



TKUP – Westfield Substation Extension

Air Quality Assessment

August 2026

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Project Number:
331201479

TKUP – Westfield Substation Extension

Revision	Description	Author	Date	Quality Check	Date	Independent Review	Date
Draft	Draft	WS	January 2026	ER	January 2026	PB	January 2026
Final	Final	WS	August 2026	ER	August 2026	PB	August 2026



TKUP – Westfield Substation Extension

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1 Introduction

1.1 Proposed Development

- 1.1.1 SP Transmission (SPT) (the 'Applicant') has commissioned Stantec to undertake an air quality assessment to support a Planning Permission in Principle application for the extension of the Westfield Substation, decommissioning of the 275kV elements of the existing Westfield Substation and associated works (the 'Proposed Development') in Cardenden, Lochgelly Fife, KY5 0HQ (the 'Site'). The Site is located within the administrative boundary of Fife Council (FC).

1.2 Scope of Assessment

- 1.2.1 This report describes existing air quality within the study area and assesses the impact of the construction and operation of the Proposed Development on air quality in the study area. The Site itself is not considered sensitive to poor air quality due to the nature of the proposed end-use (i.e. non-residential).
- 1.2.2 The main air pollutants of concern related to construction are dust and fine particulate matter (PM₁₀) associated with on-site construction activities and off-site trackout.
- 1.2.3 The main air pollutants of concern during the operational period are nitrogen dioxide (NO₂), PM₁₀ and PM_{2.5} emissions associated with road traffic and emissions from a standby diesel generator.
- 1.2.4 The main air pollutants of concern related to decommissioning are dust and PM₁₀ associated with on-site construction activities and off-site trackout.
- 1.2.5 The assessment has been prepared taking into account relevant local and national guidance, policy and legislation.
- 1.2.6 A glossary of terms used in this assessment is provided in **Appendix A**. This assessment is also supported by **Chapter 9: Air Quality** of the Environmental Statement.

1.3 Consultation

- 1.3.1 A request for an EIA Scoping Opinion was submitted to FC in July 2024 (planning reference 24/01927/SCO) which outlined the proposed scope and methodology of the air quality assessment. An EIA Scoping Opinion was received from FC in September 2024. FC's Land and Air Quality team stated that they were satisfied with the information provided in the scoping report and had no further comments.



2 Legislation, Policy and Guidance

2.1 Air Quality Regulations

- 2.1.1 The National Air Quality Objectives (NAQOs) set out in the Air Quality (Scotland) Regulations 2000 (as subsequently amended by the Air Quality (Scotland) Amendment Regulations 2002 and the Air Quality (Scotland) Amendment Regulations 2016) provide the statutory basis for the air quality objectives under Local Air Quality Management (LAQM) in Scotland. These are set out in Scotland's LAQM Policy Guidance 2024 ((LAQM.PG(24)) (Scottish Government, 2024) and are shown in **Table 2-1**.
- 2.1.2 The Air Quality Standards Regulations 2010 (AQSR) were put in place to transpose the European Union's (EU) Directive on ambient air quality and cleaner air for Europe (2008/50/EC) (European Parliament, Council of the European Union, 2008) however, these are less stringent than the NAQOs.
- 2.1.3 The relevant NAQOs for this assessment are shown in **Table 2-1**.

Table 2-1 Relevant Air Quality Objectives

Pollutant	Time Period	NAQOs	Source
NO ₂	1-hour mean	200 µg/m ³ not to be exceeded more than 18 times a year	NAQO
	Annual mean	40 µg/m ³	NAQO
PM ₁₀	24-hour mean	50 µg/m ³ not to be exceeded more than 17 times a year	NAQO
	Annual mean	18 µg/m ³	NAQO
PM _{2.5}	Annual mean	10 µg/m ³	NAQO

National Air Quality Plan for NO₂ in the UK

- 2.1.4 The UK Air Quality Plan for NO₂ (DEFRA, 2018) sets out how the Government (and devolved administrations) planned to deliver reductions in NO₂ throughout the UK, with a focus on reducing concentrations to below the EU limit values throughout the UK within the "*shortest possible time*".
- 2.1.5 The plan requires all Local Authorities (LAs) to develop local plans to improve air quality and identify measures to deliver reduced emissions, with the aim of meeting the Limit Values within their area within "*the shortest possible time*". Potential measures include changing road layouts, encouraging public and private ultra-low emission vehicle (ULEV) uptake, the use of retrofitting technologies and new fuels and encouraging public transport. In Scotland, the National Low Emission Framework (Scottish Government, 2019) was developed to help LAs consider transport related actions, such as Low Emission Zones (LEZs), to improve local air quality where transport is identified as the key contributor to air quality problems.

2.2 Air Quality Management

The Air Quality Strategy

- 2.2.1 Part IV of the Environment Act 1995 required the Secretary of State to prepare and publish and 'strategy' regarding air quality.
- 2.2.2 The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007) establishes the policy framework for ambient air quality management and assessment in the UK (DEFRA



in partnership with the Scottish Executive, The Welsh Assembly Government and the Department of the Environment for Northern Ireland, 2007). The primary objective of the Air Quality Strategy is to ensure that everyone can enjoy a level of ambient air quality which poses no significant risk to health or quality of life. The Air Quality Strategy sets out the NAQOs and Government policy on achieving these. In 2015, Scotland moved away from The Air Quality Strategy to the Clean Air for Scotland (CAFS) strategy (Scottish Government, 2015) and have since, in 2021, moved their focus to its successor Cleaner Air for Scotland 2.

Cleaner Air for Scotland 2 – Towards a Better Place for Everyone

2.2.3 In July 2021, the Scottish Government published 'Cleaner Air for Scotland 2 – Towards a Better Place for Everyone' (Scottish Government, 2021a) which is Scotland's second separate air quality strategy and sets out measures to further reduce air pollution over the period 2021-2026. The CAFS2 sets out how Scotland intends to deliver further air quality improvements around 10 general themes:

- Health
- Integrated Policy
- Placemaking
- Public Engagement and Behaviour Change
- Industrial Emissions Regulation
- Tackling Non-Transport Emissions Sources
- Governance, Accountability and Delivery
- Further Progress Local Planning Policy

Local Air Quality Management

2.2.4 Part IV of the Environment Act 1995 introduced a system of Local Air Quality Management (LAQM) which requires local authorities to regularly and systematically review and assess air quality within their boundary and appraise development and transport plans against these assessments.

2.2.5 Where a NAQO is unlikely to be met, the local authority must designate an Air Quality Management Area (AQMA) and draw up an Air Quality Action Plan (AQAP) setting out the measures it intends to introduce in pursuit of the NAQOs within its AQMA.

2.2.6 The Local Air Quality Management Technical Guidance 2022 ((LAQM.TG(22); (DEFRA, 2025)), issued by the Department for Environment, Food and Rural Affairs (DEFRA) for local authorities provides advice as to where the NAQOs apply. These include outdoor locations where members of the public are likely to be regularly present for the averaging period of the objective (which vary from 15 minutes to a year) as summarised in **Table 2-2**.

Table 2-2 Relevant Public Exposure

Averaging Period	NAQOs should apply at:	NAQOs do not apply at:
Annual mean	All locations where members of the public might be regularly exposed For example: Building façades of residential properties, schools, hospitals, care homes etc	Façades of offices or other places of work where members of the public do not have regular access Hotels, unless people live there as their permanent residence Gardens of residences



		Kerbside sites Any other location where public exposure is expected to be short term
24-hour mean and 8-hour mean	All locations where the annual mean NAQO would apply, together with hotels and gardens of residences	Kerbside sites Any other location where public exposure is expected to be short term
1-hour mean	All locations where the annual mean and 24 and 8-hour mean NAQOs apply as well as: Kerbside sites Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer.	Kerbside locations where the public would not be expected to have regular access
15-minute mean	All locations where members of the public might reasonably be regularly exposed for a period of 15 minutes or longer.	

2.3 Planning Policy

National Planning Policy

National Planning Framework (NPF) 4

- 2.3.1 National Planning Framework 4 (NPF4) (Scottish Government, 2023) is the national spatial strategy for Scotland. It sets out the spatial principles, regional priorities, national developments and national planning policy.

Policy 23 states that:

“... d) Development proposals that are likely to have significant adverse effects on air quality will not be supported. Development proposals will consider opportunities to improve air quality and reduce exposure to poor air quality. An air quality assessment may be required where the nature of the proposal or the air quality in the location suggest significant effects are likely.”

Local Planning Policy

Fife Local Development Plan (FIFEplan)

- 2.3.2 The Fife Local Development Plan was adopted in 2017 (Fife Council, 2017) and intends to shape the land use and planning for Fife and its communities until 2027. The policy relating to air quality has been set out below.

Policy 10 Amenity

“Development will only be supported if it does not have a significant detrimental impact on the amenity of existing or proposed land uses. Development proposals must demonstrate that they will not lead to a significant detrimental impact on amenity in relation to:



1. *Air quality, with particular emphasis on the impact of development on designated Air Quality Management Areas;*

[...]

Air Quality

Development proposals that lead to a breach of National Air Quality Standards or a significant increase in concentrations of air pollution within an existing Air Quality Management Area (AQMA) will not be supported.

Statutory supplementary guidance will provide additional information, detail and guidance on air quality assessments, including an explanation of how proposals could demonstrate that they would not lead to an adverse impact on air quality.”

Air Quality Strategy for Fife 2025-2030

- 2.3.3 The Air Quality Strategy for Fife was adopted in 2024 (Fife Council, 2024) and seeks to contribute to Fife becoming a healthier and more sustainable place. The strategy sets out the steps to be taken for the council to improve their air quality.

2.4 Assessment Guidance

- 2.4.1 The primary guidance documents used in undertaking this assessment are detailed below.

DEFRA ‘Local Air Quality Management Technical Guidance (LAQM.TG(22))’

- 2.4.2 DEFRA LAQM.TG(22) was published for use by local authorities in their LAQM review and assessment work (DEFRA, 2025). The document provides key guidance on aspects of air quality assessment, including screening, use of monitoring data, and use of background data that are applicable to all air quality assessments.

EPUK and IAQM ‘Land-Use Planning & Development Control: Planning for Air Quality’

- 2.4.3 EPUK and the IAQM have together published guidance to help ensure that air quality is properly accounted for in the development control process (EPUK and IAQM, 2017) (**Appendix C**). It clarifies when an air quality assessment should be undertaken, what it should contain, and how impacts should be described and assessed including guidelines for assessing the significance of impacts.

IAQM ‘Guidance on the Assessment of Dust from Demolition and Construction’

- 2.4.4 Guidance on the assessment of dust from demolition and construction has been published by the IAQM (IAQM, 2024). The guidance provides a series of matrices to determine the risk magnitude of potential dust sources associated with construction activities in order to identify appropriate mitigation measures that are defined within further IAQM guidance.

Air Quality in Fife Advice for Developers

- 2.4.5 FC has developed an Air Quality Supplementary Planning Document (SPD) (Fife Council, 2020) to assist developers in preparing planning proposals and to guide their discussions with FC officers prior to the submission on planning applications. The SPD sets out the criteria for deciding whether a simple or detailed air quality assessment is required.



3 Methodology

3.1 Introduction

- 3.1.1 The assessment methodology detailed in the following sections has been applied to ascertain the potential impacts of emissions to air in order to identify their significance and compliance with policy and regulatory requirements (outlined in **Section 2** of this report), and whether or not additional mitigation is required.
- 3.1.2 This assessment outlines the existing air quality within the study area and assesses the impact of construction and operational activities on air quality and sensitive receptors in the study area.

3.2 Baseline Air Quality

- 3.2.1 A desk-based review of baseline conditions has been completed. Information regarding baseline air quality has been obtained by collating the information from the following sources:
- Recent monitoring data from the latest FC Air Quality Annual Progress Report 2024 (Fife Council, 2025);
 - Scottish Government's 2021 – based maps of annual concentrations (Scottish Government, 2021b); and
 - NO₂ and PM Projections Data published by DEFRA (DEFRA, 2020) (DEFRA, 2023).

3.3 Construction Dust Impacts

- 3.3.1 During demolition and construction, dust from on-site activities and off-site trackout by construction vehicles has the potential to impact on sensitive human receptors within the study area. The main potential impacts are loss of amenity (as a result of dust soiling) and deterioration of human health (as a result of increased concentrations of PM₁₀). It is also possible for deposited dust to harm nearby ecological receptors.
- 3.3.2 The suspension of particles in the air is dependent on surface characteristics, weather conditions and on-site activities. Impacts have the potential to occur when dust generating activities coincide with dry, windy conditions, and where sensitive receptors are located downwind of the dust source(s).
- 3.3.3 Separation distance is also an important factor. Large dust particles (greater than 30 µm), can be potentially responsible for most dust annoyance, will largely deposit within 100 m of sources. Intermediate particles (10-30 µm) can travel 200-500 m. Consequently, significant dust annoyance is usually limited to within a few hundred metres of its source. Smaller particles (less than 10 µm), which are the predominant fraction that can be potentially responsible for human health impacts largely remain airborne. However, the impact on the short-term concentrations of PM₁₀ occurs over a shorter distance due to the rapid decrease in concentrations with distance from the source due to dispersion.
- 3.3.4 The assessment of the risk of potential construction dust impacts has been undertaken with reference to relevant guidance (IAQM, 2024). The assessment methodology considers three separate potential dust impacts:
- loss of amenity due to dust soiling;
 - human health effects due to increases in concentrations of PM₁₀; and
 - harm to ecological receptors due to increased dust deposition.



- 3.3.5 The first stage of the assessment involves screening to determine if there are sensitive receptors within threshold distances of the activities associated with the construction phase of the scheme; defined as the study area. No further assessment is required if there are no receptors within the study area.
- 3.3.6 The IAQM guidance outlines that an assessment is only required in cases where:
- A 'human receptor' is located within:
 - 250 m of the boundary of the Site; and / 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' is located within:
 - 50 m of the boundary of the Site; and / or
 - 50 m of the route(s) used by construction vehicles on the public highway, up to 250 m from the Site entrance(s).
- 3.3.7 The assessment of potential risk is determined by considering the risk of dust impacts arising from four activities in the absence of mitigation demolition, earthworks, construction and trackout.
- 3.3.8 The dust emission class (or magnitude) for each activity, receptor sensitivity and the overall sensitivity of the area are determined using the criteria outlined in **Table B-1** to **Table B-5** in **Appendix B** (based on the IAQM guidance), indicative thresholds and professional judgement. The risk of dust impacts arising is a product of the relationship between the dust emission magnitude and the area sensitivity and is based on the criteria outlined in **Table B-6** (based on the IAQM guidance). The risk of impact is then used to determine the mitigation requirements.
- 3.3.9 The IAQM guidance recommends that no assessment of the significance of effects is made without mitigation in place, as mitigation is assumed to be secured by planning conditions, legal requirements or required by regulations.
- 3.3.10 With appropriate mitigation in place, the IAQM guidance indicates that the residual effect dust emissions associated with the demolition and construction can be classified as being 'not significant'.

3.4 Construction Road Traffic Emission Impacts

- 3.4.1 The potential for a significant overall effect on existing sensitive receptors within the study area as a result of emissions from traffic generated by the Proposed Development during the construction phase have been determined qualitatively. The assessment takes into consideration the screening criteria outlined in the EPUK and IAQM guidance (EPUK and IAQM), 2017) (see **Appendix C**), the anticipated routing of the generated traffic and the anticipated duration of impacts associated with the generated traffic.

3.5 Construction and Decommissioning Non-Road Mobile Machinery Emission Impacts

- 3.5.1 The impacts of emissions associated with NRMM during the construction phase of Proposed Development has been undertaken qualitatively, taking into account the following:
- Duration of works;
 - Type and number of NRMM to be used on-site;



- Operating hours of NRMM;
- Emissions standard to which NRMM comply;
- Proximity of receptors to NRMM working areas; and
- Existing background pollutant concentrations.

3.5.2 In accordance with DEFRA's LAQM TG.22 (DEFRA, 2025), with suitable controls and site management in place, emissions associated with NRMM and site traffic are unlikely to have significant impact on local air quality.

3.6 Operational Road Traffic Emission Impacts

3.6.1 The potential for significant impacts on existing sensitive receptors within the study area as a result of emissions from operational traffic generated by the Proposed Development is determined based on the screening criteria outlined in the EPUK and IAQM Guidance (EPUK and IAQM, 2017) (see **Appendix C**) which include consideration of the volume and composition of traffic generated by the Proposed Development and existing local air quality conditions (i.e. the presence of any declared AQMAs). It should be noted that if traffic from a development exceeds these levels, then it does not necessarily mean that a modelling assessment is necessary, only that the air quality impacts of traffic require more detailed consideration.

3.7 Operational Combustion Emission Impacts

3.7.1 The potential for a significant overall effect on existing sensitive receptors within the study area as a result of emissions from the back-up power generator during the operational phase have been determined qualitatively considering the potential emission rates and operational frequency.

3.7.2 Research indicates that given the limited capacity, flue discharge conditions and operating duration of the generator, resultant impacts during operation will be limited and inherently cannot result in exceedance of the short-term NO₂ NAQO (which allows 18 hours of exceedance per annum) and will have a minimal influence on annual average concentrations. Therefore, as per IAQM guidance (Air Quality Consultants Ltd, 2025) it is considered that the life safety backup power generators do not require detailed assessment

3.7.3 The NO_x emission rate (g/s) of the unit is compared to the EPUK and IAQM guidance indicative criteria for combustion processes which states that *“typically, any combustion plant where the single or combined NO_x emission rate is less than 5 mg/sec is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion”* (EPUK and IAQM, 2017) (see **Appendix C**). If the emission rate falls below the screening criteria then a detailed assessment of combustion emissions is not required.

3.8 Decommissioning Road Traffic Emission Impacts

3.8.1 The potential for a significant overall effect on existing sensitive receptors within the study area as a result of emissions from traffic generated by the Proposed Development during the decommissioning phase have been determined qualitatively. The assessment takes into consideration the screening criteria outlined in the EPUK and IAQM guidance (EPUK and IAQM, 2017) (see **Appendix C**), the anticipated routing of the generated traffic and the anticipated duration of impacts associated with the generated traffic.



4 Baseline Environment

4.1 Site Context

- 4.1.1 The Site lies to the south of the B9097 and the Westfield Energy Recovery Facility and to the west of the existing Westfield substation. The local area is predominately agricultural land with industrial facilities.

4.2 Study Area

- 4.2.1 The study area adopted for this assessment is as follows:
- For the construction phase dust assessment, the study area (based on IAQM, 2024 guidance) is defined as up to 250 m from the site or 50 m from the route of construction vehicles (up to 250 m from the site entrance).
 - For the construction and operational phase road traffic emissions assessment, the study area (based on Environmental Protection United Kingdom (EPUK) and IAQM, 2017 guidance is defined as all roads which could potentially exceed the screening criteria outlined in **Appendix C**.

4.3 Ambient Air Quality

Limit Values

- 4.3.1 The study area does not contain any predicted exceedances of a limit values either in the existing year (2026) or future years (DEFRA, 2020) (DEFRA, 2023).

LAQM

- 4.3.2 FC has investigated air quality within its area as part of its responsibilities under the LAQM regime. Currently, no AQMAs have been declared within the county. The nearest AQMA to the site is in Edinburgh, more than 22 km to the southeast.

Local Monitoring Data

NO₂

- 4.3.3 FC carries out monitoring at four automatic monitoring stations, the nearest of which, Kirkcaldy, is located approximately 10.8 km from the Proposed Development and is therefore not considered to be representative of baseline air quality conditions at the site. The Council also deploys NO₂ diffusion tubes at a number of locations, including one location located within Cowdenbeath. 2020-2024 monitoring results for the closest and most representative monitoring locations to the Site are shown in **Table 4-1** and their locations are shown in **Figure 4-1** below. Whilst 2020 and 2021 monitoring results have been included below, it should be noted that these are not considered to be representative of longer term trends due to COVID-19 restrictions in place during these years.





Figure 4-1 Monitoring Locations in the vicinity of the Site. Contains OS Data © Crown Copyright and Database rights 2026. Contains data from OS Zoomstack.

Table 4-1 Measured Annual Mean NO₂ Concentrations 2020-2024

Site ID	Site Type	Within AQMA	Annual Mean NO ₂ (µg/m ³)				
			2020	2021	2022	2023	2024
High Street, Cowdenbeath	Kerbside	No	14.0	16.0	14.0	15.4	12.7
Chapel Level, Kirkcaldy	Roadside	No	-	-	11.0	12.3	12.2
NAQO		40					

2020 - 2024 data taken from the Fife Air Quality Annual Progress Report (Fife Council, 2025)

- 4.3.4 There have been no measured exceedances of the annual mean NO₂ NAQO between 2020-2024 at the closest monitoring location to the Site. Furthermore, measured concentrations at all diffusion tube monitoring sites in the borough are below 60 µg/m³, indicating that it is unlikely that any exceedances of the 1-hour mean NAQO have occurred.

PM₁₀ and PM_{2.5}

- 4.3.5 At the time of writing, FC do not undertake particulate matter (PM₁₀ or PM_{2.5}) monitoring in close proximity to the Study Area.

Predicted Background Concentrations

- 4.3.6 Estimated background concentrations for the Site have been obtained from the latest Scottish Government's 2018 – based maps of annual concentrations (Scottish Government, 2021b). The background concentrations for the study area/identified receptors area are provided **Table 4-2**.
- 4.3.7 The background concentrations are all well below the relevant NAQOs in both the existing year and the future year, 2030.

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Table 4-2 Estimated Annual Mean Background Concentrations

Year	Location	Annual Mean ($\mu\text{g}/\text{m}^3$)		
		NO ₂	PM ₁₀	PM _{2.5}
2026	319_697	3.5	8.3	3.8
	318_697	3.6	8.2	3.9
2030	319_697	3.1	8.2	3.6
	318_697	3.1	7.9	3.7
NAQOs		40	18	10



5 Predicted Impacts

5.1 Construction Dust Impacts

Screening Assessment

- 5.1.1 There are existing sensitive human receptors including a number of residential properties, located within 250 m of the site boundary and within 50 m of the routes that may be used by construction vehicles. As such, further assessment of the risk of dust soiling and PM₁₀ emissions is required.
- 5.1.2 There are no sensitive ecological receptors located within 50 m of the site boundary or within 50 m of the routes used by construction vehicles on the public highway. The closest designated ecological site to the site, Loch Leven Site of Special Scientific Interest (SSSI), is located more than 2 km from the site boundary. As such, the potential for ecological impacts as a result of dust soiling can be screened out as being 'not significant'.

Further Assessment

Dust Emission Magnitude

- 5.1.3 The dust emissions magnitude of demolition, earthworks and construction activities and as a result of trackout have been determined in **Table 5-1** below based the criteria shown in **Table B-1, Appendix B**. No demolition is required during the construction of the proposed development; however, demolition is required for the decommissioning phase of the proposed development. The 275kV elements of the existing substation are to be decommissioned once the substation extension is complete and electrified therefore, this demolition has been included in the Construction Dust Assessment and associated Mitigation table (**Table 6-1**).

Table 5-1: Dust Emissions Magnitudes

Activity	Magnitude	Justification
Demolition	Medium	The Site currently includes the existing 275kV component of the substation which will be deconstructed following the completion of the construction and electrification of the proposed extension to the Westfield substation. Deconstruction activities could occur more than 12 m above ground however, it is unlikely to create in excess of 75,000 m ³ of material. As well as this, the deconstructed components will mainly be metal which have low dust potential. Therefore, the dust emission magnitude of demolition activities is judged to be 'medium' as a precautionary measure.
Earthworks	Large	Proposed earthworks activities comprise clearance of vegetation, soil preparation and landscaping across an area greater than 110,000 m ² . The soil at the site is derived from Carboniferous sandstone, shales and limestones (Scottish Government, 2025) which are considered to be moderately dusty, particularly during periods of dry weather. Based on this, the dust emission magnitude of earthworks activities is judged to be 'large'.
Construction	Medium	The total building volume to be constructed is expected to be between 12,000 m ³ and 75,000 m ³ . Aside from foundations, construction materials will primarily comprise of metal with a lower dust potential. Based on this, the dust emission magnitude of construction activities is judged to be 'medium'.
Trackout	Large	The number of Heavy Duty Vehicles (HDVs) that will exit the site will vary depending upon the processes occurring at any one time. There are expected to be 39 outward HDV movements in



		any one day. However, due to the nature of the site, there could be an unpaved road length greater than 100 m in length comprising moderately dusty surface material. Based on this, the dust emission magnitude of trackout is judged to be 'large' as a precautionary measure.
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Area Sensitivity

- 5.1.4 The area sensitivity to dust soiling and human health impacts has been determined based on the criteria shown in **Table B-3, Table B-4, Table B-5, Appendix B**. The IAQM demolition and construction band criteria used to determine the sensitivity of the local area is shown in **Figure 5-1** below.

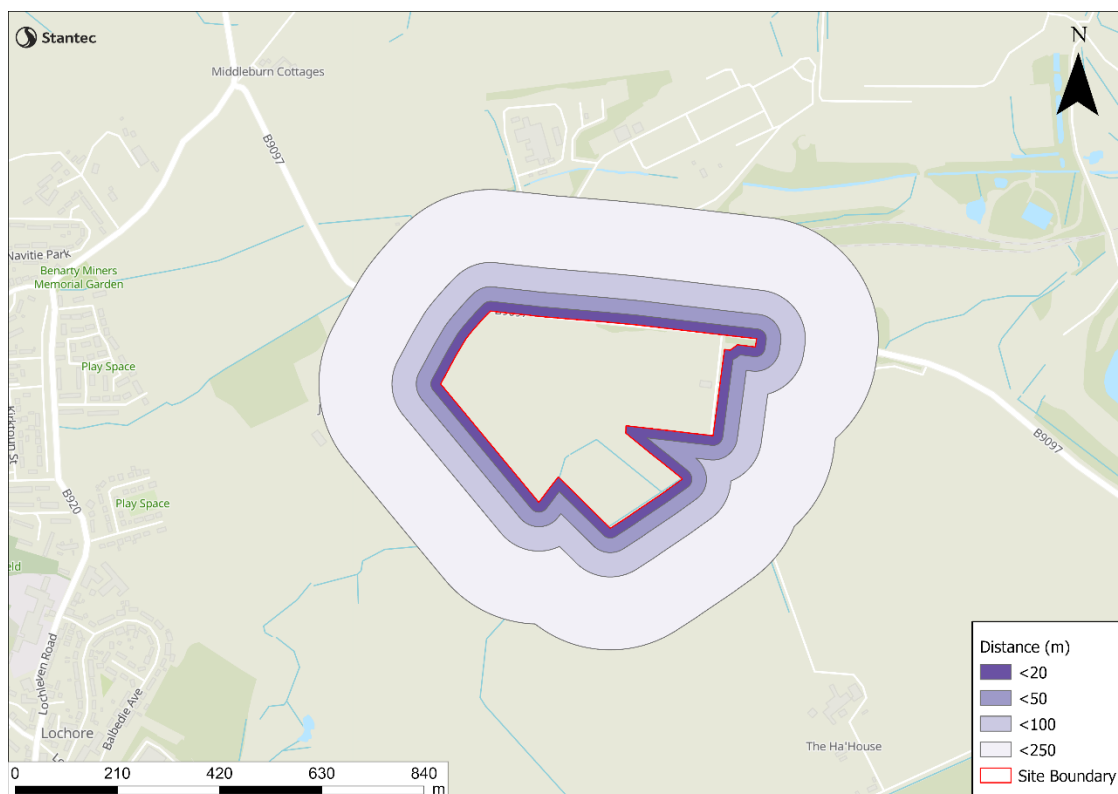


Figure 5-1: IAQM Demolition and Construction Dust band Criteria from the Site boundary. Contains OS Data © Crown Copyright and Database rights 2026. Contains data from OS Zoomstack.

- 5.1.5 The existing Westfield Substation is classed as being 'low sensitivity' receptor to dust soiling, based on the IAQM guidance (IAQM, 2024) (see **Table B-3, Appendix B**). It is located within 20 m of the site boundary. There are no high or medium sensitivity receptors located within 20 m of the site boundary, and only three high sensitivity receptors within 250 m. As such, the sensitivity of the area surrounding the site to dust soiling is judged to be 'low'.
- 5.1.6 The IAQM guidance indicates that potential impacts of trackout should be considered for sensitive receptors within 50 m of the route used by construction vehicles within a distance of up to 250 m from the site entrance. As the construction traffic routing is currently unknown, the worst-case assumption has been made that all main roads may potentially be used by HDVs leaving the site entrance(s). The existing Westfield Substation and between one and ten residential receptors are located within 20 m of roads extending up to 250 m of the site; as such, the sensitivity to dust soiling of the area surrounding roads along which material may be tracked is judged to be 'medium'.
- 5.1.7 The IAQM also defines receptors such as the Westfield Substation as being a 'low sensitivity' and residential properties as being 'high sensitivity' receptors to human health impacts (see



Table B-4, Appendix B). PM₁₀ concentrations within the study area are anticipated to be similar to the maximum of the predicted 2026 PM₁₀ background concentrations at the site (8.3 µg/m³). Based on the predicted existing PM₁₀ concentrations and the number of sensitive receptors within 20 m of the site boundary and roads along which material may be tracked, the sensitivity to human health impacts of the areas surrounding the site and the area surrounding roads along which material may be tracked are judged to be 'low'.

Risk of Impacts

- 5.1.8 The risk of construction dust impacts, without mitigation, have been defined based on the criterion shown in **Table B-6, Appendix B** and are presented in **Table 5-2**.

Table 5-2 Risk of Construction Dust Impacts without Mitigation

Potential Impacts	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low Risk	Low Risk	Low Risk	Medium Risk
Human Health	Low Risk	Low Risk	Low Risk	Low Risk

5.2 Construction Road Traffic Emission Impacts

- 5.2.1 During the construction period, the peak increase in heavy duty vehicles (HDVs) movements on the road network will be 78 AADT which is below the threshold of 100 HDV movements per day outside an AQMA for an assessment to be necessary according to EPUK and IAQM guidance. Therefore, this level of additional HDV movements will not have a significant effect on local air quality and the impacts of emissions associated with construction road traffic on air quality in the local area are considered to be 'not significant'.

5.3 Construction and Decommissioning Non-Road Mobile Machinery Emission Impacts

- 5.3.1 At present, detailed information regarding NRMM specifications and operating hours are not available. The closest existing high sensitivity receptor to the Proposed Development is located approximately 140 m northeast of the Site. Also, background concentrations at the Site are all well below the relevant NAQOs both in the 'existing' and future years.
- 5.3.2 In accordance with Part 4 of the IAQM construction dust guidance, all NRMM will need to adhere to the NRMM emissions standards for NO₂ and PM₁₀ outlined in the Road Vehicles and Non-Road Mobile Machinery (Type-Approval) (Amendment and Transitional Provisions) (EU Exit) Regulations 2022 (Statutory Instrument, 2022).
- 5.3.3 Considering the above, the impacts of emissions associated with NRMM during the construction and decommissioning phase of the Proposed Development are considered to be 'not significant'.

5.4 Operational Road Traffic Emission Impacts

- 5.4.1 The Proposed Development will be mainly unmanned during operation and the only operational vehicle trips associated with the Proposed Development will be from infrequent maintenance or repair works. As such, traffic generated by the Proposed Development is expected to fall below the EPUK and IAQM screening criteria (see **Appendix C**). Therefore, the impacts of operational road traffic emissions are considered to be 'not significant'.

5.5 Operational Combustion Emission Impacts

- 5.5.1 As part of the Proposed Development, there is a standby diesel power generator (diesel fired) which is required in case of a power outage. The NO_x emission rate screening criteria of 5 mg/sec (EPUK and IAQM, 2017) would be exceeded (**Appendix C**) however, the generator



will be operated very infrequently (one hour tests per month, totalling less than 18 hours per annum) and will therefore not have the potential to impact the short-term or long-term NO₂, PM₁₀ and PM_{2.5} NAQOs.

- 5.5.2 Given the limited capacity and operating frequency and duration of the standby diesel generator alongside the low background concentrations and separation distance from the closest sensitive receptor (located >100 m to the northeast), the emissions to air (of NO_x and PM₁₀/PM_{2.5}) from the standby diesel generator are not considered to have the potential to give rise to significant offsite impacts on the short-term and long-term NAQOs and therefore considered 'not significant'.

5.6 Decommissioning Road Traffic Emission Impacts

- 5.6.1 During the decommissioning period, the peak increase in heavy duty vehicles (HDVs) movements on the road network will be 36 AADT which is below the threshold of 100 HDV movements per day outside an AQMA for an assessment to be necessary according to EPUK and IAQM guidance. Therefore, this level of additional HDV movements will not have a significant effect on local air quality and the impacts of emissions associated with decommissioning road traffic on air quality in the local area are considered to be 'not significant'.



6 Mitigation

6.1 Construction

- 6.1.1 The following standard mitigation measures from the IAQM guidance (IAQM, 2024) are recommended, taking into account the outcomes of the construction dust risk assessment (presented in **Table 5-2**).
- 6.1.2 Furthermore, in accordance with Part 4 of the IAQM demolition and construction guidance, all NRMM will need to adhere to the relevant NRMM emissions standards for NO₂ and PM₁₀. These measures will be implemented through a Construction Environment Management Plan (CEMP) secured by a suitably worded planning condition on any permission.

Table 6-1 Construction Phase Mitigation Measures

Category	Mitigation Measure
Communications	Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
	Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager.
	Display the head or regional office contact information.
Management	Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The DMP may include monitoring of dust deposition, dust flux, real time PM ₁₀ continuous monitoring and/or visual inspections.
	Record all dust and air quality complaints, identify cause(s) and take measures to reduce emissions in a timely manner, and record the measures taken.
	Make the complaints log available to the local authority when asked.
	Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book.
Monitoring	Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of the site boundary, with cleaning to be provided if necessary.
	Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
	Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
	Agree dust deposition, dust flux, or real-time PM ₁₀ continuous monitoring locations with the local authority. Where possible, commence baseline monitoring at least three months before work on a phase commences.
Preparing and maintaining the site	Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
	Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
	Fully enclose site or specific operations where there is a high potential for dust productions and the site is active for an extensive period.
	Avoid site runoff of water of mud.
	Keep site fencing, barriers and scaffolding clean using wet methods.
	Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site, cover as described below.



Category	Mitigation Measure
	Cover, seed or fence stockpiles to prevent wind whipping.
Operating vehicle/machinery and sustainable travel	Ensure all vehicles switch off engines when stationary – no idling vehicles.
	Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
	Impose and signpost a maximum speed limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
	Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.
	Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking and car sharing).
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
	Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
	Use enclosed chutes and conveyors and covered skips.
	Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
	Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste management	Avoid bonfires and burning of waste materials.
Construction	Avoid scabbling (roughening of concrete surfaces) if possible.
	Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
Trackout	Use water assisted dust sweeper(s) on the site access and local roads, to remove, as necessary, any material trackout out of the site. This may require the sweeper being continuously in use.
	Avoid dry sweeping of large areas.
	Ensure vehicles entering and leaving the site are covered to prevent escape of materials during transport.
	Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
	Record all inspections of haul routes and any subsequent action in a site log book.
	Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
	Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
	Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
	Access gates to be located at least 10 m from receptors where possible.

6.2 Operation

6.2.1 The operational impacts of the Proposed Development are considered to be 'not significant' and no additional mitigation is therefore required.



7 Summary and Conclusions

- 7.1.1 The air quality impacts associated with the Proposed Development . The Site is located within the administrative boundary of Fife Council (FC).
- 7.1.2 FC has investigated air quality within its area as part of its responsibilities under the Local Air Quality Management (LAQM) regime. Currently, no Air Quality Management Areas (AQMA) have been declared within the county. The nearest AQMA to the site is in Edinburgh, more than 22 km to the southeast.
- 7.1.3 The construction activities have the potential to create dust. During construction, it is recommended that in accordance with the Institute of Air Quality Management (IAQM) guidance packages of mitigation measures is put in place to minimise the risk of elevated particulate matter (PM₁₀) concentrations and dust soiling in the surrounding area. With mitigation in place the construction impacts are judged as being 'not significant'.
- 7.1.4 During the construction period, the peak increase in heavy duty vehicles (HDVs) movements on the road network will be 78 Average Annual Daily Traffic (AADT) which is below the threshold of 100 HDV movements per day outside an AQMA for an assessment to be necessary according to Environmental Protection United Kingdom (EPUK) and IAQM guidance. Therefore, this level of additional HDV movements will not have a significant effect on local air quality and the impacts of emissions associated with construction road traffic on air quality in the local area are considered to be 'not significant'.
- 7.1.5 The Proposed Development will be mainly unmanned during operation and the only operational vehicle trips associated with the Proposed Development will be from infrequent maintenance or repair works. As such, traffic generated by the Proposed Development is expected to fall below the EPUK and IAQM screening criteria. Therefore, the impacts of operational road traffic emissions are considered to be 'not significant'.
- 7.1.6 During the decommissioning period, the peak increase in HDVs movements on the road network will be 36 AADT which is below the threshold of 100 HDV movements per day outside an AQMA for an assessment to be necessary according to EPUK and IAQM guidance. Therefore, this level of additional HDV movements will not have a significant effect on local air quality and the impacts of emissions associated with decommissioning road traffic on air quality in the local area are considered to be 'not significant'.
- 7.1.7 As part of the Proposed Development, there is a standby diesel generator which is required in case of a power outage. The IAQMs Nitrogen Oxide (NO_x) emission rate screening criteria of 5 mg/sec would be exceeded however, the generator will be operated very infrequently and will therefore not have the potential to impact the short-term or long-term nitrogen dioxide (NO₂) and particulate matter national air quality objectives (NAQOs). Alongside this, the background concentrations at the Site are low and the separation distance from the closest sensitive receptor is over 100 m, therefore the potential impact of emissions to air from the back-up power generator are considered 'not significant'.
- 7.1.8 There are not predicted to be any significant air quality effects as a result of the Proposed Development, and the Proposed Development is considered to be in accordance with the requirements of the National Planning Framework 4 (NPF4) and the Fife Air Quality Supplementary Planning Document (SPD).



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Appendix A Glossary

Abbreviations	Meaning
AADT	Annual Average Daily Traffic
AQAP	Air Quality Action Plan
AQMA	Air Quality Management Area
CAFS	Clean Air for Scotland
CEMP	Construction Environmental Management Plan
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
Diffusion Tube	A passive sampler used for collecting NO ₂ in the air
EPUK	Environmental Protection UK
FC	Fife Council
HDV	Heavy Duty Vehicle; a vehicle with a gross vehicle weight greater than 3.5 tonnes. Includes Heavy Goods Vehicles and buses
IAQM	Institute of Air Quality Management
LA	Local Authority
LAQM	Local Air Quality Management
LAQM.PG(24)	Scotland's LAQM Policy Guidance 2024
LAQM.TG(22)	Local Air Quality Management Technical Guidance 2022
LEZ	Low Emission Zone
NAQO	National Air Quality Objective as set out in the Air Quality Strategy and the Air Quality Regulations
NO ₂	Nitrogen Dioxide
NO _x	Oxides of nitrogen generally considered to be nitric oxide and NO ₂ . Its main source is from combustion of fossil fuels, including petrol and diesel used in road vehicles
NPPF	National Planning Policy Framework
NRMM	Non-Road Mobile Machinery
PAN	Planning Advice Note
PM ₁₀ /PM _{2.5}	Small airborne particles less than 10/2.5 µm in diameter
Receptor	A location where the effects of pollution may occur
SPD	Supplementary Planning Document
SPT	SP Transmission
ULEV	Ultra-low emission vehicle



Appendix B IAQM Dust Guidance (2024)

Approach

Table B-1 Dust Emission Magnitude Classification

Activity	Dust Emission Magnitude		
	Large	Medium	Small
Demolition	Total building volume of >75,000 m ³ , potentially dusty construction material, on-site crushing and screening, demolition activities >12 m above ground	Total building volume of 12,000 – 75,000 m ³ , potentially dusty construction material, demolition activities 6 – 12 m above ground level	Total building volume of <12,000 m ³ , construction material with low potential for dust release, demolition activities <6 m above ground, demolition during wetter months
Earthworks	Total site area of >110,000 m ² , potentially dusty soil type, >10 heavy earth moving vehicles active at any one time, formation of bunds >6 m in height	Total site area of 18,000 – 110,000 m ² , moderately dusty soil type, 5 - 10 heavy earth moving vehicles active at any one time, formation of bunds 3 - 6 m in height	Total site area of <18,000 m ² , soil type with large grain size, <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 - 75,000 m ³ , potentially dusty construction material, on-site concrete batching	Total building volume <12,000 m ³ , construction material with low potential for dust release
Trackout	>50 HDV outwards movements in any one day, potentially dusty surface material, unpaved road length >100 m	20 - 50 HDV outwards movements in any one day, moderately dusty surface material, unpaved road length 50 - 100 m	<20 HDV outwards movements in any one day, surface material with low potential for dust release, unpaved road length <50 m



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Table B-2 Receptor Sensitivity

Receptor Sensitivity	Impact		
	Dust Soiling	Health Effects of PM ₁₀	Ecological Impacts
High	An area 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. Examples include dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms.	Locations where members of the public are exposed over a time period relevant to the air quality objective for PM₁₀ (in the case of the 24-hour objective, a relevant location would be one where individuals may be exposed for eight hours or more per day). 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.	Locations with an international or national designation <i>and</i> the designated features may be affected by dust soiling; OR Locations where there is a community of particularly dust sensitive species such as vascular species included in the Red Data List for Great Britain. Indicative examples include a Special Area of Conservation designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
Medium	An area 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 wouldn't reasonably be expected to be present here continuously or regularly for extended periods, as part of the normal pattern of use of the land. Examples include parks and places of work.	Locations where people exposed are workers, and exposure is over a time period relevant to the air quality objective for PM₁₀ (in the case of the 24-hour objective, a relevant location would be one where individuals may be exposed for eight hours or more per day). Examples include office and shop workers, but will generally not include workers occupationally exposed to for PM₁₀, as protection is covered by Health and Safety at Work legislation.	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; OR Locations with a national designation where the features may be affected by dust deposition. Indicative example is a Site of Special Scientific Interest with dust sensitive features.



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Low	An area 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. Examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short-term car parks and roads.	Locations where human exposure is transient. Examples include public footpaths, playing fields, parks and shopping streets.	Locations with a local designation where the features may be affected by dust deposition. Indicative example is a Local Nature Reserve with dust sensitive features.
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Table B-3 Sensitivity of an Area to Dust Soiling Effects

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

Table B-4 Sensitivity of an Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from the 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
	<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
		>10	Low	Low	Low	Low



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		1 - 10	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low

Table B-5 Sensitivity of an Area to Ecological Impacts

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

Table B-6 Risk of Dust Impacts Calculation Matrix

Sensitivity of Area		Dust Emission Magnitude		
		Large	Medium	Small
Demolition	High	High Risk	Medium Risk	Medium Risk
	Medium	High Risk	Medium Risk	Low Risk
	Low	Medium Risk	Low Risk	Negligible Risk
Earthworks	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Medium Risk	Low Risk
	Low	Low Risk	Low Risk	Negligible Risk
Construction	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Medium Risk	Low Risk
	Low	Low Risk	Low Risk	Negligible Risk
Trackout	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Medium Risk	Low Risk
	Low	Low Risk	Low Risk	Negligible Risk



Appendix C EPUK & IAQM Guidance (2017)

Screening Criteria

The Development Will:	Indicative Criteria to Proceed to an Air Quality Assessment
Cause a significant change in LDV traffic flows on local roads with relevant receptors.	A change of LDV flow of: • >100 AADT within or adjacent to an AQMA; and • >500 AADT elsewhere.
Cause a significant change in HDV flows on local roads with relevant receptors.	A change of HDV flow of: • >25 AADT within or adjacent to an AQMA; and • >100 AADT elsewhere.
Realign roads i.e. changing the proximity of receptors to traffic lanes.	Where the change is 5 m or more and the road is within an AQMA.
Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle acceleration / deceleration, e.g. traffic lights, or roundabouts.
Introduce or change a bus station.	A change of bus flows of: • >25 AADT within or adjacent to an AQMA; and • >100 AADT elsewhere.
Have an underground car park with extraction system.	The ventilation extract for the car park will be located within 20 m of a relevant receptor; and The car park will have >100 movements per day (total in and out).
Have one or more substantial combustion processes, where there is a risk of impacts at relevant receptors. NB. this includes combustion plant associated with standby emergency generators (typically associated with centralised energy centres) and shipping.	Typically, any combustion plant where the single or combined NO _x emission rate is less than 5 mg/sec ^a is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion. In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates. Conversely, where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable.

The screening criteria presented is amended from Table 6.2 of the EPUK and IAQM guidance (EPUK and IAQM, 2017).

^a As a guide, the 5 mg/s criterion equates to a 450 kW ultra low NO_x gas boiler or a 30 kW CHP unit operating at <95 mg/Nm³. Users of this guidance should quantify the NO_x mass emission rate from the proposed plant, based on manufacturers' specifications and operational conditions.

