

MR & MRS A. BRAZIL

**ATHELSTAN WAY,
HORSHAM**

AIR QUALITY ASSESSMENT

2026-08-04

**AIR QUALITY SOLUTIONS LTD
AQ15101**

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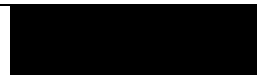
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EXECUTIVE SUMMARY

Air Quality Solutions Ltd were commissioned by Mr & Mrs A. Brazil to undertake an Air Quality Assessment in support of a proposed development at Athelstan Way, Horsham.

The proposal comprises the residential development of 21 dwellings with associated landscaping and parking.

Due to the scale of the development, there is the potential for the development to expose future site users to poor air quality, as well as to cause impacts at nearby sensitive receptors because of the construction and operational phases. Therefore, an Air Quality Assessment is required to determine baseline conditions at the site, assess site suitability for the proposed end-use and assess the potential impacts as a result of the proposed development.

Potential construction phase air quality impacts from fugitive dust emissions were assessed as a result of earthworks and construction activities. It is considered that the use of good practice control measures would provide suitable mitigation for a development of this size and nature and reduce potential impacts to an acceptable level.

Dispersion modelling was undertaken in order to predict annual mean pollutant concentrations across the application site to determine exposure risk to future occupiers. Results were subsequently verified using local monitoring results provided by Horsham District Council (HDC).

The dispersion modelling results indicated that annual mean pollutant concentrations across the application site were below the relevant air quality objectives at proposed sensitive locations.

The level of anticipated traffic generation from the site concluded that impacts on existing pollutant levels as a result of operational phase pollutant emissions were predicted to be not significant in accordance with relevant screening criteria. The use of robust assumptions, where necessary, was considered to provide sufficient confidence of results for an assessment of this nature.

There is also no onsite combustion plant with significant emissions associated with the Proposed Development. As a result, building emissions from combustion processes were also screened as not significant throughout the operational phase.

The Sussex Air Quality Partnership has developed 'Air Quality and Emissions Mitigation Guidance for Sussex' to improve air quality across the region. According to the guidance, the development is classified as major, and an Air Quality Emissions Mitigation Assessment is required. The results indicated a total damage cost value of £5,453 which will be offset by investing in enhancing the two direct connections to the existing Public Bridleway 1670/01 which provide direct access to the bridleway and the wider footpath network. It will be constructed using a material that would make it all-weather appropriate. It is considered that implementation of this measure would suitably offset impacts associated with the proposed development.

Based on the assessment results the site is considered suitable for the proposed end use and complies with the HDC Local Plan and NPPF.

1. INTRODUCTION

1.1 Background

Air Quality Solutions Ltd has been commissioned by Mr & Mrs A. Brazil, hereafter referred to as “the Client” to undertake an Air Quality Assessment in support of a proposal, comprising the residential development of 21 dwellings with associated landscaping and parking, hereinafter referred to as the “Proposed Development”.

1.2 Site Location and Assessment Context

The application site is located at Athelstan Way, Horsham at approximate National Grid Reference (NGR) 518000, 129877.

The application site is located 11,808m from the Crawley Borough Council Air Quality Management Area (AQMA) which has been declared due to exceedances of NO₂ Air Quality Objective (AQO). Subsequently, the Proposed Development has low potential to introduce future occupants into an area of elevated NO₂ and particulate matter (PM₁₀ and PM_{2.5}) concentrations, as well as to cause impacts at sensitive receptor locations during the construction and operational phases.

An Air Quality Assessment has been produced to assess the potential for air quality impacts at existing sensitive use and to assess site suitability for the proposed end-use. The assessment will be undertaken in accordance with the requirements of the National Planning Policy Framework (NPPF) and the HDC Local Planning Policy.

Reference should be made to Figure 1 within Appendix A for a location plan.

1.3 Limitations

This report has been produced in accordance with Air Quality Solutions Ltd' standard terms of engagement. Air Quality Solutions Ltd has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from Air Quality Solutions Ltd; a charge may be levied against such approval.

2. LEGISLATION, GUIDANCE AND POLICY

The following legislation, guidance and policy will be considered and adhered to during the preparation of the Air Quality Assessment:

- European Union (EU) Directive 2008/50/EC;
- The National Planning Policy Framework (NPPF), updated on 12th December 2024;
- The National Planning Practice Guidance (NPPG), relevant chapters produced on 1st November 2019;
- Section 82 of the Environment Act (1995) (Part IV), updated 9th November 2021;
- Air Quality Strategy: Framework for local authority delivery, April 2023;
- The Air Quality Standards (Amendment) Regulations (2016);
- Local Air Quality Management Technical Guidance 2022 LAQM.TG(22), DEFRA, 2022;
- Guidance on the Assessment of Dust from Demolition and Construction, Institute of Air Quality Management (IAQM), January 2024;
- Land-Use Planning and Development Control: Planning for Air Quality, Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM), January 2017;
- Environmental Improvement Plan 2025, DEFRA, December 2025; and
- Horsham District Planning Framework (excluding South Downs National Park), November 2015; and
- Air Quality and Emissions Mitigation Guidance For Sussex, 2021.

2.1 UK Legislation and Guidance

The Air Quality Standards (Amendment) Regulations (2016) came into force on 31st December 2016. These Regulations amend the Air Quality Standards Regulations 2010 and transpose the EU Directive 2008/50/EC into UK law. Air Quality Limit Values (AQLVs) were published in these regulations for 7 pollutants, as well as Target Values for an additional 6 pollutants. It should be taken into consideration that the AQLV for PM_{2.5} stated in the Air Quality Standards Regulations (2010) was amended in the Environment (Miscellaneous Amendments) (EU Exit) Regulations (2020).

Part IV of the Environment Act (2021) requires the UK government to produce a national Air Quality Strategy (AQS) which contains standards, objectives and measures for improving ambient air quality. The most recent AQS was produced by DEFRA and published on 28th April 2023. The AQS sets out Air Quality Objectives (AQOs) that are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedances over a specified timescale. These are generally in line with the AQLVs, although the requirements for compliance vary slightly.

The Environmental Improvement Plan, released in December 2025, outlines both long-term and interim objectives aimed at minimising public exposure to PM_{2.5}. Following this, the 2040

concentration goal was established within the Environmental Targets (Fine Particulate Matter) Regulations (2023).

Table 1 presents the AQOs for pollutants considered within this assessment.

Table 1: Air Quality Objectives

Pollutant	Air Quality Objectives	
	Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Periods
NO ₂	40	Annual mean
	200	1-hour mean; not to be exceeded more than 18 times a year
PM ₁₀	40	Annual mean
	50	24-hour mean; not to be exceeded more than 35 times a year
PM _{2.5}	20 (10*)	Annual mean

* Target to be achieved by 2030.

Table 2 summarises the advice provided in LAQM.TG(22) on where the AQOs for pollutants considered within this report apply.

Table 2: Examples of Where the Air Quality Objectives Apply

Averaging Periods	Objectives Should Apply At	Objectives Should Not Apply At
Annual mean	All locations where members of the public might be regularly exposed: building façades of residential properties, schools, hospitals, care homes etc.	Building 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 residential properties; kerbside sites (as opposed to locations at the building façade); or any other location where public exposure is expected to be short term.
24-hour mean	All locations where the annual mean objective would apply, together with hotels and gardens of residential properties.	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
1-hour mean	All locations where the annual mean and 24-hour mean objectives apply; kerbside sites (for example, pavements of busy shopping streets); 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	Kerbside sites where the public would not be expected to have regular access.

Averaging Periods	Objectives Should Apply At	Objectives Should Not Apply At
	the public might reasonably be expected to spend one hour or longer.	

The results of the dispersion modelling assessment will also be compared against the relevant AQOs detailed in Table 1 to determine significance.

2.2 Local Air Quality Management

Under Section 82 of the Environment Act (2021) (Part IV), Local Authorities (LAs) are required to periodically review and assess air quality within their area of administration under the system of Local Air Quality Management (LAQM). This review and assessment of air quality involves considering present and likely future air quality against the AQOs. If it is predicted that levels at sensitive locations where members of the public are regularly present for the relevant averaging period are likely to be exceeded, the LA is required to declare an AQMA. For each AQMA the LA is required to produce an Air Quality Action Plan (AQAP), the objective of which is to reduce pollutant concentrations in pursuit of the AQOs.

2.3 Local Planning Policy

A review of the local policy indicated the following policy in relation to air quality that is relevant to this assessment:

Policy 24

Strategic Policy: Environmental Protection

The high quality of the district's environment will be protected through the planning process and the provision of local guidance documents. Taking into account any relevant Planning Guidance Documents, developments will be expected to minimise exposure to and the emission of pollutants including noise, odour, air and light pollution and ensure that they:

4. Minimise the air pollution and greenhouse gas emissions in order to protect human health and the environment;
5. Contribute to the implementation of local Air Quality Action Plans and do not conflict with its objectives;
6. Maintain or reduce the number of people exposed to poor air quality including odour.

Consideration should be given to development that will result in new public exposure, particularly where vulnerable people (e.g. the elderly, care homes or schools) would be exposed to the areas of poor air quality).

Reference has been made to these policies during the undertaking of this Air Quality Assessment.

3. METHODOLOGY

3.1 Construction Phase Assessment

There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the IAQM document 'Guidance on the Assessment of Dust from Demolition and Construction'.

Reference should be made to Appendix C for details of the relevant IAQM construction phase assessment criteria, which were utilised in conjunction with site specific information.

Activities on the proposed construction site have been divided into the following types to reflect their different potential impacts. These are:

- Demolition
- Earthworks
- Construction
- Trackout

The potential for dust emissions was assessed for each activity that is likely to take place and considered three separate dust effects:

- Annoyance due to dust soiling
- Harm to ecological receptors
- The risk of health effects due to a significant increase in exposure to PM₁₀ and PM_{2.5}

A desktop survey will be undertaken to identify human and ecological receptors within the relevant assessment buffers specified by the IAQM guidance. Should sensitive receptors not be present within the relevant distances then negligible impacts would be expected and further assessment is not necessary.

Following the identification of sensitive receptors, a site is then allocated a risk category which is assigned to each activity, based on the scale and nature of the works, as well as the sensitivity of the area to dust impacts.

The assigned magnitude and sensitivity will then determine the overall risk and appropriate mitigation measures to be employed during construction phase activities.

3.2 Operational Phase Assessment

3.2.1 Future Exposure

The Proposed Development is located 11,808m from the from Crawley Borough Council AQMA. As such, the proposals have low potential to introduce new receptors into an area of existing poor air quality, as well as to cause impacts upon existing pollution levels at nearby sensitive receptors within the AQMA.

Detailed dispersion modelling was therefore undertaken to quantify NO₂, PM₁₀ and PM_{2.5} pollutant exposure across the site and determine suitability for the proposed use. The following modelling scenarios were utilised during the assessment:

- 2024 as baseline year for verification against latest ratified data;
- 2028 do-something (DS) (predicted traffic flows in 2028 should the proposals be completed)

In light of expected emission improvements to the national vehicle fleet guided by government policy, it would be unrealistic not to assume a reduction to vehicle emission factors in future years, given the anticipated development year of 2028.

The 2028 scenario assumes an emission drop off based on assumptions provided by the Emission Factor Toolkit (EFT v14.1) supported by the uptake of low emission vehicles and government incentives and targets concerning fleet proportions by 2030.

The results of the dispersion modelling assessment will also be compared against the relevant AQOs detailed in Table 1 to determine significance. Full details of data used for the modelling assessment are presented in Appendix B of this report.

3.2.2 Road Vehicle Exhaust Impact Assessment

Based on the details of the Proposed Development and anticipated trip generation a screening assessment in accordance with the EPUK and IAQM guidance was determined a suitable assessment approach. The assessment will determine road traffic exhaust and combustion emission impacts associated with the Proposed Development and confirm the requirement for detailed assessment work. The EPUK and IAQM document states the following criteria to help establish when an air quality assessment is likely to be considered necessary:

- Proposals that will cause a change in Light Duty Vehicle (LDV) flows of more than 100 Annual Average Daily Traffic (AADT) within or adjacent to an AQMA or more than 500 elsewhere;
- Proposals that will cause a change in Heavy Duty Vehicle (HDV) flows of more than 25 AADT within or adjacent to an AQMA or more than 100 elsewhere;
- Proposals which include either a centralised plant using biofuel, a combustion plant with single or thermal input >300KWh or a standby emergency generator associated with a centralised energy centre; and
- Proposals which include combustion processes of any size.

Should the above criteria not be met, the EPUK and IAQM document considers air quality impacts associated with the scheme to be not significant and no further assessment is required. Conversely, should the criterion be exceeded it may be deemed necessary that further assessment is required.

3.3 Air Quality Emissions Mitigation Assessment

The DEFRA guidance states that new developments may be required to incorporate additional measures in order to offset emissions at an early stage. Offsetting measures must be proportional to the nature and scale of the proposed development and may be based on quantification of the emissions associated with a development. The DEFRA guidance outlines the damage cost analysis methodology as the below:

- Identify the additional trip rates (as trips/annum) generated by the proposed development (this information will normally be provided in the Transport Assessment);
- Assume an average distance travelled of 10km/trip;
- Calculate the additional emissions of Oxides of Nitrogen (NO_x) and particulate matter with an aerodynamic diameter of less than 10µm (PM_{2.5}) (tonne/annum), based on emissions factors in the Emissions Factor Toolkit (Version 14.1), and an assumption of an average speed of 50 km/h;
- Calculate emissions using the Emissions Factor Toolkit over a 5-year time frame;
- Use the latest DEFRA Damage Cost approach to provide a valuation of the excess emissions, using the currently applicable values for each pollutant; and
- Sum the NO_x and PM_{2.5} costs.

The sum calculated following the above methodology provides a basis for defining the financial commitment required for the offsetting of emissions associated with the scheme.

4. BASELINE

Existing air quality conditions in the vicinity of the application site were identified in order to provide a baseline for assessment. These are detailed in the following sections.

4.1 Local Air Quality Management

As required by the Environment Act (2021), HDC has undertaken a review and assessment of air quality within their area of administration. The closest AQMA that has been declared is described as:

- Crawley Borough Council Air Quality Management Area

The application site is located 11,808m from the Crawley Borough Council AQMA. As such there is low potential for the Proposed Development to introduce future site users into an area of elevated NO₂ concentrations, and cause air quality impacts during the construction and operational phases. This has been considered within this report.

HDC has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs and as such no further AQMAs have been designated.

4.2 Air Quality Monitoring

Monitoring of pollutant concentrations is undertaken by HDC using monitoring methods throughout their areas of administration. A review of most recent Air Quality Monitoring Data indicated that there are currently 1 automatic analyser and 3 diffusion tubes located within the vicinity of the Proposed Development, presented in Table 3.

Table 3: Monitoring Results

ID	Site Name	Type	Monitoring Method	NGR (m)		Distance to Site (m)	Pollutant	Annual Mean Concentration (µg/m ³)		
				X	Y			2022	2023	2024
HO2	Horsham Park Way	Roadside	Automatic	517485	130590	879.27	NO ₂	17.7	16.2	15.7
							PM ₁₀	19.3	20.5	16.1
							PM _{2.5}	13.1	14.6	10.1
Horsham 12.2	Albion Way / Bishopric	Roadside	Diffusion Tube	516876	130703	1396.66	NO ₂	N/A	N/A	22.0
Horsham 13	St John's and Arunside Primary	Roadside	Diffusion Tube	516307	130498	1803.48	NO ₂	N/A	N/A	8.6

ID	Site Name	Type	Monitoring Method	NGR (m)		Distance to Site (m)	Pollutant	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)		
				X	Y			2022	2023	2024
	School									
A281_A24	A281 (Worthing Rd closed)	Other	Diffusion Tube	515513	131159	2798.06	NO ₂	N/A	N/A	11.8

As indicated in Table 3, there were exceedances of annual mean AQOs for PM_{2.5} at monitoring location ID: H02 shown above in bold. Reference should be made to Figure 2 within Appendix A for a graphical representation of the monitoring locations.

4.3 Background Pollutant Concentrations

The total concentration of a pollutant consists of explicit local emission sources (such as roads and industrial sources) and the background component. The background component consists of indeterminate sources which are transported into an area from further away by meteorological conditions. Background pollutant concentrations are therefore the ambient level of pollution that is not affected by local sources of pollution.

It is not usually practical to obtain a true representation of background levels in urban areas due to corruption by local sources; background levels used in assessments may contain a mixture of both sources.

Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by DEFRA for the entire of the UK to assist LAs in their Review and Assessment of air quality. The Proposed Development site is located across grid square:

- NGR: 518500, 129500

Data for this location was downloaded from the DEFRA website. For the purpose of this assessment, background concentrations are summarised in Table 4 for the base year (2024) and the predicted development opening year (2028).

The Urban Background monitoring station (ID: Horsham 3N), located approximately 2081 m from the site, was used to obtain background concentrations for NO₂, as it provides more representative measurements of local concentrations.

Table 4: Predicted Background Pollutant Concentrations

Pollutant	Predicted Background Concentration ($\mu\text{g}/\text{m}^3$)	
	2024	2028
NO _x	10.47193	9.13266
NO ₂	7.20000	7.20000
PM ₁₀	10.34589	10.01971
PM _{2.5}	6.41492	6.12453

As shown in Table 4, background concentrations of all pollutants are below the relevant AQOs detailed in Table 1.

4.4 Sensitive Receptors

A sensitive receptor is defined as any location which may be affected by changes in air quality as a result of a development. These have been defined for construction dust impacts in the following Sections.

4.4.1 Construction Phase Sensitive Receptors

There are no nationally or European designated ecological receptors within 50m of the Site boundary, or within 50m from a route used by construction vehicles on the public highway (up to 250m from the Site entrance(s)). Therefore, the risk of dust effects at a nationally or European designated ecological receptor site from construction impacts have not been considered further in this assessment.

Human receptors sensitive to potential dust impacts during earthworks and construction were identified from a desk-top study of the area up to 250m from the Proposed Development boundary. These are summarised in Table 5.

Table 5: Construction Phase Dust Sensitive Receptors

Distance from Site Boundary (m)	Approximate Number of Human Receptors
Less than 20	1 - 10
20 - 50m	10 - 100
50 - 100m	10 - 100
100 - 250m	More than 100

Reference should be made to Figure 3 within Appendix A for a graphical representation of construction phase dust buffer zones.

Receptors sensitive to potential dust impacts from trackout were identified from a desk-top study of the area up to 50m from the road network within 250m of the site access route. These are

summarised in Table 6. The construction traffic will access the Proposed Development via Athelstan Way.

Table 6: Trackout Dust Sensitive Receptors

Distance from Trackout Routes (m)	Approximate Number of Human Receptors
Less than 20	10 - 100
20 - 50m	More than 100

Reference should be made to Figure 4 within Appendix A for a graphical representation of trackout dust buffer zones. A number of additional factors have been considered when determining the sensitivity of the surrounding area. These are summarised in Table 7.

Table 7: Additional Area Sensitivity Factors

Guidance	Comment
Whether there is any history of dust generating activities in the area	The site is located in a High sensitivity area. There is likely to have been a history of dust generating activities due to commuting, development and agricultural processes in the locality.
The likelihood of concurrent dust generating activity on nearby sites.	A review of the HDC Planning Portal indicated that there are planning applications within proximity of the Proposed Development. As such, there is potential for concurrent dust generation to occur should the construction phases of the aforementioned developments overlap.
Pre-existing screening between the source and the receptors	There is vegetation present along the boundaries of the site. If retained, this could provide natural protective screening to receptors in these directions.
Conclusions drawn from analysing local meteorological data which accurately represent the area: and if relevant the season during which works will take place	The wind direction is predominantly from the Southwest of the development. As such, properties to the Northeast of the site would be most affected by dust emissions.
Conclusions drawn from local topography	The topography of the area appears to be slightly southerly inclined. As such, there are no constraints to dust dispersion.
Duration of the potential impact, as a receptor may become more sensitive over time	Currently the duration of the construction phase is unknown.
Any known specific receptor sensitivities which go beyond the classifications given in the document.	No specific receptor sensitivities identified during the baseline.

4.1.2 Operational Phase Sensitive Receptors

A desk top study was undertaken to identify the closest receptor locations to the application site. This indicated residential locations within close proximity to development boundaries. There are

care facilities in the vicinity of the application site and affected road networks. The nearest care facility, Glen Arun Nursing Home, is located approximately 55m East of the site. This has been considered within this report.

5. ASSESSMENT

5.1 Construction Phase Assessment

The undertaking of activities such as excavation, ground works, cutting, construction, concrete batching and storage of materials has the potential to result in fugitive dust emissions throughout the construction phase. Vehicle movements both on-site and on the local road network also have the potential to result in the re-suspension of dust from haul road and highway surfaces.

The desk-study detailed in Section 4.4 identified a number of receptors with a high classification of sensitivity within 250m of the site boundary, and within 50m of the anticipated trackout routes. As such, a detailed assessment of potential dust impacts was required, and summarised in the below sections.

Reference should be made to Appendix B for details of the relevant IAQM construction phase assessment criteria, which were utilised in conjunction with site specific information.

5.1.1 Step 2A – Magnitude

The scale and nature of the works was determined to assess the magnitude of dust arising from each construction phase activity. The determination of magnitude was based upon the criteria detailed in Appendix B, with the outcome of Step 2A is summarised below in Table 8.

Demolition

Demolition was not required for this project, and thus, it is not anticipated that air quality impacts would arise as a result of demolition activities.

Earthworks

The area of the site is less than 18,000m². As such, the magnitude of potential dust emissions related to earthwork activities is considered Small.

Construction

Given the scale of the Proposed Development the total building and infrastructure volume is less than 12,000m³. As such, the magnitude of potential dust emissions related to construction activities is considered Small.

Trackout

Information on the number of HDV trips to be generated during the construction phase of the Proposed Development was not available at the time of assessment. As such, it is anticipated that the unpaved road length is likely to be greater than 100m. The magnitude of potential dust emissions from trackout is therefore considered Large.

Table 8: Dust Emission Magnitude

Magnitude of Activities		
Earthworks	Construction	Trackout
Small	Small	Large

5.1.2 Step 2B – Sensitivity

The next step (Step 2B) is to determine the sensitivity of the surrounding area, based on general principles such as amenity and aesthetics, as well as human exposure sensitivity.

Dust Soiling

As shown in Section 4.4.1, the desktop study indicated approximately more than 100 sensitive receptors within 250m of the Proposed Development boundary and more than 100 within 20m of the anticipated trackout routes.

Based on the assessment criteria detailed in Appendix B, the sensitivity of the receiving environment to potential dust soiling impacts was considered to be Medium for all construction phase activities. This is because the site is situated in a predominantly High sensitivity area, and the people would reasonably be expected to be present here for extended periods of time.

Human Health

The annual mean concentration of PM₁₀ is 10.35µg/m³ as detailed in Section 4. Based on annual mean PM₁₀ concentrations, receptor sensitivity and the receptor counts provided above, the area is considered to be Low for all construction phase activities.

The sensitivity of the receiving environment to specific potential dust impacts, based on the criteria detailed in Appendix B is summarised in Table 9.

Table 9: Sensitivity of the Surrounding Area

Potential Impact	Sensitivity of the Surrounding Area		
	Earthworks	Construction	Trackout
Dust Soiling	Medium	Medium	High
Human Health	Low	Low	Low
Ecological	Negligible	Negligible	Negligible

5.1.3 Step 2C – Risk

Both the magnitude and sensitivity factors are combined in Step 2C to determine the risk of dust impacts without the application of best practice mitigation measures.

It should be noted that the potential for impacts depends significantly on the distance between the dust generating activity and receptor location. Risk was predicted based on a worst-case scenario of works being undertaken at the site boundary closest to each sensitive area. Therefore, actual risk is likely to be lower than that predicted during the majority of the construction phase. A summary of the risk from each dust generating activity is provided in Table 10.

Table 10: Summary of Potential Unmitigated Dust Risks

Potential Impact	Risk		
	Earthworks	Construction	Trackout
Dust Soiling	Low	Low	High
Human Health	Negligible	Negligible	Low
Ecological	Negligible	Negligible	Negligible

5.1.4 Step 3 – Mitigation

The IAQM guidance provides a number of potential mitigation measures to reduce impacts during the construction phase. These measures have been adapted for the Proposed Development site as summarised in Table 11.

Table 11: Fugitive Dust Mitigation Measures

Issue	Control Measure
Communication	• 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. • Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site.
Site Management	• Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. • Make the complaints log available to the local authority when asked.

Issue	Control Measure
	• 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. • Hold regular liaison meetings with other high risk construction sites within 250 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.
Monitoring	• Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary. • 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 PM10 continuous monitoring locations with the Local Authority. Where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.
Preparing and Maintaining the Site	• 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 production and the site is active for an extensive period. • Avoid site runoff of water or 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. • 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.

Issue	Control Measure
	• 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 access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. • Avoid dry sweeping of large areas. • Ensure vehicles entering and leaving sites 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 10m from receptors where possible.

5.1.5 Step 4 – Residual Impacts

Assuming the relevant mitigation measures outlined in Table 11 are implemented, the residual effect from all dust generating activities is predicted to be negligible and therefore **not significant** in accordance with the IAQM guidance.

5.2 Operational Phase Assessment

The assessment was undertaken in accordance with the methodology detailed in Section 3.2.

5.2.1 Future Exposure

Annual mean NO₂, PM₁₀ and PM_{2.5} concentrations were predicted across the Proposed Development for the 2028 DS scenario at a height of 1.5m to represent exposure across the ground floor level, as shown in Figures 7 to 9 within Appendix A.

Background NO₂ PM₁₀ and PM_{2.5} levels are likely to be lower at elevated heights due to increased distance from emission sources, such as roads. Therefore, predicted concentrations at heights above ground floor level are considered acceptable in regards to future exposure and have not been assessed further.

Nitrogen Dioxide (NO₂)

Predicted annual mean NO₂ concentrations across the Proposed Development site during the DS scenario are summarised in Table 12.

Table 12: Modelling Results - Annual Mean NO₂ at Proposed Development

Floor Level	Predicted 2028 Annual Mean NO ₂ Concentration (µg/m ³)
Ground (1.5m)	7.34 – 7.52

The predicted concentrations indicate that there were no exceedances of the AQO across the Proposed Development. As such, it is considered that annual mean NO₂ levels at the Proposed Development site should not be viewed as a constraint to development.

Predictions of 1-hour NO₂ concentrations were not produced as part of the dispersion modelling assessment. LAQM.TG(22) states if annual mean NO₂ concentrations are below 60µg/m³ then it is unlikely that the 1-hour AQO will be exceeded. As such, based on the results in Table 12, it is not predicted that on-site concentrations will exceed the 1-hour mean AQO for NO₂.

Based on the results of the dispersion modelling assessment, the site is considered to be suitable for the proposed end use for NO₂ concentrations.

Particulate Matter (PM₁₀ & PM_{2.5})

Predicted annual mean PM₁₀ and PM_{2.5} concentrations across the Proposed Development site during the DS scenario are summarised in Table 13.

Table 13: Modelling Results - Annual Mean PM₁₀ and PM_{2.5} at Proposed Development

Floor Level	Predicted 2028 Annual Mean Concentration (µg/m ³)	
	PM ₁₀	PM _{2.5}
Ground (1.5m)	10.07 – 10.12	6.16 – 6.19

The predicted concentrations indicate that there were no exceedances of the AQO across the Proposed Development. As such, it is considered that annual mean PM₁₀ and PM_{2.5} levels at the Proposed Development site should not be viewed as a constraint to development.

Based on the results of the dispersion modelling assessment, the site is considered to be suitable for the proposed end use for PM₁₀ and PM_{2.5} concentrations.

5.2.2 Road Vehicle Exhaust Emission Impacts

Any additional vehicle movements associated with the proposed development will generate exhaust emissions, such as NO₂, PM₁₀ and PM_{2.5} on the local and regional road networks.

It is considered that the operational phase of the site will not result in a change of AADT flows of more than 500, produce over 100 HDV movements per day or significantly affect average speeds on the local road network.

Subsequently, potential air quality impacts associated with operational phase road vehicle exhaust emissions are predicted to be **not significant** in accordance with the EPUK and IAQM screening criteria shown in Section 3.2.2.

5.2.3 Combustion Emission Impacts

There is also no onsite combustion plant with significant emissions associated with the Proposed Development. As a result, building emissions from combustion processes were also screened as not significant throughout the operational phase.

5.3 DEFRA Damage Cost Calculation

5.3.1 Emission Mitigation Assessment

The Sussex Air Quality Partnership has developed 'Air Quality and Emissions Mitigation Guidance for Sussex' to improve air quality across Sussex and encourage emissions reduction to improve the environment and health of the population.

The guidance provides a methodology for determining the scale of a development and outlines the required air quality mitigation. Review of the criteria indicated the proposals were classified as major as the number of dwellings to be provided is 10 or more. Based on the development classification, an Air Quality Emissions Mitigation Assessment is required

The Air Quality Emissions Mitigation Assessment was used to inform the level of mitigation required for the Proposed Development and demonstrate that the emission mitigation measures are proportionate to the damage costs.

5.3.2 Road Traffic Emissions

Based on the DEFRA guidance, the Emissions Factor Toolkit (version 14.1) was used in order to calculate the additional emissions of NO_x and PM_{2.5} (tonnes/annum) as a result of road vehicle exhaust emission associated with the Proposed Development.

For the calculation, the additional trip generation for the Proposed Development was estimated based on the size of the development. This indicated a total development AADT flow of 113 with no associated Heavy-Duty Vehicle (HDV) movements during the operational phase. This figure was utilised whilst undertaking the damage cost calculation.

Details of the development traffic data and parameters including average speeds and link length are summarised in Table 14.

Table 14: Road Traffic Emission Factor Toolkit Inputs

AADT	%HDV	Speed (kph)	Link Length (km)
113	0	50	10

5.3.3 Total Development Emissions

Measures aimed to improve the efficiency of vehicles, including electric and hybrid fleets, are to be introduced throughout the UK and as such, vehicle pollutant emissions are predicted to reduce over time. The calculated NO_x and PM_{2.5} emissions (tonnes/annum) as a result of the operational phase of the Proposed Development are summarised in Table 15.

Table 15: Development Emissions per Year

Year	NO _x Emissions (tonnes/annum)	PM _{2.5} Emissions (tonnes/annum)
2028	0.050864623	0.007220655
2029	0.04329592	0.007063313
2030	0.036222135	0.006901649
2031	0.030103507	0.006767116
2032	0.024877935	0.006649772

The DEFRA guidance provides a variety of damage cost values dependant on the pollutants emitted from a development, as well as considerations to geographical contexts. For the purpose of the assessment, Road Transport Urban Medium Central damage costings were used and are considered representative of the Proposed Development and surrounding area. The following calculation was undertaken using the most recent DEFRA damage costs released in 2025 summarised in Table 16.

Table 16: 2025 Damage Costs

Pollutant	Road Transport Urban Medium (£/tonne)
NO _x	11,630
PM _{2.5}	99,639

In accordance with the Air quality and emissions mitigation guidance for Sussex, total costs were calculated by multiplying the EFT Output with the central present values for Road Transport Rural source over a 5-year period:

5 Year Exposure Cost Value = EFT Output x Damage Costs

The Proposed Development damage costs per year are summarised in Table 17.

Table 17: Development Air Quality Damage Costs

Year	Road NO _x (£/tonne)	Road PM _{2.5} (£/tonne)
2028	592	719
2029	496	693
2030	409	667
2031	335	645
2032	273	624
5-years	2,104	3,339

The final damage costs are summarised in Table 18.

Table 18: Development Air Quality Damage Costs - 5-Year Time Frame

Pollutant	Development Damage Costs (£)
NO _x	2,104
PM _{2.5}	3,349
Total	5,453

As outlined in Table 18, the total damage cost for the Proposed Development was calculated at **£5,453**. This cost should be used as an indicator to the level of emissions offsetting measures required as part of the Proposed Development scheme.

5.3.4 Mitigation Measures

Table 19 shows the objective and indicative costings of mitigation measures which are deemed suitable for the proposed development. Please note the cost are indicative and may be subject to change when applied to real world scenarios.

Table 19: Mitigation Measures and Indicative Costings

Mitigation Measure	Description	Quantity	Estimated Costing per Unit	Estimated Costing
<i>Enhance the two direct connections to the existing Public Bridleway 1670/01 which provides direct access to the bridleway and the wider footpath network – It will be constructed using a material that would make it all-weather appropriate.</i>	<i>Northern Connection</i>	<i>6</i>	<i>£160 per meter</i>	<i>£960</i>
	<i>Southern Connection</i>	<i>29</i>	<i>£160 per meter</i>	<i>£4,640</i>
Total				£5,600

As shown in the indicative costings above, the planned mitigation is greater than the DEFRA Damage Cost value and as such, it is considered that implementation of the above measures would suitably reduce potential effects associated with the proposed development.

5.3.5 Environment Act PM_{2.5} Additional Considerations

An Interim Planning Guidance on the consideration of the Environmental Act PM_{2.5} target in planning decisions was published in October 2024. Applicants are advised to provide evidence in their planning applications that they have identified key sources of air pollution within their schemes and taken appropriate action to minimise emissions of PM_{2.5} and its precursors as far as is reasonably practicable.

The site is located in a low-density suburban area, approximately 12 km from the nearest AQMA, with no nearby schools or hospitals, but within close proximity to residential receptors and Glen Arun Nursing Home. Dispersion modelling results demonstrate that operational future PM_{2.5} concentrations are low, with predicted concentrations of approximately 6 µg/m³ in the opening year (2028), which are well below the Air Quality Objective and 2030 Target.

During construction, PM_{2.5} emissions will be controlled through IAQM-compliant mitigation including dust suppression, wheel washing, speed controls and enforced with a Construction Environmental Management Plan (CEMP). Operationally, PM_{2.5} emissions have been considered through 40 cycle spaces and the use of EV Charging points to encourage sustainable methods of transport and is supported by Part S of the New Building Regulations in Sussex. In addition, there will be estimated £5600 investment in an all-weather footpath linking the site to the wider footpath network, discouraging private car use thereby reducing vehicle-related PM_{2.5} from exhaust, brake and tyre wear on development users and nearby sensitive receptors.

6. CONCLUSION

Air Quality Solutions Ltd were commissioned by Mr & Mrs A. Brazil to undertake an Air Quality Assessment in support of a proposed development at Athelstan Way, Horsham.

During the construction phase of the Proposed Development there is the potential for air quality impacts as a result of fugitive dust emissions from the site. These were assessed in accordance with the IAQM methodology. Assuming good practice dust control measures are implemented, the residual potential air quality impacts from dust generated by earthworks and construction and trackout activities was predicted to be **not significant**.

Dispersion modelling was undertaken to quantify annual mean NO₂, PM₁₀ and PM_{2.5} concentrations across the application to assess suitability for proposed use. Modelling results were subsequently verified using local monitoring data.

The dispersion modelling results indicated that annual mean NO₂, PM₁₀ and PM_{2.5} concentrations across the application site were **below** the relevant AQOs at the proposed sensitive use.

An assessment was undertaken using the EPUK and IAQM screening criteria to determine the potential for vehicle trips generated by the Proposed Development to affect local air quality. The traffic data indicated that operational traffic flows are **below** the relevant EPUK and IAQM assessment thresholds.

There is also no onsite combustion plant with significant emissions associated with the Proposed Development. As a result, building emissions from combustion processes were also screened as not significant throughout the operational phase.

The Sussex Air Quality Partnership has developed 'Air Quality and Emissions Mitigation Guidance for Sussex' to improve air quality across the region. According to the guidance, the development is classified as major, and an Air Quality Emissions Mitigation Assessment is required. The results indicated a total damage cost value of £5,453 which will be offset by investing in enhancing the two direct connections to the existing Public Bridleway 1670/01 which provide direct access to the bridleway and the wider footpath network. It will be constructed using a material that would make it all-weather appropriate. It is considered that implementation of this measure would suitably offset impacts associated with the proposed development.

Based on the assessment results the site is considered suitable for the proposed end use and complies with the HDC Local Plan and NPPF.

ABBREVIATIONS

HDC	Horsham District Council
AADT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
APEC	Air Pollution Exposure Criteria
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objectives
AQS	Air Quality Strategy
CERC	Cambridge Environmental Research Consultants
DEFRA	Department for Environment, Food and Rural Affairs
DfT	Department for Transport
DM	Do Minimum
DS	Do Something
DMP	Dust Management Plan
EPUK	Environmental Protection UK
EU	European Union
GIA	Gross Internal Area
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LA	Local Authority
LDV	Light Duty Vehicle
NGR	National Grid Reference
NO ₂	Nitrogen dioxide
NO _x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5µm
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10µm
TEMPRO	Trip End Model Presentation Program
z ₀	Roughness Length

END OF REPORT

APPENDIX A: FIGURES

Figure 1
 Site Location

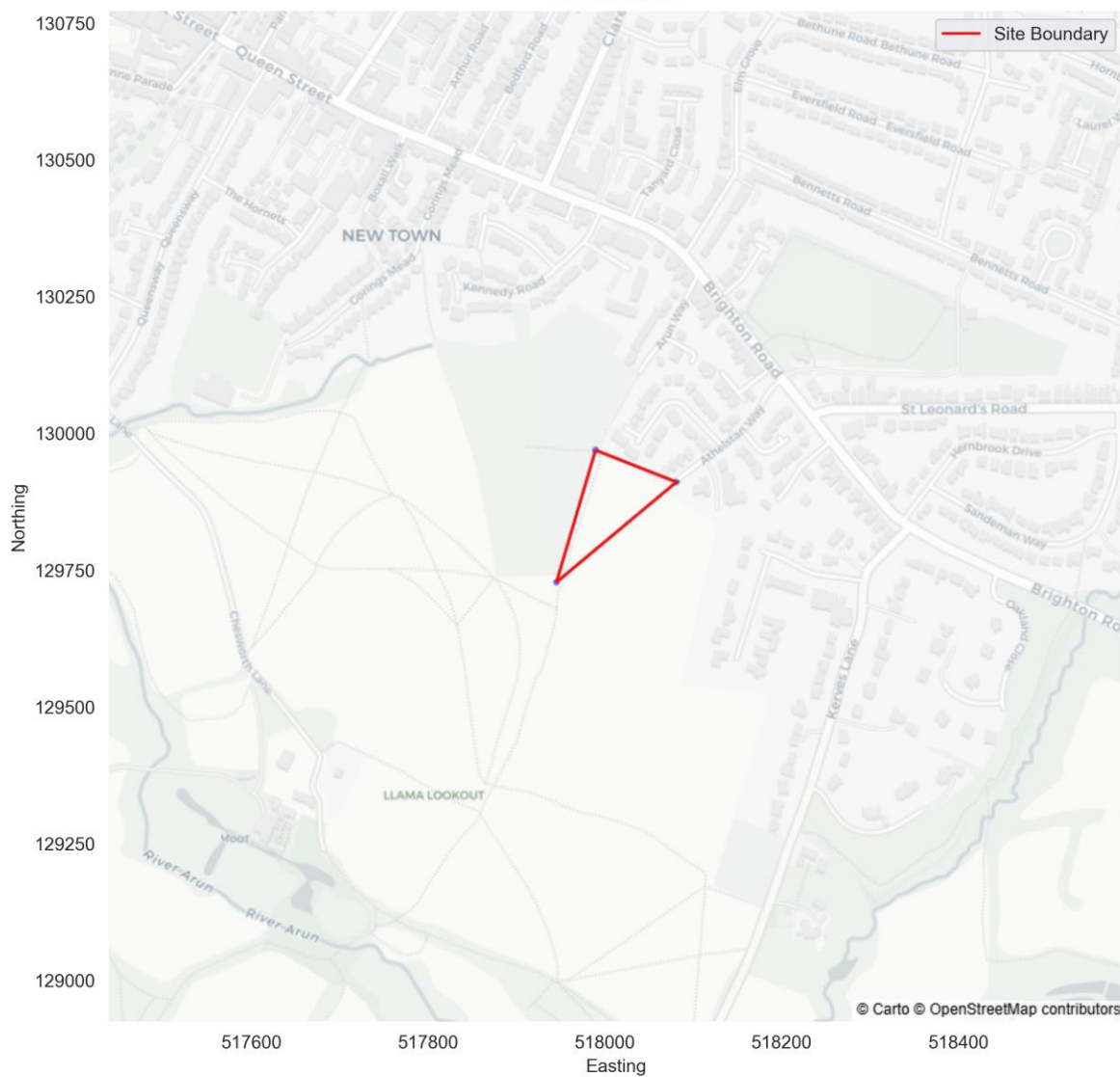
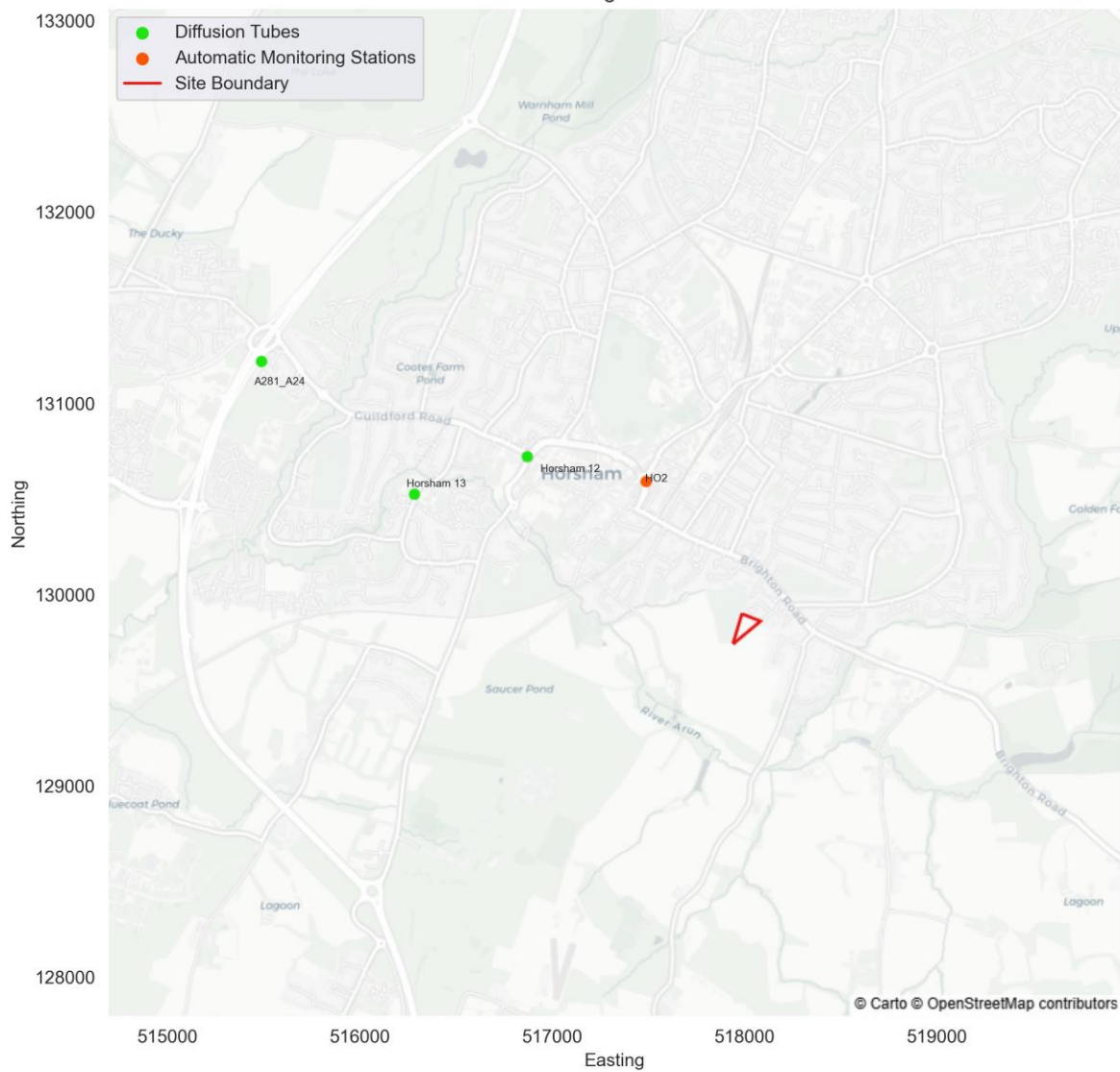
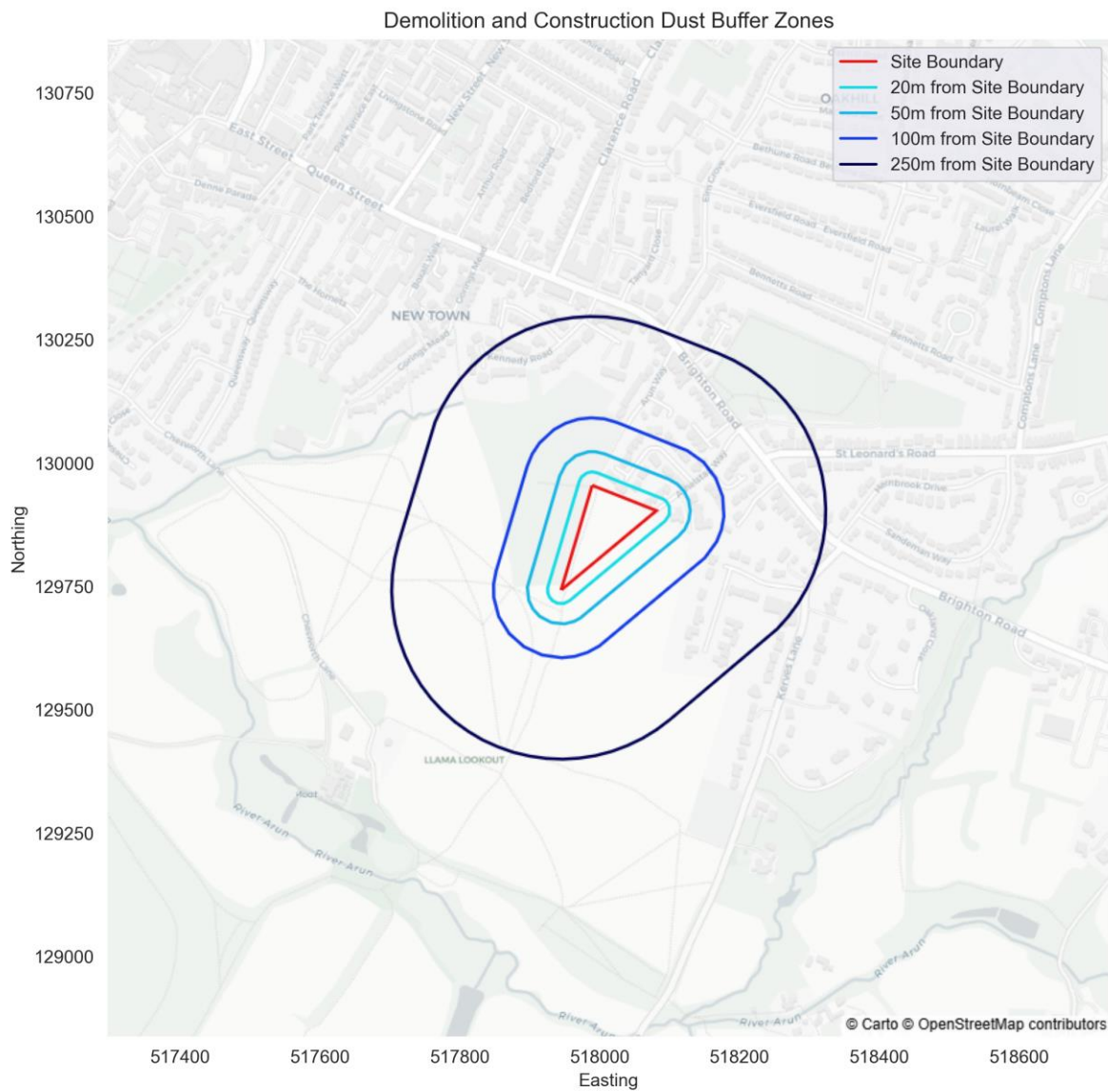
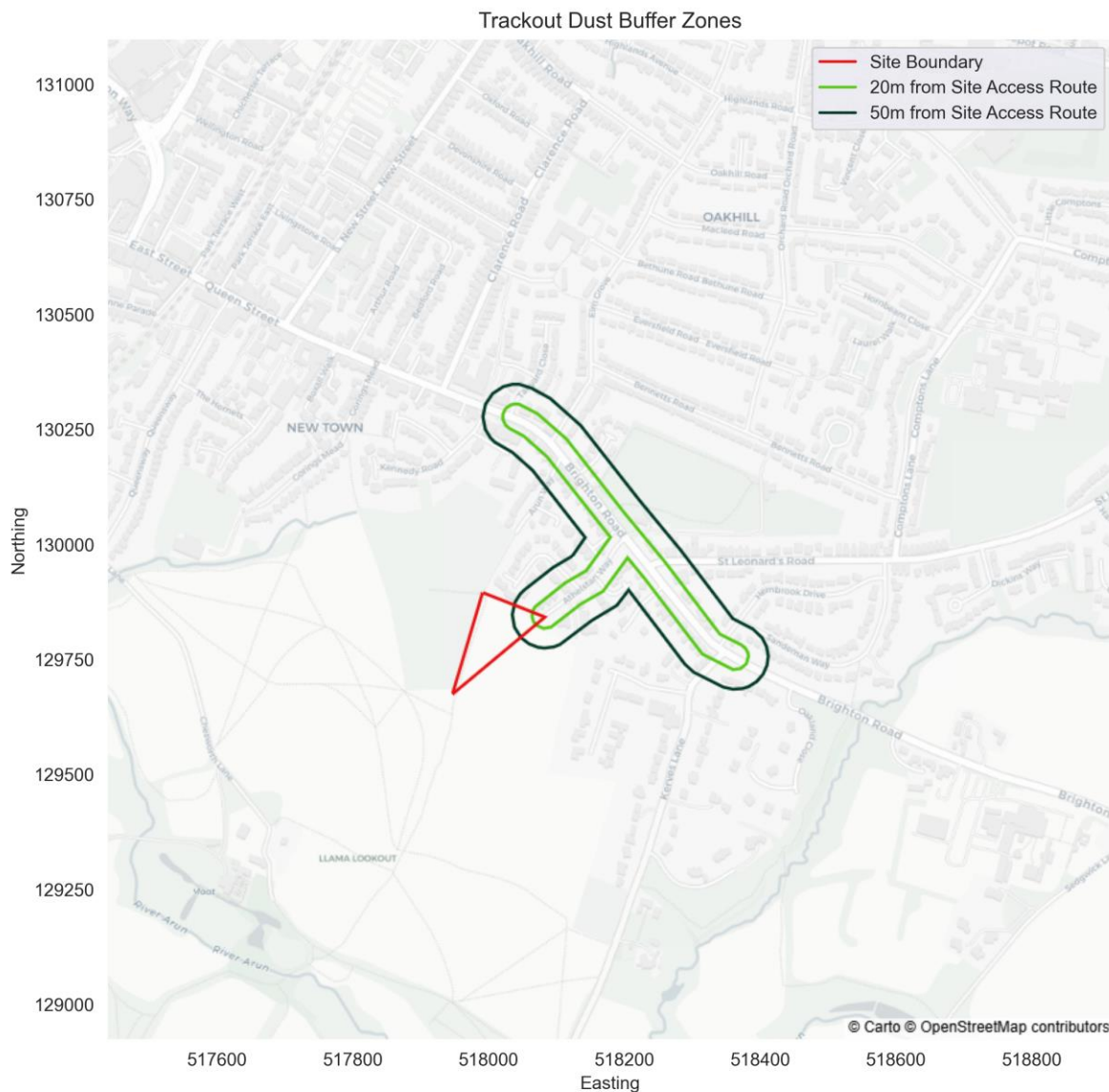


Figure 2
Monitoring Locations







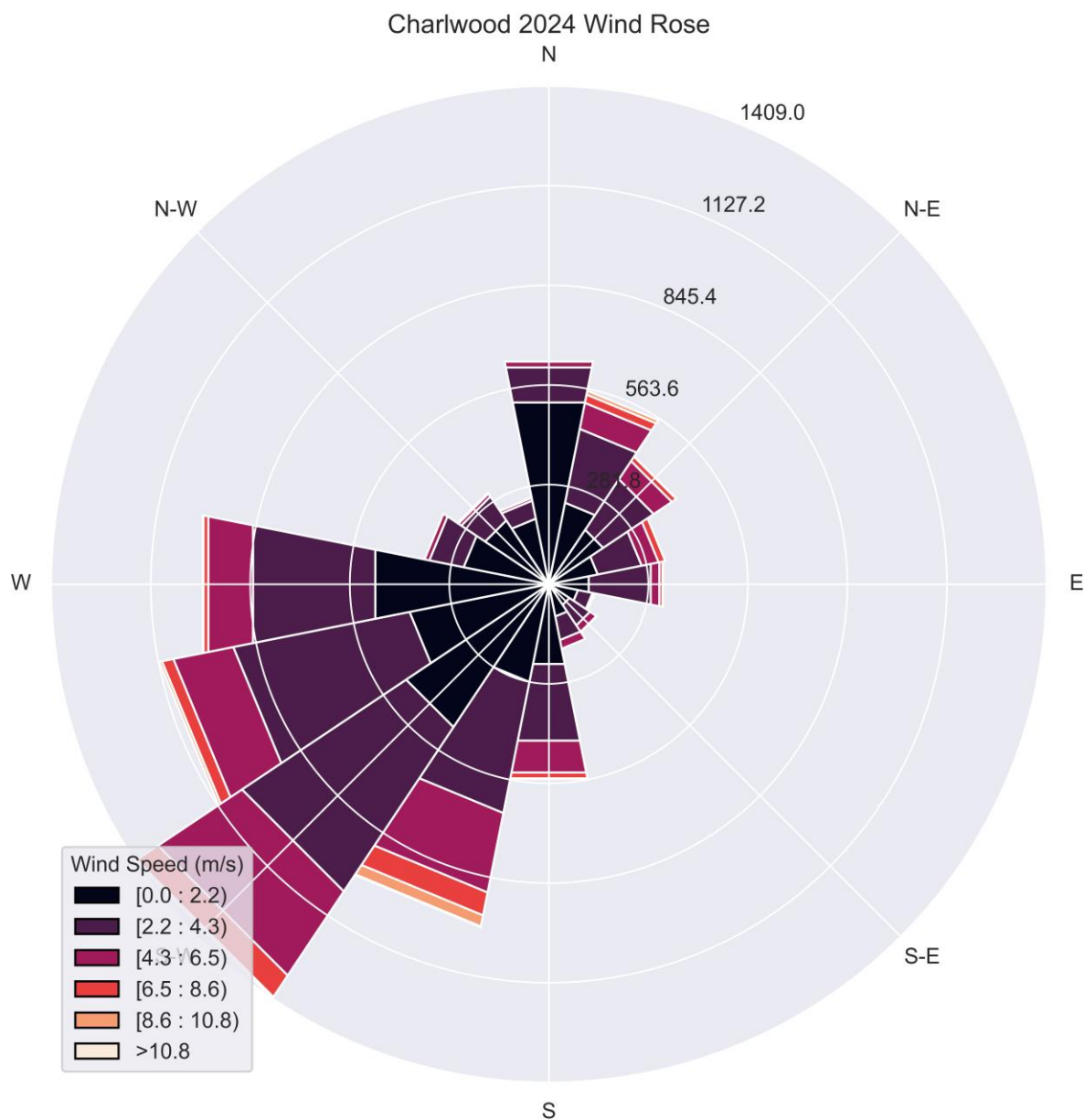
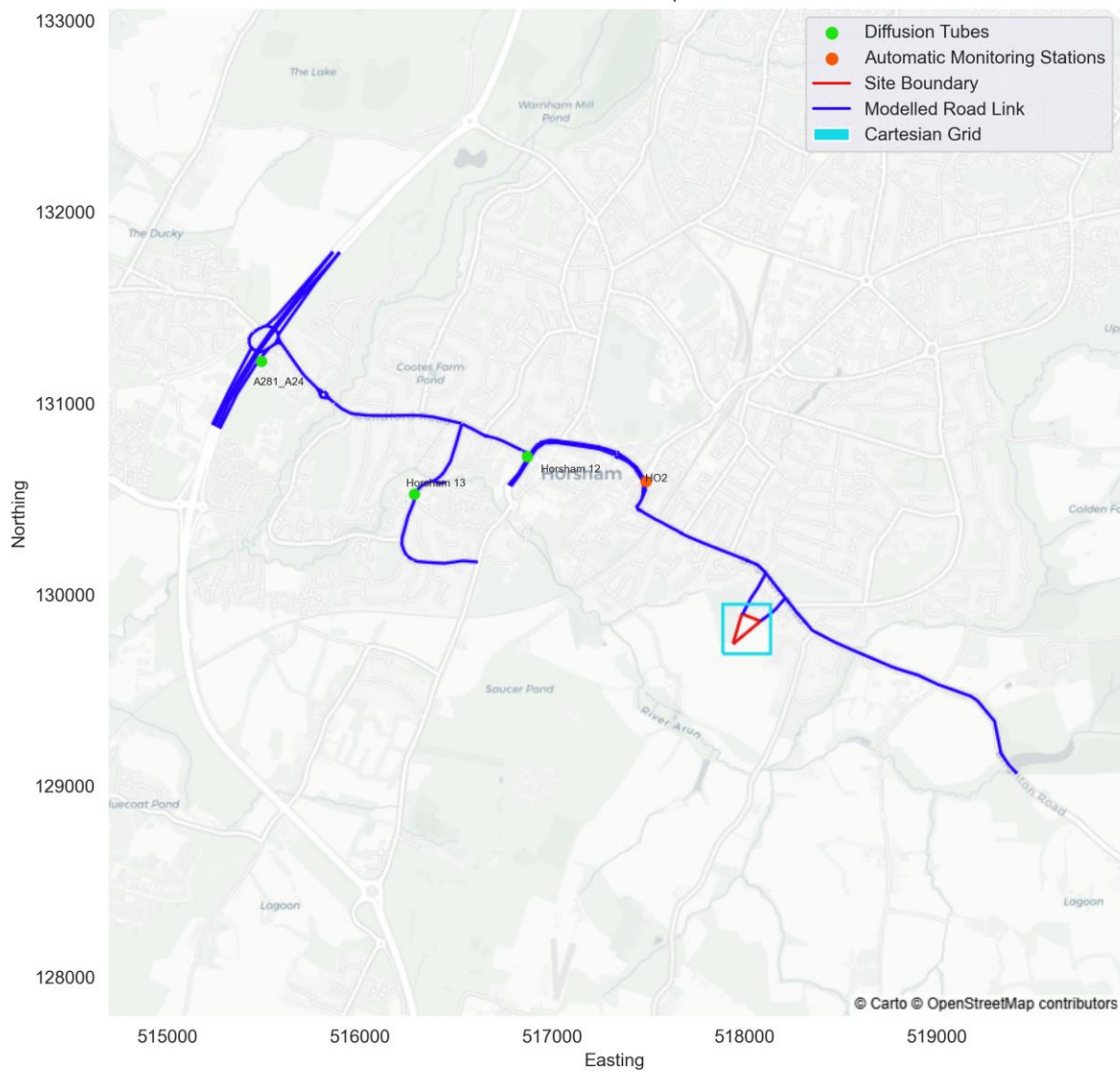
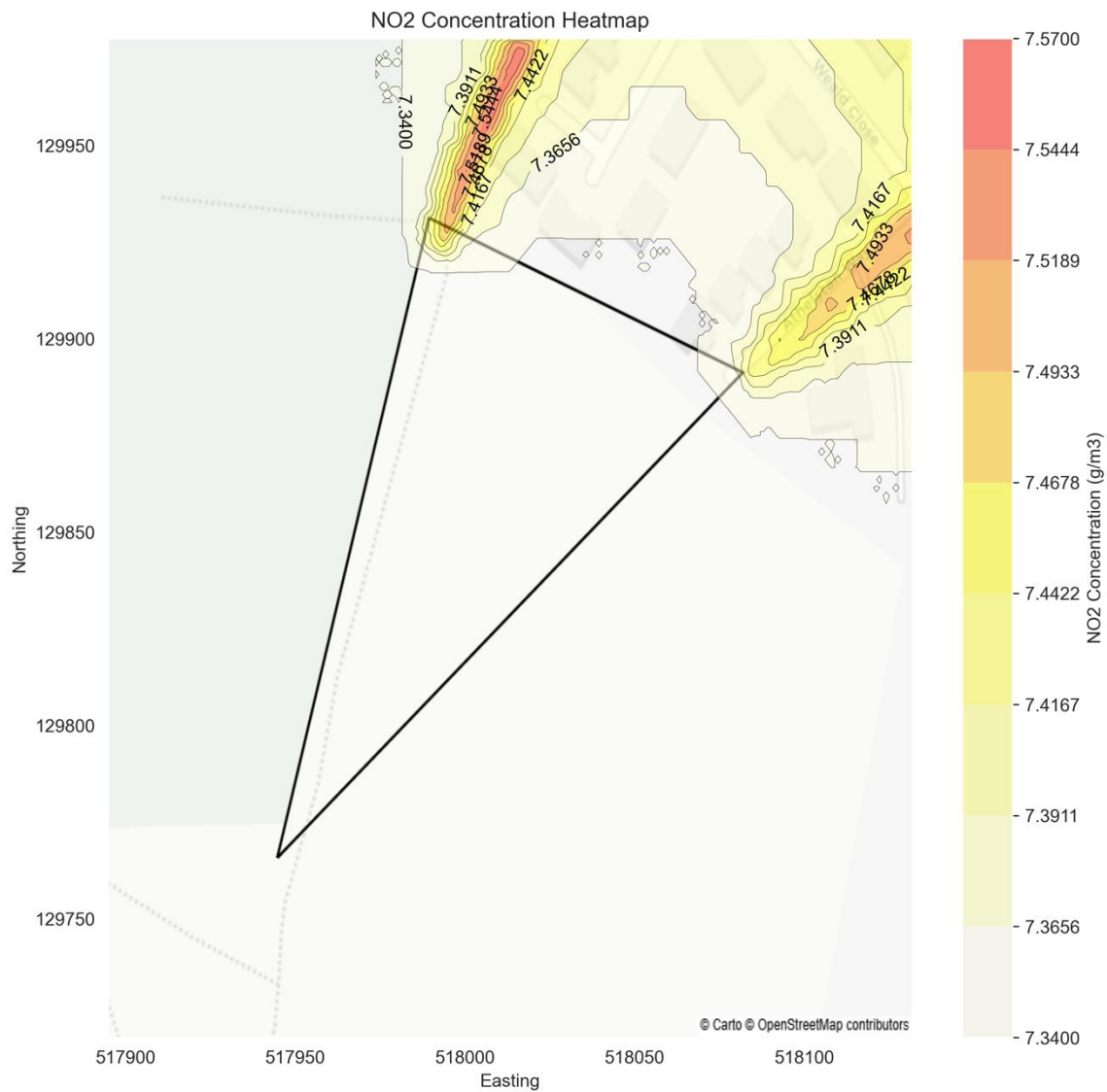
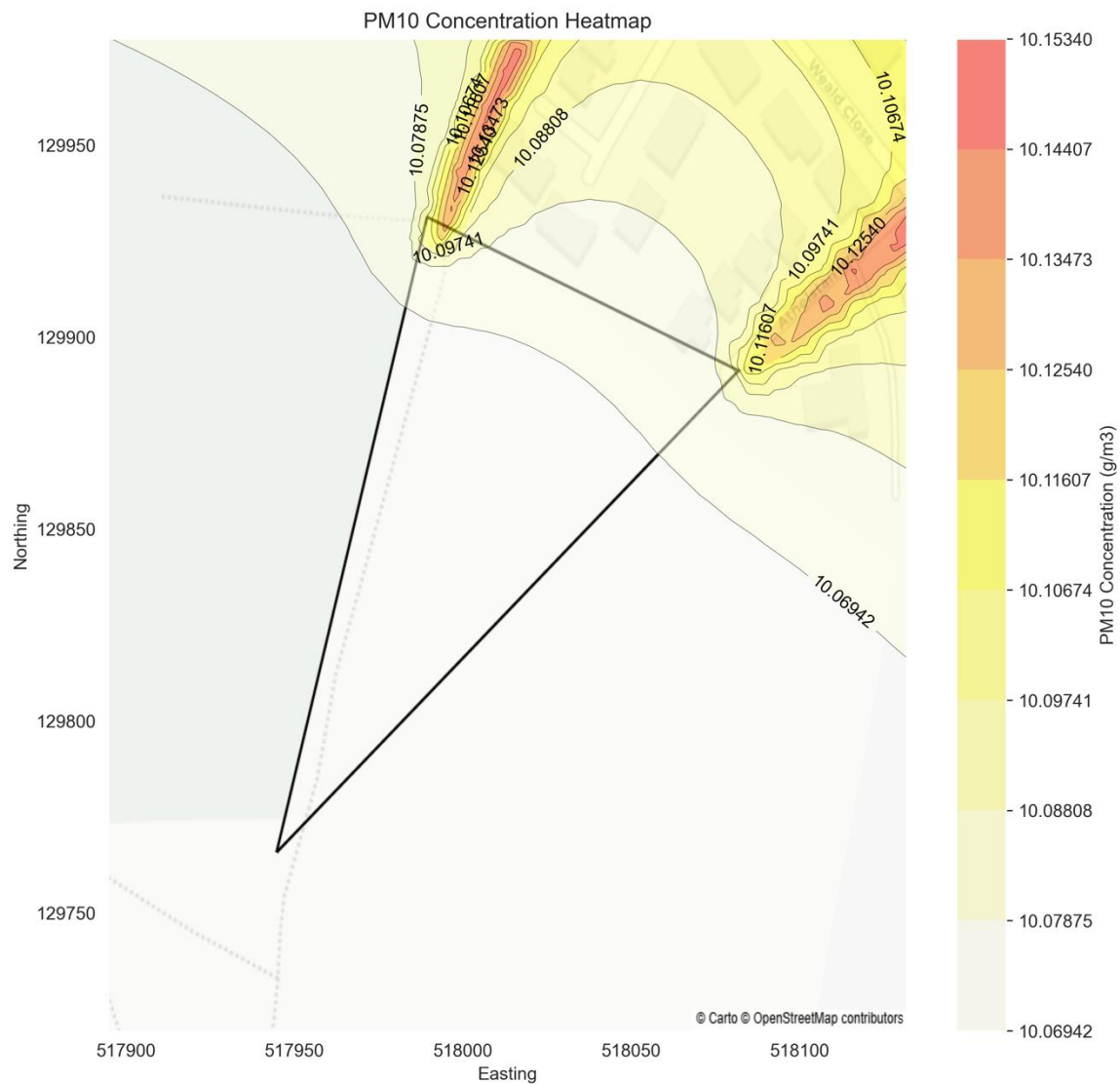
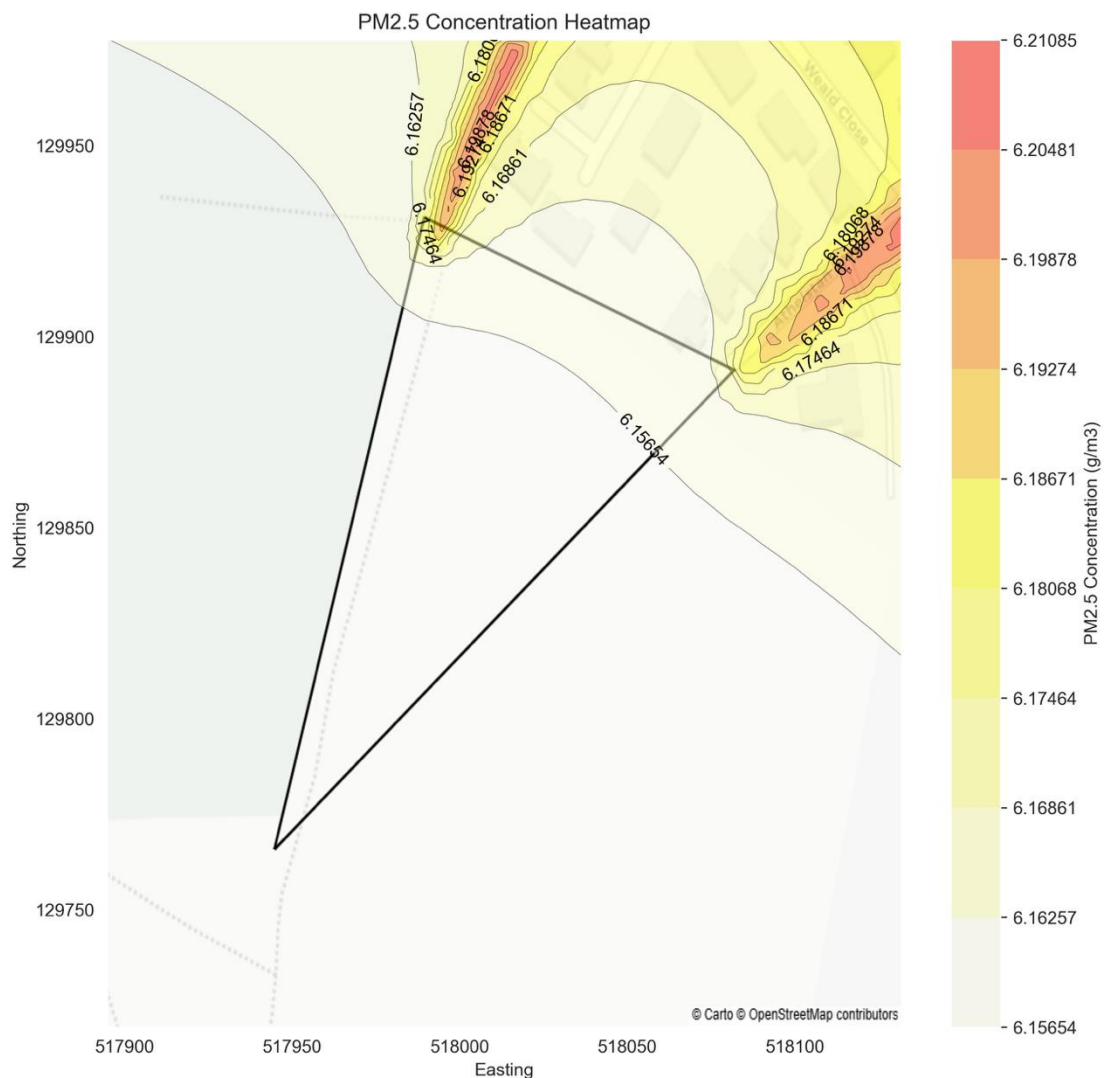


Figure 6
ADMS Roads Inputs









APPENDIX B: ASSESSMENT INPUTS

The Proposed Development has the potential to introduce future site users to poor air quality. Dispersion modelling using ADMS Roads was therefore undertaken to predict pollutant concentrations across the site to consider site suitability for the proposed end-use.

The assessment was undertaken in accordance with the guidance contained within LAQM.TG(22) and the EPUK and IAQM guidance.

Dispersion Model

Dispersion modelling was undertaken using the ADMS-Roads dispersion model (version 5.0). ADMS-Roads is developed by Cambridge Environmental Research Consultants (CERC) and is routinely used throughout the world for the prediction of pollutant dispersion from road sources. Modelling predictions from this software package are accepted within the UK by the Environment Agency and DEFRA.

The model requires input data that details the following parameters:

- Assessment area;
- Traffic flow data;
- Vehicle emission factors;
- Spatial coordinates of emissions;
- Street width;
- Meteorological data;
- Roughness length; and
- Monin-Obukhov length.

Assessment Area

Ambient concentrations were predicted over the Proposed Development site and surrounding highway network. One Cartesian grid was included in the model over the area at approximately NGR: 518000, 129877 at a height of 1.5m to represent the proposed ground floor level for the 2028 opening year scenario.

Results were subsequently used to produce contour plots. Reference should be made to Figure 6 within Appendix A for a graphical representation of the verification inputs and operation phase DS extents, respectively.

Traffic Flow Data

Development flow traffic data and associated network distribution was provided by the appointed Transport Consultants for the scheme and indicated that a total flow generation of 113 AADT is anticipated as a result of the Proposed Development.

Baseline traffic data for the road links were obtained from the Department for Transport (DfT). The DfT Matrix web tool enables the user to view and download traffic flows at count points in Great Britain from 1999 to present. The DfT matrix is referenced in LAQM.TG(22) as being a suitable source of data for air quality assessments and is therefore considered to provide a reasonable representation of traffic flows in the vicinity of the site.

Growth factors provided by the Trip End Model Presentation Program (TEMPO) software package were utilised to allow for conversion from the obtained traffic flow to 2028 which was used to represent the opening year scenario. Vehicle speeds and road widths were obtained from the Ordnance Survey.

A summary of the traffic data used in the verification scenario is provided in Table B1.

Table B1: 2024 Verification Traffic Data

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L1	A24	9.8	11878.0	3.2	93.0
L2	A24	9.0	11878.0	3.2	93.0
L3	A24	11.8	47512.0	3.2	94.8
L4	A24	10.0	47512.0	3.2	95.5
L5	A24	8.5	47512.0	3.2	94.6
L6	A24	8.0	47512.0	3.2	94.1
L7	A281	9.4	11878.0	3.2	70.8
L8	A281	11.6	47512.0	3.2	77.5
L9	A281	9.7	15033.0	1.6	62.9
L10	A281	8.1	11878.0	3.2	30.0
L11	A281	10.7	47512.0	3.2	39.7
L12	A281	9.3	47512.0	3.2	44.3
L13	A281	10.0	47512.0	3.2	44.5
L14	A281	8.8	47512.0	3.2	42.0
L15	A281	10.2	15033.0	1.6	42.2
L16	A281	11.3	15033.0	1.6	42.9
L17	A281	11.4	47512.0	3.2	28.9

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L18	A281	9.6	47512.0	3.2	16.7
L19	A281	9.3	47512.0	3.2	18.1
L20	A281	12.1	47512.0	3.2	46.7
L21	A281	9.4	47512.0	3.2	43.4
L22	A281	9.6	15033.0	1.6	41.5
L23	A281	12.0	15033.0	1.6	40.5
L24	A281	11.3	15033.0	1.6	47.8
L25	A281	11.3	15033.0	1.6	44.2
L26	A281	10.7	15033.0	1.6	33.1
L27	A281	11.2	15033.0	1.6	38.2
L28	A281	11.1	15033.0	1.6	49.6
L29	A281	9.2	47512.0	3.2	30.6
L30	A281	8.9	47512.0	3.2	44.0
L31	A281	11.2	15033.0	1.6	46.8
L32	A281	7.3	11878.0	3.2	71.0
L33	A281	8.1	11878.0	3.2	76.2
L34	A281	10.2	47512.0	3.2	41.4
L35	A281	11.2	47512.0	3.2	39.8
L36	A281	9.9	47512.0	3.2	35.8
L37	Albion Way	7.3	9126.0	1.5	36.2
L38	Albion Way	7.7	9126.0	1.5	5.0
L39	Albion Way	7.7	9126.0	1.5	15.4
L40	Albion Way	8.9	24156.0	1.1	27.9
L41	Albion Way	7.7	24156.0	1.1	44.0
L42	Albion Way	8.8	24156.0	1.1	36.1
L43	Albion Way	8.1	24156.0	1.1	26.7
L44	Albion Way	9.5	24156.0	1.1	32.2
L45	Albion Way	9.6	24156.0	1.1	11.6
L46	Albion Way	13.2	24156.0	1.1	41.8
L47	Albion Way	10.0	24156.0	1.1	6.3
L48	Albion Way	10.4	24156.0	1.1	23.7
L49	Albion Way	10.0	24156.0	1.1	26.0
L50	Albion Way	8.6	24156.0	1.1	44.0
L51	Albion Way	10.5	24156.0	1.1	42.7

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L52	Albion Way	9.8	24156.0	1.1	28.9
L53	Albion Way	22.3	24156.0	1.1	41.9
L54	Albion Way	10.6	24156.0	1.1	35.4
L55	Albion Way	10.3	24156.0	1.1	31.5
L56	Albion Way	22.5	24156.0	1.1	23.5
L57	Albion Way	10.9	24156.0	1.1	25.6
L58	Albion Way	10.2	24156.0	1.1	35.4
L59	Albion Way	9.0	24156.0	1.1	23.3
L60	Albion Way	11.0	24156.0	1.1	29.7
L61	Albion Way	14.7	24156.0	1.1	18.0
L62	Albion Way	7.8	24156.0	1.1	37.2
L63	Albion Way	7.2	24156.0	1.1	39.2
L64	Albion Way	9.1	9126.0	1.5	30.4
L65	Albion Way	8.5	24156.0	1.1	34.5
L66	Albion Way	7.5	24156.0	1.1	36.9
L67	Albion Way	8.5	24156.0	1.1	12.6
L68	Albion Way	11.6	24156.0	1.1	35.4
L69	Albion Way	8.8	24156.0	1.1	31.6
L70	Albion Way	9.5	24156.0	1.1	33.3
L71	Albion Way	10.5	24156.0	1.1	20.8
L72	Albion Way	16.0	9126.0	1.5	5.0
L73	Albion Way	10.9	24156.0	1.1	32.2
L74	Albion Way	7.8	24156.0	1.1	44.6
L75	Albion Way	14.5	9126.0	1.5	5.0
L76	Albion Way	7.3	24156.0	1.1	41.3
L77	Albion Way	11.4	24156.0	1.1	12.1
L78	Albion Way	18.9	24156.0	1.1	38.2
L79	Albion Way	20.3	24156.0	1.1	33.3
L80	Albion Way	15.1	24156.0	1.1	25.4
L81	Albion Way	10.5	24156.0	1.1	29.7
L82	Albion Way	7.8	24156.0	1.1	34.6
L83	Albion Way	7.2	24156.0	1.1	60.5
L84	Albion Way	7.3	24156.0	1.1	49.9
L85	Albion Way	7.3	24156.0	1.1	23.2

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L86	Arun Way	6.4	264.0	0.0	23.2
L87	Arun Way	4.1	264.0	0.0	14.2
L88	Arun Way	6.5	264.0	0.0	24.9
L89	Arun Way	4.4	264.0	0.0	14.2
L90	Arun Way	4.7	264.0	0.0	20.7
L91	Athelstan Way	8.6	264.0	0.0	22.6
L92	Athelstan Way	7.4	264.0	0.0	24.9
L93	Athelstan Way	7.9	264.0	0.0	24.8
L94	Athelstan Way	7.5	264.0	0.0	22.8
L95	Bishopric	11.8	24156.0	1.1	28.4
L96	Bishopric	12.9	24156.0	1.1	34.6
L97	Bishopric	11.5	24156.0	1.1	18.0
L98	Bishopric	9.6	24156.0	1.1	36.4
L99	Bishopric	12.3	24156.0	1.1	5.0
L100	Bishopric	11.3	24156.0	1.1	5.0
L101	Bishopric	24.0	24156.0	1.1	5.0
L102	Bishopric	19.2	24156.0	1.1	37.0
L103	Bishopric	11.0	24156.0	1.1	17.2
L104	Bishopric	11.3	24156.0	1.1	39.9
L105	Bishopric	11.4	24156.0	1.1	42.3
L106	Bishopric	11.2	24156.0	1.1	21.1
L107	Bishopric	10.9	24156.0	1.1	33.7
L108	Blackbridge Lane	6.8	2417.0	1.0	38.1
L109	Blackbridge Lane	6.6	2417.0	1.0	37.7
L110	Blackbridge Lane	8.4	2417.0	1.0	46.0
L111	Blackbridge Lane	9.1	2417.0	1.0	23.4
L112	Blackbridge Lane	7.2	2417.0	1.0	33.3
L113	Blackbridge Lane	5.5	264.0	0.0	25.1
L114	Blackbridge Lane	6.9	2417.0	1.0	39.8
L115	Blackbridge Lane	7.7	2417.0	1.0	40.1
L116	Blackbridge Lane	8.6	2417.0	1.0	44.9
L117	Blackbridge Lane	7.8	2417.0	1.0	35.2
L118	Blackbridge Lane	6.8	2417.0	1.0	42.2
L119	Blackbridge Lane	7.8	2417.0	1.0	40.6

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L120	Blackbridge Lane	8.0	2417.0	1.0	38.7
L121	Blackbridge Lane	9.9	2417.0	1.0	47.0
L122	Blackbridge Lane	9.1	2417.0	1.0	45.7
L123	Blackbridge Lane	9.5	2417.0	1.0	44.4
L124	Blackbridge Lane	16.5	264.0	0.0	25.7
L125	Blackbridge Lane	6.5	2417.0	1.0	41.9
L126	Blackbridge Lane	6.8	2417.0	1.0	20.0
L127	Blackbridge Lane	7.3	2417.0	1.0	45.7
L128	Blackbridge Lane	8.2	2417.0	1.0	43.7
L129	Blackbridge Lane	7.9	2417.0	1.0	42.8
L130	Blackbridge Lane	8.6	2417.0	1.0	22.4
L131	Blackbridge Lane	7.7	2417.0	1.0	42.3
L132	Blackbridge Lane	6.9	2417.0	1.0	34.3
L133	Blackbridge Lane	7.8	2417.0	1.0	32.3
L134	Blackbridge Lane	8.8	2417.0	1.0	37.2
L135	Blackbridge Lane	6.4	264.0	0.0	24.8
L136	Blackbridge Lane	6.9	2417.0	1.0	40.3
L137	Blackbridge Lane	8.2	2417.0	1.0	36.5
L138	Brighton Road	6.2	9671.0	1.8	58.6
L139	Brighton Road	7.3	11533.0	1.5	59.6
L140	Brighton Road	7.4	11533.0	1.5	49.3
L141	Brighton Road	10.2	11533.0	1.5	35.6
L142	Brighton Road	8.0	11533.0	1.5	40.4
L143	Brighton Road	9.2	11533.0	1.5	42.4
L144	Brighton Road	9.4	11533.0	1.5	35.8
L145	Brighton Road	10.0	11533.0	1.5	39.4
L146	Brighton Road	9.0	11533.0	1.5	39.2
L147	Brighton Road	8.3	11533.0	1.5	35.1
L148	Brighton Road	8.3	11533.0	1.5	43.1
L149	Brighton Road	8.9	11533.0	1.5	44.5
L150	Brighton Road	9.5	11533.0	1.5	35.7
L151	Brighton Road	9.4	11533.0	1.5	35.1
L152	Brighton Road	8.4	11533.0	1.5	43.2
L153	Brighton Road	13.6	11533.0	1.5	36.2

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L154	Brighton Road	8.6	11533.0	1.5	61.0
L155	Brighton Road	10.7	11533.0	1.5	46.9
L156	Brighton Road	7.6	11533.0	1.5	60.2
L157	Brighton Road	9.0	11533.0	1.5	44.3
L158	Brighton Road	7.1	11533.0	1.5	54.9
L159	Brighton Road	8.8	11533.0	1.5	42.3
L160	Brighton Road	9.3	11533.0	1.5	42.0
L161	Brighton Road	10.0	11533.0	1.5	32.2
L162	Brighton Road	9.2	11533.0	1.5	43.9
L163	Brighton Road	9.0	11533.0	1.5	39.3
L164	Brighton Road	8.9	11533.0	1.5	46.6
L165	Brighton Road	7.8	11533.0	1.5	47.7
L166	Brighton Road	7.8	11533.0	1.5	48.2
L167	Brighton Road	9.9	11533.0	1.5	32.0
L168	Brighton Road	6.3	11533.0	1.5	63.8
L169	Brighton Road	5.9	11533.0	1.5	70.1
L170	Brighton Road	6.4	11533.0	1.5	59.0
L171	Brighton Road	7.8	11533.0	1.5	47.0
L172	Brighton Road	9.3	11533.0	1.5	46.2
L173	Brighton Road	9.2	11533.0	1.5	47.2
L174	Brighton Road	5.9	11533.0	1.5	50.2
L175	Brighton Road	5.5	11533.0	1.5	51.7
L176	Brighton Road	9.2	11533.0	1.5	45.1
L177	Brighton Road	11.0	11533.0	1.5	62.0
L178	East Street	8.5	24156.0	1.1	30.4
L179	East Street	12.6	24156.0	1.1	46.0
L180	East Street	12.0	24156.0	1.1	14.2
L181	East Street	13.6	24156.0	1.1	23.2
L182	East Street	9.7	24156.0	1.1	25.8
L183	East Street	9.3	24156.0	1.1	31.1
L184	East Street	11.2	24156.0	1.1	26.9
L185	Farthings Hill	7.8	15033.0	1.6	43.8
L186	Farthings Hill	7.1	15033.0	1.6	46.4
L187	Farthings Hill	7.9	15033.0	1.6	38.3

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L188	Farthings Hill	7.9	15033.0	1.6	23.5
L189	Farthings Hill	9.6	15033.0	1.6	41.6
L190	Farthings Hill	13.7	15033.0	1.6	37.5
L191	Farthings Hill	13.4	15033.0	1.6	33.4
L192	Farthings Hill	10.7	15033.0	1.6	52.6
L193	Farthings Hill	7.2	15033.0	1.6	48.2
L194	Farthings Hill	6.2	15033.0	1.6	49.0
L195	Farthings Hill	7.6	15033.0	1.6	45.0
L196	Guildford Road	8.8	15033.0	1.6	43.1
L197	Guildford Road	8.6	15033.0	1.6	45.6
L198	Guildford Road	8.2	15033.0	1.6	45.2
L199	Guildford Road	8.4	15033.0	1.6	47.2
L200	Guildford Road	10.6	15033.0	1.6	37.7
L201	Guildford Road	7.9	15033.0	1.6	45.4
L202	Guildford Road	8.4	15033.0	1.6	40.1
L203	Guildford Road	13.4	15033.0	1.6	37.2
L204	Guildford Road	15.0	15033.0	1.6	33.5
L205	Guildford Road	16.6	15033.0	1.6	34.7
L206	Guildford Road	11.2	15033.0	1.6	48.8
L207	Guildford Road	8.2	15033.0	1.6	47.1
L208	Guildford Road	12.2	15033.0	1.6	40.5
L209	Guildford Road	10.8	15033.0	1.6	41.9
L210	Guildford Road	7.7	15033.0	1.6	40.8
L211	Guildford Road	10.2	15033.0	1.6	42.9
L212	Guildford Road	7.2	15033.0	1.6	44.1
L213	Park Way	8.3	24156.0	1.1	18.8
L214	Park Way	8.3	24156.0	1.1	33.0
L215	Park Way	10.2	24156.0	1.1	5.0
L216	Park Way	11.5	24156.0	1.1	27.4
L217	Park Way	13.4	24156.0	1.1	31.4
L218	Park Way	13.6	24156.0	1.1	30.2
L219	Park Way	19.2	24156.0	1.1	23.4
L220	Park Way	13.5	24156.0	1.1	32.3
L221	Park Way	7.9	24156.0	1.1	40.1

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L222	Park Way	13.0	24156.0	1.1	23.5
L223	Park Way	17.8	24156.0	1.1	29.2
L224	Park Way	12.6	24156.0	1.1	12.3
L225	Queen Street	8.0	11533.0	1.5	31.9
L226	Queen Street	8.3	24156.0	1.1	30.8
L227	Queen Street	8.9	11533.0	1.5	26.7
L228	Queen Street	5.6	11533.0	1.5	40.7
L229	Queen Street	9.0	11533.0	1.5	33.2
L230	Queen Street	8.4	11533.0	1.5	32.9
L231	Queen Street	5.4	11533.0	1.5	32.1

Reference should be made to Figure 6 within Appendix A for a graphical representation of the road link locations used within the verification assessment. The road width and mean vehicle speed shown in Table B1 remained the same for the 2028 scenarios.

A summary of the 2028 traffic data is shown in Table B2.

Table B2: 2028 Traffic Data

Road Link		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)
L1	A24	12368.0	3.2
L2	A24	12368.0	3.2
L3	A24	49131.0	3.2
L4	A24	49131.0	3.2
L5	A24	49131.0	3.2
L6	A24	49131.0	3.2
L7	A281	12368.0	3.2
L8	A281	49131.0	3.2
L9	A281	15623.0	1.6
L10	A281	12368.0	3.2
L11	A281	49131.0	3.2
L12	A281	49131.0	3.2
L13	A281	49131.0	3.2
L14	A281	49131.0	3.2

Road Link		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)
L15	A281	15623.0	1.6
L16	A281	15623.0	1.6
L17	A281	49131.0	3.2
L18	A281	49131.0	3.2
L19	A281	49131.0	3.2
L20	A281	49131.0	3.2
L21	A281	49131.0	3.2
L22	A281	15623.0	1.6
L23	A281	15623.0	1.6
L24	A281	15623.0	1.6
L25	A281	15623.0	1.6
L26	A281	15623.0	1.6
L27	A281	15623.0	1.6
L28	A281	15623.0	1.6
L29	A281	49131.0	3.2
L30	A281	49131.0	3.2
L31	A281	15623.0	1.6
L32	A281	12368.0	3.2
L33	A281	12368.0	3.2
L34	A281	49131.0	3.2
L35	A281	49131.0	3.2
L36	A281	49131.0	3.2
L37	Albion Way	9528.0	1.5
L38	Albion Way	9528.0	1.5
L39	Albion Way	9528.0	1.5
L40	Albion Way	25035.0	1.1
L41	Albion Way	25035.0	1.1
L42	Albion Way	25035.0	1.1
L43	Albion Way	25035.0	1.1
L44	Albion Way	25035.0	1.1
L45	Albion Way	25035.0	1.1
L46	Albion Way	25035.0	1.1
L47	Albion Way	25035.0	1.1
L48	Albion Way	25035.0	1.1
L49	Albion Way	25035.0	1.1

Road Link		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)
L50	Albion Way	25035.0	1.1
L51	Albion Way	25035.0	1.1
L52	Albion Way	25035.0	1.1
L53	Albion Way	25035.0	1.1
L54	Albion Way	25035.0	1.1
L55	Albion Way	25035.0	1.1
L56	Albion Way	25035.0	1.1
L57	Albion Way	25035.0	1.1
L58	Albion Way	25035.0	1.1
L59	Albion Way	25035.0	1.1
L60	Albion Way	25035.0	1.1
L61	Albion Way	25035.0	1.1
L62	Albion Way	25035.0	1.1
L63	Albion Way	25035.0	1.1
L64	Albion Way	9528.0	1.5
L65	Albion Way	25035.0	1.1
L66	Albion Way	25035.0	1.1
L67	Albion Way	25035.0	1.1
L68	Albion Way	25035.0	1.1
L69	Albion Way	25035.0	1.1
L70	Albion Way	25035.0	1.1
L71	Albion Way	25035.0	1.1
L72	Albion Way	9528.0	1.5
L73	Albion Way	25035.0	1.1
L74	Albion Way	25035.0	1.1
L75	Albion Way	9528.0	1.5
L76	Albion Way	25035.0	1.1
L77	Albion Way	25035.0	1.1
L78	Albion Way	25035.0	1.1
L79	Albion Way	25035.0	1.1
L80	Albion Way	25035.0	1.1
L81	Albion Way	25035.0	1.1
L82	Albion Way	25035.0	1.1
L83	Albion Way	25035.0	1.1
L84	Albion Way	25035.0	1.1

Road Link		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)
L85	Albion Way	25035.0	1.1
L86	Arun Way	385.0	0.0
L87	Arun Way	385.0	0.0
L88	Arun Way	385.0	0.0
L89	Arun Way	385.0	0.0
L90	Arun Way	385.0	0.0
L91	Athelstan Way	385.0	0.0
L92	Athelstan Way	385.0	0.0
L93	Athelstan Way	385.0	0.0
L94	Athelstan Way	385.0	0.0
L95	Bishopric	25035.0	1.1
L96	Bishopric	25035.0	1.1
L97	Bishopric	25035.0	1.1
L98	Bishopric	25035.0	1.1
L99	Bishopric	25035.0	1.1
L100	Bishopric	25035.0	1.1
L101	Bishopric	25035.0	1.1
L102	Bishopric	25035.0	1.1
L103	Bishopric	25035.0	1.1
L104	Bishopric	25035.0	1.1
L105	Bishopric	25035.0	1.1
L106	Bishopric	25035.0	1.1
L107	Bishopric	25035.0	1.1
L108	Blackbridge Lane	2607.0	0.9
L109	Blackbridge Lane	2607.0	0.9
L110	Blackbridge Lane	2607.0	0.9
L111	Blackbridge Lane	2607.0	0.9
L112	Blackbridge Lane	2607.0	0.9
L113	Blackbridge Lane	385.0	0.0
L114	Blackbridge Lane	2607.0	0.9
L115	Blackbridge Lane	2607.0	0.9
L116	Blackbridge Lane	2607.0	0.9
L117	Blackbridge Lane	2607.0	0.9
L118	Blackbridge Lane	2607.0	0.9
L119	Blackbridge Lane	2607.0	0.9

Road Link		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)
L120	Blackbridge Lane	2607.0	0.9
L121	Blackbridge Lane	2607.0	0.9
L122	Blackbridge Lane	2607.0	0.9
L123	Blackbridge Lane	2607.0	0.9
L124	Blackbridge Lane	385.0	0.0
L125	Blackbridge Lane	2607.0	0.9
L126	Blackbridge Lane	2607.0	0.9
L127	Blackbridge Lane	2607.0	0.9
L128	Blackbridge Lane	2607.0	0.9
L129	Blackbridge Lane	2607.0	0.9
L130	Blackbridge Lane	2607.0	0.9
L131	Blackbridge Lane	2607.0	0.9
L132	Blackbridge Lane	2607.0	0.9
L133	Blackbridge Lane	2607.0	0.9
L134	Blackbridge Lane	2607.0	0.9
L135	Blackbridge Lane	385.0	0.0
L136	Blackbridge Lane	2607.0	0.9
L137	Blackbridge Lane	2607.0	0.9
L138	Brighton Road	10091.0	1.8
L139	Brighton Road	12012.0	1.5
L140	Brighton Road	12012.0	1.5
L141	Brighton Road	12012.0	1.5
L142	Brighton Road	12012.0	1.5
L143	Brighton Road	12012.0	1.5
L144	Brighton Road	12012.0	1.5
L145	Brighton Road	12012.0	1.5
L146	Brighton Road	12012.0	1.5
L147	Brighton Road	12012.0	1.5
L148	Brighton Road	12012.0	1.5
L149	Brighton Road	12012.0	1.5
L150	Brighton Road	12012.0	1.5
L151	Brighton Road	12012.0	1.5
L152	Brighton Road	12012.0	1.5
L153	Brighton Road	12012.0	1.5
L154	Brighton Road	12012.0	1.5

Road Link		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)
L155	Brighton Road	12012.0	1.5
L156	Brighton Road	12012.0	1.5
L157	Brighton Road	12012.0	1.5
L158	Brighton Road	12012.0	1.5
L159	Brighton Road	12012.0	1.5
L160	Brighton Road	12012.0	1.5
L161	Brighton Road	12012.0	1.5
L162	Brighton Road	12012.0	1.5
L163	Brighton Road	12012.0	1.5
L164	Brighton Road	12012.0	1.5
L165	Brighton Road	12012.0	1.5
L166	Brighton Road	12012.0	1.5
L167	Brighton Road	12012.0	1.5
L168	Brighton Road	12012.0	1.5
L169	Brighton Road	12012.0	1.5
L170	Brighton Road	12012.0	1.5
L171	Brighton Road	12012.0	1.5
L172	Brighton Road	12012.0	1.5
L173	Brighton Road	12012.0	1.5
L174	Brighton Road	12012.0	1.5
L175	Brighton Road	12012.0	1.5
L176	Brighton Road	12012.0	1.5
L177	Brighton Road	12012.0	1.5
L178	East Street	25035.0	1.1
L179	East Street	25035.0	1.1
L180	East Street	25035.0	1.1
L181	East Street	25035.0	1.1
L182	East Street	25035.0	1.1
L183	East Street	25035.0	1.1
L184	East Street	25035.0	1.1
L185	Farthings Hill	15623.0	1.6
L186	Farthings Hill	15623.0	1.6
L187	Farthings Hill	15623.0	1.6
L188	Farthings Hill	15623.0	1.6
L189	Farthings Hill	15623.0	1.6

Road Link		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)
L190	Farthings Hill	15623.0	1.6
L191	Farthings Hill	15623.0	1.6
L192	Farthings Hill	15623.0	1.6
L193	Farthings Hill	15623.0	1.6
L194	Farthings Hill	15623.0	1.6
L195	Farthings Hill	15623.0	1.6
L196	Guildford Road	15623.0	1.6
L197	Guildford Road	15623.0	1.6
L198	Guildford Road	15623.0	1.6
L199	Guildford Road	15623.0	1.6
L200	Guildford Road	15623.0	1.6
L201	Guildford Road	15623.0	1.6
L202	Guildford Road	15623.0	1.6
L203	Guildford Road	15623.0	1.6
L204	Guildford Road	15623.0	1.6
L205	Guildford Road	15623.0	1.6
L206	Guildford Road	15623.0	1.6
L207	Guildford Road	15623.0	1.6
L208	Guildford Road	15623.0	1.6
L209	Guildford Road	15623.0	1.6
L210	Guildford Road	15623.0	1.6
L211	Guildford Road	15623.0	1.6
L212	Guildford Road	15623.0	1.6
L213	Park Way	25035.0	1.1
L214	Park Way	25035.0	1.1
L215	Park Way	25035.0	1.1
L216	Park Way	25035.0	1.1
L217	Park Way	25035.0	1.1
L218	Park Way	25035.0	1.1
L219	Park Way	25035.0	1.1
L220	Park Way	25035.0	1.1
L221	Park Way	25035.0	1.1
L222	Park Way	25035.0	1.1
L223	Park Way	25035.0	1.1
L224	Park Way	25035.0	1.1

Road Link		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)
L225	Queen Street	12012.0	1.5
L226	Queen Street	25035.0	1.1
L227	Queen Street	12012.0	1.5
L228	Queen Street	12012.0	1.5
L229	Queen Street	12012.0	1.5
L230	Queen Street	12012.0	1.5
L231	Queen Street	12012.0	1.5

Reference should be made to Figure 6 within Appendix A for a graphical representation of the road link locations used within the operation phase assessment.

Emission Factors

Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 14.1) released in May 2026, which incorporates updated COPERT v5.9.1 vehicle emissions factors for NO_x, PM₁₀ and PM_{2.5} and EURO 6 vehicle fleet sub-categories.

NO_x to NO₂ Conversion

Predicted annual mean NO_x concentrations from the dispersion model were converted to NO₂ concentrations using the NO_x to NO₂ Calculator (v.9.1) provided by DEFRA, which is the method detailed within LAQM.TG(22).

Meteorological Data

Meteorological data used in this assessment was taken from Charlwood meteorological station over the period 1st January 2024 to 31st December 2024 (inclusive).

Charlwood meteorological station is located at approximate NGR: 523979, 139795 which is approximately 11.58km East of the Proposed Development. Charlwood data has been used for this assessment as it represents the closest meteorological station to the development site and as such, it is considered to provide a reasonable representation of conditions present.

All meteorological records used in the assessment were provided by the Met Office. Reference should be made to Figure 5 within Appendix A for a wind rose of utilised meteorological data.

Roughness Length

The specific roughness length (z_0) values used to represent conditions during the verification process, DS scenario, as well as conditions at the Charlwood meteorological station are summarised in Table B3.

Table B3: Utilised Roughness Lengths

Scenario	Roughness Length (m)	ADMS Description
Verification, DM and DS Scenarios	0.5	Parkland, open suburbia
Charlwood meteorological station	0.3	Agricultural areas (max)

These values of z_0 are considered appropriate for the morphology of the assessment area.

Monin-Obukhov Length

The Monin-Obukhov length provides a measure of the stability of the atmosphere within certain urban or rural contexts. The specific length values used to represent conditions during the verification process, DS scenario, as well as conditions at Charlwood are summarised in Table B4.

Table B4: Utilised Monin-Obukhov Lengths

Scenario	Monin-Obukhov Length (m)	ADMS Description
Verification, DM and DS Scenarios	30	Cities and large towns or Mixed urban/industrial
Charlwood meteorological station	30	Cities and large towns or Mixed urban/industrial

This Monin-Obukhov value is considered appropriate for the morphology of the assessment area.

Background Concentrations

The 2024 annual mean background concentrations detailed in Table B5, were used in the dispersion modelling assessment to represent annual mean pollutant levels at the Proposed Development site and local monitoring sites.

Table B5 displays the specific background concentrations as predicted by DEFRA, utilised to represent the condition at the monitoring locations used within the verification process.

The Urban Background monitoring station (ID: Horsham 3N), located approximately 2080 m from the site, was used to obtain background concentrations for NO₂, as it provides more representative measurements of local concentrations.

Table B5: Predicted Background Pollutant Concentrations for Monitoring Locations

Monitoring Location	DEFRA Grid Square	Pollutant	2024 Predicted Background Concentration ($\mu\text{g}/\text{m}^3$)
HO2	517500, 130500	NO _x	13.5296
		NO ₂	7.2000
		PM ₁₀	11.0524
		PM _{2.5}	7.0043
Horsham 12.2	516500, 130500	NO _x	12.5947
		NO ₂	7.2000
		PM ₁₀	11.0459
		PM _{2.5}	6.9344
Horsham 13	516500, 130500	NO _x	12.5947
		NO ₂	7.2000
		PM ₁₀	11.0459
		PM _{2.5}	6.9344
A281_A24	515500, 131500	NO _x	12.3823
		NO ₂	7.2000
		PM ₁₀	11.7189
		PM _{2.5}	6.7214

Street Canyons

Street canyon effects have been considered where building configurations restrict dispersion and influence pollutant concentrations along modelled roads. Only the roads with buildings modelled are considered. These are summarised in Table B6.

Table B6: Modelled Street Canyons

Road Link		Width	Average Building Height	Building Length
L7	A281	6.5178	10.0	485.0

Verification

The predicted results from a dispersion model may differ from measured concentrations for a large number of reasons, including:

- Estimates of background concentrations;
- Uncertainties in source activity data such as traffic flows and emission factors;
- Variations in meteorological conditions;
- Overall model limitations; and
- Uncertainties associated with monitoring data, including locations.

Model verification is the process by which these and other uncertainties are investigated and where possible minimised. In reality, the differences between modelled and monitored results are likely to be a combination of all of these aspects.

For the purpose of this assessment model verification was undertaken for 2024, using traffic data, meteorological data and monitoring results from this year.

HDC undertakes periodic monitoring of NO₂ concentrations at 4 roadside monitoring locations within the assessment extent. The road contribution to total NO_x concentration was calculated from the monitored NO₂ result for use in the verification process. This was undertaken following the methodology contained within LAQM.TG(22). The monitored annual mean NO_x concentration and calculated road NO_x concentration are summarised in Table B7.

Table B7: NO_x Concentrations

Site ID	Monitored Road NO _x Concentration (µg/m ³)	Modelled Road NO _x Concentration (µg/m ³)
HO2	18.20	23.46
Horsham 12.2	33.37	29.20
Horsham 13	2.85	1.59
A281_A24	9.57	13.84

The monitored and modelled Road NO_x contribution concentrations were compared, and this indicated that a verification factor of **0.9631** was required to be applied to NO_x modelling results, as shown in Graph 1.

Graph 1 is provided below.

Graph 1 - Verification Adjustment Factor

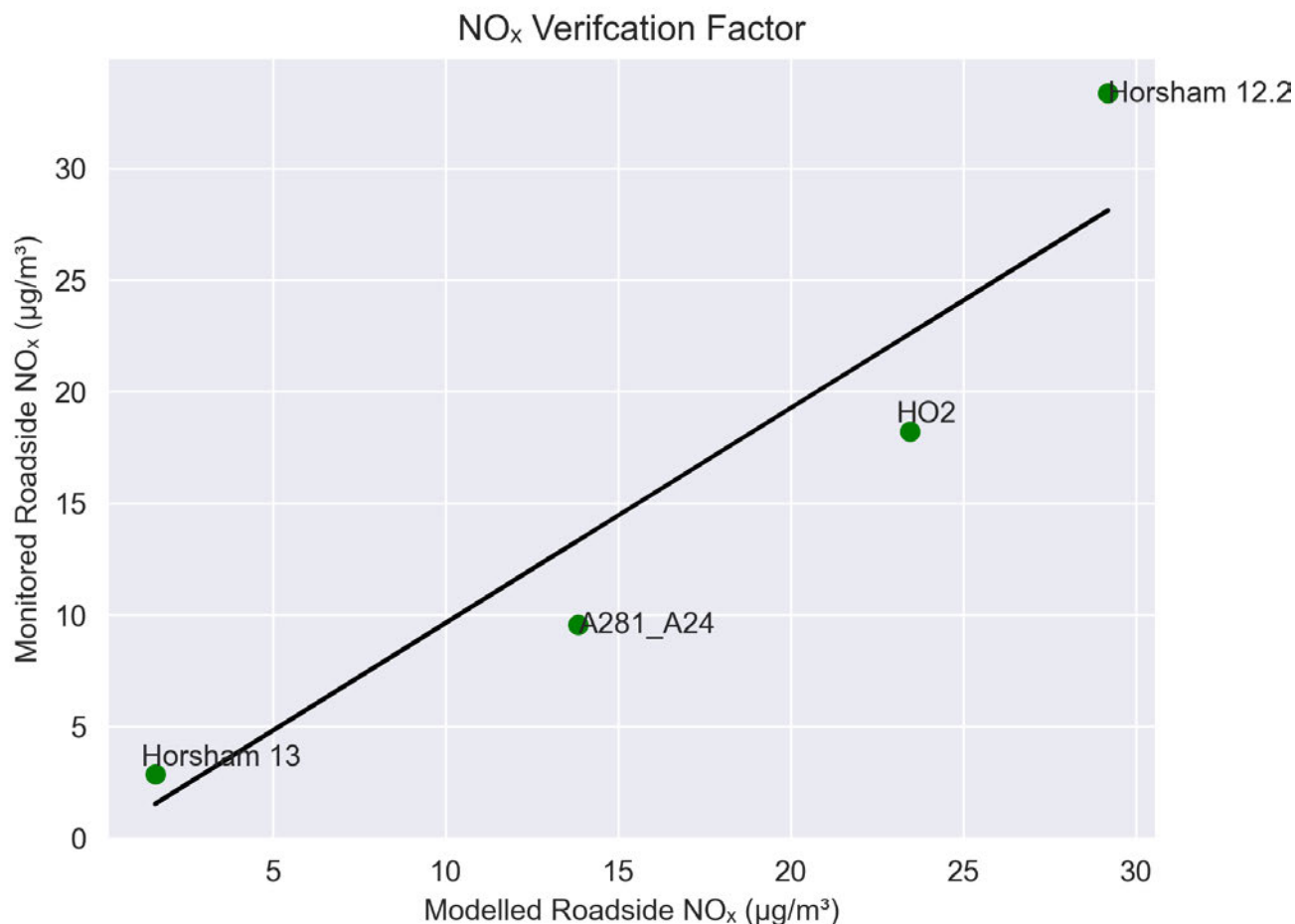


Table B8 presents the monitored annual mean NO₂ concentrations and the adjusted modelled total NO₂ concentration based on the above verification factor. Exceedances of the annual mean NO₂ AQO are highlighted in **bold**.

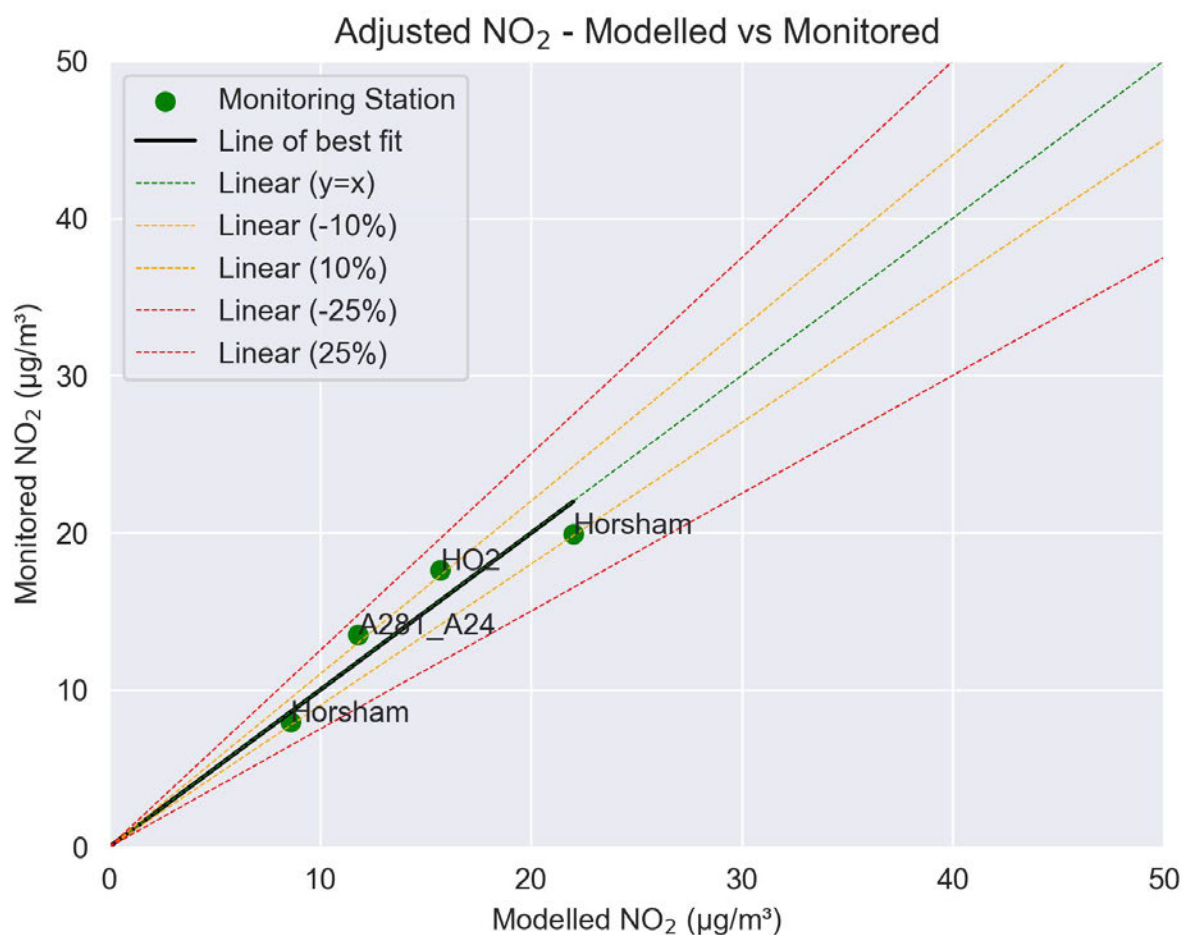
Table B8: NO₂ Concentrations

Site ID	Monitored Road NO ₂ Concentration (µg/m³)	Adjusted Modelled Road NO ₂ Concentration (µg/m³)	% Difference ((Monitored - Modelled)/Monitored) * 100
HO2	15.70	17.60	-12.1%
Horsham 12.2	22.00	19.90	9.55%
Horsham 13	8.60	7.95	7.56%
A281_A24	11.80	13.53	-14.66%

As demonstrated in Table B8, the percentage difference between modelled and monitored concentrations is deemed acceptable and is less than 25% in all cases, and less than or equal to 10% at 2 locations. This reduces uncertainties in the model predictions and provides a robust representation of pollutant concentrations in accordance with the guidance suggested in LAQM.TG(22).

A graphical representation of the adjusted NO₂ concentrations is provided within Graph 2.

Graph 2 – Modelled vs Monitored NO₂



As PM₁₀ and PM_{2.5} monitoring was only undertaken at one location within the assessment extent, the NO₂ adjustment factor of **0.9631** was utilised to adjust model predictions of PM₁₀ and PM_{2.5} in accordance with the guidance provided within LAQM.TG(22).

APPENDIX C: CONSTRUCTION PHASE METHODOLOGY

There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the Institute of Air Quality Management (IAQM) document 'Guidance on the Assessment of Dust from Demolition and Construction'.

Activities on the proposed construction site have been divided into three types to reflect their different potential impacts. These are:

- Demolition
- Earthworks
- Construction
- Trackout

The potential for dust emissions was assessed for each activity that is likely to take place and considered three separate dust effects:

- Annoyance due to dust soiling;
- Harm to ecological receptors; and
- The risk of health effects due to a significant increase in exposure to PM₁₀ and PM_{2.5}.

The assessment steps are detailed below.

Step 1

Step 1 screens the requirement for a more detailed assessment. Should human receptors be identified within 250m from the site boundary or 50m from the construction vehicle route up to 250m from the site entrance, then the assessment should proceed to Step 2. Additionally, should ecological receptors be identified within 50m of the boundary site or 50m from the construction vehicle route up to 250m from the site entrance, then the assessment should also proceed to Step 2.

Should sensitive receptors not be present within the relevant distances then negligible impacts would be expected and further assessment is not necessary.

Step 2

Step 2 assesses the risk of potential dust impacts. A site is allocated to a risk category based on two factors:

- The scale and nature of the works, which determines the magnitude of dust arising as: small, medium or large (Step 2A); and
- The sensitivity of the area to dust impacts, which can be defined as low, medium or high sensitivity (Step 2B).

The two factors are combined in Step 2C to determine the risk of dust impacts without mitigation applied.

Step 2A defines the potential magnitude of dust emission through the construction phase. The relevant criteria are summarised in Table C1.

Table C1: Construction Dust - Magnitude of Emission

Magnitude	Activity	Criteria
Large	Demolition	• Total building volume greater than 75,000m³ • Potentially dusty construction material (e.g. concrete) • On-site crushing and screening • Demolition activities greater than 12m above ground level
	Earthworks	• Total site area greater than 110,000m² • Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) • More than 10 heavy earth moving vehicles active at any one time • Formation of bunds greater than 6m in height
	Construction	• Total building volume greater than 75,000m³ • On site concrete batching • Sandblasting
	Trackout	• More than 50 Heavy Duty Vehicle (HDV) trips per day • Potentially dusty surface material (e.g. high clay content) • Unpaved road length greater than 100m
Medium	Demolition	• Total building volume 12,000m³ to 75,000m³ • Potentially dusty construction material • Demolition activities 6m to 12m above ground level
	Earthworks	• Total site area 18,000m² to 110,000m² • Moderately dusty soil type (e.g. silt) • 5 to 10 heavy earth moving vehicles active at any one time • Formation of bunds 3m to 6m in height
	Construction	• Total building volume 18,000m³ to 110,000m³ • Potentially dusty construction material (e.g. concrete) • On site concrete batching
	Trackout	• 20 to 50 HDV trips per day • Moderately dusty surface material (e.g. high clay content) • Unpaved road length 50m to 100m
Small	Demolition	• Total building volume under 12,000m³ • Construction material with low potential for dust release (e.g. metal cladding or timber) • Demolition activities less than 6m above ground level • Demolition during wetter months
	Earthworks	• Total site area less than 18,000m² • Soil type with large grain size (e.g. sand) • Less than 5 heavy earth moving vehicles active at any one time • Formation of bunds less than 4m in height • Earthworks during wetter months
	Construction	• Total building volume less than 18,000m³

Magnitude	Activity	Criteria
		Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	<20 HDV (3.5t) outward movements in any one day - Surface material with low potential for dust release - Unpaved road length <50m

Step 2B defines the sensitivity of the area around the development site for construction, earthworks and trackout. The factors influencing the sensitivity of the area are shown in Table C2.

Table C2: Examples of Factors Defining Sensitivity of an Area

Sensitivity	Examples	
	Human Receptors	Ecological Receptors
High	- Users expect of high levels of amenity - High aesthetic or value property - People expected to be present continuously for extended periods of time - Locations where members of the public are exposed over a time period relevant to the AQO for PM₁₀ e.g. residential properties, hospitals, schools and residential care homes	Internationally or nationally designated site e.g. Special Area of Conservation
Medium	- Users would expect to enjoy a reasonable level of amenity - Aesthetics or value of their property could be diminished by soiling - 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 e.g. parks and places of work	Nationally designated site e.g. Sites of Special Scientific Interest
Low	- Enjoyment of amenity would not reasonably be expected - Property would not be expected to be diminished in appearance - Transient exposure, where people would only be expected to be present for limited periods. e.g. public footpaths, playing fields, shopping streets, playing fields, farmland, footpaths, short term car park and roads	Locally designated site e.g. Local Nature Reserve

The guidance also provides the following factors to consider when determining the sensitivity of an area to potential dust impacts during the construction phase:

- Any history of dust generating activities in the area;
- The likelihood of concurrent dust generating activity on nearby sites;
- Any pre-existing screening between the source and the receptors;

- Any conclusions drawn from analysing local meteorological data which accurately represent the area; and if relevant the season during which works will take place;
- Any conclusions drawn from local topography;
- Duration of the potential impact, as a receptor may become more sensitive over time; and
- Any known specific receptor sensitivities which go beyond the classifications given in the document.

These factors were considered in the undertaking of this assessment. The sensitivity of the area to dust soiling effects on people and property is shown in Table C3.

Table C3: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 250
High	More than 100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low
Medium	More than 1	Medium	Low	Low	Low
Low	More than 1	Low	Low	Low	Low

Table C4 outlines the sensitivity of the area to human health impacts.

Table C4: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance to Site			
			Less than 20	Less than 50	Less than 100	Less than 250
High	Greater than 32µg/m ³	More than 100	High	High	High	Medium
		10 - 100	High	High	Medium	Low
		1 - 10	High	Medium	Low	Low
	28 - 32µg/m ³	More than 100	High	High	Medium	Low
		10 - 100	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low
	24 - 28µg/m ³	More than 100	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low
		1 - 10	Medium	Low	Low	Low
	Less than 24µg/m ³	More than 100	Medium	Low	Low	Low
		10 - 100	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Medium	Greater than 32µg/m ³	More than 10	High	Medium	Low	Low

	28 - 32µg/m ³	1 - 10	Medium	Low	Low	Low
		More than 10	Medium	Low	Low	Low
	24 - 28µg/m ³	1 - 10	Low	Low	Low	Low
		More than 10	Low	Low	Low	Low
	Less than 24µg/m ³	1 - 10	Low	Low	Low	Low
		More than 10	Low	Low	Low	Low
Low	-	More than 1	Low	Low	Low	Low

Table C5 outlines the sensitivity of the area to ecological impacts.

Table C5: Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from the Source (m)	
	Less than 20	Less than 50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Step 2C combines the dust emission magnitude with the sensitivity of the area to determine the risk of unmitigated impacts.

Table C6: Dust Risk Category from Demolition

Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Medium
Medium	High	Medium	Low
Low	Medium	Low	Negligible

Table C7 outlines the risk category from earthworks and construction activities.

Table C7: Dust Risk Category from Earthworks and Construction

Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

Table C8 outlines the risk category from trackout.

Table C8: Dust Risk Category from Trackout

Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

Step 3

Step 3 requires the identification of site-specific mitigation measures within the IAQM guidance to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with negligible risk mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice.

Step 4

Once the risk of dust impacts has been determined and the appropriate mitigation measures identified, the final step is to determine the significance of any residual impacts. For almost all construction activity, the aim should be to control effects through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'.