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Environmental Impact Assessment Report
Chapter 12: Air Quality

EIAR Chapter 12
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12 AIR QUALITY

12.1 Introduction

This chapter of the EIAR identifies, describes, and assesses the potential likely significant effects of the Proposed Scheme on Air Quality. The assessment will examine the potential impacts during the construction and operational phases of the Proposed Scheme.

This Chapter should be read in conjunction with the following Chapters:

- Chapter 5: Project Description;
- Chapter 6: Traffic & Transportation; and
- Chapter 13: Climate.

12.2 Methodology

12.2.1 Legislation, Policy, and Guidance

The key legislation and guidance referenced in the preparation of the EIAR is outlined in Chapter 1: Introduction (**Sections 1.5 and 1.6**). Specific to Air Quality, the following legislation, policy, and relevant guidance has informed the assessment as outlined below.

12.2.1.1 Legislation

The assessment has been undertaken in accordance inter alia with the 2001 Act and the EIA Directive.

In terms of legislation for air quality, this is presented on two separate levels as follows:

- Ambient air quality legislation for the protection of human health; and
- National emissions legislation for transboundary pollution.

The ambient air quality standards in Ireland are outlined in the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) (as amended) by the Air Quality Standards (Amendment) and Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air (Amendment) Regulations 2016 (S.I. 659 of 2016) and Ambient Air Quality Standards Regulations 2022 (S.I. No. 739 of 2022) ("the Air Quality Regulations"), which incorporate the ambient air quality limits set out in 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 (known as the CAFE Directive), for a range of air pollutants.

The CAFE Directive replaced the previous Council Directive 96/62/EC of 27 September 1996 on ambient air quality assessment and management and daughter directives, Council Directive 1999/30/EC of 22 April 1999 relating to limit values for sulphur dioxide, nitrogen dioxide and oxides of nitrogen, particulate matter and lead in ambient air and Directive 2000/69/EC of the European Parliament and of the Council of 16 November 2000 relating to limit values for benzene and carbon monoxide in ambient air.

The ambient air quality standards were revised in 2024. The revised Ambient Air Quality Directive (Directive (EU) 2024/2881) merges the previous two Directives into one and streamlines provisions to clarify and simplify the rules, aligning 2030 EU air quality standards more closely with the recommendations of the World Health Organization. Member States will have two years to adopt the laws, regulations and administrative provisions to transpose the revised Directive. The Commission will adopt secondary legislation (implementing acts) to complement the new rules and assist with their application.

The Air Quality Regulations set limit values for the pollutants nitrogen dioxide (NO_2) and nitrogen oxides (NO_X), particulate matter (PM) with an aerodynamic diameter of less than 10 microns (PM_{10}), PM with an aerodynamic diameter of less than 2.5 microns ($PM_{2.5}$), lead (Pb), sulphur dioxide (SO_2), benzene and carbon monoxide (CO) as presented in **Table 12-1**.

On a national level, Ireland is a party to the Convention on Long Range Transboundary Air Pollution (CLRTAP) under which certain transboundary air pollutants are controlled. For EU Member States, implementation of the Gothenburg Protocol (a daughter protocol of the CLRTAP) is achieved through limits set out in Directive 2001/81/EC of the European Parliament and of the Council of 23 October 2001 on

national emission ceilings for certain atmospheric pollutants ("the NEC Directive") which has been amended by Directive (EU) 2016/2284 and the European Union (National Emission Ceilings) Regulations (Amendment) 2024.

The NEC Directive sets national emission ceilings for key pollutants including particulate matter (PM_{10} (particles with a diameter of 10 microns or less) and $PM_{2.5}$ (particles with a diameter of 2.5 microns or less)), sulphur dioxide (SO_2), nitrogen oxides (NO_x), ammonia (NH_3) and Volatile Organic Compounds (VOCs). The aim of the Directive is to cut the negative impacts of air pollution on human health by almost half by 2030. Reducing levels of illness, including respiratory and cardiovascular diseases and premature death is the main priority.

Ireland's emissions ceilings under the first NEC Directive applied until December 2019 with reference to 2005 as the base year. Article 4(1) and Annex II of the Directive (as amended) then sets out new reduction commitments which apply from 2020 to 2029, and from 2030 onwards as shown in **Table 12-2**. The European Union (National Emission Ceilings) Regulations (Amendment) 2024 updates the reporting requirements for emissions and projections as referred to in Article (2).

Table 12-1: Air Quality Regulations (based on the CAFE Directive)

Pollutant	Regulation	Limit Type	Value
Nitrogen Dioxide	S.I. 180 of 2011	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200µg/m^3 NO_2
		Annual limit for protection of human health	40µg/m^3 NO_2
Nitrogen Oxides (NO + NO_2)		Critical limit for the protection of vegetation and natural ecosystems	30µg/m^3 NO + NO_2
Lead	S.I. 180 of 2011	Annual limit for protection of human health	0.5µg/m^3
Sulphur Dioxide	S.I. 180 of 2011	Hourly limit for protection of human health - not to be exceeded more than 24 times/year	350µg/m^3
		Daily limit for protection of human health - not to be exceeded more than three times/year	125µg/m^3
		Critical limit for the protection of vegetation and natural ecosystems (calendar year and winter)	20µg/m^3
Particulate Matter (as PM_{10})	S.I. 180 of 2011	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50µg/m^3
		Annual limit for protection of human health	40µg/m^3
Particulate Matter (as $PM_{2.5}$)	S.I. 180 of 2011	Annual limit for protection of human health	25µg/m^3
Benzene	S.I. 180 of 2011	Annual limit for protection of human health	5µg/m^3
Carbon Monoxide	S.I. 180 of 2011	8-hour limit (on a rolling basis) for protection of human health	10mg/m^3

Table 12-2: Ireland's National Emissions Ceiling Directive 2020 and 2030 Targets

Pollutant	2010-20 Targets under 2001/81/EC (kilotonnes)	Targets under 2016/2284/EU (kilotonnes)	
		2020	2030
SO_2	42	25.574	10.960
NO_x	65	66.836	40.626

Pollutant	2010-20 Targets under 2001/81/EC (kilotonnes)	Targets under 2016/2284/EU (kilotonnes)	
		2020	2030
NMVOC	55	56.335	51.077
NH_3	116	112.066	107.539
$PM_{2.5}$	N/A	15.606	11.229

12.2.1.2 Policy

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%; and
- Reducing by 25% the EU ecosystems where air pollution threatens biodiversity.

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

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

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 by the Department of the Environment, Climate and Communications (DECC) in April 2023 (DECC, 2023) with the following aims:

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

- To develop the additional targeted/specific policy measures as required to deal with national or local air quality issues.

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

Regional Policy

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

12.2.1.3 Guidance

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

- TII Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document PE-ENV-01106 (December 2022) (TII, 2022a);
- TII Air Quality Assessment of Proposed National Roads - Standard PE-ENV-01107 (December 2022) (TII, 2022b); and
- TII Road Emissions Model (REM): Model Development Report GE-ENV-01107 (December 2022) (TII, 2022c).

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

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

The WHO Guidelines are particularly pertinent in relation to the statutory limits for the protection of human health as presented in **Table 12-1**. The WHO Guidelines are based on reducing the risk to human health and in some cases the levels differ from the statutory limits as these limits are based on balancing health risks with technological feasibility, economic considerations, and various other political and social factors in the EU. The 2021 Air Quality Guidelines (AQG) and interim targets recommended by the WHO are presented in **Table 12-3**. 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.

Table 12-3: WHO Recommended Air Quality Guideline (AQG) Levels and Interim Targets (2021)

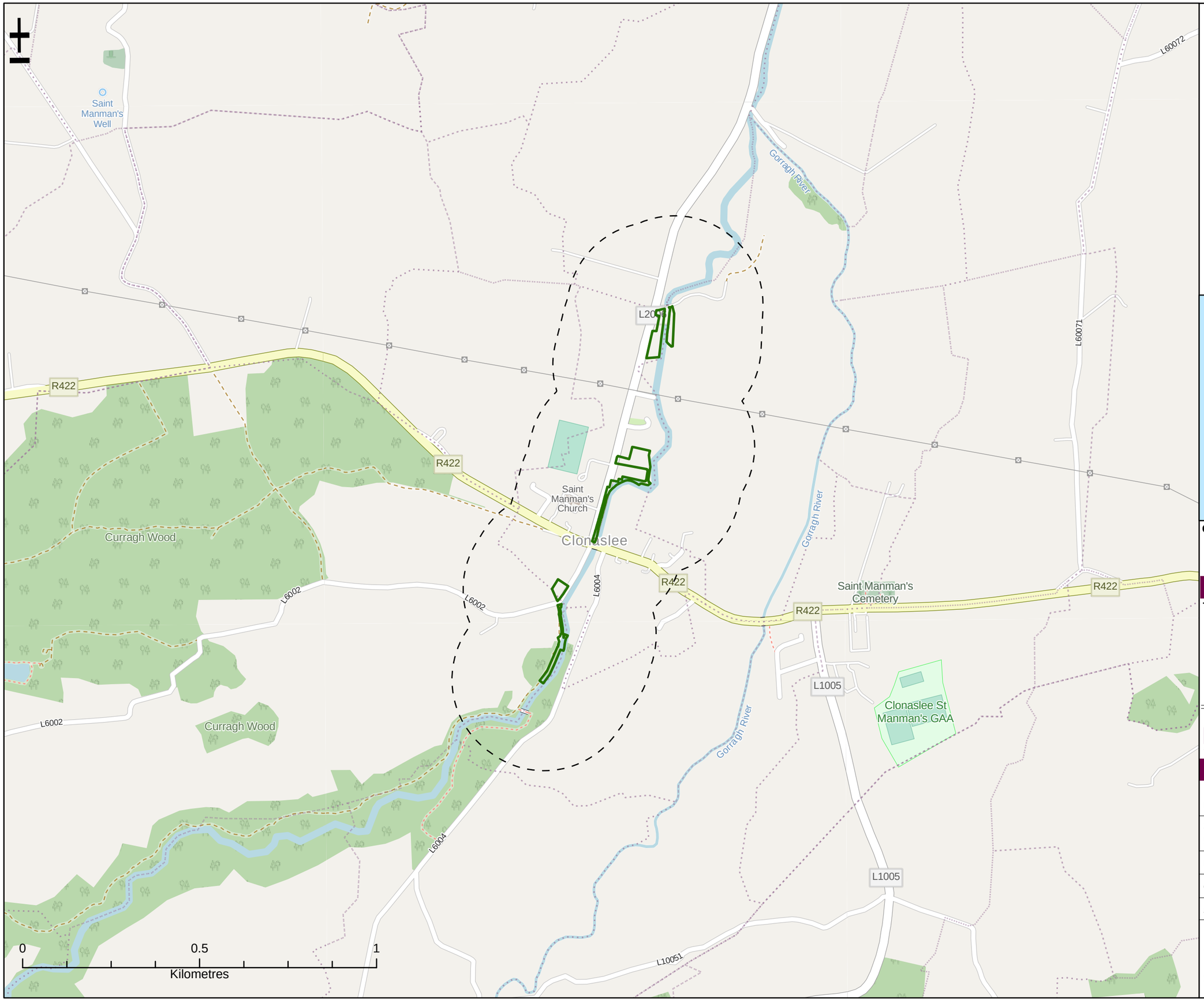
Pollutant	Averaging Time	Interim Target				AQG
		1	2	3	4	
$PM_{2.5}$ (µg/m^3)	Annual	35	25	15	10	5
	24-hour	75	50	37.5	25	15
PM_{10} (µg/m^3)	Annual	70	50	30	20	15
	24-hour	150	100	75	50	45
O_3 (µg/m^3)	Annual	100	70	-	-	60
	24-hour	160	120	-	-	100
NO_2 (µg/m^3)	Annual	40	30	20	-	10
	24-hour	120	50	-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

12.2.2 Zone of Influence

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

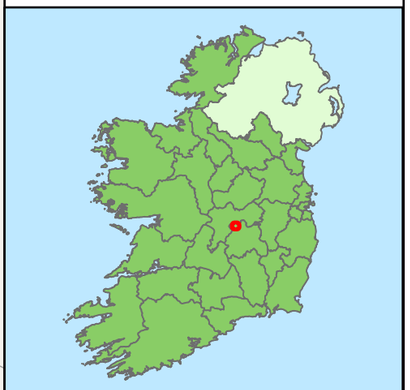
- A 'human receptor' within:
  - 250 m of the boundary of the site; or
  - 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the site entrance(s).
- An 'ecological receptor' within:
  - 50 m of the boundary of the site; or
  - 50 m of the route(s) used by construction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

To ensure a robust assessment the zone of influence (ZoI) for the construction phase dust impacts is set at 250 m from the temporary landtake boundary, as can be seen in **Figure 12-1**.



Legend

- Zone of Influence (250m)
- Works Area



Client

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Clonaslee FRS

Title

Figure 12-1
Zone of Influence

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NOTE:

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2.

The Proposed Scheme centres along the Clodiagh River that runs through Clonaslee, County Laois. Clonaslee is located upstream of the confluence where the River Clodiagh and Gorragh River converge. The Proposed Scheme aims to alleviate flooding intensity associated with the Clodiagh River along three sections, including:

- Area 1- Brittas Woods;
- Area 2- Chapel Street; and
- Area 3- Tullamore Road and ICW.

The design for each of the elements for the Proposed Scheme were selected to achieve the target Standard of Protection (SoP) for fluvial floods to protect areas from flood risk within the community of Clonaslee. All proposed works are planned for the Clodiagh River with no works considered necessary on the Gorragh River.

12.2.3 Sources of Information to Inform the Assessment

The baseline ambient air quality environment has been characterised through a desk study of publicly available published data sources and baseline ambient monitoring surveys undertaken in the area by the EPA.

A desk-based air quality assessment was carried out following TII's guidelines. The guideline states 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 most recent EPA Annual Air Quality in Ireland reports detail the range and scope of monitoring undertaken throughout Ireland and data from these reports is referenced to inform the baseline air quality.

A review of potentially sensitive ecological areas has also been conducted using the National Parks and Wildlife Services (NPWS) online mapping services.

12.2.4 Key Parameters for Assessment

The following aspects were considered in the assessment of potential effects of the Proposed Scheme 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 Scheme;
- Plant emissions from diesel use on mobile and fixed plant engaged in the construction phase; and
- Road traffic emissions from transport of personnel and materials to and from site for consultation activities.

Operational Phase

Due to the nature of the Proposed Scheme, there are unlikely to be any emissions to atmosphere during the operational phase. There may be some minor dust emissions and vehicle or plant emissions if maintenance work is required; however, these will be temporary and highly infrequent in nature. It is not predicted that maintenance dust emissions or vehicle or plant emissions will have a significant impact on air quality. Therefore, operational phase air quality impacts have been screened out of this assessment.

12.2.5 Assessment Criteria and Significance

12.2.5.1.1 Impact Assessment Criteria for Construction Dust

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.

The USEPA states that it is typical to assume no dust is generated under 'wet day' conditions where rainfall greater than 0.2mm has fallen. The 30-year average rainfall (1991-2020) from Birr, the closest weather station to the Proposed Scheme with available data, shows that on average 206 days (55%) will experience rainfall greater than 0.2mm. High levels of moisture either retained in soil or because of rainfall help suppress the generation of dust due to the cohesive nature of water between dust particles. Rain also assists in removing dust from the atmosphere through washout. Wind can lift particles up into the air and transport the dust downwind as well as drying out the surface. The worst dust deposition conditions typically occur, therefore, 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 Scheme, 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 in the tables below under the headings of demolition, earthworks, construction and track-out, based on a series of criteria set out by the IAQM. The risk of potential for dust impacts with respect to dust nuisance, human health and ecology are a function of magnitude of the dust generation at each construction site in combination with the sensitivity of the surrounding area as detailed in **Section 12.3.2**.

Demolition

Dust emission magnitude from demolition can be classified as small, medium, or large and are described as follows (**Table 12-4**):

- Large: 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;
- Medium: Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material, demolition activities 6-12 m above ground level; and
- Small: 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.

Table 12-4: Risk of Dust Impacts - Demolition

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

12.2.5.1.2 Earthworks

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 and are described as follows (**Table 12-5**):

- 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;
- Medium: 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; and
- Small: 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.

Table 12-5: Risk of Dust Impacts - Earthworks

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

12.2.5.1.3 Construction

Dust emission magnitudes from construction can be classified as small, medium, or large and are described as follows (**Table 12-6**):

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

Table 12-6: Risk of Dust Impacts – Construction

Sensitivity ofArea	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

12.2.5.1.4 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 and are described as follows **Table 12-7**.

- Large: >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;
- Medium: 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; and
- Small: <20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length

Table 12-7: Risk of Dust Impacts – Track Out

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

12.2.5.2 Impact Assessment Criteria for Human Receptors (Road Traffic)

The TII Guidance (PE-ENV-01106) states that the magnitude of change from road traffic emissions should be used to describe the quality of the effect as positive, negative, or neutral using the criteria in **Table 12-8.** In addition, the impact descriptors in

Table 12-9 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.

Table 12-8: 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 12-9: TII Impact Descriptors

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

12.2.5.3 Impact Assessment Criteria for Ecological Receptors

The impact of nitrogen deposition from traffic emissions is also considered in the assessment at ecologically sensitive areas such as European or Nationally designated sites. The relevant assessment criteria employed in the TII guidance is summarised in **Table 12-10**, which is largely based around the critical loads for nitrogen.

Table 12-10: TII Assessment Criteria for Sensitive Designated Habitats

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

Where total N deposition and acid deposition are more than 1% of the critical load, the project biodiversity practitioner should consider the following:

- Factors such as the nature of site management;
- Other factors such as regular flooding in maintaining a suitable habitat;
- The degree of sensitivity to fauna to relatively subtle changes in botanical composition;
- Whether nitrogen or phosphorous is the key limiting nutrient; and

- The extent of the sensitive designated site that is negatively affected should be taken into consideration.

Where significant effects are determined, site survey information is required to determine if the sensitive habitat of relevance is actually present in the affected area and to inform potential mitigation measures that may be required.

The Slieve Bloom Special Protection area and Special Area of Conservation is located on the R422 west of the village. The Proposed Scheme is located within this boundary and hen harriers are noted as the qualifying interest. The protected habitats located in this area include 4010 Northern Atlantic Wet Heath, 7130 Blanket Bog and 91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*).

It should be noted that there is no recommended empirical critical range for the 91E0 habitat. The critical loads for each of these habitats can be seen in **Table 12-11**.

The 'Review and revision of empirical critical loads of nitrogen for Europe' (German Environment Agency, 2022) provides a 2022 critical load for a variety of habitats of relevance to the Slieve Bloom site. The strictest critical load relates to raised and blanket bogs with a critical load of the range 5-10 kg/ha/year.

Table 12-11: Critical loads of nutrient nitrogen (CLempN) for Annex I habitats in the Atlantic[1]

Annex I code	EUNIS[a] code 2007	$CL_{emp}N$[b] ICP M&M	No. z– (No. PI)	No. z+ (No. PI)	z– CP	z+ CP	CLN_{max}	$CL_{emp}N$ ABR
1xxx[c]	A2.5x	20–30	15 (11)	8 (9)	7.8	7.5	–	5–10
21xx[d]	B1.x [N]	10–20	7 (6)	0 (0)	6.2	10.3[e]	–	5–10
4010	F4.11 [S]	10–20	11 (4)	6 (5)	4.7	6.4	4.5	5–10
4030	F4.2 [S]	10–20	17 (0)	5 (0)	5.6	7.6	6.1	5–10
4060	F2.2 [S]	5–15	15 (5)	6 (1)	5.6	5.6	2.9	5–10
5130[f]	F3.16 [S]	–	19 (16)	23 (11)	6.2	6.6	–	5–10
6210	E1.26 (E1.2) [R]	15–25	68 (7|10)[g]	33 (3|8)	6.5	8.6	12.1	5–15
6230	E1.7 (E1.71) [R]	10–15	18 (0|0)	11 (0|5)	5.1	5.5	4.5	5–15
6410	E3.51 [R]	15–25	26 (1|8)	19 (0|3)	6.8	6.7	14.8	5–15
6430	E5.5 [R]	–	20 (2)	10 (5)	5.6	8.6	12.4	5–15
6510	E2.2 [R]	20–30	8 (0|1)	11 (0|1)	6.4	10.4	11.3	5–15
7110[h]	D1.11 [Q]	5–10	4 (3)	5 (2)	6.7	10.2	–	5–10
7130	D1.22 [Q]	5–10	15 (8)	12 (6)	6.1	8.3	4.7	5–10
7230	D4.1 [Q]	15–30	5 (2)	2 (1)	5.5	6.1	–	5–10
8220	H3.1	–	2 (1)	0 (0)	5.4	6.9[e]	–	5–10
8240	H3.511	–	15 (8)	8 (4)	5.8	6.1	–	5–10
91A0	G1.83 [T]	10–15	62 (17)	8 (0)	8.1	10.1	–	10–15

12.2.6 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.

12.2.7 Consultation

As part of statutory consultation, the Environmental Protection Agency (EPA) and the Health Service Executive (HSE) were contacted, but no submissions were received.

[1] EPA, 2021. https://www.epa.ie/publications/research/air/Research_Report_390.pdf

12.3 Description of the Existing Environment (Baseline Scenario)

12.3.1 Baseline Air Quality

As part of the implementation of the Air Quality Standards Regulations 2011, four air quality zones have been defined in Ireland for air quality management and assessment purposes. The four areas are as follows:

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

In terms of air monitoring zoning, the area of the Proposed Scheme (refer to **Section 12.2.4**) is located within air quality Zone D. The nearest air quality monitoring sites with historic data available are located in Emo Court, Kilkitt, Edenderry, and Longford (for $PM_{2.5}$).

12.3.1.1 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. Long term NO_2 monitoring was carried out at two rural Zone D locations in Emo and Kilkitt in recent years by the EPA.

The NO_2 annual mean in 2022 was 2 µg/m^3 at Kilkitt, and 3 µg/m^3 at Emo Court. Long-term average concentrations measured at all locations were significantly lower than the annual average limit value of 40 µg/m^3. Concentrations of NO_2 over the period 2018 – 2022 in Kilkitt and Emo Court are summarised in **Table 12-12.** Results for the period 2018 to 2022 are well below the statutory limit for the protection of human health and are also below the WHO Guideline (see **Table 12-1** and **Table 12-3**).

Table 12-12: Trends in Zone D Air Quality – Nitrogen Dioxide

Station	Averaging Period	Year				
		2018	2019	2020	2021	2022
Kilkitt	Annual Mean NO_2 (µg/m^3)	3	5	2	2	2
Emo Court	Annual Mean NO_2 (µg/m^3)	3	4	4	4	3

12.3.1.2 Particulate Matter

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

Continuous PM_{10} monitoring was carried out by the EPA at Edenderry and Kilkitt. Long-term PM_{10} measurements carried out at the Zone D location in Edenderry, Co. Offaly in 2022 gave an average level of 17.7 µg/m^3, and measurements in Kilkitt gave an average level of 9 µg/m^3. Data for PM_{10} is presented in **Table 12-13**. The PM_{10} data shows levels in the range of 17.7 – 17.8 µg/m^3 at Edenderry, which is an urban location, and in the range of 7-9 µg/m^3 in Kilkitt, which is a more rural location. Both of these values are well below the statutory limit value of 40 µg/m^3, and below the WHO Guideline at Kilkitt but above the guideline in Edenderry (see **Table 12-3**).

Table 12-13: Trends in Zone D Air Quality – PM_{10}

Station	Averaging Period	Year				
		2018	2019	2020	2021	2022
Edenderry	Annual Mean PM_{10} (µg/m^3)	-	-	-	17.8	17.7
Kilkitt	Annual Mean PM_{10} (µg/m^3)	9	7	8	8	9

12.3.1.2.1 $PM_{2.5}$

EPA annual mean concentrations of $PM_{2.5}$ at the Zone D background location of Co. Longford over the period 2018 – 2022 ranged from 9-11 µg/m^3 (see **Table 12-14**). Based on this information a background $PM_{2.5}$ concentration of 9 µg/m^3 has been used in this assessment, which is well below the statutory limit value of 25 µg/m^3 but above the WHO Guideline (**Table 12-3**).

Table 12-14: Trends in Zone D Air Quality $PM_{2.5}$ (µg/m^3)

Station	Averaging Period	Year				
		2018	2019	2020	2021	2022
Longford	Annual Mean PM_{10} (µg/m^3)	9	9	9	9	11

12.3.2 Baseline Dust Sensitivity Assessment

An appraisal has been carried out to assess the risk to sensitive receptors because of dust soiling, health impacts and ecological impacts due to the construction phase in accordance with the IAQM Guidance. This appraisal reviews the sensitivity of the site's location with respect to dust nuisance, human health and ecological impacts and then calculates a risk of impact using the magnitude of site activities.

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

- High sensitivity receptor with respect to dust nuisance – surrounding land where:
  - Users can reasonably expect enjoyment of a high level of amenity;
  - The appearance, aesthetics or value of their property would be diminished by soiling;
  - The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land; or
  - Examples include dwellings, museums and other culturally important collections, medium and long-term car parks, and car showrooms.
- 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
  - Locations with a national designation where the features may be affected by dust deposition.
  - Indicative example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.
- Low sensitivity receptor with respect to ecology – surrounding land where:
  - Locations with a local designation where the features may be affected by dust deposition; or
  - Indicative example is a local Nature Reserve with dust sensitive features.

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

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

The sensitivity of the area is considered as per the criteria outlined in the IAQM Guidance and as reproduced in **Table 12-15, Table 12-16** and **Table 12-17.**

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 12-18, the sensitivity of the area to dust soiling can be established. The sensitivity will change along the linear project with some areas more sensitive to potential dust soiling effects than others with **Area 1** classed as **'Low'**, **Area 2** classed as **'High'** and **Area 3** classed as **'Medium'** sensitivity to dust soiling effects on people and property.

Table 12-15: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

The IAQM Guidance also outlines the criteria for assessing the human health impact from PM_{10} emissions from construction activities based on the current annual mean PM_{10} concentrations, receptor sensitivity and the number of receptors effected as per **Table 12-16**. The annual mean background PM_{10} concentration was reviewed in **Section 12.3.1.3.** This found concentrations to be significantly less than 24 µg/m^3 (see **Table 12-13**). With this taken into consideration, as there are between 10-100 residential receptors all over 20m away from the project boundary, the sensitivity of the three project areas to human health impacts is considered **'Low'**.

Table 12-16: Sensitivity of the Area to PM_{10} Human Health Impacts

Receptor Sensitivity	Annual Mean PM10 Concentration	Number of Receptors	Distance from Source (m)				
			<20	<50	<100	<200	<350
High	> 32µg/m^3	>100	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1 – 10	High	Medium	Low	Low	Low
	28µg/m^3 - 32µg/m^3	>100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 – 10	High	Medium	Low	Low	Low
	24µg/m^3 – 28µg/m^3	>100	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 – 10	Medium	Low	Low	Low	Low
	< 24µg/m^3	>100	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low
		1 – 10	Low	Low	Low	Low	Low
Medium	> 32µg/m^3	>10	High	Medium	Low	Low	Low
		1 – 10	Medium	Low	Low	Low	Low
	28µg/m^3 - 32µg/m^3	>10	Medium	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	24µg/m^3 - 28µg/m^3	>10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low

	< 24µg/m^3	>10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Low	-	1+	Low	Low	Low	Low	Low

An assessment of the Proposed Scheme was completed with respect to the sensitivity criteria presented in **Table 12-15** and **Table 12-16**. Where the number of receptors was not clear, conservative sensitivities were assumed. In addition, when calculating the sensitivity with respect to human health, the background concentrations of particulates were reviewed.

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 asacidity to soils. Often impacts will be reversible once the works are completed and dust deposition ceases. As shown in **Table 12-17** the sensitivity of the area to ecological impacts is considered **'Medium'** for **Area 1** and **'Low'** for **Areas 2 and 3** under this guidance without adequate mitigation.

Table 12-17: 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 to dust nuisance, human health and ecological impacts is shown in **Table 12-18**. Ecology sensitivity was given a 'Medium' rating for **Area 1**, as the Slieve Bloom SPA is located <50m from a high sensitivity source. Nuisance sensitivity was also given a 'Medium' rating for **Area 3** as there is a high sensitivity receptor (dwellings) <50m from source, with 10-100 dwellings present. Nuisance sensitivity for **Area 2** was rated 'High' as there is a high sensitivity receptor (dwellings and school) <20m with 10-100 receptors present.

Table 12-18: Summary of Sensitivity of the Area to Dust

Location	Description of Works	Nuisance Sensitivity	Human Health Sensitivity	Ecology Sensitivity
Area 1: Brittas Wood	• Embankment • Debris trap with access slipway • Culvert remediation • Compound 1	Low	Low	Medium
Area 2: Chapel Street	• Flood wall • Compound 2	High	Low	Low
Area 3: Tullamore Rd and Integrated Constructed Wetland (ICW)	• Flood wall • Embankment	Medium	Low	Low

12.4 Description of the Likely Significant Effects

12.4.1 Evolution of the Environment in the Absence of the Proposed Scheme

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 Proposed Project 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 absence of the Proposed Scheme the air quality in the area will continue to develop in line with trends in the wider area (including influences from new developments in the surrounding area, changes in road traffic, etc.).

12.4.2 Construction Plant Emissions

Construction of the proposed scheme in each area will require a mobile plant in operation during the construction phase in each of the three areas. Each of these areas of the proposed scheme will also include a site compound.

12.4.3 Construction Phase

The greatest potential impact on air quality during the construction phase is from construction dust emissions, PM_{10} and $PM_{2.5}$ emissions and the potential for nuisance dust. Dust is characterised as encompassing particulate matter with a particle size of between 1 and 75 microns (1- 75µm), and therefore includes both PM_{10} and $PM_{2.5}$, which have a particle size of 10 µm and 2.5 µm respectively Deposition typically occurs in close proximity to each site and potential impacts generally occur within 250m of the route used by construction vehicles on the public road, up to 250m from the site entrance.

Large particle sizes (greater than 75 microns) fall rapidly out of atmospheric suspension and are subsequently deposited in close proximity to the source. Particle sizes of less than 75 microns are of interest as these can remain airborne for greater distances and give rise to the potential dust nuisance at the sensitive receptors.

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 Scheme. 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 – removes 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 – potential for resuspension of dust as vehicles move around the site;
- Extraction of material – works will be broken down into different types however all will involve the movement of potentially dusty material which has the potential to generate dust; and
- Stockpiling of material – stockpiles have the potential to generate dust due to dry material movement and wind erosion.

In order to determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generation at each site needs to be taken into account in conjunction with the previously established sensitivity of the area. Using the appraisal criteria for the assessment of risk at sensitive receptors as detailed in **Table 12-4** to **Table 12-7,** a summary of dust emission magnitudes from the main construction sites is shown in **Table 12-19.**

12.1 The resultant requirement levels (i.e. high, medium or low levels of mitigation) for mitigation with respect to nuisance dust, health impacts and ecological impacts are shown in

12.2 **Table** 12-20 to

Table 12-23 and an overall summary provided in **Table 12-24**.

The mitigation requirement levels take into account the sensitivity of the location established in **Section 12.2.4** and the activities conducted on site which may generate dust, the assessment finds that a low level of dust mitigation is required for the majority of sites. Consistent implementation of good dust minimisation practices will ensure that the impact from construction dust is localised, reversible and not significant.

Table 12-19: Summary of Emission Magnitude

Location	Description of Works	Demolition	Earthworks	Construction	Track-out
Area 1: Brittas Wood	• Embankment • Debris trap with access slipway • Culvert remediation • Compound 1	Small	Small	Small	Medium
Area 2: Chapel Street	• Flood wall • Compound 2	Small	Small	Small	Medium
Area 3: Tullamore Rd and Integrated Constructed Wetland (ICW)	• Flood wall • Embankment	Small	Small	Small	Medium

Table 12-20: Summary of Demolition Risk to Define Site-Specific Mitigation

Location	Description of Works	Dust Nuisance Risk	Human Health Risk	Sensitive Ecology Risk
Area 1: Brittas Wood	• Embankment • Debris trap with access slipway • Culvert remediation • Compound 1	Negligible	Negligible	Low
Area 2: Chapel Street	• Flood wall • Compound 2	Low	Negligible	Negligible
Area 3: Tullamore Rd and Integrated Constructed Wetland (ICW)	• Flood wall • Embankment	Low	Negligible	Negligible

Table 12-21: Summary of Earthworks Risk to Define Site-Specific Mitigation

Location	Description of Works	Dust Nuisance Risk	Human Health Risk	Sensitive Ecology Risk
Area 1: Brittas Wood	• Embankment • Debris trap with access slipway • Culvert remediation • Compound 1	Negligible	Negligible	Low
Area 2: Chapel Street	• Flood wall • Compound 2	Low	Negligible	Negligible
Area 3: Tullamore Rd and Integrated	• Flood wall	Low	Negligible	Negligible

Constructed Wetland (ICW)	• Embankment

Table 12-22: Summary of Construction Risk to Define Site-Specific Mitigation

Location	Description of Works	Dust Nuisance Risk	Human Health Risk	Sensitive Ecology Risk
Area 1: Brittas Wood	• Embankment • Debris trap with access slipway • Culvert remediation • Compound 1	Negligible	Negligible	Negligible
Area 2: Chapel Street	• Flood wall • Compound 2	Low	Negligible	Negligible
Area 3: Tullamore Rd and Integrated Constructed Wetland (ICW)	• Flood wall • Embankment	Negligible	Negligible	Negligible

Table 12-23: Summary of Track out Risk to Define Site-Specific Mitigation

Location	Description of Works	Dust Nuisance Risk	Human Health Risk	Sensitive Ecology Risk
Area 1: Brittas Wood	• Embankment • Debris trap with access slipway • Culvert remediation • Compound 1	Low	Low	Medium
Area 2: Chapel Street	• Flood wall • Compound 2	Medium	Low	Low
Area 3: Tullamore Rd and Integrated Constructed Wetland (ICW)	• Flood wall • Embankment	Medium	Low	Low

The risk of dust impacts arising from the Proposed Scheme are summarised in **Table 12-24**. 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 medium risk, and therefore represent a **short term moderate negative impact** without mitigation.

Table 12-24: Summary Overall Dust Impact Risk to Define Site-Specific Mitigation

Location	Description of Works	Worst Case Risk
Area 1: Brittas Wood	• Embankment • Debris trap with access slipway • Culvert remediation • Compound 1	Medium
Area 2: Chapel Street	• Flood wall • Compound 2	Medium
Area 3: Tullamore Rd and Integrated Constructed Wetland (ICW)	• Flood wall • Embankment	Medium

12.4.4 Construction Traffic

The transport of material to and from the site will generate additional temporary traffic on the existing road network. The TII guidelines state that increases in Annual Average Daily Traffic (AADT) flows of less than 10% during the construction phase are unlikely to result in significant air quality effects. The construction activities are planned to take place during a 24-month construction campaign, so any effects will be short term.

12.4.4.1 Construction Traffic Local Impacts on Human Receptors

In addition to regional emissions, the scheme may also have implications for local receptors such as residential properties or other sensitive receptors, through the short-term effects of construction traffic. Indicative daily movements for one construction team operating on site are provided below:

- Six vehicles (cars/vans) will arrive on site in the morning (07:00 – 08:00) and depart in the evening (18:00 – 19:00), Mon to Friday; 08:00 to 14:00 Saturday; and
- Up to two Heavy Goods Vehicle (HGV) will arrive and depart the site per hour throughout the typical working day (07:00 – 19:00), Mon to Friday; 08:00 to 14:00 Saturday.

The closest sensitive receptor to the proposed scheme is St. Brigid's National School. This analysis takes this school and the most sensitive residential property into account to assess the air quality impact from construction traffic.

Using TII's Road Emissions Model and traffic data, the baseline and the construction phase traffic were compared using the existing and proposed layouts as appropriate and based on the distances of receptors to roads. The results of assessment are presented in **Table 12-25**.

Results show an increase in emissions during the construction phase, but this will be a short term, temporary effect. Levels will remain below the statutory limits for the protection of human health, but above WHO air quality guidelines.

Employing the significance criteria in **Table 12-8**, this equates to a **neutral** or **negligible** effect for air quality using the statutory limits as the comparator.

Table 12-25: Local Impact to Air Quality as a result of Construction Traffic

Parameter	Nitrogen Dioxide (NO_2) (µg/m^3)	Particulate Matter PM_{10} (µg/m^3)	Particulate Matter $PM_{2.5}$ (µg/m^3)
Background	3	17.7	11
Total (during construction stage) Link 1	6.94	20.05	12.35
Total (during construction stage) Link 2	3.2	17.83	11.07
Statutory limit (Annual Limit for Protection of Human Health) (µg/m^3) (Based on CAFÉ directive)	40	40	25
WHO Air Quality Guidelines (Annual) (µg/m^3)	10	15	5

12.4.4.2 Construction Traffic Local Impacts on Ecological Receptors

The principal pollutants of concern which originate from road developments are the NO_x in terms of impact on sensitive ecosystems. Nitrogen oxides may have a positive or negative impact by acting as a fertiliser or a phytotoxicant. Effects are mainly on vegetation growth, photosynthesis, and nitrogen assimilation or metabolism.

The proposed scheme is located close to the Slieve Bloom Mountains SPA. The relevant habitat types have been identified at this site along with the critical load levels in Section **12.2.5.3**.

Given the ecological sensitivity of the ecosystems in the vicinity of the proposed scheme, a nitrogen deposition assessment was undertaken, the results of which can be seen in **Table 12-26**.

Employing the significance criteria of **Table 12-8**, the impacts on air quality in these habitats is considered **negligible**. The total N deposition is less than 1% of the critical load, and therefore deemed **Not Significant**.

Table 12-26: Road Nitrogen Dioxide at Slieve Bloom SPA

Designated Site	Parameter	Level
Slieve Bloom SPA	Background ($\mu g/m^3$)	3
	Road NO_x ($\mu g/m^3$)	0.28
	Nutrient Nitrogen Deposition (kg/ha/year)	0.04

12.4.5 Operational Phase

Due to the nature of the Proposed Scheme, there will be no emissions to atmosphere during the operational phase. Therefore, there is no potential for effects to air quality as a result of the Proposed Scheme. The operational phase is considered neutral in terms of air quality.

12.5 Mitigation Measures

12.5.1 Construction Phase

Before commencing relevant works, a Dust Management Plan (DMP) shall be prepared by the appointed main contractor and submitted for approval to the relevant planning authority. The plan must include all appropriate dust and emissions mitigation measures, applicable to the circumstances of the relevant site, based on the mitigation in this EIAR and local authority requirements and industry best practices.
The plan will be developed by the main contractor and for each worksite shall include:

- An inventory and timetable of activities which may give rise to emissions or dust;
- Alert levels;
- Alert system to be used (including notification process);
- Details of control measures;
- Details of dust monitoring arrangements, including the location of sensitive receptors, monitoring locations, and monitoring equipment to be used.
- Details of the air quality reporting requirements.

To reduce dust nuisance, a series of measures will be implemented including:

- Material handling systems and site stockpiling of materials will be designed and laid out to minimise exposure to wind. Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- Liaison with local authorities and community groups.
- Hoarding will be provided around the construction compounds.
- It is anticipated that methods of collecting rainwater and recycling for general site use, will be adopted where practical.

Strict dust prevention will be always in place, to minimise any potential emissions and these procedures will be strictly monitored and assessed. In the event of dust nuisance occurring outside the site boundary, movements of materials likely to raise dust will be curtailed and satisfactory procedures implemented to rectify the problem before the resumption of construction operations.

Consistent implementation of good dust minimisation practices will ensure that the impact from construction dust is short-term, localised, reversible, and not significant.

12.5.2 Operational Phase

As all ambient air pollutants will remain in compliance with the ambient air quality standards and the Proposed Scheme has negligible effects at all modelled receptors no specific operation phase mitigation measures are required.

12.6 Residual Impacts

12.6.1 Construction Phase

When the dust minimisation measures detailed in the mitigation section of this chapter are implemented, fugitive emissions of dust from the site are not predicted to be significant and pose no nuisance, human health, or ecological risk to nearby receptors. Thus, there will be no residual construction phase dust impacts. Consistent implementation of good dust minimisation practices will ensure that the impact from construction dust is localised and a short term slight negative impact.

Given that the expected peak traffic construction traffic volumes will be below the 10% of baseline traffic on the existing road network, the effect to air quality from this traffic is considered **negligible**.

12.6.2 Operational Phase

There are no predicted impacts to air quality as a result of the operational phase of the Proposed Scheme.

12.7 Monitoring

12.7.1 Construction Phase

Monthly monitoring of dust deposition levels will be undertaken for the duration of construction for comparison with the guideline of 350 mg/m2/day (for non-hazardous dusts). This monitoring shall be carried out at a series of locations based on potential risk of dust nuisance during the construction phase of the Proposed Scheme. This monitoring should be carried out at a minimum of three locations (Compound A, Compound B and Area 3) with a medium to high risk of dust nuisance and further monitoring locations at sensitive receptors around the proposed works. This can be carried out using the Bergerhoff method in accordance with the requirements of the German Standard VDI 2119. The Bergerhoff Gauge consists of a collecting vessel and a stand with a protecting gauge. The collecting vessel is secured to the stand with the opening of the collecting vessel located approximately 2 m above ground level. The TA Luft limit value is 350 mg/m^2/day (for non-hazardous dusts) during the monitoring period between 28 – 32 days.

Where dust levels are measured to be above the guideline of 350 mg/m2/day, the mitigation measures in the area must be reviewed and improved to ensure that dust deposition is reduced to below 350 mg/m2/day. Should high dust levels continue to occur following these improvements, the contractor will provide alternative mitigation measures and/or will modify the construction works taking place.

12.7.2 Operational Phase

There is no monitoring recommended for the operational phase of the Proposed Scheme as there are no potential effects to air quality. The EPA have monitoring stations for air quality in Kilkitt, Edenderry and Emo Court.

12.8 Interactions and Cumulative Effects

There is potential for interactions between Air Quality and other environmental factors including Traffic & Transport, Population & Human Health, Land, Soils & Hydrogeology, Biodiversity; and Climate. There is also

According to the IAQM guidance (2024), there is the potential for cumulative dust impacts to any nearby sensitive receptors should the construction phase of the Proposed Scheme coincide with the construction phase of any other permitted projects within 250 m of the site. If a simultaneous construction phase were to occur this would result in cumulative dust soiling and dust-related human health and ecological effects

associated with the proposed works localised to the works area. Seven projects were screened out as they were more than 250m from the project site. Four projects were screened in for potential cumulative effects.

Please see **Chapter 18 Interactions and Cumulative Effects** for details.

12.9 Schedule of Environmental Commitments

Chapter 20 Schedule of Environmental Commitments collates all the mitigation and monitoring commitments recommended in this chapter.

12.10 Conclusion

Table 12-27 collates all the mitigation and monitoring commitments recommended in this chapter. Construction phase impacts of the Proposed Scheme will be short-term in durations. Operational phase impacts were screened out of this assessment.

Table 12-27: Summary of Likely Significant Effects and Environmental Commitments

Description of Impact	Magnitude of Impact	Importance of Receptor	Significance of Effect	Controls and Mitigation Measures	Residual Effect
Construction dust soiling and dust-related human health and ecological effects	Small to Medium	Medium to Low	Short-term, direct, negative, localised, negligible to slight, not significant.	Implement dust mitigation measures.	Short-term, direct, negative, localised, negligible, not significant.
Construction Traffic dust generation	Small to Medium	Medium to Low	Short-term, direct, negative, localised, negligible to slight, not significant.	Implement dust mitigation measures.	Short-term, direct, negative, localised, negligible, not significant.
Operational dust soiling and dust-related human health and ecological effects	N/A*	N/A*	N/A*	N/A*	N/A*
Operational traffic dust generation	N/A*	N/A*	N/A*	N/A*	N/A*

N/A* = operational phase air quality impacts have been screened out of this assessment.

12.11 Chapter References

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