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Air Quality Assessment

Land at Hornbrook Farm, Brighton Road, Horsham

Air Quality Assessment

Project: LAND AT HORNBROOK FARM, BRIGHTON ROAD,
HORSHAM

Report reference: RP01-24596-R1

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1. EXECUTIVE SUMMARY

- 1.1 Cass Allen has been instructed by Jaynic Properties Ltd to assess the potential air quality effects associated with a proposed residential development at Land at Hornbrook Farm, Brighton Road, Horsham in West Sussex. The assessment was carried out regarding relevant local and national planning policy and guidance.
- 1.2 The site is not located within or close to an Air Quality Management Area (AQMA), indicating that local air quality is generally acceptable. Pollutant concentrations in the vicinity are primarily influenced by vehicle emissions along the adjacent Brighton Road (A281) and the local road network.
- 1.3 Potential construction phase dust soiling and particulate matter (PM: PM₁₀) health effects were assessed qualitatively, resulting in Medium and Low Risk levels being identified, respectively, in the absence of mitigation. Suitable best practice mitigation measures have been recommended, and no significant residual air quality impacts are expected.
- 1.4 A detailed atmospheric dispersion model was utilised to predict nitrogen dioxide (NO₂) and PM (PM₁₀ and PM_{2.5}) concentrations at relevant sensitive receptor locations within the study area during the operation of the development. The results indicate that pollutant concentrations at these locations will be below the relevant Air Quality Objectives (AQOs) during the operational phase, with no requirement for additional mitigation.
- 1.5 Furthermore, no significant impacts on local air quality as a result of development-generated traffic are anticipated. Taking into account the predicted extent and magnitude of changes in NO₂, PM₁₀ and PM_{2.5} concentrations at relevant receptors, the overall effect of the development is considered 'not significant' with regard to air quality.
- 1.6 A Damage Cost Calculation was also undertaken, at the request of the local authority, to identify the monetary value of the environmental 'damage' associated with the proposal and determine the amount of mitigation that is appropriate to offset this cost.
- 1.7 In summary, it is our view that the site is suitable for the development in terms of air quality and that there are no air quality constraints with respect to planning consent.

2. INTRODUCTION

- 2.1 Cass Allen has been instructed by Jaynic Properties Ltd to assess the potential air quality effects associated with a proposed residential development at Land at Hornbrook Farm, Brighton Road, Horsham in West Sussex.
- 2.2 The assessment was carried out regarding relevant local and national planning policy and guidance, and in line with the Horsham District Council (HDC) 'Development Management Local Information Requirements for Validation' (January 2024).
- 2.3 The aim of the assessment is to consider air quality conditions, and their potential to influence the development in terms of its design, scale and layout, taking into account the following aspects :
- Dust and PM emissions generated by construction phase activities;
 - Exhaust emissions from construction plant and traffic;
 - The exposure of new sensitive receptors to elevated pollutant concentrations; and
 - Emissions from traffic generated by the operation of the development.
- 2.4 Subsequently, where required, appropriate measures have been identified to minimise the impacts.
- 2.5 This report contains technical terminology; a glossary of terms can be found at www.cassallen.co.uk/glossary.

3. PROJECT DESCRIPTION AND SITE CONTEXT

3.1 This report has been prepared to inform the outline application for up to 180 dwellings, open space and associated works and infrastructure with all matters reserved apart from access.

3.2 The site is located in a residential area to the southeast of Horsham. There are residential properties to the southwest of the site bordering the A281 which have the potential to be impacted by construction dust and operational phase transport emissions. Brighton Road (A281) runs adjacent to the southern boundary and is considered the primary influence upon pollutant concentrations at the site.

3.3 The site location is shown in Figure 1.

Figure 1 Site Location and Surrounding Area



4. PLANNING POLICY

Air Quality Legislation

- 4.1 The wider air quality legislation underpinning national, regional and local planning policy, is summarised in Appendix 1.
- 4.2 The National AQOs and Air Quality Standards Regulations limit and target values for the UK are summarised in the Air Quality Strategy. These limits, for ten key air pollutants, are based on both European Union directives and World Health Organization (WHO) guidelines. They are periodically updated, informed by the latest scientific evidence, to protect public health, vegetation and ecosystems. The Local Air Quality Management (LAQM) regime requires local authorities to regularly evaluate the air quality in their areas based on these AQOs.
- 4.3 As a regional pollutant, many sources of PM_{2.5} are beyond local authority control therefore, it does not form part of the LAQM regime. However, long-term (2040) targets for ambient PM_{2.5} concentrations are set in 'The Environmental Targets (Fine Particulate Matter) (England) Regulations' (2023), and an interim (2028) target is published in the 'Environmental Improvement Plan' (2023). PM_{2.5} is a key air pollutant for health impacts, and local authorities must monitor progress towards meeting these reduced levels.
- 4.4 The National AQOs for the pollutants most associated with vehicle emissions, and therefore applicable to this assessment, are detailed in Table 1.

Table 1 UK National Air Quality Objectives

Pollutant	Objective	Averaging Period
Nitrogen Dioxide (NO ₂)	40µg/m ³	Annual mean
	200µg/m ³ not to be exceeded more than 18 times per year	1-hour mean
Particulate Matter (PM ₁₀)	40µg/m ³	Annual mean
	50µg/m ³ not to be exceeded more than 35 times per year	24-hour mean
Particulate Matter (PM _{2.5})	20µg/m ³	Annual mean

- 4.5 The above AQOs are typically applied where there is 'relevant exposure', i.e., where members of the public are likely to be present for the relevant averaging periods, or regularly exposed, and not in workplaces where relevant provisions concerning health and safety at work apply.

National Policy

- 4.6 Outline guidance for the assessment of air quality affecting new developments is given in the 'National Planning Policy Framework' (NPPF) (December 2024; as amended February 2025). Relevant sections in this case are included in Appendix 1.

Local Policy

- 4.7 The HDC planning policy relevant to air quality is summarised in Appendix 1.
- 4.8 To address the requirements of the national and local policies, the following key air quality matters have been considered:
- Construction phase fugitive emissions of dust and PM impacts at existing receptors;
 - Construction phase plant and vehicle emissions impacts at existing receptors;
 - Operational phase vehicle emissions exposure at proposed receptors; and
 - Operational phase vehicle emissions impacts at existing receptors.

5. ASSESSMENT METHODOLOGY

- 5.1 The scope and methodology for this assessment have been determined with regard to:
- Defra 'LAQM Technical Guidance' (May 2025) (LAQM.TG22);
 - EPUK & IAQM 'Land Use Planning & Development Control: Planning for Air Quality' (2017) (LUPDC); and
 - Sussex Air Quality Partnership (SAQP) 'Air Quality and Emissions Mitigation Guidance for Sussex' (2021).
- 5.2 Reference has also been made to other relevant technical guidance, where applicable.
- 5.3 Additionally, consultation was undertaken with the *Scientific Officer (Environmental Protection)* at HDC (response via email, dated 4 February 2025), to inform the methodology and local assessment requirements. They confirmed the requirement for an Emissions Mitigation Statement containing an itemised costing for each proposed mitigation option totalling the value of the emissions cost. It was agreed that due to the outline nature of the proposal, this document would be submitted at a later stage, with only the Damage Cost Calculation undertaken in this report, as detailed in Section 10.

Construction Phase

- 5.4 The assessment of potential air quality impacts during the construction phase has focused on the generation and dispersion of dust and PM₁₀, following the IAQM 'Guidance on the Assessment of Dust from Demolition and Construction' (January 2024) methodology, summarised as follows:
- Step 1 - screen the need for an assessment: consider impacts to sensitive human and ecological receptors within 250m or 50m of the site boundary, respectively (indicated on Figure 2), and within 50m of a route used by construction vehicles up to 250m from the site entrance.
 - Step 2A - estimate the dust emission magnitude for each of the main construction activities – demolition, earthworks, general construction, and trackout.
 - Step 2B - determine the sensitivity of the receiving environment, through consideration of factors such as meteorological conditions, number of nearby receptors, their proximity and sensitivity. Other factors to consider are detailed in Box 9 of the guidance. A wind rose for nearby Charlwood (Gatwick) meteorological station is included in Appendix 2.
 - Step 2C - define the risk of impacts.
 - Step 3 - identify site-specific mitigation requirements (in addition to basic project controls).
- 5.5 The IAQM methodology has been used to assess the potential impact of dust and PM₁₀ arising from onsite activities. As indicated within the guidance, the use of professional judgment is necessary, due to the diverse range of projects that are subject to dust impact assessment, meaning that it is not possible to be prescriptive as to how to assess the impacts.

- 5.6 In addition, exhaust emissions from construction vehicles and plant may impact local air quality. The potential for significant effects resulting from these emissions has also been considered with reference to screening and significance criteria in LUPDC.
- 5.7 A review of the Multi-Agency Geographic Information for the Countryside (MAGIC) website did not identify any statutory designated ecological sites within the relevant screening distances, and therefore these have been excluded from the construction phase assessment.

Operational Phase

- 5.8 Concentrations of NO₂, PM₁₀ and PM_{2.5} have been considered in the operational phase assessment as road traffic is a major source of these pollutants and their concentrations are often close to, or in exceedance of, the relevant AQOs in urban locations.

Air Quality Impacts

- 5.9 LUPDC indicates the magnitude of change in traffic flows that is potentially significant, and therefore likely to require further assessment, as follows:
- 5.10 For roads distant from an AQMA:
- Light Duty Vehicle (LDV) flows of 500 Annual Average Daily Traffic (AADT);
 - Heavy Duty Vehicle (HDV) flows of 100 AADT or more; and/or
 - Introduce a new junction or remove an existing junction near to relevant receptors.
- 5.11 These criteria were, therefore, used to determine the study area, in liaison with the project's Transport Consultant (Richard Jackson Limited).
- 5.12 Richard Jackson Limited has indicated that the development is expected to generate approximately 962 AADT (1.01% HDV). As such, existing receptors here have the potential to be affected by changes in pollutant concentrations, and these are considered further within the assessment.

Site Suitability

- 5.13 The development also has the potential to expose future users to elevated pollutant concentrations. As such, an assessment of exposure is required to address planning requirements.

Modelled Receptors

- 5.14 Cambridge Environmental Research Consultants' (CERC) ADMS-Roads (version 5.1.0.2) atmospheric dispersion model has been used to predict pollutant concentrations both without and with the development in place at existing sensitive receptor (R) locations and with the development in place at proposed receptor (PR) locations, as detailed in Table 2.

Table 2 Modelled Receptor Locations

ID	Description	Grid Reference (OSGB)	Height (m)*
Existing receptors			
R1	Hornbrook Farmhouse, A281 Brighton Road	518781.5, 129715.0	1.5
R2	Holbrook Barn, A281 Brighton Road	518721.5, 129698.4	
R3	Hornbrook House, A281 Brighton Road	518720.2, 129754.0	
R4	Hilliers Cottage, A281 Brighton Road	518966.3, 129582.5	
R5	1 Hornbrook Copse	518630.9, 129706.8	
R6	Birchenbridge House, A281 Brighton Road	519422.7, 129099.9	
R7	Birchenbridge Cottage, A281 Brighton Road	519448.9, 129073.6	
R8	West Lodge, Doomsday Lane	519107.0, 129742.1	
Proposed receptors			
PR1	Red Line Boundary, southwest edge	518663.5, 129722.8	1.5
PR2	Red Line Boundary, southern edge, opposite Garden Centre	518813.0, 129664.1	
PR3	Red Line Boundary, southern edge, opposite Hilliers Cottage	518956.9, 129617.4	
PR4	Red Line Boundary, eastern edge	519057.5, 129674.6	

* To represent the average adult breathing zone above floor level and to align with Defra national background modelling used within this assessment.

- 5.15 A review of the MAGIC website did not identify any statutory designated ecological sites in the vicinity of roads affected by significant changes in traffic flows, and therefore, these have been excluded from the operational phase assessment.
- 5.16 To assess the local air quality effects of the development, the following scenarios have been modelled:
- 2024 – Model Verification;
 - 2031 – Anticipated Opening Year, Without Development; and
 - 2031 – Anticipated Opening Year, With Development.
- 5.17 The study area, including modelled road links and receptors, is shown in Figure 2, below.
- 5.18 Details of the traffic data used in the model are included in Appendix 3, and other model inputs such as emission factors, verification and adjustment, in Appendix 4.

PM_{2.5} Targets

5.19 Additionally, Defra's 'PM_{2.5} Targets: Interim Planning Guidance' (October 2024), prompts developers to consider:

1. *How has exposure to PM_{2.5} been considered when selecting the development site?*
2. *What actions and/or mitigations have been considered to reduce PM_{2.5} exposure for development users and nearby receptors (houses, hospitals, schools etc.) and to reduce emissions of PM_{2.5} and its precursors?*

5.20 Accordingly, these aspects are also considered in the operational phase assessment.

Significance Criteria

5.21 Significance criteria applicable to the assessment of vehicle emissions impacts have been derived from LUPDC. Where the 'without' and 'with' development pollutant concentrations are predicted at an individual receptor, the guidance recommends expressing the magnitude of incremental change as a proportion of the Air Quality Assessment Level (normally the applicable AQO).

5.22 The LUPDC significance criteria applicable to the assessment of impacts at existing receptors are included in Appendix 5. It should be noted that, in line with LUPDC:

...the criteria should not be applied rigidly; in some instances, it may be appropriate to amend them on the basis of professional judgement... the objective is to identify situations where there is a possibility of a significant effect on local air quality.

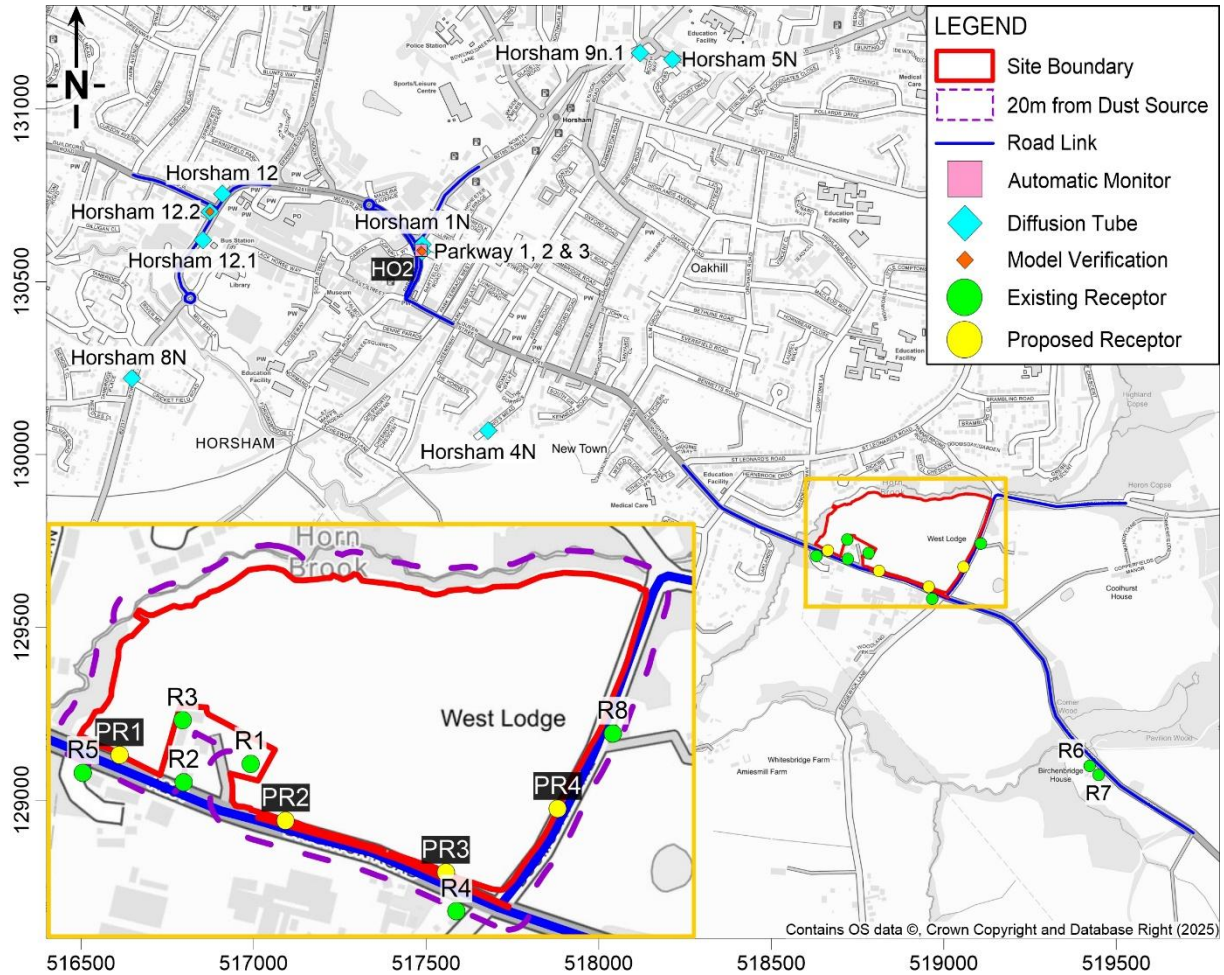
5.23 For proposed receptors, predicted pollutant concentrations have been compared to the relevant AQOs to determine the potential for exceedance, and therefore, the suitability of the site for the proposed use.

Damage Cost Calculation

5.24 For 'Major' proposals, including development of 10 or more dwellings, the SAQP guidance requires an emissions cost calculation to identify the environmental 'damage' costs associated with the proposal and determine the amount (value) of mitigation (including intrinsic mitigation) that is appropriate to offset this cost. This has been undertaken following the Defra Interdepartmental Group on Costs and Benefits (IGCB) approach, which utilises the following calculation:

Cost of Road Transport Emission Increase = $\sum$ [Estimated trip rate for 5 years $\times$ Emission rate per 10km per vehicle type $\times$ Damage Costs]

Figure 2 Study Area



6. BASELINE CONDITIONS

- 6.1 Air quality conditions in the vicinity of the site have been reviewed to provide a baseline for consideration. The closest collected data are included in the tables below and were obtained from HDC and Defra. Monitoring locations are indicated on Figure 2.

Table 3 HDC Monitored Concentrations Across Study Area – NO₂

ID	Location	Type	Distance to site (km)	Monitored Annual Mean (µg/m ³)				
				2020	2021	2022	2023	2024
HO2	Horsham Park Way	Automatic	1.41	18.8	21.1	17.7	16.2	15.7
Horsham 1N	Park Way	Roadside	1.41	21.6	23.2	22.6	20.9	-
Horsham 4N	Goring's Mead	Urban Background	1.00	9.1	9.0	8.7	-	-
Horsham 5N	Harwood Rd West	Roadside	1.37	21.0	22.7	21.6	20.4	18.1
Horsham 8N	Worthing Rd (near Cricketfield Rd)	Roadside	2.04	19.1	20.7	19.9	18.7	13.4**
Horsham 9n.1	Station Rd (Century House)	Roadside	1.43	22.1	23.3	24.1	20.3	17.3
Horsham 12	Albion Way / Kings Gate	Roadside	1.99	30.5	33.4	29.7	-	-
Horsham 12.1	29 Albion Way	Roadside	1.98	-	-	-	20.1	-
Horsham 12.2	Albion Way / Bishopric	Roadside	2.00	-	-	-	-	22.0
Park Way 1,2,3	Park Way AQMS	Roadside	1.40	18.4	19.9	19.6	17.0	15.6

Note: Data obtained from HDC 2025 Air Quality Annual Status Report (ASR) (2025). Results from 2020 and 2021 are likely to be atypical due to COVID-19 travel restrictions.

Table 4 HDC Monitored Concentrations Across Study Area – PM₁₀

ID	Location	Type	Distance to site (km)	Monitored Annual Mean (µg/m ³)				
				2020	2021	2022	2023	2024
HO2	Horsham Park Way	Automatic	1.41	15.7	17.5	19.3	20.5	16.1

Note: Data obtained from HDC 2025 Air Quality ASR (2025). Results from 2020 and 2021 are likely to be atypical due to COVID-19 travel restrictions.

Table 5 HDC Monitored Concentrations Across Study Area – PM_{2.5}*

ID	Location	Type	Distance to site (km)	Monitored Annual Mean (µg/m ³)				
				2020	2021	2022	2023	2024
HO2	Horsham Park Way	Automatic	1.41	11.0	12.3	13.1	14.6	10.1

Note: Data obtained from HDC 2025 ASR (2025). Results from 2020 and 2021 are likely to be atypical due to COVID-19 travel restrictions.

*Concentrations estimated by HDC from the monitored PM₁₀ data.

- 6.2 As indicated in Table 3, Table 4 and Table 5 above, annual mean pollutant concentrations in the vicinity of the site were consistently below the relevant long-term AQOs in the most recent monitoring years. The general trend shows air quality conditions in the area improving over time, and this is illustrated in Figure A.1 of the HDC 2025 ASR.
- 6.3 Moreover, no exceedances (above those permitted) of the respective short-term AQOs for NO₂, and PM₁₀ were recorded at the automatic monitor, HO2, during 2024 (HDC ASR, 2025).

Table 6 Defra Mapped Background Annual Mean Concentrations (µg/m³) – Study Area

2024				2028**			
*NO _x	NO ₂	PM ₁₀	PM _{2.5}	NO _x	NO ₂	PM ₁₀	PM _{2.5}
10.0 - 13.9	7.8 - 10.6	10.0 - 11.3	6.2 - 7.2	8.8 - 12.3	6.9 - 9.5	9.7 - 11.0	5.9 - 6.9

Note: Data obtained from <https://uk-air.defra.gov.uk/data/laqm-background-home>. A range is given as the study area spans multiple grid squares. *Nitrogen oxides (nitric oxide (NO) & NO₂). **Interim year used for 2031 scenarios as part of an overall robust assessment.

- 6.4 Furthermore, Defra-predicted annual mean background concentrations for 2024 and 2028, as shown in Table 6, are 'well below' (defined by the IAQM as <75% of) the relevant AQOs for all pollutants and are expected to reduce further in future years. These background concentrations are later combined with roadside modelling results to provide total predicted environmental concentrations at receptor locations.

7. CONSTRUCTION PHASE ASSESSMENT

- 7.1 Sensitive receptors were identified within the relevant IAQM screening distances, therefore the assessment progressed to Step 2, which has been summarised in the tables below.

Table 7 Step 2A – Dust Emission Magnitude for Construction Activities

Activity	Magnitude	Explanation
Demolition	N/A	Site is vacant.
Earthworks	Medium	Total site area 18,000 - 110,000m ² , 5-10 heavy earth-moving vehicles active at once.
Construction	Medium	Total building volume 12,000 - 75,000m ³ .
Trackout	Large	>100m unpaved road length likely.

Table 8 Step 2B – Sensitivity of the Area

Potential Impact	Details	Construction Activity		
		Earthworks	Construction	Trackout
Dust Soiling: Amenity	1-10 high sensitivity receptors within 20m of site.	Medium	Medium	Medium
PM ₁₀ : Health	As above; low background PM ₁₀ concentration.	Low	Low	Low

Table 9 Step 2C – Summary of Impact Risks to Define Site-Specific Mitigation

Potential Impact	Construction Activity		
	Earthworks	Construction	Trackout
Dust Soiling	Medium	Medium	Medium
Human Health	Low	Low	Low

- 7.2 It should be noted that the prevailing winds (as shown in Appendix 2) are south-westerly and thus, locations downwind of the site, to the northeast, are more at risk of construction dust impacts. Nonetheless, overall, the development is considered Medium Risk for dust soiling effects and Low Risk for PM₁₀ health effects, in the absence of mitigation. Following implementation of the recommended mitigation measures for the relevant activities' risk levels in Appendix 6, it is anticipated that the residual effect of the construction phase will be not significant.
- 7.3 With regard to construction traffic, the construction phase flows are not expected to exceed the criteria detailed in paragraph 5.10 and therefore, significant residual effects are not anticipated.

8. OPERATIONAL PHASE ASSESSMENT – SITE SUITABILITY

- 8.1 To consider the suitability of the site for the proposed use, the potential for future occupants of the development to be exposed to exceedances of the relevant AQOs has been assessed. Proposed receptor locations have been chosen to represent worst-case air quality conditions at the site boundary. Modelled predicted pollutant concentrations at proposed receptors are detailed in Table 10.

Table 10 Predicted Pollutant Concentrations at the Development in 2031

Receptor	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)					
	NO ₂	% of AQO (40 $\mu\text{g}/\text{m}^3$)	PM ₁₀	% of AQO (40 $\mu\text{g}/\text{m}^3$)	PM _{2.5}	% of AQO (20 $\mu\text{g}/\text{m}^3$)
PR1	8.7	21.6	12.0	30.0	7.2	35.9
PR2	9.1	22.9	12.7	31.8	7.5	37.7
PR3	8.8	22.1	12.3	30.8	7.3	36.6
PR4	7.6	19.0	10.6	26.6	6.4	32.2

Note: Results are reported to the nearest 0.1 $\mu\text{g}/\text{m}^3$. Any apparent discrepancies are due to rounding.

- 8.2 The data in Table 10 show that pollutant concentrations were predicted to be well below the relevant annual mean AQOs at all proposed receptor locations. The highest predicted NO₂, PM₁₀ and PM_{2.5} concentrations were 9.1 $\mu\text{g}/\text{m}^3$, 12.7 $\mu\text{g}/\text{m}^3$, and 7.5 $\mu\text{g}/\text{m}^3$, respectively, at receptor PR2, which is located on the southern site boundary adjacent to Brighton Road, the most influential emission source at the site. As the proposed residential properties will be set back further from the roadside than the site boundary, where these receptors were modelled, it is expected that concentrations would diminish with distance and thus, actual long-term pollutant concentrations would be lower still, approaching regional background concentrations.
- 8.3 The annual mean NO₂ concentrations predicted by the model were all below 60 $\mu\text{g}/\text{m}^3$. As indicated in LAQM.TG22, a breach of the hourly mean AQO for NO₂ is unlikely where this is the case. Equally, exceedances of the 24-hour mean AQO for PM₁₀ are not anticipated, as all predicted annual mean concentrations fall below the 32 $\mu\text{g}/\text{m}^3$ proxy value.
- 8.4 Accordingly, it is not anticipated that proposed receptors would be exposed to exceedances of the relevant AQOs; therefore, the site is considered suitable for the proposed use, with no requirement for additional mitigation.
- 8.5 In addition to the above, Defra guidance requires consideration of how a development will reduce exposure to PM_{2.5}. In terms of selecting this development site, which is in an area where PM_{2.5} concentrations are expected to be well below the AQO and where there is no requirement to reduce exposure further, exposure to PM_{2.5} has been considered.

9. OPERATIONAL PHASE ASSESSMENT – AIR QUALITY IMPACTS

- 9.1 To assess the potential air quality impacts resulting from operational phase development-generated vehicle emissions at existing receptor locations, dispersion modelling has been undertaken to quantify pollutant concentrations in both 'without development' and 'with development' scenarios. A summary of the worst-case impacts is provided in Table 11, with full model results detailed in Appendix 7.

Table 11 Worst-Case Predicted Operational Impacts at Existing Receptors in 2031

Pollutant	Receptor	Annual Mean Concentration (µg/m³)			Change (% AQO)	Impact Descriptor
		AQO	Without	With		
Highest Absolute Concentrations						
NO ₂	R2	40	8.6	8.7	0.1	Negligible
PM ₁₀	R2	40	12.0	12.0	0.2	Negligible
PM _{2.5}	R2	20	7.2	7.2	0.2	Negligible
Maximum Predicted Changes						
NO ₂	R2	40	8.6	8.7	0.1	Negligible
PM ₁₀	R2	40	12.0	12.0	0.2	Negligible
PM _{2.5}	R2	20	7.2	7.2	0.2	Negligible

Note: Results are reported to the nearest 0.1 $\mu\text{g}/\text{m}^3$. Any apparent discrepancies are due to rounding.

- 9.2 No existing receptors are expected to experience pollutant concentrations exceeding the relevant annual mean AQOs. Furthermore, the impact at all receptor locations is considered 'Negligible' in accordance with LUPDC.
- 9.3 As such, based on the extent of predicted population exposure to NO₂, PM₁₀ and PM_{2.5} impacts, the overall effect of the development is considered 'not significant' with regard to air quality.
- 9.4 Nonetheless, Defra guidance requires consideration of how a development will reduce emissions of PM_{2.5}. The site benefits from nearby public transport links, including Horsham train station (approximately 30 minutes' walk away) and bus stops along Brighton Road, reducing the need for personal car use and associated PM_{2.5} emissions.

10. DAMAGE COST CALCULATION

10.1 The inputs and outputs of the damage cost calculation are shown in Table 12 and Table 13 below.

Table 12 Damage Cost Calculation Inputs

Input	Value
Development trip rate	962 AADT (1.01% HDV anticipated)
Average speed	50km/hr
Emissions year	2031
Area / road type	England (not London) – Urban (not London)
Link Length	10km – from SAQP guidance
Defra road transport cost per tonne ('urban small')	NO _x : £10,012
2025 central damage cost	PM _{2.5} : £84,998
Development vehicle emissions from EFT (Defra Emissions Factors Toolkit v13.1)	NO _x : 0.2866 tonnes/year PM _{2.5} : 0.0593 tonnes/year

10.2 Defra's Damage Cost Guidance was utilised to calculate the monetary value of air quality 'damage' caused by the development, and consequent cost of mitigation required. Using the annual link emissions above and *Road Transport Urban Small* damage costs, the estimated emissions costs of NO_x and PM_{2.5} are shown in Table 13. This accounts for 2% uplift per year to reflect a higher willingness to pay for health.

Table 13 Damage Cost Calculation Outputs

Emissions Year	Calculated Cost by Pollutant (Discounted Central Benefit)	
	NO _x	PM _{2.5}
2031	£2,869.24	£5,037.83
2032	£2,926.62	£5,138.59
2033	£2,985.16	£5,241.36
2034	£3,044.86	£5,346.19
2035	£3,105.76	£5,453.11
Central Present Value	£14,931.63	£26,217.08
Total Cost	£41,148.71	

10.3 The calculated emissions cost value in Table 13 gives an indication of the potential cost of the development to local air quality over a 5-year period. However, the development will include extensive measures intended to encourage the transition to more sustainable transport options and, therefore, minimise emissions during its operation.

10.4 The mitigation proposed to offset the calculated emissions cost is outlined in detail in Appendix 8.

11. CONCLUSIONS

- 11.1 Cass Allen has been instructed by Jaynic Properties Ltd to assess the potential air quality effects associated with a proposed residential development at Land at Hornbrook Farm, Brighton Road, Horsham in West Sussex. The assessment was carried out regarding relevant local and national planning policy and guidance.
- 11.2 Potential construction phase dust soiling and PM₁₀ health effects were assessed qualitatively, resulting in Medium and Low Risk levels being identified, respectively, in the absence of mitigation. Suitable best practice mitigation measures have been recommended, and no significant residual air quality impacts are expected.
- 11.3 A detailed atmospheric dispersion model was utilised to predict NO₂, PM₁₀ and PM_{2.5} concentrations at relevant sensitive receptor locations within the study area during the operational phase. The results indicate that pollutant concentrations at existing and proposed sensitive receptors will be below the relevant AQOs during the operational phase.
- 11.4 Furthermore, no significant impacts on local air quality as a result of development-generated traffic are anticipated. Taking into account the predicted extent and magnitude of changes in NO₂, PM₁₀ and PM_{2.5} concentrations at relevant receptors,, the overall effect of the development is considered to be 'not significant', with regard to air quality, with no requirement for additional mitigation.
- 11.5 In summary, it is our view that the site is suitable for the development in terms of air quality and that there are no air quality constraints with respect to planning consent.

Appendix 1 Air Quality Legislation and Policy

Legislation

Defra and the Devolved Administrations (200–) - The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2):

The Air Quality Strategy provides a framework for reducing air pollution in the UK, with the aim of meeting the requirements of European Union (EU) legislation. This has been brought into UK law via the EU (Withdrawal) Act 2018 (as amended) and is referred to as 'retained EU law'.

The air quality standards set within the Air Quality Strategy are recommended by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO), based on current scientific knowledge regarding the effects of each pollutant on health and the environment.

The AQOs are medium-term policy-based targets set by the government, taking into account economic efficiency, practicability, feasibility and timescales. Whilst some of the AQOs correspond with the EPAQS / WHO limits, others have a margin of tolerance, by specifying a number of permitted exceedances of the standard over a given period.

Many of the AQOs in the Air Quality Strategy have been made statutory in England via The Air Quality (England) Regulations, 2000, The Air Quality (England) Amendment Regulations, 2002 and The Air Quality Standards (Amendment) Regulations, 2016 – Statutory Instrument 2016 No. 1184.

Environmental Protection Act (1990):

Section 79 of the Environmental Protection Act 1990 defines statutory nuisance relevant to dust and particles as:

'Any dust, steam, smell or other effluvia arising from industrial, trade or business premises or smoke, fumes or gases emitted from premises so as to be prejudicial to health or a nuisance'; and

'Any accumulation or deposit which is prejudicial to health or a nuisance'.

Furthermore, Section 80 states that where a statutory nuisance is shown to exist, the Local Authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the Local Authority may abate the nuisance and recover expenses. However, there are no statutory limit values for dust deposition above which 'nuisance' is deemed to exist and nuisance is a subjective concept, its perception being highly dependent upon the existing conditions and the change which has occurred.

Environment Act (2021):

The Act mandates that local authorities review and document local air quality within their jurisdiction by way of staged appraisals and respond accordingly, with the aim of meeting the AQOs defined in the Regulations. There is a requirement for local authorities to identify relevant sources of emissions that are likely to be responsible for any failure to achieve the AQOs, or to identify relevant sources within neighbouring authorities' areas. Where the objective(s) are not likely to be achieved within the relevant period(s), the authority is required to designate an AQMA. For each AQMA the Local Authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality, in order to work towards achieving air quality standards in the future.

Defra (2019) Clean Air Strategy:

The UK Government's Clean Air Strategy sets out the comprehensive actions required to improve air quality, required from all parts of government and society.

The primary focus of previous iterations of the Clean Air Strategy has been NO₂, and its principal source – road traffic. The 2019 Strategy broadens the focus into other areas, including actions on clean growth and pollutant emissions from other sources such as industry, agriculture, and domestic wood-burning stoves.

Policy

National

NPPF sections relevant to air quality are stated below for planning policy context:

110. *...Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health.*
187. *Planning policies and decisions should contribute to and enhance the natural and local environment by: ... preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of ... air ... pollution. Development should, wherever possible, help to improve local environmental conditions such as air ... quality.*
198. *Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.*
199. *Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.*
201. *The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.*

Local

The Horsham District Planning Framework (November 2015) is the current Local Plan for the area and outlines the policies which shape development in the area. A review of this document has highlighted the following policies as 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 ... odour [and] air ... pollution and ensure that they:

...

4. *Minimise the air pollution ... 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 ...*

Policy 33

Development Principles

In order to conserve and enhance the natural and built environment developments shall be required to:

...

2. *Ensure that it is designed to avoid unacceptable harm to the amenity of occupiers/users of nearby property and land... whilst having regard to the sensitivities of surrounding development;*

The HDC Local Plan (2021-2038), when adopted, will become the main planning document for Horsham District. The Regulation 19 Draft Copy of this document includes the following policies relevant to air quality:

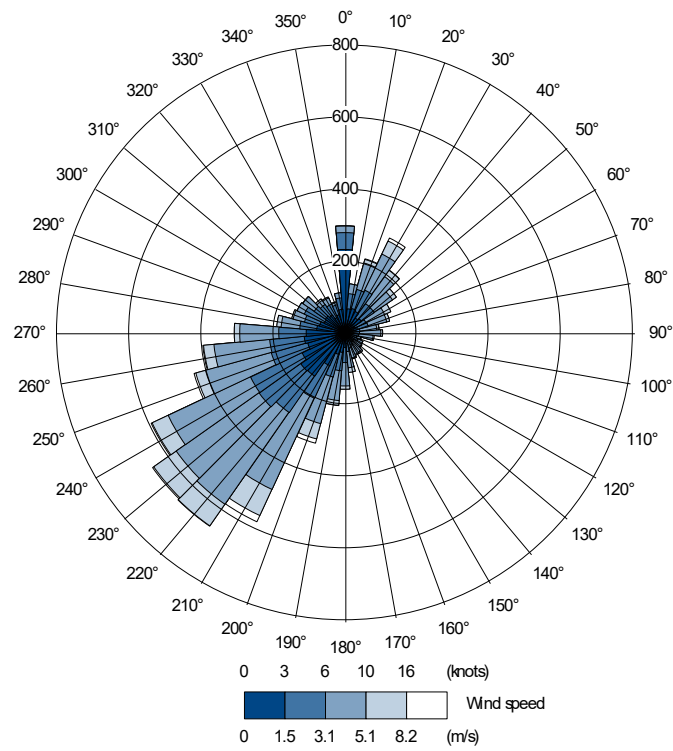
Strategic Policy 25

Air Quality

The Council recognises the direct effects air quality has on public health, natural habitats and biodiversity, including its contribution to climate change, and the importance of the management of air quality. Taking into account any relevant Planning Guidance Documents and / or policies within this plan, proposals will be required to:

- 1 *Adhere to the Air Quality and Emissions Mitigation Guidance for Sussex (2020), or any future updates, to identify if an Air Quality Impact Assessment and / or an Emissions Mitigation Statement is required;*
2. *Contribute to the implementation of local Air Quality Action Plans, and not conflict with the set objectives;*
3. *Minimise traffic generation and congestion through access to sustainable transport modes, maximising the provision for cycling and pedestrian facilities;*
4. *Encourage the use of cleaner transport fuels, including through the provision of electric car charging points.*
5. *Take into account habitats or biodiversity designations that are sensitive to air quality changes, including ancient woodland...*
6. *Mitigate the impact on the amenities of users of the site and surrounding land to an appropriate level, where development creates or results in pollution including particulates, dust, smoke, pollutant gases or odour, as outlined in the Air Quality and Emissions Mitigation Guidance for Sussex (2020), or any future updates; and*
7. *Ensure that the cumulative impact of all relevant permitted and allocated developments, including associated traffic impacts is appropriately assessed.*

Appendix 2 Wind Rose for Charlwood (2024)



Appendix 3 Traffic Data

Traffic data for the dispersion model were obtained from Richard Jackson Limited and supplemented by additional data from Department for Transport (DfT) Traffic Counts.

Road Link Details

ID	Description	Road Type	Speed (km/h)
1	A281 East Street, west of Park Terrace, east of Pets at Home Horsham	Urban (not London)	30
2	A281 East Street, west of Pets at Home Horsham, east of Albion Way junction		5
3	A281 Albion Way, north of East Street (northbound)		30
4	A281 Albion Way, south of B2195 (northbound)		5
5	A281 Albion Way, north of B2195 (northbound)		30
6	A281 Albion Way, Maderia Avenue roundabout approach (northbound)		5
7	Maderia Avenue roundabout		5
8	A281 Albion Way, south of Maderia Avenue roundabout (southbound)		20
9	A281 Albion Way, north of B2195 (southbound)		5
10	A281 Albion Way, south of B2195 (southbound)		30
11	A281 Albion Way, north of East Street (southbound)		5
12	A281 Albion Way, west of B2237 Springfield Road, north of The Olive Branch		30
13	A281 Albion Way, south of The Olive Branch, north of The Gym Group Horsham		5
14	B2237 Albion Way, south of The Gym Group Horsham, north of Waitrose roundabout approach		20
15	B2237 Albion Way, Waitrose roundabout approach		5
16	Waitrose roundabout		5
17	B2237 Albion Way, south of Waitrose roundabout		5
18	A281 Bishopric, west of Albion Way, east of Barnes Mews		5
19	A281 Bishopric, west of Barnes Mews, east of Rushams Road		30
20	B2195, east of Albion Way, south of Wellington Road		5
21	B2195, north of Wellington Road, south of Sussex House		20
22	B2195, north of Sussex House		30
23	Worthing roundabout		5
24	A281 Brighton Road, west of Doomsday Lane, east of site access		40
25	A281 Brighton Road, west of site access, east of Garden centre		40
26	A281 Brighton Road, west of Garden centre, east of 30mph sign		50
27	A281 Brighton Road, west of 30mph sign		30
28	A281 Brighton Road, east of Doomsday Lane, west of 50mph sign		50
29	A281 Brighton Road, east of 50mph sign, north of River Arun		65
30	A281 Brighton Road, south of River Arun, north of Rickfield Farm		66
31	Doomsday Lane, north of A281, south of Give Way sign		10
32	Doomsday Lane, north of Give Way sign, south of West Lodge entrance		50

ID	Description	Road Type	Speed (km/h)
33	Doomsday Lane, north of former site entrance, south of Give Way Sign		50
34	Doomsday Lane, north of Give Way sign, south of Hammerpond Road		10
35	Hammerpond Road, east of Doomsday Lane, west of Horsham Football Club entrance		65

Traffic Data

Link ID	2024 Model Verification		2031 Without Development		2031 With Development	
	AADT	%HDV	AADT	%HDV	AADT	%HDV
1	11,533	1.47	-	-	-	-
2	11,533	1.47	-	-	-	-
3	12,770	1.57	-	-	-	-
4	12,770	1.57	-	-	-	-
5	12,770	1.57	-	-	-	-
6	12,770	1.57	-	-	-	-
7	24,156	1.10	-	-	-	-
8	11,386	0.58	-	-	-	-
9	11,386	0.58	-	-	-	-
10	11,386	0.58	-	-	-	-
11	11,386	0.58	-	-	-	-
12	24,156	1.10	-	-	-	-
13	24,156	1.10	-	-	-	-
14	24,156	1.10	-	-	-	-
15	24,156	1.10	-	-	-	-
16	24,156	1.10	-	-	-	-
17	24,156	1.10	-	-	-	-
18	15,033	1.57	-	-	-	-
19	15,033	1.57	-	-	-	-
20	12,645	1.09	-	-	-	-
21	12,645	1.09	-	-	-	-
22	12,645	1.09	-	-	-	-
23	24,156	1.10	-	-	-	-
24	-	-	9,388	2.22	9,930	2.16
25	-	-	9,388	2.22	9,807	2.17
26	-	-	9,956	2.23	10,376	2.18
27	-	-	9,956	2.23	10,376	2.18
28	-	-	9,388	2.22	9,710	2.18
29	-	-	9,388	2.22	9,710	2.18
30	-	-	9,388	2.22	9,710	2.18
31	-	-	3,346	1.43	3,567	1.40

Link ID	2024 Model Verification		2031 Without Development		2031 With Development	
	AADT	%HDV	AADT	%HDV	AADT	%HDV
32	-	-	3,346	1.43	3,567	1.40
33	-	-	3,346	1.43	3,567	1.40
34	-	-	3,346	1.43	3,567	1.40
35	-	-	3,346	1.43	3,567	1.40

Appendix 4 Dispersion Model Details

Model Details and Input Parameters

Parameter	Value
Emissions Factors	Defra Emissions Factors Toolkit v13.1 using the traffic data in Appendix 3.
Emissions Year	2024 for verification, 2028* for future scenarios.
Background Concentrations	Defra 2021 background maps – 2024 for verification, 2028* for future scenarios.
Surface Roughness	Dispersion site – 0.5m; Meteorological Station – 0.2m
Monin-Obukhov Length	Dispersion site – 30m; Meteorological Station – 10m
Meteorological Data	Hourly sequential, Charlwood (2024)
Road-contribution Adjustment Factor (See Model Verification, below)	NO ₂ : 1.06 PM ₁₀ and PM _{2.5} : 2.63
NO _x to NO ₂ conversion	Defra NO _x to NO ₂ Calculator v9.1 and Defra-mapped background concentrations

*A robust 2028 future year was applied to reduce uncertainty with a more distant opening year. It is expected that emission rates and background concentrations will improve with time, therefore using an earlier future year provides robust estimates within the modelling exercise.

NO₂

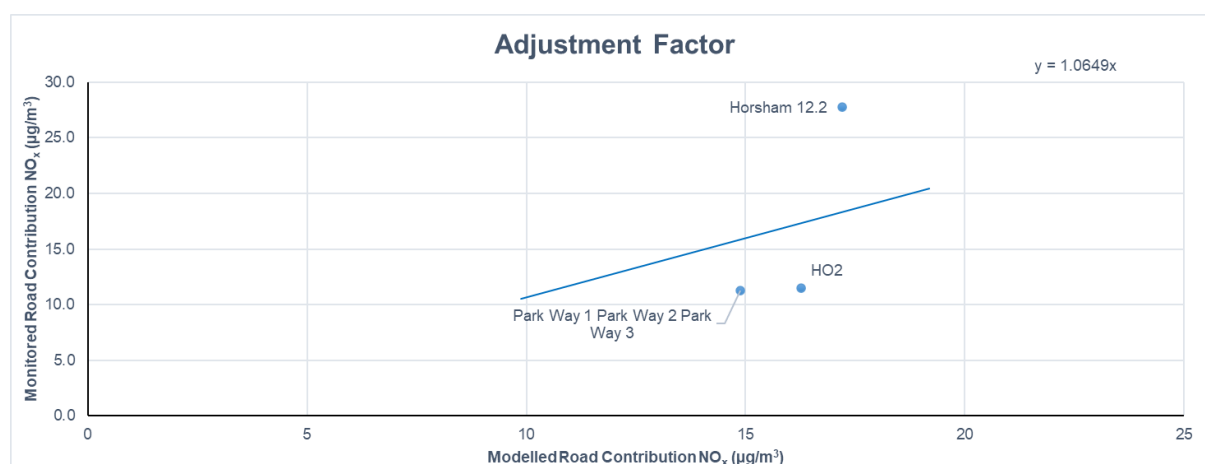
Model Verification

The model has been verified using the LAQM.TG22 methodology. The model has been used to predict 2024 annual mean road-NO_x contributions at roadside monitoring locations within the study area. The modelled road-NO_x concentrations have been compared with the 'measured' road-NO_x utilising the Defra NO_x to NO₂ Calculator.

2024 Model Verification (all concentrations in µg/m³)

Monitor ID	Monitored NO ₂	Background NO ₂	Monitored Road NO _x	Modelled Road NO _x	Ratio
HO2	15.7	10.3	11.5	16.3	0.707
Horsham 12.2	22.0	9.7	27.8	17.2	1.615
Park Way 1, 2 & 3	15.6	10.3	11.3	14.9	0.758

Comparison of Measured Road-NO_x with Modelled Road NO_x



Calculation of Model Uncertainty

To assess model uncertainty, the Root Mean Square Error (RMSE) of the above data was calculated to provide an estimate of the average error of the model. The overall weighted RMSE value calculated following model verification was 2.95µg/m³ (7.37%), which is within the acceptable range specified in LAQM.TG22.

PM

Model Verification

The model has been verified using the LAQM.TG22 methodology. The model has been used to predict 2024 annual mean road-PM₁₀ contributions at the automatic roadside monitoring location, HO2. The modelled concentrations have been compared with the 'measured' road-PM₁₀ values and a factor of **2.61** has been applied to the PM₁₀ and PM_{2.5} results.

Model Verification (all concentrations in µg/m³)

Pollutant	2024 Monitored	2024 Background	2024 Monitored Road	2024 Modelled Road	Ratio
PM ₁₀	16.1	11.1	5.0	1.9	2.625

Appendix 5 Operational Phase Significance Criteria

Long Term Average Concentration at Receptors in Assessment Year	% Change in Concentration Relative to Air Quality Objective (AQO)			
	1	2 – 5	6 – 10	>10
75% or less of AQO	Negligible	Negligible	Slight	Moderate
76 - 94% of AQO	Negligible	Slight	Moderate	Moderate
95 - 102% of AQO	Slight	Moderate	Moderate	Substantial
103 - 109% of AQO	Moderate	Moderate	Substantial	Substantial
110% or more of AQO	Moderate	Substantial	Substantial	Substantial

Notes:

- The Table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. The user is encouraged to treat the numbers with recognition of their likely accuracy and not assume a false level of precision. Changes of 0%, i.e. less than 0.5%, will be described as Negligible.
- The Table is only designed to be used with annual mean concentrations.
- Descriptors for individual receptors only; the overall significance is determined using professional judgement. For example, a 'moderate' adverse impact at one receptor may not mean that the overall impact has a significant effect. Other factors need to be considered.
- The total concentration categories reflect the degree of potential harm by reference to the AQO value. At exposure less than 75% of this value, i.e. 'well below', the degree of harm is likely to be small. As the exposure approaches and exceeds the AQO, the degree of harm increases. This change naturally becomes more important when the result is an exposure that is approximately equal to, or greater than the AQO.
- It is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the AQO. For a given year in the future, it is impossible to define the new total concentration without recognising the inherent uncertainty, which is why there is a category that has a range around the AQO, rather than being exactly equal to it.
- When defining the concentration as a percentage of the AQO, 'without scheme' concentration should be used where there is a decrease in pollutant concentration and the 'with scheme;' concentration where there is an increase. Where concentrations increase, the impact is described as adverse, and where it decreases as beneficial.
- LUPDC states that an assessment must reach a conclusion on the likely significance of the predicted effect. It should be noted that this is a binary judgement of either it is significant, or it is not significant.

Appendix 6 Recommended Construction Phase Mitigation

Highly Recommended Mitigation Measures for Medium-Risk Sites

Communications

- Develop and implement a stakeholder communications plan that includes community engagement before work commences onsite.
- 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, where applicable.
- 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 Appendix. Further, 'desirable' measures from IAQM guidance should be included as appropriate for the site. The DMP may include monitoring of dust deposition, dust flux, real-time PM₁₀ continuous monitoring and/or visual inspections.

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 complaints log available to the Local Authority when asked.
- Record any exceptional incidents that cause dust and/or air emissions, either on or offsite should be recorded, and the action taken to resolve the situation, in the logbook.

Monitoring

- 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 onsite 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 onsite 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 the 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 onsite.
- 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 reused onsite. If they are being reused onsite cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicle/Machinery and Sustainable Travel

- Ensure all vehicle operators 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.

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 is available on the site for effective dust/PM suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes/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 onsite 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.

Measures Specific to Construction (Medium Risk)

- 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 make sure that that appropriate additional control measures are in place.

Measures Specific to Trackout (Medium Risk)

- 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.

Appendix 7 Dispersion Model Results

Annual Mean NO₂ Impacts

Receptor	Without (µg/m ³)	With (µg/m ³)	With % of AQO	Change (µg/m ³)	Change (% AQO)	Impact Descriptor
R1	7.6	7.6	19.1	<0.1	0.1	Negligible
R2	8.6	8.7	21.7	0.1	0.1	Negligible
R3	7.5	7.5	18.8	<0.1	<0.1	Negligible
R4	7.8	7.9	19.7	<0.1	0.1	Negligible
R5	7.8	7.9	19.7	<0.1	0.1	Negligible
R6	7.3	7.4	18.4	<0.1	<0.1	Negligible
R7	7.3	7.3	18.4	<0.1	<0.1	Negligible
R8	7.6	7.7	19.2	0.1	0.1	Negligible

Note: Results are reported to the nearest 0.1µg/m³. Any apparent discrepancies in results are due to rounding.

Annual Mean PM₁₀ Impacts

Receptor	Without (µg/m ³)	With (µg/m ³)	With % of AQO	Change (µg/m ³)	Change (% AQO)	Impact Descriptor
R1	10.6	10.6	26.6	<0.1	0.1	Negligible
R2	12.0	12.0	30.1	0.1	0.2	Negligible
R3	10.5	10.5	26.3	<0.1	<0.1	Negligible
R4	10.9	11.0	27.4	<0.1	0.1	Negligible
R5	10.9	10.9	27.4	<0.1	0.1	Negligible
R6	10.2	10.2	25.6	<0.1	<0.1	Negligible
R7	10.2	10.2	25.6	<0.1	<0.1	Negligible
R8	10.7	10.8	26.9	0.1	0.2	Negligible

Note: Results are reported to the nearest 0.1µg/m³. Any apparent discrepancies in results are due to rounding.

Annual Mean PM_{2.5} Impacts

Receptor	Without (µg/m ³)	With (µg/m ³)	With % of AQO	Change (µg/m ³)	Change (% AQO)	Impact Descriptor
R1	6.4	6.4	32.2	<0.1	0.1	Negligible
R2	7.2	7.2	36.0	<0.1	0.2	Negligible
R3	6.4	6.4	31.9	<0.1	0.1	Negligible
R4	6.6	6.6	33.1	<0.1	0.1	Negligible
R5	6.6	6.6	33.1	<0.1	0.1	Negligible
R6	6.2	6.2	31.2	<0.1	<0.1	Negligible
R7	6.2	6.2	31.2	<0.1	<0.1	Negligible
R8	6.5	6.5	32.5	<0.1	0.2	Negligible

Note: Results are reported to the nearest 0.1µg/m³. Any apparent discrepancies in results are due to rounding.

Appendix 8 Emissions Mitigation Statement

It is anticipated that committed measures would be confirmed with the Project Team at reserved matters stage.



Architectural & Environmental Consultants

Noise | Vibration | Air Quality

This report has been prepared by Cass Allen Associates Ltd in accordance with the CDM regulations with all reasonable skill, care and diligence, and taking account of the resources devoted to it by agreement with the client. Information reported herein is based on the interpretation of data collected and has been accepted in good faith as being accurate and valid at the time of collection. This report is for the exclusive use of the client named above; no warranties or guarantees are expressed or should be inferred by any third parties. This report may not be relied upon by other parties without written consent from Cass Allen Associates Ltd. Cass Allen Associates Ltd disclaims any responsibility to the client and others in respect of any matters outside the agreed scope of work.



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