

Chapter 09:

Air Quality

Environmental Impact Assessment
Report for:

Westfield Substation Extension

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9. Air Quality

9.1 Introduction

- 9.1.1 This chapter has been prepared by Stantec UK and assesses the likely environmental effects of the Proposed Development with respect to air quality. This chapter also describes the methods used to assess the effects; the baseline conditions currently existing at the site and surrounding area; the mitigation measures required to prevent, reduce or offset any significant adverse effects; and the likely residual effects after these measures have been adopted.
- 9.1.2 Cumulative effects associated with air quality have additionally been considered and can be found in **Chapter 11**.

9.2 Scope of Assessment and Consultation

- 9.2.1 A request for an EIA Scoping Opinion was submitted to Fife Council in July 2024 (planning reference 24/01927/SCO). An EIA Scoping Opinion was received from Fife Council in September 2024. In its response to the Scoping Report dated 20 August 2024 Fife Council's Land and Air Quality team stated that they were generally satisfied with the information provided in the scoping report and had no further comments. It was agreed in the Scoping Opinion that construction dust impacts and construction road traffic impacts were being 'Scoped In' and all operational impacts were 'Scoped Out' of the assessment. However, since consultation with Fife Council, a standby diesel generator is now proposed, and the 275kV elements of the existing Westfield Substation will be decommissioned once the extension is complete and electrified. Therefore, effects of combustion emissions and decommissioning road traffic emissions have also been considered in this chapter.

9.3 Assessment Methodology and Significance Criteria

Assessment Guidance

- 9.3.1 The primary guidance documents used in undertaking this assessment are detailed in the sections below.

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

- 9.3.2 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/IAQM 'Land-Use Planning and Development Control: Planning for Air Quality'

- 9.3.3 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). 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'

- 9.3.4 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

- 9.3.5 Fife Council 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.

Study Area

- 9.3.6 The study area adopted for this assessment is as follows:
- For the construction phase dust risk assessments, the study area (based on the IAQM, 2024 guidance) is defined as up to 250m from the site or 50m from the route to be used by construction vehicles (up to 250m from the site entrance); and
 - For the construction phase road traffic emissions assessment, the study area (based on EPUK and IAQM, 2017 guidance) is defined as all roads, which could potentially exceed the screening criteria outlined in **Technical Appendix 9.2**.

Baseline Data Collection

- 9.3.7 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 Fife Council (FC) Air Quality Annual Progress Report 2024 (Fife Council, 2025); and
 - Scottish Government's 2021 – based Maps of annual concentrations (Scottish Government, 2021a).

Construction Dust Impacts

- 9.3.8 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.

- 9.3.9 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).
- 9.3.10 Separation distance is also an important factor. Large dust particles (greater than 30 µm), which can be potentially responsible for most dust annoyance, will largely deposit within 100m 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.
- 9.3.11 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.
- 9.3.12 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.
- 9.3.13 The IAQM guidance outlines that an assessment is only required in cases where:
- 9.3.14 A 'human receptor' is located within:
- 250m of the boundary of the site; and/or
 - 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s).
- 9.3.15 An 'ecological receptor' is located within:
- 50m of the boundary of the site; and/or
 - 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s).
- 9.3.16 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.

- 9.3.17 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 **Tables 9.1.1 to 9.1.5** in **Technical Appendix 9.1** (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 9.1.6** (based on the IAQM guidance). The risk of impact is then used to determine the mitigation requirements.
- 9.3.18 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.
- 9.3.19 With appropriate mitigation in place, the IAQM guidance indicates that this *“will ensure that a potential significant adverse effect will not occur, so the residual effect will normally be ‘not significant’”*.

Construction Road Traffic Emission Impacts

- 9.3.20 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 **Technical Appendix 9.2**), the anticipated routing of the generated traffic and the anticipated duration of impacts associated with the generated traffic.

Back-up Power Generator Emission Impacts

- 9.3.21 The potential for a likely significant effect on existing sensitive receptors within the study area as a result of emissions from the back-up power generator during the operation phase have been determined qualitatively considering the potential emission rates and operational frequency.
- 9.3.22 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.
- 9.3.23 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 **Technical Appendix 9.2**). If the emission rate falls below the screening criteria, then a detailed assessment of combustion emissions is not required.

Decommissioning Road Traffic Emission Impacts

- 9.324 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 **Technical Appendix 9.2**), the anticipated routing of the generated traffic and the anticipated duration of impacts associated with the generated traffic.

Receptor Sensitivity

- 9.325 The following relevant sensitive receptor locations within the study area were considered within this assessment:
- Human health receptors – places where members of the public might be expected to be regularly present over the averaging period of the NAQOs. Receptors considered as part of the assessment include those within close proximity to the site and the surrounding road network such as the existing substation itself; and
 - Ecological receptors – both statutorily designated and non-statutorily designated ecological sites are considered. However, there are no ecological receptors in the study area that are relevant to the EPUK and IAQM screening criteria set out in **Appendices 9.2**.

Significance of Effect

- 9.326 Significance of effect is determined by comparing the trip generation and the combustion emissions associated with the Proposed Development to the EPUK and IAQM guidance screening criteria set out in **Technical Appendix 9.2**. Where the trip generation or combustion emissions fall below the screening criteria the effect is considered to be '**Not Significant**'.
- 9.327 The IAQM guidance recommends that no assessment of the significance of construction dust effects is made without mitigation in place, as mitigation is assumed to be secured by planning conditions, legal requirements or required by regulations.

Assessment Limitations and Assumptions

- 9.328 The assessment uses predicted AADT flows generated by the Proposed Development to determine the likely significant effects in relation to air quality. The traffic flows will have inherent uncertainties associated with them. However, this is not expected to change the conclusions of the report.

9.4 Legislation and Policy Context

Air Quality Regulations

- 9.4.1 The National Air Quality Objectives (NAQOs) set out in the Air Quality (Scotland) Regulations 2000 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 9.1**.

9.4.2 The Air Quality Standards (Scotland) 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.

9.4.3 The relevant NAQOs for this assessment are shown in **Table 9.1**.

Table 9.1: Relevant Air Quality Objectives

Pollutant	Time Period	Objectives	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

Air Quality Plan for NO₂ in the UK

9.4.4 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*".

9.4.5 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 (LEZ), to improve local air quality where transport is identified as the key contributor to air quality problems.

Air Quality Management

The Air Quality Strategy

9.4.6 Part IV of the Environment Act 1995 required the Secretary of State to prepare and publish a 'strategy' regarding air quality.

9.4.7 The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007) establish 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.

9.4.8 In July 2021, the Scottish Government published ‘Cleaner Air for Scotland 2 – Towards a Better Place for Everyone’ (the CAFS2) (Scottish Government, 2021b), 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; and
- Further Progress Local Planning Policy.

Local Air Quality Management

9.4.9 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. In addition, local authorities are required to appraise development and transport plans against these assessments.

9.4.10 Where an 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.

9.4.11 The Local Air Quality Management Technical Guidance 2022 ((LAQM.TG (22); (DEFRA, 2025)), issued by DEFRA for local authorities provides advice on 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 9.2**.

Table 9.2: 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; and - 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.	

Planning Policy

National Planning Policy

National Planning Framework (NPF) 4

9.4.12 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.

9.4.13 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.”

Fife Local Development Plan (FIFEplan)

9.4.14 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:

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

9.4.15 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.

9.5 Baseline Conditions

Current Baseline (2025)

Ambient Air Quality

Limit Values

9.5.1 According to Pollution Climate Mapping data published by DEFRA (DEFRA, 2020), the area in the vicinity of the site does not contain any predicted exceedances of a NAQO in the ‘existing’ year (2025) or future years.

Local Air Quality Management

9.5.2 Fife Council has investigated air quality within its area as part of its responsibilities under the LAQM regime. When the EIA Scoping report was written Fife Council had two AQMAs declared within the county. However, since then these have both been revoked and at the time of writing, no AQMAs are declared within the county. The nearest AQMA to the site is in Edinburgh, more than 22 km to the south-east.

Local Monitoring Data

NO₂

9.5.3 Fife Council 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 9.3** and their locations are shown in **Figure 9.1**. Whilst 2020 and 2021 monitoring results have been included in **Table 9.3**, it should be noted that these are not considered to be representative of longer-term trends due to COVID-19 restrictions in place over this period.

Table 9.3: 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					

9.5.4 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 objective have occurred.

PM₁₀ and PM_{2.5}

9.5.5 At the time of writing, Fife Council do not undertake particulate matter (PM₁₀ or PM_{2.5}) monitoring in close proximity to the study area.

Predicted Background Concentrations

- 9.56 Estimated background concentrations for the site have been obtained from the latest Scottish Government's 2018 – based Maps of annual concentrations (Scottish Government, 2021a). The background concentrations for the study area/identified receptors area are provided in **Table 9.4**.
- 9.57 The background concentrations are all well below the relevant NAQOs and limit value both in the 'existing' year and the 'future' year 2030.

Table 9.4: 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
NAQO		40	18	10

Future Baseline (2030)

- 9.58 Baseline concentrations of NO₂, PM₁₀ and PM_{2.5} are predicted to decrease between 2025 and the opening year (2030) as vehicle emission factors and background concentrations are expected to improve, despite the traffic increase in the network.

9.6 Assessment of Likely Significant Effects

Construction

Construction Dust Impacts

Screening Assessment

- 9.61 There are existing sensitive human receptors including a number of residential properties, located within 250m of the site boundary and within 50m 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.
- 9.62 There are no sensitive ecological receptors located within 50m of the site boundary or within 50m 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 2km 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

- 9.6.3 The dust emissions magnitudes have been determined in **Table 9.5** based the criteria shown in **Table 9.1-1** in **Technical Appendix 9.1**. 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 9.7**).

Table 9.5: Dust Emission 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 12,000m ³ and 75,000m 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 HDV that will exit the site will vary depending upon the processes occurring at any one time. There are unlikely to be more than 50 outward HDV movements in any one day. However, due to the nature of the site, there could be an unpaved road length greater than 100m 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.

Area Sensitivity

- 9.6.4 The area sensitivity to dust soiling and human health impacts has been determined based on the criteria shown in **Tables 9.1-2, 9.1-3, 9.1-4 and 9.1-5 in Technical Appendix 9.1**. The IAQM demolition and construction band criteria used to determine the sensitivity of the local area is shown in **Figure 9.2**.
- 9.6.5 The existing Westfield Substation is classed as being 'low sensitivity' receptor to dust soiling, based on the IAQM guidance (IAQM, 2024) (see **Table 9.1-3 in Technical Appendix 9.1**). It is located within 20m of the site boundary. There are no high or medium sensitivity receptors located within 20m of the site boundary, and only three high sensitivity receptors within 250m. As such, the sensitivity of the area surrounding the site to dust soiling is judged to be 'low'.
- 9.6.6 The IAQM guidance indicates that potential impacts of trackout should be considered for sensitive receptors within 50m of the route used by construction vehicles within a distance of up to 250m 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 1 and 10 residential receptors is located within 20m of roads extending up to 250m 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'.
- 9.6.7 The IAQM also defines receptors such as Westfield Substation as being a 'low sensitivity' and residential properties as being 'high sensitivity' receptors to human health impacts (see **Table 9.1-4 in Technical Appendix 9.1**). 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

- 9.6.8 The risk of construction dust impacts, without mitigation, have been defined based on the criterion shown in **Table 9.1-6 in Technical Appendix 9.1** and are presented in **Table 9.6**.

Table 9.6: 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

Construction Road Traffic Emission Impacts

- 9.6.9 During the construction period, the peak increase in HDV 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**'.

Operational Phase

Operational Combustion Emission Impacts

- 9.6.10 As part of the Proposed Development, there is a standby diesel generator, which is required in case of a power outage. Due to the size of the generator (circa 200 kWe) the NO_x emission rate screening criteria of 5mg/sec (EPUK and IAQM, 2017) would be exceeded 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 nitrogen dioxide (NO₂) and particulate matter (PM₁₀) national air quality objectives (NAQOs).
- 9.6.11 Given the limited capacity and operating frequency and duration of the standby generator alongside the low background concentrations and separation distance from the closest sensitive receptor (located >100m to the north-east), 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**' and have not been assessed further.

Decommissioning

Decommissioning Road Traffic Emission Impacts

- 9.6.12 During the decommissioning period, the peak increase in HDV 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**'.

Mitigation

Construction

- 9.6.13 A Construction Environmental Management Plan (CEMP) will be implemented throughout the construction phase of the Proposed Development. The mitigation measures set out in **Table 9.7** will be incorporated into the CEMP where appropriate and are based on the IAQM guidance (IAQM, 2024) and the outcomes of the construction dust risk assessment provided in **Table 9.6**. It should be noted that demolition measures are to apply to decommissioning phase only and construction measures to apply to the construction phase only.

Table 9.7 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- of 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 windowsills within 100m 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 or mud.

Category	Mitigation Measure
	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.
	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.
Demolition	Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).
	Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.

Category	Mitigation Measure
	Avoid explosive blasting, using appropriate manual or mechanical alternatives.
	Bag and remove any biological debris or damp down such material before demolition.
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.

9.6.14 Furthermore, in accordance with Part 4 of the IAQM construction dust guidance, all NRMM will 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.

9.6.15 The mitigation measures outlined above are considered to be embedded into the design of the Proposed Development. As the effects of the construction phase of the Proposed Development are **'Not Significant'** no additional mitigation is required.

Assessment of Residual Effects

Construction

- 9.6.16 As no additional mitigation is required for the construction phase of the Proposed Development, the residual effects remain the same as those reported in the Construction Dust Impacts and Construction Road Traffic Emission Impacts sections and are '**Not Significant**'.

Operation

- 9.6.17 As no additional mitigation is required for the operational phase of the Proposed Development, the residual effects remain the same as those reported in the Operational Combustion Impacts Emissions section and are '**Not Significant**'.

Decommissioning

- 9.6.18 As no additional mitigation is required for the decommissioning phase of the Proposed Development, the residual effects remain the same as those reported in the Decommissioning Road Traffic Impacts Emissions sections and are '**Not Significant**'.

9.7 Future Monitoring of Significant Environmental Effects

Construction

- 9.7.1 The assessment has demonstrated that residual effects associated with the construction phase of the Proposed Development on air quality are considered '**Not Significant**', therefore no monitoring is required.

Operation

- 9.7.2 The assessment has demonstrated that residual effects associated with the operation phase of the Proposed Development on air quality are considered '**Not Significant**', therefore no monitoring is required.

Decommissioning

- 9.7.3 The assessment has demonstrated that residual effects associated with the decommissioning phase of the Proposed Development on air quality are considered '**Not Significant**', therefore no monitoring is required.

9.8 Summary

- 9.8.1 The potential air quality impacts associated with the Proposed Development have been assessed. The site is located within the administrative boundary of Fife Council. Fife Council has investigated air quality within its area as part of its responsibilities under the (Local Air Quality Management (LAQM) regime. When the Environmental Impact Assessment (EIA) Scoping report was written Fife Council had two Air Quality Management Areas (AQMAs) declared within the county. However,

since then these have both been revoked and at the time of writing, no AQMAs are declared within the county. The nearest AQMA to the site is in Edinburgh, more than 22 km to the south-east.

- 9.8.2 The construction activities associated with the Proposed Development have the potential to create dust. During construction it is recommended that, in accordance with the Institute of Air Quality Management guidance, a package of mitigation measures are put in place to minimise the risk of elevated Particulate Matter (PM₁₀) concentrations and dust soiling in the surrounding area. With the mitigation from **Table 9.7** in place, the construction dust impacts are judged as being '**Not Significant**'.
- 9.8.3 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, the air quality impacts of the Proposed Development with regards to construction traffic are considered to be '**Not Significant**' and additional mitigation is not required.
- 9.8.4 As part of the Proposed Development, there is a standby diesel generator required in case of a power outage. Due to the size of the generator (circa 200 kWe) the IAQMs NO_x emission rate screening criteria of 5mg/sec (EPUK and IAQM, 2017) 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 (PM₁₀) 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 100m, therefore the potential impact of emissions to air from the back-up power generator are considered '**Not Significant**'.
- 9.8.5 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, the air quality impacts of the Proposed Development with regards to decommissioning traffic are considered to be '**Not Significant**' and additional mitigation is not required.
- 9.8.6 No secondary mitigation measures or further monitoring is required as the effects of construction dust, traffic and combustion emissions on existing sensitive human receptors is considered to be '**Not Significant**'.
- 9.8.7 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). The summary of effects is presented in **Table 9.8**.

Table 9.8: Summary of Residual Effects

Receptor	Effect	Significance (before mitigation)	Supplementary Mitigation	Residual Effect	Significance (after mitigation)
Ecological and Human Receptors	Impacts of Construction Dust	N/A	None	Not Significant	Not Significant

Receptor	Effect	Significance (before mitigation)	Supplementary Mitigation	Residual Effect	Significance (after mitigation)
Ecological and Human Receptors	Impacts of Construction Traffic	Not Significant	None	Not Significant	Not Significant
Ecological and Human Receptors	Impacts for emissions from back-up power generator	Not Significant	None	Not Significant	Not Significant
Ecological and Human Receptors	Impacts of Decommissioning Traffic	Not Significant	None	Not Significant	Not Significant