur dioxide (SO_2)	Upper assessment threshold for the protection of Human Health	24 hours	75	Not to be exceeded more than 3 times in a calendar year
Sulphur dioxide (SO_2)	Lower assessment threshold for the	24 hours	50	Not to be exceeded more

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Pollutant	Limit Value Objective	Averaging Period	Limit Value ($\mu g/m^3$)	Basis of Application of Limit Value
	protection of human health			than 3 times in a calendar year
Nitrogen dioxide (NO_2)	Upper assessment threshold for the protection of human health	1 hour	140	Not to be exceeded more than 18 times in a calendar year
Nitrogen dioxide (NO_2)	Lower assessment threshold for the protection of human health	1 hour	100	Not to be exceeded more than 18 times in a calendar year
Particulate matter 10 (PM_{10})	Upper assessment threshold	24 hours	35	Not to be exceeded more than 35 times in a calendar year
Particulate matter 10 (PM_{10})	Lower assessment threshold	24 hours	25	Not to be exceeded more than 35 times in a calendar year
Lead (Pb)	Upper assessment threshold	Calendar Year	0.35	-
Lead (Pb)	Lower assessment threshold	Calendar Year	0.25	-
Carbon Monoxide (CO)	Upper assessment threshold	8 hours	7000	-
Carbon Monoxide (CO)	Lower assessment threshold	8 hours	5000	-
Benzene (C_6H_6)	Upper assessment threshold	Calendar Year	3.5	-
Benzene (C_6H_6)	Lower assessment threshold	Calendar Year	2	-

Ozone is set out differently in the CAFE Directive in that it sets target values and long-term objectives for ozone rather than limit values. Table 9-3 presents the target values and long-term target value for ozone and Table 9-4 details the threshold values for Ozone.

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Table 9-3 Target values for Ozone defined in the Directive 2008/50/EC

Objective	Parameter	Target Value for 2010	Long-term Objective
Protection of human health	Maximum daily 8-hour mean	120 µg/m^3 not to be exceeded more than 25 days per calendar year averaged over 3 years	120 µg/m^3
Protection of vegetation	AOT40* calculated from 1-hour values from May to July	18,000 µg/m^3.h averaged over 5 years	6,000 µg/m^3.h

* AOT40 is a measure of the overall exposure of plants to ozone. It is the sum of the excess hourly concentrations greater than 80 µg/m^3 and is expressed as µg/m^3 hours.

Table 9-4 Threshold for Ozone defined in Directive 2008/50/EC (source: https://airquality.ie/information/air-quality standards and Directive 2008/50/EC)

Pollutant	Averaging Period	Threshold
Information Threshold	1-hour average	180 µg/m^3
Alert Threshold	1-hour average	240 µg/m^3

9.2.3.1 Air Quality and Health

Environmental pollution likely contributes to a range of health issues. Air pollution, aircraft and road traffic noise, exposure to lead (Pb), second-hand smoke (SHS), endocrine disruptors and other chemicals may increase the risk of health issues. Progress towards zero pollution targets can deliver co-benefits for health and well-being; additionally, nature-based solutions (NbS) can support health through contact with good quality green and blue spaces.[16] Environmental factors contribute to cardiovascular disease, as found in the European Environmental Agency Briefing in 2025. Environmental risk factors cause nearly one in five cardiovascular deaths in the European Union. The main environmental cardiovascular risk factors include air pollution, noise, chemicals and extreme temperatures.[17]

Harmful exposures including air, water, radiation and noise pollution can have substantial negative impacts on our health and wellbeing. Reducing pollution, adapting to and mitigating climate impacts, and restoring ecosystems means that people can be healthier and live longer. The State of the Environment Report for Ireland 2025 has the following Key Messages[18]:

- Ireland is not meeting the guidelines set by WHO for multiple pollutants including fine particulate matter and nitrogen dioxide. Meeting the health-based WHO air quality guideline limits will have a significant and positive impact on health.
- In Ireland, over 1 million people are likely to be exposed to noise levels above the mandatory reporting thresholds.

[16] European Environment Agency (EEA) (2026), *'Pollution and mental health: Current scientific evidence'*. Available at: Pollution and mental health: current scientific evidence | Publications | European Environment Agency (EEA)

[17] EEA (2025), *'Preventing cardiovascular disease through a health environment'*. Available at: Preventing cardiovascular disease through a healthy environment | Publications | European Environment Agency (EEA)

[18] Environmental Protection Agency (EPA) (2025) *'Irelands State of the Environment Report 2024'*, Available at: Ireland's State of the Environment Report 2024 | Environmental Protection Agency

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- Climate change is already having an impact on people, animals and plants in Ireland. The evidence is unequivocable, Ireland is being affected by climate change now, and the severity of the impacts is likely to increase significantly in the coming years.

In September 2025, the EPA published *'Air Quality in Ireland 2024'*[19] which reports that although Ireland met the current EU legal air quality limits in 2024, Ireland is falling behind on the targets set in Ireland's Clean Air Strategy (discussed below) for 2026. The Air Quality in Ireland Report 2024 also reports that monitoring results were higher than the more stringent health-based World Health Organization (WHO) air quality guidelines for a number of pollutants including: particulate matter (PM), nitrogen dioxide (NO_2), sulphur dioxide (SO_2) and ozone (O_3). PM and NO_2 are the most significant pollutants in Ireland. The main sources of these pollutants are the burning of solid fuel in our towns and villages and traffic in our cities. People's health and the health of our environment are impacted by these pollutants.

The EEA Report, *Air Quality in Europe 2023,* highlights the negative effects of air pollution on human health across the EU. The report concluded that in 2021, exposure to air pollution in the EU-27 member countries led to:

- 253,000 deaths were attributable to exposure to PM2.5 concentrations above the World Health Organisation (WHO) guideline level of 5 µg/m3.
- 52,000 deaths were attributable to exposure to NO2 concentrations above the WHO's guideline level of 10 µg/m3.
- 22,000 deaths were attributable to short-term exposure to O3 concentrations above 70 $\mu g/m^3$.

These figures are further informed by the EEA publication of '*Ireland – Air Pollution Country Fact Sheet 2024*' on the 10th December 2024[20]. This states that 530 Irish deaths were attributable to fine particulate matter ($PM_{2.5}$), 100 Irish deaths were attributable to nitrogen oxides (NO_x), and 240 Irish deaths were attributable to Ozone (O_3).

More recently a few key messages are outlined in the 'Air Quality Status Report 2025' published on the 9th of April 2025 on the EEA website[21]. These are:

- EU air quality standards are still not fully met across Europe, despite ongoing overall improvements.
- Since 2011, all countries have reduced exposure of their urban population to fine $PM_{2.5}$ particles, the most harmful pollutant from a health perspective. Nevertheless, the vast majority (94%) of the EU urban population remains exposed to $PM_{2.5}$ concentrations above the WHO guideline level, highlighting the need for additional measures to reduce the associated health risks.

Many locations already have air quality concentrations below the new EU 2030 standards. But in order to meet these new standards everywhere, and based on current progress, additional measures to improve air quality, especially in cities, are likely to be needed.

Ireland's Clean Air Strategy 2023[22] sets out the detail of seven strategic frameworks that will be used to ensure that air quality continues to improve (Figure 9-1). The aims of these key strategic frameworks are:

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[19] *Air Quality in Ireland Report 2024. Available at: https://www.epa.ie/publications/monitoring--assessment/air/EPA-Air-Quality-in-Ireland-Report-2024-INTERACTIVE.pdf*

[20] *Ireland – air pollution country fact sheet 2024. Available at: Ireland – air pollution country fact sheet 2024 | European Environment Agency's home page*

[21] *Air quality status report 2025. Available at: Air quality status report 2025 | European Environment Agency's home page*

[22] *Rialtas na hÉireann Clean Air Strategy April 2023. Available at: https://www.gov.ie/en/publication/927e0-clean-air-strategy/#:~:text=The%20Clean%20Air%20Strategy%20provides,delivering%20on%20wider%20national%20objectives.*

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- To set the appropriate targets and limits to ensure continuous improvements in air quality across the country and 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 Ireland to continue to evolve it's 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.
- To develop the additional targeted/specific policy measures as required to deal with national or local air quality issues.



Figure 9-1 Seven Strategic Frameworks for Air Quality, with associated chapters in brackets. Reproduced as Figure 1 from Clean Air Strategy 2023

Chapter 11 of the Clean Air Strategy discusses Air Quality Policy Development. The chapter discusses energy policy and acknowledges how the State's accelerated transition to renewable electricity will be critical to successfully meeting the ambitious renewable energy and greenhouse gas emission reduction targets outlined in the European Green Deal and Ireland's Climate Action Plan 2023, as well as to protecting against security of supply risks and removal of fossil fuels from power generation.

Wind (offshore and onshore) and solar energy will be the leading cost-effective technologies to achieve our energy and emissions targets, as well as displacing emissions in other sectors, including household heating and vehicle transport. While the Clean Air Strategy was informed by the Climate Action Plan 2023, Climate Action Plan 2025 is currently the latest revision. The targets of the Climate Action Plan 2025 and the Green Deal are to deliver net-zero GHG emissions by 2050 and reduce GHG emissions by at least 55% by 2030, compared to 1990 levels.

Since the publication of the Clean Air Strategy 2023, the Clean Air strategy for Ireland *First Progress Report* 2024 was released[23]. This report detailed the significant progress that has been made on the actions in the strategy since its publication in April 2023. In July 2025, a second progress report titled

[23] *Clean Air Strategy For Ireland First Progress Report 2024*

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'Clean Air Strategy for Ireland – Progress Report 2025' was released which states that Ireland has made further progress in reducing air pollution emissions and improving overall air quality, while recognising that additional measures will still be needed to meet future EU and WHO standards. The seven Strategic Frameworks introduced in the 2023 Clean Air Strategy for Ireland and illustrated above in Figure 9-1 remain the core structure underpinning the 2025 Progress Report.

Key points from the 2025 Progress Report include:

- Ireland remains compliant with current EU air quality standards for major pollutants.
- Emissions reductions have continued, supported by cleaner energy generation, reduced coal use, improved transport measures, and changes in home heating.
- Ireland achieved compliance with EU emissions reduction targets for all five major air pollutants in 2023, including ammonia.
- The Government approved the Air Pollution (Amendment) Bill 2025 to strengthen enforcement powers and regulation of solid fuels.

The report highlights ongoing challenges from:

- Domestic solid fuel burning,
- Transport emissions,
- Agricultural emissions,
- Meeting the stricter standards under Directive (EU) 2024/2881.

The EPA notes that, although Ireland currently complies with existing EU standards, it may struggle to achieve the tighter 2030 air quality limits without further action. Following the completion of the two progress reports the Department of Climate, Energy and the Environment sought feedback on the strategy in order to assess the potential for new actions to be included. This public consultation ended in November 2025.

Whilst there is the potential of such emissions to be generated from the construction and operational phases of the Proposed Development mitigation measures will be implemented at this site to reduce the impact from dust and vehicle emissions, which are discussed in Section 9.4 below.

9.3 Methodology

9.3.1 Air Quality Zones

The air quality zone for the Proposed Development was selected, followed by a review of EPA collated baseline air quality data namely Sulphur Dioxide (SO_2), Particulate Matter (PM_{10}), Nitrogen Dioxide (NO_2), Carbon Monoxide (CO) and Ozone (O_3) for the selected air quality zone to determine the representative levels of such emissions for the Proposed Development.

The EPA has designated four Air Quality Zones for Ireland:

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

These zones were defined to meet the criteria for air quality monitoring, assessment and management described in the CAFE Directive. The site of the Proposed Development lies within Zone C, which represents other cities and large towns.

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9.3.2 Air Quality Data Review

The EPA publishes Air Monitoring Station Reports for monitoring locations in all four Air Quality Zones. The most recent report on air quality in Ireland, 'Air Quality in *Ireland 2024*[19]' was published by the EPA in 2025. The EPA reports provide SO_2, PM_{10}, NO_2 and O_3 concentrations for areas in Zone C. These are detailed in the Baseline Air Quality section below.

9.3.3 Dust

The Institute of Air Quality Management in the UK (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (2024)[24] was considered in the dust impact assessment. The guidance document outlines an assessment method for predicting the impact of dust emissions from construction activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. This methodology has been used to predict the likely risk of dust as a result of the construction phase works and operational phase activities. The use of UK guidance is considered best practice in the absence of applicable Irish guidance. The major dust generating activities are divided into four types within the IAQM (2024) guidance to reflect their different potential impacts. These are:

- Demolition.
- Earthworks.
- Construction.
- Trackout - The transport of dust and dirt from the construction / demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when Heavy Goods Vehicles (HGVs) leave the construction / demolition site with dusty materials, which may then spill onto the road, and/or when HGVs transfer dust and dirt onto the road having travelled over muddy ground on site.

The magnitude of dust generating activities is divided into 'Large', 'Medium' or 'Small' scale depending on the nature of the activities involved. IAQM (2024) guidance provides example definitions for the scale of the activities, and these are applied for this development as outlined in Table 9-5.

[24] *Institute of Air Quality Management (IAQM), 2024. Guidance on the Assessment of Dust from Demolition and Construction. Version 2.2. [online] Available at: https://iaqm.co.uk/guidance/*

Table 9-5 Description of Magnitude for nature of activities (Adapted from: IAQM. 2024. Guidance on the Assessment of Dust from Demolition and Construction, pages 16 & 17)

	Large	Medium	Small
Demolition	Total building volume >75,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12 m above ground level	Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material, demolition activities 6-12m above ground level	Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6 m above ground, demolition during wetter months
Earthworks	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 >6 m in height	Total site area 18,000 m^2 – 110,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3m - 6m in height	Total site area <18,000 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <3 m in height
Construction	Total building volume >75,000 m^3, on site concrete batching, sandblasting	Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching	Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber)
Trackout	>50 Heavy Duty Vehicle(HDV) (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m	20-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m	<20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m
	Note: A vehicle movement is a one way journey. i.e. from A to B and excludes the return journey. HDV (or Heavy Goods Vehicles (HGVs) movements during a construction project vary over its lifetime, and the number of movements is the maximum not the average		

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There are a number of existing buildings within the site which will be demolished as part of the Proposed Development. One of these buildings will be renovated and retained on site during the operational phase. The demolition requirements for the Proposed Development are classified as "**Small**" given the materials to be demolished (predominately concrete blocks, timber, metal) and the total size of the existing buildings to be demolished.

The earthwork requirements for the Proposed Development are classified as "**Medium**" for the total earthworks. The total area of the site is 2.9ha which equates to 29,000 m^2.

The construction requirements for the Proposed Development are classified as "**Medium**". This is primarily in relation to the number of proposed residential dwellings to be built (133 residential units) and associated works.

As outlined in Chapter 15 Material Assets of this EIAR and the Traffic and Transport Assessment (TTA) which has been prepared by Tobin's Consulting Engineers, it is estimated that HGV movements during the busiest period onsite, namely the groundworks element of the works, an estimated 20 no. HGV's will deliver to the site on a daily basis for the duration of this construction work element. HGV deliveries are envisaged at other periods during the construction phase, but these are expected to be at a lower frequency. This would result in a "**Medium**" classification for Trackout.

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The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities.

9.3.3.1 Defining the Sensitivity of the Area

For the purposes of this assessment:

High Sensitivity Receptors

- Residential properties, hospitals, schools, museums and other locations where people are present continuously, or regularly for extended periods, and where a high level of amenity is expected;
- The appearance, aesthetics or value of property would be diminished by soiling;
- Locations where 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);
- Locations with an international or national designation and the designated features which may be affected by dust;
- Locations where there is a community of a particularly sensitive dust species such as vascular plants. Examples include Special Area of Conservation (SACs) designated for heathlands or local sites designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.

Medium Sensitivity Receptors

- Commercial properties, parks, and places of work, and where humans are transient.
- Exposure is 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);
- Locations where there is particularly important plant species, where its dust sensitivity is unknown;
- Nationally designated sites where the features may be affected by dust deposition.

Low Sensitivity Receptors

- Locations where human exposure is transient;
- Locations where the enjoyment of amenity or property is not reasonably expected, such as playing fields and farmland;
- Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling;
- Locally designated sites or features may be affected by dust. Example: local nature reserve with dust sensitive features.

The IAQM (2024)[9] guidance has outlined three types of effects to be considered:

- Sensitivities of People to Dust Soiling Effects
- Sensitivities of People to the Health Effects of PM_{10}
- Sensitivities of Receptors to Ecological Effects

For the purposes of this assessment, high sensitivity receptors are residential properties. Commercial properties and places of work are regarded as medium sensitivity while low sensitivity receptors are farmlands, and places where people are present for short periods or do not expect a high level of amenity.

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Dust Soiling Study Area

IAQM (2024) guidance identifies a screening distance of up to 250m for potential dust soiling effects from construction activities, while also noting that dust deposition reduces quickly with increasing distance from the source. As such, for the purposes of this EIAR, 250m is the dust soiling study area for the Proposed Development.

Sensitivity of People to Dust Soiling Effects

Dust soiling effects can occur for a distance of 250m from works areas. Table 9-6 below identifies the sensitivity of an area to dust soiling effects on people and their properties, relative to different receptor sensitivities.

Table 9-6 Sensitivity of the Area to Dust Soiling Effects on People and Property. (Source: IAQM. 2024. Guidance on the Assessment of Dust from Demolition and Construction, page 21)

Receptor Sensitivity	Number Of Receptors	Distance from source (m)			
		<20	<50	<100	<250
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

Sensitivities of People to the Health Effects of PM_{10}

When assessing sensitivity of people to the health effects of PM_{10}, the IAQM (2024) guidance recommends the use of sensitivities bands based on whether or not the receptor is likely to be exposed to elevated concentrations of PM_{10} over a 24-hour period. Table 9-7 below identifies the sensitivity of an area to human health effects of PM_{10}, relative to different receptor sensitivities.

Table 9-7 Sensitivity of the Area to Human Health Impacts (Source: IAQM. 2024. Guidance on the Assessment of Dust from Demolition and Construction, page 22)

Receptor Sensitivity	Annual Mean PM_{10} concentration	Number Of Receptors	Distance from source (m)			
			<20	<50	<100	<250
High	>32 µg/m^3	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32 µg/m^3	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28 µg/m^3	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low

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Receptor Sensitivity	Annual Mean PM_{10} concentration	Number Of Receptors	Distance from source (m)			
			<20	<50	<100	<250
	<24 µg/m^3	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32 µg/m^3	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	28-32 µg/m^3	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	–	≥1	Low	Low	Low	Low

Sensitivities of Receptors to Ecological Effects

Dust deposition due to earthworks, construction, and trackout has the potential to physically and chemically affect sensitive habitats and plant communities. Table 9-8 below identifies the sensitivity of an area to ecological impacts.

Table 9-8 Sensitivity of the Area to Ecological Impacts (Source: IAQM. 2024. Guidance on the Assessment of Dust from Demolition and Construction, page 23).

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

There are no high ecological sensitive receptors, as described by the IAQM (2024) guidance within 50m of the Proposed Development footprint. Therefore, dust impacts on ecological receptors have been scoped out from this assessment.

Defining the Risk of Impact

The dust emission magnitude is combined with the sensitivity of the area to determine the risk of impacts with no mitigation applied. The matrix in Table 9-9 provides a method of assigning the level of risk for each activity.

Table 9-9 Risk of Dust Impacts for Earthworks, Construction, Trackout (Adapted from IAQM, 2024, Guidance on the Assessment of Dust from Demolition and Construction, page 24)

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

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The risk of dust impacts for the Demolition, Earthworks, Construction and Trackout activities from the Proposed Development is summarised in Section 9.3.3 above.

Correlation of Impact Classification Terminology

EPA classification terminology as presented in Chapter 1 Introduction of this EIAR have been correlated with the equivalent risk rating from Table 9-10 below.

Table 9-10 Correlation of Impact Classification Terminology to Risk Rating

EPA Term	EPA Description	Risk Rating
Imperceptible	An effect capable of measurement but without significant consequences.	Negligible
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.	Low
Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends.	Medium
Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.	High

The risk of dust impacts for the Earthworks, Construction and Trackout activities from the Proposed Development is summarised in Section 9.4.2 below.

9.3.4 Baseline Air Quality

The EPA publishes Air Monitoring Station Reports for monitoring locations in all four Air Quality Zones. The most recent ambient air quality monitoring data for air quality is available in the Air Quality in Ireland 2024 report, published by the EPA in September 2025. The figures from the summary tables appendix of this report relate to air quality data from Ennis (46km to the south of the site), Portlaoise (123km to the south-east), Dundalk (195km to the north-east) and Letterkenny (260km northeast). Monitoring Stations have been used to inform the tables below. These monitoring locations lie within Zone C respectively. Similar measurement values for all air quality parameters at the Zone C sites would be expected for the Proposed Development site.

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9.3.4.1 Sulphur Dioxide (SO_2)

Sulphur dioxide data for representative Zone C towns Ennis, Portlaoise, Dundalk and Letterkenny in 2024 is presented in Table 9-11.

Table 9-11 Sulphur Dioxide Date for Zone C Sites in 2024

Parameter	Measurement
Average Annual Mean	6.5 µg/m^3
Hourly values > 350	3 (Letterkenny station only)
Average Hourly max	173.2 µg/m^3
Daily values > 125	0
Average Daily max	39.6 µg/m^3

During the monitoring period, there was three exceedances of the hourly limit value of 350 µg/m^3 for the protection of human health, all of which occurred in Letterkenny. However, no exceedances of the daily limit value were recorded. As shown in table 9-11 the average maximum hourly value recorded during the assessment period was 173.2 µg/m^3. In addition, there were no exceedances of the annual mean limit for the protection of ecosystems. It is expected based on professional judgement that SO_2 values at the Proposed Development site would be similar to those recorded for the Zone C sites above.

9.3.4.2 Particulate Matter (PM_{10})

Sources of particulate matter include vehicle exhaust emissions, soil and road surfaces, construction works and industrial emissions. The EPA report[1] provide annual mean PM_{10} concentration for twenty-four Zone C locations. For the purposes of this assessment, average data figures from Galway Rahoon, Galway Eyre Square and Galway Briarhill from 2024 only are outlined in Table 9-12 below.

Table 9-12 Average Particulate Matter (PM10) Data for Galway Rahoon, Galway Eyre Square and Galway Briarhill (Zone C) in 2024

Parameter	Measurement
Average Annual Mean	12.4 µg/m^3
Average % Data	89.3%
Days > 50 ug/m^3	1
Average Daily Max	45.9 µg/m^3

Notes: [1-] PM_{10} daily limit for the protection of human health: No more than 35 days >50 µg/m^3

The daily limit of 50 µg/m^3 for the protection of human health was exceeded on 1 day, which is below the PM_{10} daily limit for the protection of human health of a max 35 days >50 µg/m^3 applicable from 2005. It is expected based on professional judgement that PM_{10} values at the Proposed Development site is similar to those recorded for the Zone C sites above.

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9.3.4.3 Nitrogen Dioxide (NO_2)

The EPA report[1] provides annual Nitrogen dioxide (NO_2) data for eleven Zone C locations. For the purposes of this assessment, average data figures from Galway Eyre Square and Galway Briarhill from 2024 is presented in Table 9-13 below.

Table 9-13 Average Nitrogen Dioxide Data for Galway Eyre Square and Galway Briarhill Zone C Sites in 2024

Parameter	Measurement
Average Annual Mean	14.9 µg/m^3
NO_2 Values >200	0
Values > 140 (UAT)	0
Values >100 (LAT)	1
Average Hourly Max.	88.3 µg/m^3

The annual mean NO_2 value was below the annual mean limit value for the protection of human health of 40 µg/m^3. The lower assessment threshold of 100 µg/m^3 was exceeded a total of 1 no. times during the monitoring periods at Galway Briarhill.

In 2024, the average hourly max. NO_2 value of 88.3 µg/m^3 measured during the monitoring period was below the hourly max threshold of 200 µg/m^3. It would be expected that NO_2 values at the Proposed Development site would be similar to those recorded for the Zone C sites above.

9.3.4.4 Carbon Monoxide (CO)

The EPA Report[1] provides rolling 8-hour carbon monoxide concentrations for Portlaoise and Dundalk which are Zone C sites. Carbon Monoxide data for 2024 is presented in Table 9-14 below.

Table 9-14 Carbon Monoxide Data for Portlaoise and Dundalk - Zone C Site in 2024

Parameter	Measurement
Average Annual Mean	0.2 mg/m^3
Median	0.2 mg/m^3
Average % Data Capture	96.6%
Values > 10	0
Average Max	1.2 mg/m^3

The average concentration of carbon monoxide was 0.2 mg/m^3. The carbon monoxide limit value for the protection of human health is 10,000 µg/m^3 (or 10 mg/m^3). On no occasions were values in excess of the 10 mg limit value set out in Directive 2008/69/EC. It is expected based on professional judgement that CO values at the Proposed Development site would be similar to those recorded for the Zone C site above.

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9.3.4.5 Ozone (O_3)

The EPA report[1] provide rolling 8-hour ozone concentrations for six Zone C sites, Kilkenny, Limerick Henry Street, Limerick Peoples Park, Waterford, Waterford Port and Bray. Ozone (O_3) data for 2024 is presented in Table 9-15 below. As can be observed from Table 9-15 there were no exceedances of the maximum daily eight-hour mean limit of 120 µg/m^3. It is expected based on professional judgement that O_3 values at the Proposed Development site would be similar or lower than those recorded for the Zone C sites below.

Table 9-15 Average Ozone Data for Zone C Sites in 2024

Parameter	Measurement
Annual Mean	52.6 µg/m^3
Median	54.4 µg/m^3
% Data Capture	92.7%
No. of days > 120	0 days

9.3.4.6 Dust

There are no statutory limits for dust deposition in Ireland. However, EPA guidance suggests that a deposition of 10 mg/m^2/hour can generally be considered as posing a soiling nuisance. This equates to 240 mg/m^2/day. The EPA recommends a maximum daily deposition level of 350 mg/m^2/day when measured according to the TA Luft Standard 2002. This limit value can also be implemented with regard to dust impacts from construction activities associated with the Proposed Development.

The extent of dust generation at any site depends on the type of activity undertaken, the location, the nature of the dust, i.e., soil, sand, etc., and the weather. In addition, dust dispersion is influenced by external factors such as wind speed and direction and/or periods of dry weather. Construction dust has the potential to be generated from on-site activities such as excavation and backfilling. Construction traffic movements also have the potential to generate dust as they travel along the haul route.

9.3.4.6.1 *High Sensitivity Receptors*

9.3.4.6.2 *Human*

As discussed in section 9.3.3.1, dwellings, where people would be reasonably expected to be present regularly or continuously, are categorised as High Sensitivity Receptors.

A review of the receiving environment identified a number of residential receptors in close proximity to the Proposed Development site.

Table 9-16 Number of Receptors (Residential) within 20m, 50m, 100m, and 250m of the Proposed Development Site Boundary

Number Of Receptors	Distance from source (m)			
	<20	20-50	50 - 100	100 - 250
Number of High Sensitivity Receptors	4	15	13	199

526,500

527,000

724,500

526,500

N

Western Distributor Road

Gort Siar

Gort Siar

Western Distributor Road

Altan

Altán

Gort Siar

An Logán

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Doire Gheal

The Orchard

Knocknacarra NS

Clybaun Road

Kingston Road

Kingston Road

Kingston Road

Kingston Gardens

Kingston Road

Clybaun Road

Kingston Gardens

Kingston Road

Kingston Road

Kingston Road

ane

Oldfield

0 100 200 m

Map Legend

Site Boundary

IAQM 20m Buffer

Residential Receptors within 20m of Proposed Development

N

SITE LOCATION - NOT TO SCALE

Drawing Title

Figure 9-2: Receptors (IAQM) within 20m of Proposed Development

Project Title

King Knocknacarra West - Large Residential Development

Project No.	Drawing No.	Scale
251145	9-2	1:4,000
Drawn By	Checked By	Date
JB	DB	10/06/2026

Email: info@mkoireland.ie/ Website: www.mkoireland.ie

526,500

527,000

724,500

526,500

N

Western Distributor Road

Gort Siar

Gort Siar

Western Distributor Road

Gort Siar

Altan

Altán

An Logán

RECEIVED: 05/08/2026

Doire Gheal

Knocknacarra NS

The Orchard

Clybaun Road

Kingston Road

Kingston Road

Kingston Road

Kingston Gardens

Kingston Gardens

Clybaun Road

Kingston Road

Kingston Road

Kingston Road

ane

Oldfield

0 100 200 m

Map Legend

- Site Boundary
- IAQM 20-50m Buffer
- Residential Receptors within 20-50m of Proposed Development

N

SITE LOCATION - NOT TO SCALE

Drawing Title

Figure 9-3: Receptors (IAQM) within 20-50m of Proposed Development

Project Title

King Knocknacarra West - Large Residential Development

Project No.	Drawing No.	Scale
251145	9-3	1:4,000
Drawn By	Checked By	Date
JB	DB	10/06/2026

Email: info@mkoireland.ie/ Website: www.mkoireland.ie

526,500

527,000

724,500

526,500

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Western Distributor Road

Gort Siar

Gort Siar

Western Distributor Road

Altan

Altán

An Logán

Gort Siar

Doire Gheal

The Orchard

Knocknacarra NS

Clybaun Road

Clybaun Road

Kingston Road

Kingston Gardens

Kingston Road

Kingston Road

Kingston Road

Kingston Road

Kingston Road

Kingston Gardens

Oldfield

0 100 200 m

Map Legend

- Site Boundary
- IAQM 50-100m Buffer
- Residential Receptors within 50-100m of Proposed Development

SITE LOCATION - NOT TO SCALE

Drawing Title

Figure 9-4: Receptors (IAQM) within 50-100m of Proposed Development

Project Title

King Knocknacarra West - Large Residential Development

Project No.	Drawing No.	Scale
251145	9-4	1:4,000
Drawn By	Checked By	Date
JB	EC	22/06/2026

MKO

Email: info@mkoireland.ie/ Website: www.mkoireland.ie

526,000 526,500 527,000

725,000 724,500

Hawthorn Place
Hawthorn Place
Sliabh Ard
Western Distributor Road
Western Distributor
An Logán
Gort Siar
Gort Siar
Western Distributor Road
Altan
Manor Close
The Orchard
Manor Drive
Knocknacarra NS
Kingston Road
Kingston Gardens
Kingston Road
R337
Oldfield
R337
Shangort Road
Kingston Road
0 100 200 m

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Map Legend

- Site Boundary
- IAQM 100-250m Buffer
- Residential Receptors within 100-250m of Proposed Development

SITE LOCATION - NOT TO SCALE

Drawing Title

Figure 9-5: Receptors (IAQM) within 100-250m of Proposed Development

Project Title

King Knocknacarra West - Large Residential Development

Project No.	Drawing No.	Scale
251145	9-5	1:6,000
Drawn By	Checked By	Date
JB	EC	22/06/2026

Email: info@mkoireland.ie/ Website: www.mkoireland.ie

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9.4 Likely and Significant Effects and Associated Mitigation Measures

9.4.1 "Do-Nothing" Scenario

If the Proposed Development were not to proceed, the site would continue to function as it does at present, with no changes to local air quality. The impact of this is considered neutral in the context of the EIAR. If the Proposed Development were not to proceed, there would be no potential for negative effects on human health during the construction and operational phases of the Proposed Development. If the Proposed Development is not permitted, the site would remain largely unaltered as a result of the Do-Nothing Scenario. The potential for additional investment and employment in the area in relation to the Proposed Development would be lost.

9.4.2 Construction Phase

9.4.2.1 Exhaust Emissions

The Proposed Development will involve (as outlined in Chapter 4 of this EIAR) the construction of 133 no. residential units and all associated works in Knocknacarra, Co. Galway.

The construction phase of the Proposed Development will require the operation of construction vehicles and plant on site. Exhaust emissions associated with vehicles and plant such as NO_2, Benzene, and PM_{10} will arise as a result of construction activities.

This potential effect will be restricted to the duration of the construction phase and localised to works areas. Therefore, this is considered a short-term, slight, negative effect.

Mitigation measures to reduce this effect are presented below.

Proposed Mitigation Measures

- A detailed haulage plan will be put in place to ensure minimal impact on the surrounding road network. Spoil removal from site will be kept to a minimum with a detailed site survey completed to ascertain where spoil can be distributed on the site.
- All deliveries and removals will be subject to stringent site rules governing the loading / off-loading times, location of loading / off loading, covering of loads and cleaning of vehicles exiting the site, etc.
- Delivery loads to and from the site and management of large deliveries on site to occur outside of peak periods.
- No vehicle will be allowed to stop or park on the access road to the Proposed Development site.
- Ample parking will be provided within the site to cater for the staff and visitors during the construction phases of the proposed development.
- Construction traffic will be managed and scheduled to ensure no queueing occurs on either the internal road system or the main approach roads. The provision of an on-site vehicle staging area will facilitate waiting vehicles.
- Routine sweeping/cleaning of the road and footpaths in front of the site; and
- No uncontrolled runoff to the public road from dewatering/pumping carried out during construction activity.

There will be on-going monitoring of the impact of construction traffic on the wider roads network to ensure prompt action is taken in the event of an issue arising.

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Residual Effect

Following implementation of the mitigation measures above, residual effects of emissions arising from the construction phase of the Proposed Development will be a short term, imperceptible, negative effect on air quality.

Significance of Effects

Based on the evaluation above there will be no significant direct or indirect effects on air quality due to the construction of the Proposed Development.

9.4.2.1.2 *Dust Emissions*

The IAQM (2024) methodology for the Assessment of Dust from Demolition and Construction, as discussed in Section 9.3.3, is used to assess the potential risk to sensitive receptors from dust deposition.

The sensitive receptors identified in Section 9.3.4.6 were used to inform the dust risk assessment.

Table 9-17 below identifies the sensitivity of the area to dust soiling effects on people and property surrounding the Proposed Development site, as described in Section 9.3.4. Only the highest level of area sensitivity from the table needs to be considered (IAQM, 2024). Given the presence of nearby residential receptors and high-sensitivity receptors, including a childcare facility within 20m of the site boundary and a school within 100m, the overall sensitivity of the area to dust soiling effects is considered to be High

Table 9-17 Sensitivity Assessment of the Area to Dust Soiling Effects on People and Property from Proposed Development construction works. (Adapted from: IAQM. 2024. Guidance on the Assessment of Dust from Demolition and Construction, page 21)

Receptor Sensitivity	Number Of Receptors	Distance from source (m)			
		<20	20 - 50	50 - 100	100 - 250
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 9-18 Sensitivity Assessment of the Area to Human Health Impacts from Proposed Development construction works. (Adapted from: IAQM. 2024.Guidance on the Assessment of Dust from Demolition and Construction, page 22)

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number Of Receptors	Distance from source (m)			
			<20	<50	<100	<250
High	<24 µg/m^3	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low

Table 9-18 above identifies the sensitivity of people in the area surrounding the development footprint of the Proposed Development site to the health effects of PM_{10}, as described in Section 9.3.4. The overall sensitivity of the area to human health effects of PM_{10} is considered to be Low.

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Note that the subsection of the table is used because the expected PM_{10} annual mean concentration for the site is anticipated to be similar to that recorded for Zone C, as shown above.

As identified in Section 9.3 above, the Proposed Development is classified as 'Small' for Demolition, 'Medium' for Earthworks and trackout activities and 'Medium' for Construction. Therefore, when combined with the sensitivity of the area, using Table 9-8 to 9-10 above as guidance, the pre-mitigation risk of impacts from the Proposed Development is summarised in Table 9-19 below.

Table 9-19 Summary of Dust Risk for the Proposed Development Activities (Adapted from IAQM. 2024. Guidance on the Assessment of Dust from Demolition and Construction, page 24).

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low Risk	Medium Risk	Medium Risk	Medium Risk
Human Health	Low Risk	Low Risk	Low Risk	Low Risk
Ecological	n/a	n/a	n/a	n/a

The overall risk of dust emissions impacts with no mitigation applied for the major dust generating activities during the construction phase is Medium. Therefore, the potential effects of dust from the construction phase of the Proposed Development are considered to be equivalent to short-term, moderate negative effects.

Mitigation Measures

Mitigation and monitoring measures are proposed and outlined in the Construction Environmental Management Plan (CEMP) which is included as Appendix 4-1 of this EIAR. These are as follows:

- Any site roads with the potential to give rise to dust will be regularly watered, as required, during dry and/or windy conditions.
- The designated public roads outside the site and along the main transport routes to the site will be regularly inspected by Site Management for cleanliness and cleaned as necessary.
- Material handling systems and material storage areas will be designed and laid out to minimise exposure to wind.
- Water misting or bowsers will operate on-site as required to mitigate dust in dry weather conditions.
- The transport of soils or other material, which has significant potential to generate dust, will be undertaken in tarpaulin-covered vehicles where necessary.
- All vehicles leaving the construction areas of the site will rinse their wheels at a designated wheel wash area prior to entering the local road network.
- All construction related traffic will have speed restrictions on un-surfaced roads to 15 kph.
- Daily inspection of construction sites to examine dust measures and their effectiveness.
- If deemed necessary, sections of the approach road will be swept using a truck mounted vacuum sweeper.
- It is proposed to carry out dust monitoring at the site during the construction phase. Monitoring will be carried out quarterly using the Bergerhoff method. This monitoring will ensure that the mitigation measures outlined above are functional and being implemented. A map of the proposed monitoring locations is shown in the CEMP in Appendix 4-1.
- A complaints log will be maintained by the construction site manager and in the event of a complaint relating to dust nuisance, an investigation shall be initiated.

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Residual Effect

With the implementation of the above mitigation measures, the residual effect on air quality is considered to be a short-term, imperceptible, negative effect brought about by dust emissions generated during the construction activities.

Significance of Effects

Based on the evaluation above there will be no significant effects on air quality from dust emissions generated during the construction phase.

9.4.2.2 Operational Phase

9.4.2.3 Exhaust and Dust Emissions

The operational phase of the Proposed Development will comprise 133 residential units and an assumption of at least one vehicle per dwelling has been made for the purpose of this EIAR. The associated increase in traffic on the surrounding road network has been estimated using standard trip generation methodologies and results in a modest increase in vehicle flows dispersed across the local road network. The predicted increase in traffic volumes is not of a scale that would give rise to a material change in emissions of nitrogen dioxide (NO_2), particulate matter (PM_{10} or $PM_{2.5}$), or dust. Given the existing baseline air quality environment, the limited magnitude of change in traffic flows, and the dispersive nature of emissions, any increase in pollutant concentrations at nearby receptors will be imperceptible and well below relevant air quality limit values. Accordingly, the operational phase traffic associated with the Proposed Development will not result in a significant negative effect on air quality.

Mitigation

None Proposed.

Residual Effect

The residual effect from the operational phase will result in a long-term, imperceptible, neutral effect.

Significance of Effects

Based on the assessment above there will be no significant effects.

9.4.3 Human Health

Whilst the construction phase of the Proposed Development will give rise to minor increases in vehicle emissions, the implementation of the mitigation measures discussed above, and good management practices can prevent or minimise potential effects off-site. Good management practice consists of good site design and layout, adopting appropriate working methods and choosing the right equipment. The potential for health effects is considered negligible as the potential for exhaust emissions will be limited and controlled through site layout design and mitigation measures. As discussed above, the operational phase of the Proposed Development will not give rise to significant adverse effects on human health arising from air quality. While the development will result in an increase in residential population and associated vehicular activity, the scale of traffic generation is modest and dispersed across the local road network. The resulting change in emissions is imperceptible and will not lead to a meaningful increase in ambient concentrations of key pollutants such as nitrogen dioxide (NO_2) or particulate matter (PM_{10} and $PM_{2.5}$) at nearby sensitive receptors. Predicted air quality will remain well within relevant limit

values, and the magnitude of change is imperceptible in the context of established health-based standards. Accordingly, there will be no significant negative effects on human health during the operational phase.

There will be no significant effects on human health as a result of the construction or operation of the Proposed Development as it relates to air quality and human health.

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9.4.4 Cumulative Effects

Potential cumulative effects on air quality between the Proposed Development and other permitted or proposed developments in the surrounding area were considered as part of this assessment. For construction related air quality effects, including dust emissions, developments located within 250m of the site boundary were considered, consistent with the IAQM (2024) guidance.

The Proposed Development comprises 133 no. residential units, open space and all associated infrastructure on a 2.9 ha site at Knocknacarra, Co. Galway.

The Proposed Development was assessed cumulatively with the following nearby developments:

- LRD East, comprising 362 no. residential units on lands immediately east of the Proposed Development (GCC Planning Ref. 25/60320; ACP Ref.-ACP 324237-26); and
- The permitted Regional Aquatic Centre development at Altán Road, Rahoon, Knocknacarra (GCC Planning Ref. 24/60370).

Construction of the Proposed Development may occur concurrently with construction activities associated with LRD East (GCC Planning Ref. 25/60320; ACP Ref.ACP-324237-26) and the permitted Regional Aquatic Centre (GCC Planning Ref. 24/60370). As these developments have the potential to generate construction related dust emissions and traffic movements, there is potential for temporary cumulative effects on local air quality during the construction phase.

However, mitigation measures including dust suppression, traffic management and general construction environmental controls will be implemented during construction. A review of the CEMPs prepared for the Regional Aquatic Centre development (GCC Planning Ref. 24/60370). and LRD East (GCC Planning Ref. 25/60320; ACP Ref.ACP-324237-26) confirms that appropriate mitigation measures will be implemented for these developments. Therefore, any cumulative impacts on air quality would be temporary, localised and not significant.

The nature of the Proposed Development is such that, once operational, it will have a long-term, imperceptible, negative effect on the air quality. Emissions of carbon dioxide (CO_2), oxides of nitrogen (NOx), sulphur dioxide (SO_2) during the operational phases of the Proposed Development and other developments, will be minimal, primarily relating to residential vehicles, and therefore there will be a Long-term, Imperceptible, Negative cumulative effect on air quality.

Given the nature and scale of the Proposed Development, and the limited number and size of other developments in the vicinity, no significant cumulative effects on air quality are anticipated.

Potential cumulative effects on air quality between the Proposed Project and other permitted or proposed developments in the surrounding area were considered as part of this assessment. For construction-related air quality effects, including dust emissions, developments located within 250 m of the site boundary were considered, consistent with IAQM (2024) guidance.

The Proposed Project comprises the Proposed Development and LRD East and will provide a total of 495 no. residential units together with associated infrastructure, open space and all ancillary site development works.

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The Proposed Project was assessed cumulatively with the permitted Regional Aquatic Centre development at Altán Road, Rahoon, Knocknacarra (GCC Planning Ref. 24/60370). A review of permitted and proposed developments within 250 m of the site boundary identified no other developments of sufficient scale to materially influence the cumulative air quality assessment.

The Proposed Project is anticipated to be constructed over a number of phases, with construction activities occurring concurrently across the western and eastern portions of the site. The cumulative assessment therefore considers the combined construction activities associated with the Proposed Development and LRD East together with the Regional Aquatic Centre development.

However, mitigation measures including dust suppression, traffic management and general construction environmental controls will be implemented during construction. A review of the CEMP prepared for the Regional Aquatic Centre development (GCC Planning Ref. 24/60370) confirms that appropriate mitigation measures will be implemented. Therefore, any cumulative impacts on air quality would be temporary, localised and not significant.

The nature of the Proposed Project is such that, once operational, it will have a long-term, imperceptible negative effect on air quality. Emissions of carbon dioxide (CO_2), oxides of nitrogen (NOx) and sulphur dioxide (SO_2) during the operational phase of the Proposed Project and other developments will be minimal, primarily relating to residential vehicle movements. Therefore, the cumulative operational effect on air quality would be long-term, imperceptible and negative.

Given the nature and scale of the Proposed Project, and the limited number and size of other developments in the vicinity, no significant cumulative effects on air quality are anticipated.

9.5 Conclusion

This Chapter of the EIAR has been prepared in accordance with relevant guidance and best practice to provide an assessment of potential effects from the Proposed Development on air quality, either alone or cumulatively considered with other relevant activities in the vicinity of the site. It is concluded that there will be no significant effects on Air Quality and human health from the Proposed Development, either alone or cumulatively with other relevant developments in the vicinity