



Project:
Southdean Road, Liverpool

Air Quality Impact
Assessment

Breck Homes LTD

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EXECUTIVE SUMMARY

EnviroSolution were commissioned by Breck Homes LTD to undertake an Air Quality Impact Assessment in support of a proposed residential development at Southdean Road, Liverpool, L14.

The proposal comprises the development of approximately 150 affordable homes with associated infrastructure and landscaping.

Due to the scale of the development, there is the potential 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 and to predict impacts as a result of additional road vehicle exhaust emissions associated with the proposed development. Results were subsequently verified using local monitoring results provided by Knowsley Metropolitan Borough Council (KMBC).

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.

Additionally, the assessment concluded that impacts on pollutant levels as a result of operational phase pollutant emissions were predicted to be not significant at all sensitive locations in the vicinity of the site, as a result of negligible impact at discrete sensitive receptor locations. The use of robust assumptions, where necessary, was considered to provide sufficient results confidence for an assessment of this nature.

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

1. INTRODUCTION

1.1 Background

EnviroSolution has been commissioned by Breck Homes LTD, hereafter referred to as “the Client” to undertake an Air Quality Impact Assessment in support of a proposal, comprising the development of approximately 150 affordable homes with associated infrastructure and landscaping, hereinafter referred to as the “Proposed Development”.

1.2 Site Location and Assessment Context

The application site is located at Southdean Road, Liverpool, L14, at approximate National Grid Reference (NGR) 342620, 392692.

The application site is located 17.4m from the Liverpool City Air Quality Management Area (AQMA) which has been declared due to exceedances of the Annual NO₂ Air Quality Objectives (AQOs). Subsequently, the Proposed Development has the potential to introduce future site users into an area of existing poor air quality.

Additionally, due to the scale of the Proposed Development, there is potential to cause impacts upon existing NO₂ and particulate matter (PM₁₀ and PM_{2.5}) concentrations as a result of additional road vehicle exhaust emission generated during operation. Fugitive dust impacts may also arise as a result of emission generated during construction.

An Air Quality Impact Assessment has been produced to quantify annual mean NO₂, PM₁₀ and PM_{2.5} concentrations across the site to consider suitability for the proposed end-use, and to assess potential impacts as a result of the development. The assessment will be undertaken in accordance with the requirements of the National Planning Policy Framework (NPPF) and the KMBC 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 EnviroSolution standard terms of engagement. EnviroSolution 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 EnviroSolution; 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 2023, DEFRA, February 2023; and
- Knowsley Local Plan Core Strategy, January 2016.

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 January 2023, 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 (µg/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}	25 (12*)	Annual mean

* Interim Target to be achieved by end of January 2028.

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 the public might reasonably be expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.

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

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 CS2 Development Principles

Principle 4: Recognise environmental limits, protect and enhance environmental assets, enhance local character and promote quality of place by:

j) Minimising negative impact upon flood risk, air quality, water quality, land quality, soil quality, and noise or vibration levels and ensuring any negative impacts are appropriately mitigated. Development that will have an unacceptable impact upon any of the above will only be permitted where the benefits of the proposal clearly outweigh the harm.

Policy CS7 Transport Networks

Location, Design and Management of New Development

2) New development will be required to be:

e) Inclusive of measures that will mitigate carbon emissions and improve air quality where appropriate; and

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 Institute of Air Quality Management (IAQM) document 'Guidance on the Assessment of Dust from Demolition and Construction'.

Reference should be made to Appendix E 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 Road Vehicle Exhaust Impact Assessment

The Proposed Development has potential to cause impacts upon existing pollution levels at nearby sensitive receptors as a result of additional road vehicle exhaust emissions (NO₂, PM₁₀ and PM_{2.5}) generated during the operational phase.

Impacts have been defined by predicting pollutant concentrations at sensitive locations with and without the Proposed Development in place using dispersion modelling and the following assessment scenarios:

- 2023 as baseline year for verification against latest ratified data;
- Opening year do-minimum (DM) (predicted traffic flows in 2027 should the proposals not proceed); and
- Opening year do-something (DS) (predicted traffic flows in 2027 should the proposals be completed, with the addition of traffic generated by the Proposed Development).

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 2027.

The 2027 scenario assumes an emission drop off based on assumptions provided by the Emission Factor Toolkit (Eft v12.0) supported by the uptake of low emission vehicles and government incentives and targets concerning fleet proportions by 2030. The results of this scenario will form the basis of this report.

Sensitivity analysis has also been undertaken to assess associated road vehicle exhaust emissions impacts based on the use of 2027 traffic data with 2023 and emission factors obtained from the Eft v12.0 produced by DEFRA.

The sensitivity analysis assumes that vehicle emission factors will not improve in line with current predictions and future emission factors will remain consistent with those predicted for the baseline year of 2023. This has been undertaken to consider a worst-case scenario and does not form the basis of impact significance.

Reference should be made to Appendix B for full assessment input details, Appendix C for details of the full assessment results and Appendix D for sensitivity analysis.

3.2.2 EPUK and IAQM Impact Significant Criteria

Receptors potentially sensitive to changes in pollutant concentrations were identified within the assessment extents. LAQM.TG(22) provides the following examples of where annual mean AQOs should apply:

- Residential properties;
- Schools;
- Hospitals; and
- Care homes.

The sensitivity impact significance of each receptor was defined in accordance with the criteria shown in Table 3. These are based upon the guidance provided within the EPUK and IAQM guidance.

Table 3: EPUK and IAQM Assessment Significance Criteria

Long Term Average Concentration	% Change in Concentration Relative to 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

The criteria shown in Table 3 is adapted from the EPUK and IAQM guidance with sensitivity descriptors included to allow comparisons of various air quality impacts. It should be noted that changes of 0%, i.e. less than 0.5%, will be described as negligible in accordance with the EPUK and IAQM guidance.

Following the prediction of impacts at discrete receptor locations utilising the criteria in Table 3 the EPUK and IAQM guidance states that this framework is to be used as a starting point to make a judgement on significance of effect but other influences might need to be accounted for. Whilst impacts might be determined as 'slight', 'moderate' or 'substantial' at individual receptors, overall effect might not necessarily be deemed as significant in some circumstances. The following factors may provide some assistance in determining the overall significance of a development:

- Number of properties affected by significant air quality impacts and a judgement on the overall balance;
- Where new exposure is introduced into an existing area of poor air quality, then the number of people exposed to levels above the objective will be relevant;
- The percentage change in concentration relative to the objective and the descriptions of the impacts at the receptors;
- Whether or not an exceedance of an objective is predicted to arise or be removed in the study area due to a substantial increase or decrease; and
- The extent to which an objective is exceeded e.g. an annual mean NO₂ concentration of 41µg/m³ should attract less significance than an annual mean of 51µg/m³.

These factors were considered and an overall significance determined for the impact of operational phase road traffic emissions. It should be noted that the determination of significance relies on professional judgement and reasoning should be provided as far as practicable. This has been considered throughout the assessment when defining predicted impacts.

Full details of data used for the modelling assessment are presented in Appendix B of this report.

3.2.3 Future Exposure

The Proposed Development is located 17.4m from the from Liverpool City AQMA. Subsequently, the proposals have the potential to introduce new receptors into an area of elevated NO₂, PM₁₀ and PM_{2.5} concentrations.

Detailed dispersion modelling was therefore undertaken to quantify annual mean pollutant concentrations across the site and determine suitability for the proposed use. The following modelling scenarios were utilised during the assessment:

- 2023 as baseline year for verification against latest ratified data;
- 2027 do-minimum (DM) (predicted traffic flows in 2027 should the proposals be completed, without the addition of traffic generated by the Proposed Development)
- 2027 do-something (DS) (predicted traffic flows in 2027 should the proposals be completed, with the addition of traffic generated by the Proposed Development)

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.

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), all local authorities have undertaken a review and assessment of air quality within their area of administration. This process has indicated the closest AQMA to have been declared is described as:

- Liverpool City AQMA

The application site is located 17.4m from the Liverpool City AQMA. As such there is the potential for the Proposed Development to introduce future site users into an area of elevated Annual NO₂, and cause air quality impacts during the construction and operational phases. This has been considered within this report.

4.2 Air Quality Monitoring

Monitoring of pollutant concentrations is undertaken by KMBC and Liverpool City Council using Automatic and Diffusion Tube monitoring methods throughout their areas of administration. A review of most recent Air Quality Monitoring Data indicated that there are currently no automatic analysers, and 6 diffusion tubes located within the vicinity of the Proposed Development, presented in Table 4.

Table 4: Monitoring Results

ID	Site Name	Type	NGR (m)		Distance to Site (m)	Annual Mean Concentration (µg/m ³)		
			X	Y		2021	2022	2023
B10	Corner Finch Lane / East Prescott Road	Kerbside	341809	391849	1167.6	33.5	31.6	29.6
B9	Central Reservation Prescott Road at jct of light by Sainsburys	Kerbside	340233	391475	2680.03	29.8	28.5	28.4
B8	Lamp Post by bus stop Blackhorse Lane / Prescott Road	Kerbside	339798	391301	3148.67	26.2	25.6	24.8
P1a P1b	LC227 Near Liverpool Road	Roadside	345816	392660	3195.58	25.1	21.9	21.5
P2a P2b	LC003 Outside 50 Derby Street	Roadside	346165	392801	3545.27	25.6	22.4	20.3
P3a P3b	LC014 Adjacent 2 Stanley Crescent	Roadside	346390	392844	3775.46	25.7	24.9	25.1

As indicated in Table 4, there were no exceedances of annual mean AQOs at the monitoring locations in recent years.

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: 342500, 392500

Data for this location was downloaded from the DEFRA website. For the purpose of this assessment, background concentrations are summarised in Table 5 for the base year (2023) and the predicted development opening year (2027).

Table 5: Predicted Background Pollutant Concentrations

Pollutant	Predicted Background Concentration ($\mu\text{g}/\text{m}^3$)	
	2023	2027
NO _x	17.10733	14.27348
NO ₂	12.8103	10.86217
PM ₁₀	12.666221	12.359622
PM _{2.5}	8.063559	7.745211

As indicated in Table 5, 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 6.

Table 6: 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	More than 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 7. The exact construction vehicle access routes were not available for the purpose of this assessment as they will depend on sourcing of materials. This is likely to be decided by the contractor. However, it was assumed that construction traffic would access the Proposed Development via Southdean Road, to ensure a worst-case trackout assessment is undertaken.

Table 7: 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 8.

Table 8: 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 and development processes in the locality.
The likelihood of concurrent dust generating activity on nearby sites.	A review of the KMBC Planning Portal indicated that there are no large scale planning applications within 500m of the Proposed Development. As such, there is low potential for concurrent dust generation to occur should the construction phases of the proposed 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

Guidance	Comment
	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 West of the development. As such, properties to the East of the site would be most affected by dust emissions.
Conclusions drawn from local topography	The topography of the area appears to be predominantly flat. 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.

4.4.2 Operational Phase Sensitive Receptors

A desk-top study was undertaken in order to identify any sensitive receptor locations in the vicinity of the site that require specific consideration during the assessment and are summarised Table 9.

Table 9: Existing Sensitive Human Receptors

Sensitive Receptor		NGR (m)		Height (m)
		X	Y	
R1	55 Ashbury Rd, Liverpool L14 8UX, UK	342764.607	392710.649	1.5
R2	3 Ashbury Rd, Liverpool L14 8UX, UK	342654.573	392591.035	1.5
R3	226 Southdean Rd, Liverpool L14 8UW, UK	342622.084	392569.844	1.5
R4	194 Southdean Rd, Liverpool L14 8UW, UK	342546.389	392640.97	1.5
R5	140 Lordens Rd, Liverpool L14 8UA, UK	342694.145	392483.853	1.5
R6	47 Saxby Rd, Liverpool L14 9NS, UK	342436.43	392588.23	1.5
R7	118 Lordens Rd, Liverpool L14 8UA, UK	342620.887	392405.296	1.5
R8	545 Princess Dr, Liverpool L14 9NA, UK	342558.121	392424.862	1.5
R9	521A Princess Dr, Liverpool L14 9NA, UK	342493.52	392484.728	1.5
R10	503 Princess Dr, Liverpool L14 9NA, UK	342440.349	392533.441	1.5
R11	476 Princess Dr, Liverpool L14 9NF, UK	342351.71	392540.083	1.5
R12	510B Princess Dr, Liverpool L14 9NG, UK	342454.274	392448.932	1.5
R13	58 Burtree Rd, Liverpool L14 8XH, UK	342448.414	392732.174	1.5
R14	552 Princess Dr, Liverpool L14 9NQ, UK	342602.986	392310.159	1.5
R15	455 Princess Dr, Liverpool L14 8XE, UK	342275.061	392690.668	1.5
R16	398 Princess Dr, Liverpool L14 8XQ, UK	342060.872	392826.025	1.5

Receptors modelled at 1.5m to represent the average UK “breathing height” above ground level. Reference should be made to Figure 6 within Appendix A for a graphical representation of operational phase emission sensitive human receptor locations.

5. ASSESSMENT

5.1 Construction Phase Assessment

5.1.1 Step 1 – Screening

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 E for details of the relevant IAQM construction phase assessment criteria, which were utilised in conjunction with site specific information.

5.1.2 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 E, with the outcome of Step 2A summarised below in Table 10.

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

Earthworks was required for this project but no detailed description was given. The area of the site is between 18,000m² to 110,000m². As such, the magnitude of potential dust emissions related to earthwork activities is considered Medium.

Construction

Construction was required for this project but no detailed description was given. Given the scale of the Proposed Development the total building and infrastructure volume is greater than 75,000m³. As such, the magnitude of potential dust emissions related to construction activities is considered Large.

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. Similarly, the surface material and unpaved road length was not known at this stage of the project. Based on the site area, 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 10: Dust Emission Magnitude

Magnitude of Activities		
Earthworks	Construction	Trackout
Medium	Large	Large

5.1.3 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 50m of the anticipated trackout routes.

Based on the assessment criteria detailed in Appendix E, 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 12.67µg/m³ as detailed in Section 4. Based on the receptor counts provided above, the area is considered to be of Low for all construction phase activities.

The sensitivity of the receiving environment to specific potential dust impacts, based on the criteria detailed in Appendix E is summarised in Table 11.

Table 11: 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

5.1.4 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 12.

Table 12: Summary of Potential Unmitigated Dust Risks

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

5.1.5 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 13.

Table 13: Fugitive Dust Mitigation Measures

Issue	Control Measure
Communication	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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. • 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	<ul style="list-style-type: none"> • Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection

Issue	Control Measure
	<p>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.</p> <ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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.
Operations	<ul style="list-style-type: none"> • Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/ mitigation, using non-potable water where possible and appropriate. • Use enclosed chutes and conveyors and covered skips. • Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. • Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.
Waste Management	<ul style="list-style-type: none"> • Avoid bonfires and burning of waste materials.
Earthworks	<ul style="list-style-type: none"> • Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. • Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.

Issue	Control Measure
	<ul style="list-style-type: none"> Only remove the cover in small areas during work and not all at once.
Construction	<ul style="list-style-type: none"> 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. Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overflowing during delivery. For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust
Trackout	<ul style="list-style-type: none"> 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.

5.1.6 Step 4 – Residual Impacts

Assuming the relevant mitigation measures outlined in Table 13 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 2027 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 14.

Table 14: Modelling Results - Annual Mean NO₂ at Proposed Development

Floor Level	Predicted 2027 Annual Mean NO ₂ Concentration (µg/m ³)
Ground (1.5m)	11.92 - 12.41

The predicted concentrations shown in Table 12 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 14, it is not predicted that on-site concentrations will exceed the 1-hour mean AQO for NO₂.

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 15.

Table 15: Modelling Results - Annual Mean PM₁₀ and PM_{2.5} at Proposed Development

Floor Level	Predicted 2027 Annual Mean Concentration (µg/m ³)	
	PM ₁₀	PM _{2.5}
Ground (1.5m)	12.80 – 13.22	7.98 – 8.09

The predicted concentrations shown in Table 13 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.

5.2.2 Impact Assessment - Predicted Concentrations at Existing Sensitive Use

Based on data from the appointed traffic consultant, it is expected that there will be 790 Annual Average Daily Traffic (AADT) trips generated by the Proposed Development. Based on the anticipated AADT trip generation, a dispersion modelling assessment was undertaken in order to quantify potential changes in pollutant concentrations at sensitive locations in the vicinity of the site.

Impacts on annual mean NO₂ PM₁₀ and PM_{2.5} concentrations as a result of operational phase exhaust emissions were predicted to be **Negligible**.

The overall significance of potential impacts was determined to be **not significant** in accordance with the EPUK and IAQM guidance. The use of robust assumptions, in the form of worse-case road vehicle emission factors, was considered to provide sufficient confidence of results for an assessment of this nature.

Full assessment results and commentary can be found in Appendix C, further discussion on the overall impact significance is provided in Table 16. It should be noted that predicted impacts on annual mean NO₂, PM₁₀ and PM_{2.5} concentrations using 2023 worst-case scenario emission factors were also predicted to be Negligible at 16 sensitive receptor locations within the vicinity of the site. Full assessment results on the sensitivity analysis can be found in Appendix D.

5.2.3 Impact Significance

The overall significance of operational phase road traffic emission impacts for 2027 was determined as not significant. This was based on the predicted impacts at discrete receptor locations and the considerations outlined in Section 5.2. Further justifications are provided in Table 16.

Table 16: Overall Road Emissions Impact Significance

Guidance	Comment
Number of properties affected by slight, moderate or substantial air quality impacts and a judgement on the overall balance	Impacts on annual mean NO ₂ concentrations were predicted to be Negligible at 16 sensitive receptors. Impacts on PM ₁₀ and PM _{2.5} concentrations were predicted to be negligible and therefore not significant at all sensitive receptors. The overall balance on air quality impacts as a result of the Proposed Development is therefore deemed not significant .
Where new exposure is introduced into an existing area of poor air quality, then the number of people exposed to levels above the objective or limit value will be relevant	The proposed development will not result in any new exposure to pollutant concentrations above the AQOs at sensitive locations on the application site and as such no new exposure has been introduced.
The percentage change in concentration relative to the objective and the descriptions of the impacts at the receptors	The change in concentration relative to the AQO was predicted to range from: <ul style="list-style-type: none"> ● 0.125% to 0.325% for NO₂; ● 0.063 % to 0.149% for PM₁₀; and ● 0.033% to 0.078% for PM_{2.5} Resultant impacts were subsequently predicted to be Negligible at 16 receptor locations.
Whether or not an exceedance of an objective is predicted to arise or be removed in the study area due to a substantial increase or decrease.	There were no substantial exceedances of the annual mean AQO for NO ₂ PM ₁₀ or PM _{2.5} at any location within the modelling extent.
The extent to which an objective is exceeded e.g. an annual mean NO ₂ concentration of 41µg/m ³ should attract less significance than an annual mean of 51µg/m ³	As stated above, there were no new exceedances of the annual mean AQOs for NO ₂ , PM ₁₀ and PM _{2.5} at any location within the modelling extent.

The assessment was undertaken in accordance with the methodology detailed in Section 3.2 and full impact assessment results can be found in Appendix C.

5.2.4 Combustion Emission Impacts

There is no scope within the development to provide any form of combustion plant. As such, potential air quality impacts associated with operational phase combustion emissions are therefore predicted to be not significant.

6. CONCLUSION

EnviroSolution were commissioned by Breck Homes LTD to undertake an Air Quality Impact Assessment in support of a proposed residential development at Southdean Road, Liverpool, L14.

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. 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 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.

Impacts on annual mean NO₂, PM₁₀ and PM_{2.5} concentrations as a result of operational phase exhaust emissions were predicted to be **Negligible** at 16 sensitive receptor locations within the vicinity of the site.

The overall significance of potential impacts was determined to be **not significant** in accordance with the EPUK and IAQM guidance. The use of robust assumptions, in the form of worse-case road vehicle emission factors, was considered to provide sufficient confidence of results for an assessment of this nature.

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

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

ABBREVIATIONS

KMBC	Knowsley Metropolitan Borough 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

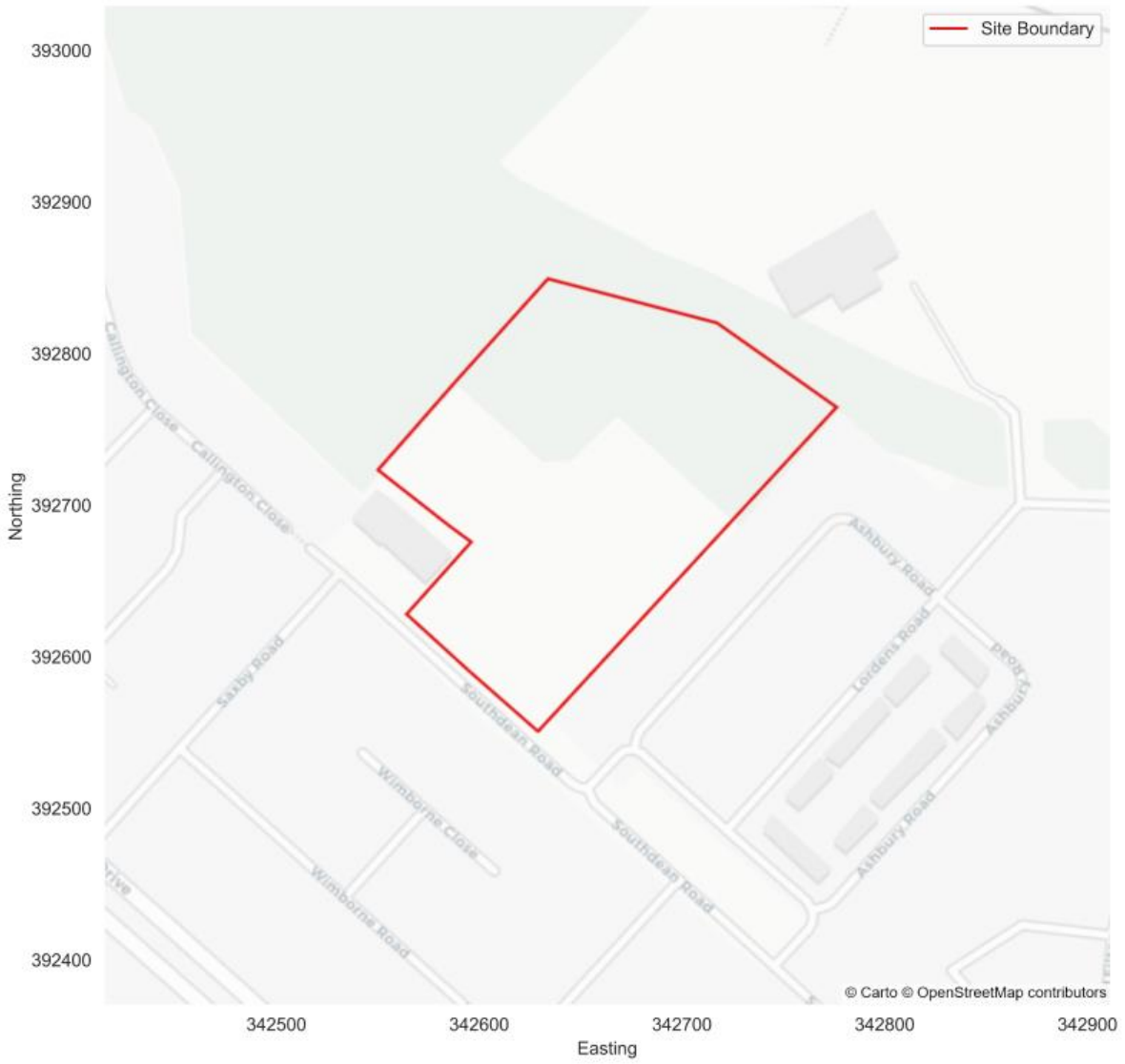
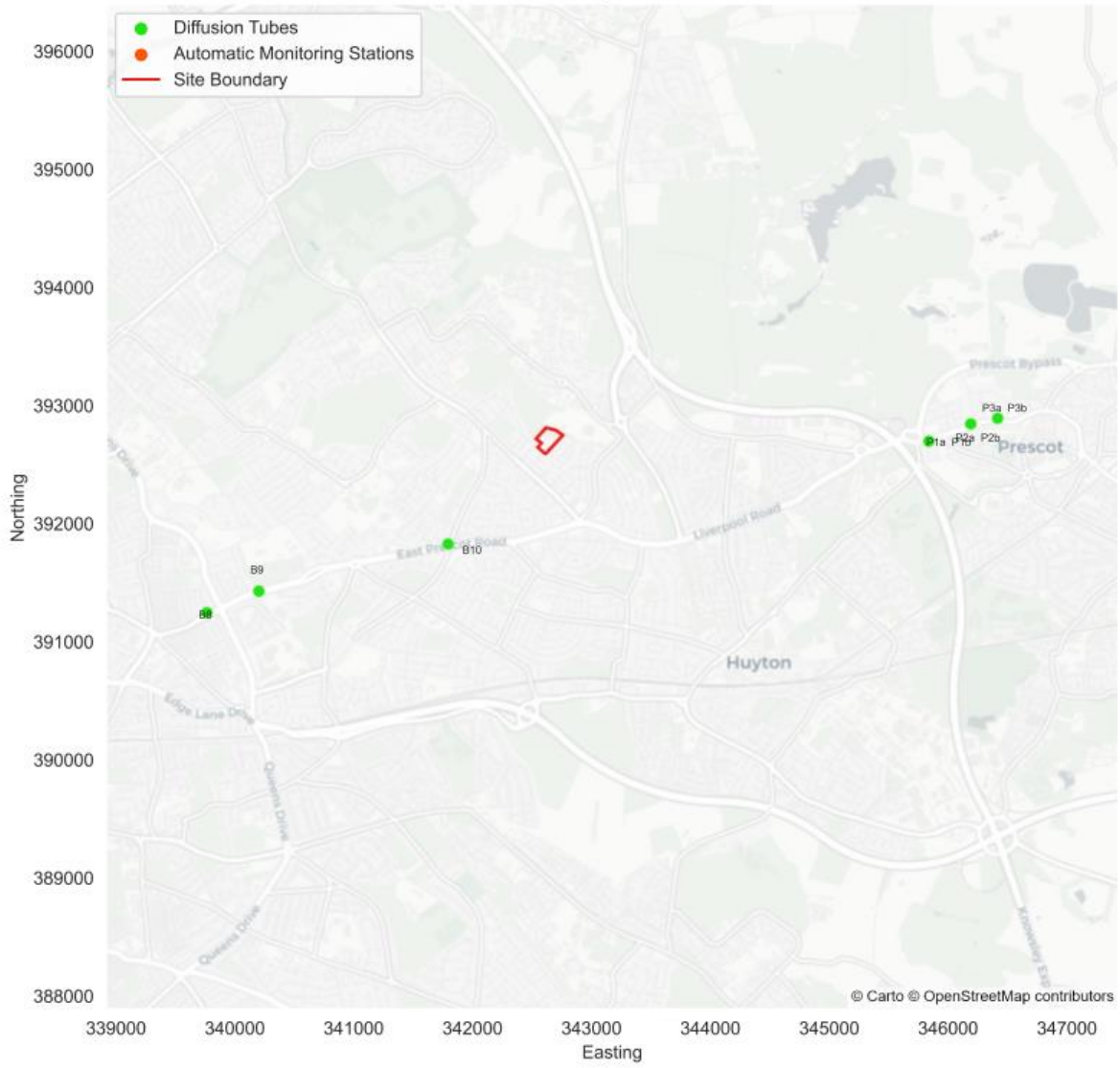
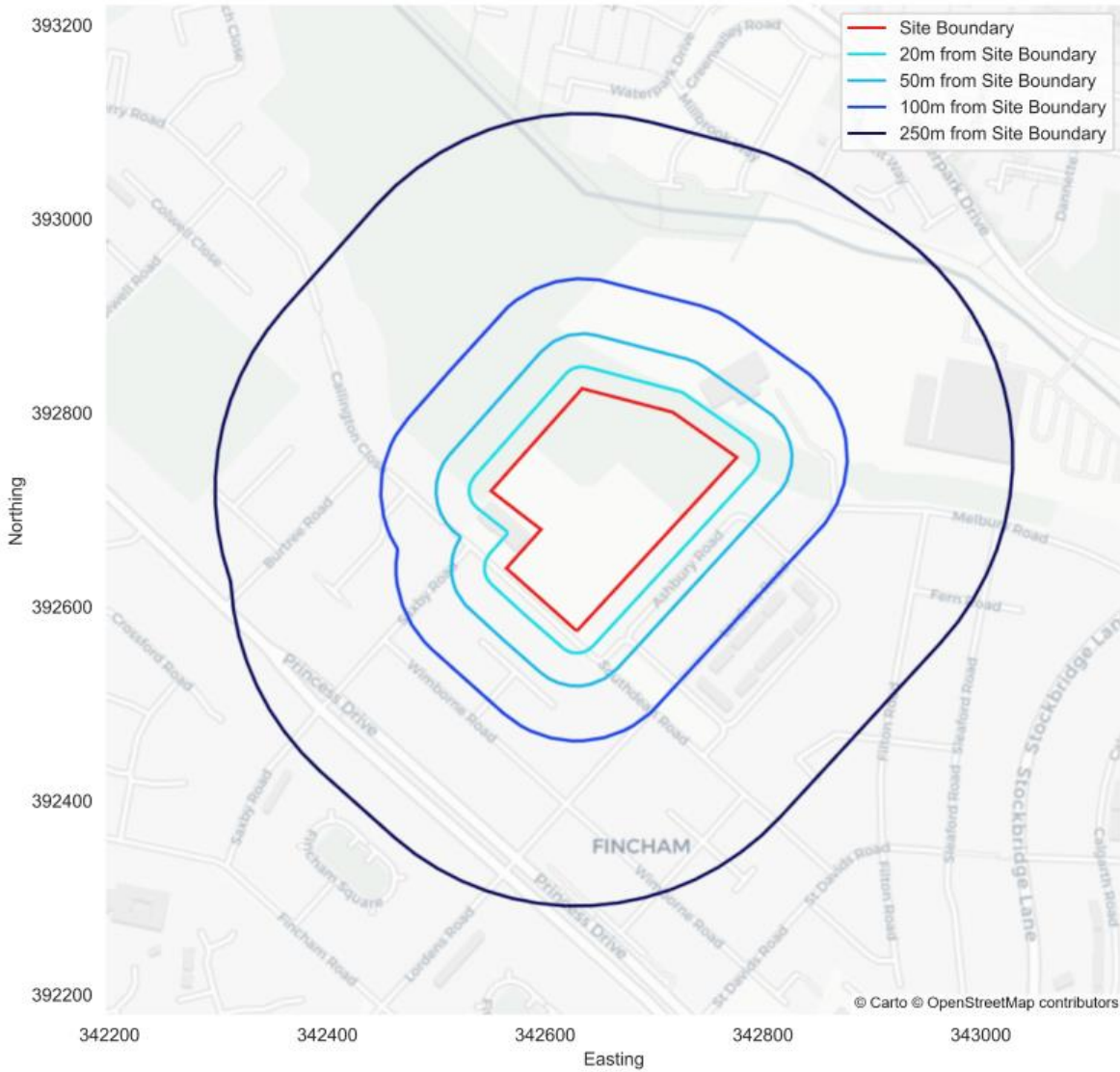


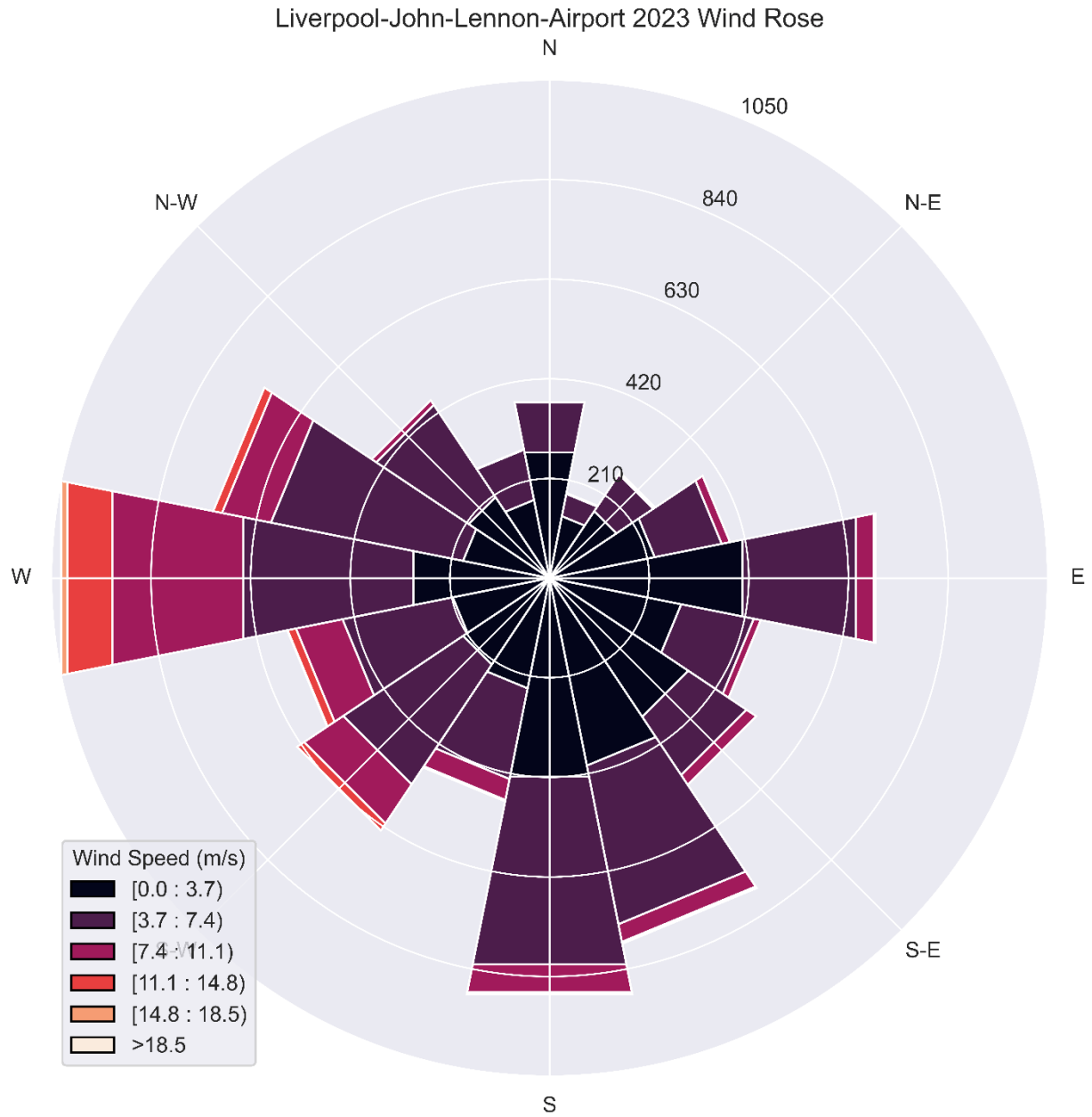
Figure 2
Monitoring Locations

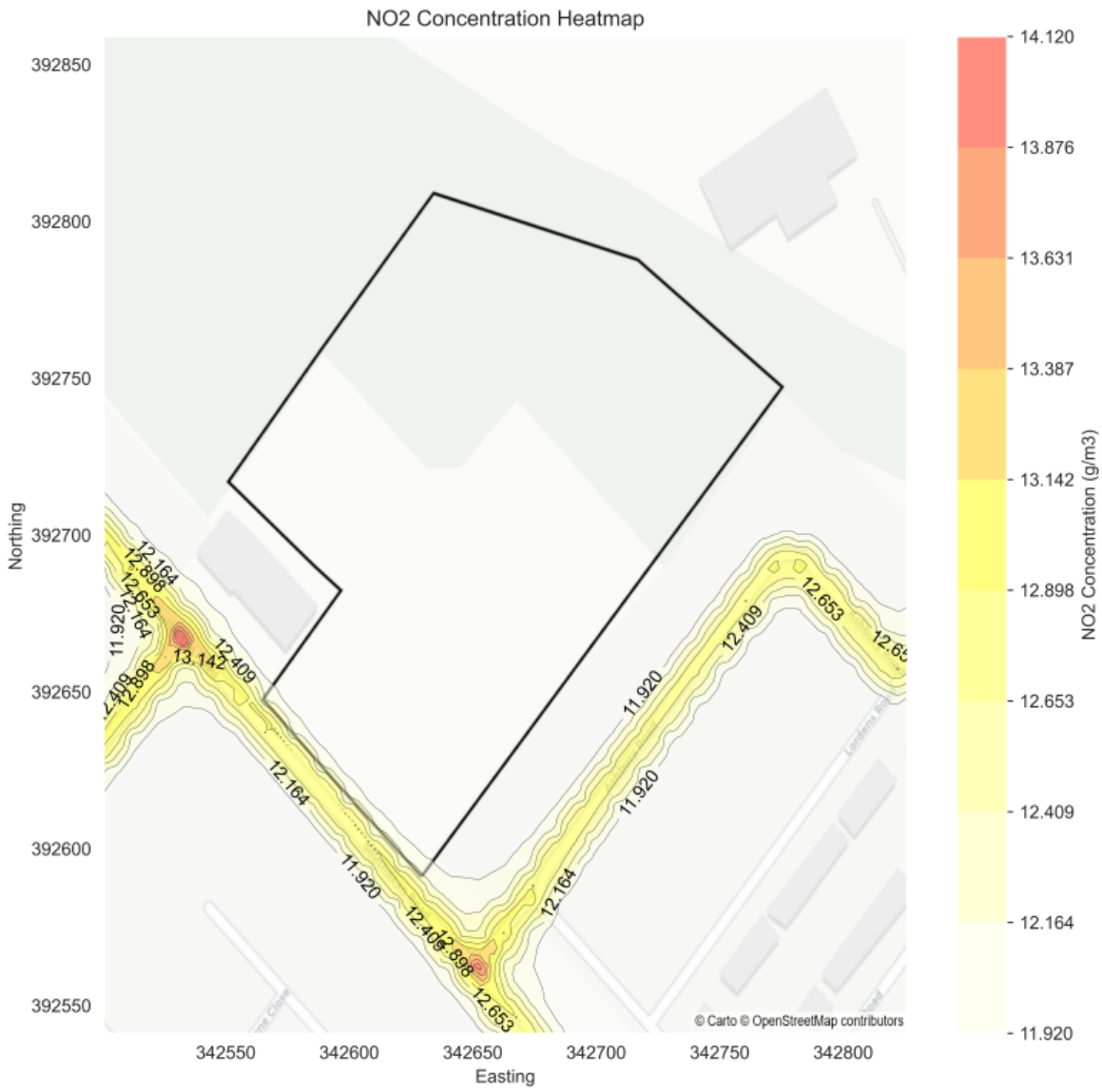


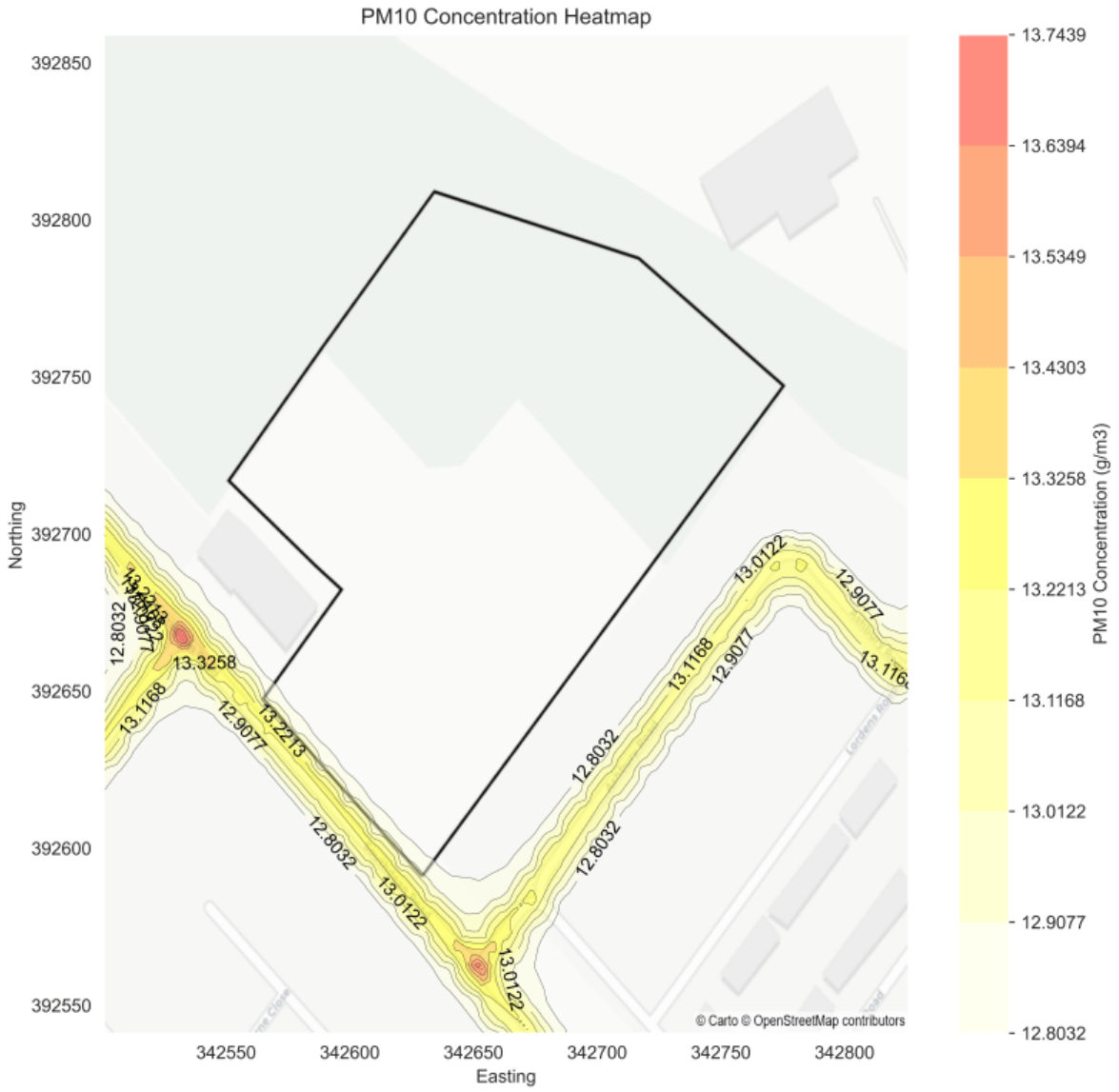
Demolition and Construction Dust Buffer Zones

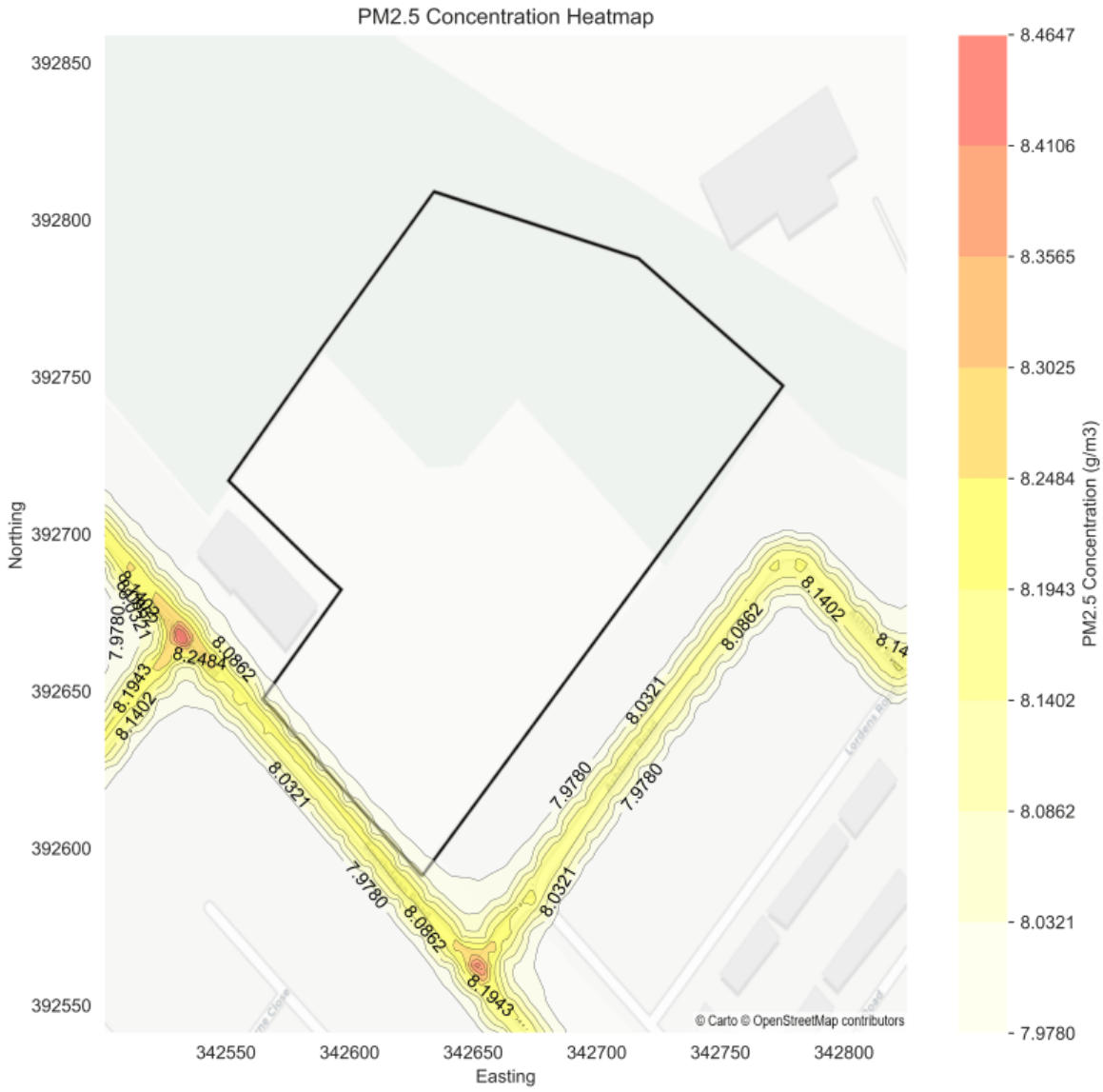












APPENDIX B: ASSESSMENT INPUTS

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: 342620, 392692 at a height of 1.5m to represent the proposed ground floor level for the 2027 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 provided by the appointed Transport Consultants for the scheme, indicated that a total flow generation of 790 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 on every link of the A-road and motorway network in Great Britain for the years 1999 to 2023. 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 (TEMPRO) software package were utilised to allow for conversion from the obtained 2023 traffic flow to 2027 which was used to represent the opening year scenario. Vehicle speed and roads 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: 2023 Verification Traffic Data

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L1	1 Hope St	10.5	1137.0	1.8	32.5
L2	1 Hope St	8.5	1147.0	1.8	24.2
L3	224 Knowsley Ln	13.6	68464.0	9.8	97.3
L4	24 Hope St	7.6	1163.0	1.8	29.5
L5	27 Huyton Ln	14.3	81806.0	8.9	100.1
L6	29 Eaton St	11.9	1179.0	1.8	32.0
L7	31 Eaton St	7.6	1131.0	1.8	32.5
L8	33 Hope St	7.6	1140.0	1.8	27.6
L9	5 St Aidan's Grove	10.6	14778.0	3.1	43.7
L10	66 The Ct	10.3	17464.0	4.3	60.8
L11	77 Liverpool Rd	13.6	21446.0	2.3	102.2
L12	77 Liverpool Rd	14.2	20684.0	2.3	114.5
L13	77 Liverpool Rd	16.0	21443.0	2.3	96.0
L14	77 Liverpool Rd	17.2	20491.0	2.3	95.6
L15	77 Liverpool Rd	14.8	21239.0	2.3	92.6
L16	77 Liverpool Rd	13.7	20666.0	2.3	105.3
L17	8 St Josephs Cl	10.7	41021.0	8.3	78.8
L18	8 St Josephs Cl	14.0	70429.0	9.9	102.4
L19	9 George Hale Ave	16.1	26087.0	5.1	87.3
L20	91 George Hale Ave	15.1	24387.0	4.7	89.0
L21	99 Knowsley Ln	14.3	76990.0	10.2	99.8
L22	99 Knowsley Ln	14.5	77925.0	10.2	95.8
L23	A57	10.2	17425.0	2.3	54.5
L24	Ashbury Road	5.7	3189.0	1.4	22.1
L25	Ashbury Road	6.1	3230.0	1.4	20.3
L26	Blackmoor Drive	11.9	6972.0	1.1	14.4
L27	Blackmoor Drive	13.0	6982.0	1.1	29.4
L28	Blackmoor Drive	16.6	6926.0	1.1	21.8
L29	Blue Bell Lane	13.0	10584.0	1.6	18.5
L30	Brookside Avenue	12.5	10161.0	1.4	33.9
L31	Brookside Avenue	12.4	10176.0	1.4	14.0
L32	Burtree Road	5.5	3830.0	1.4	24.2
L33	Burtree Road	5.8	3938.0	1.4	18.5
L34	Callington Close	5.2	3591.0	1.4	25.6

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L35	Callington Close	5.4	3529.0	1.4	25.6
L36	Callington Close	5.4	3529.0	1.4	25.6
L37	Callington Close	5.5	3660.0	1.4	22.8
L38	Carr Lane	13.7	715.0	2.0	28.0
L39	Carr Lane	16.1	716.0	2.0	40.5
L40	Derby Street	8.6	10837.0	2.7	18.0
L41	Derby Street	21.0	835.0	1.9	22.6
L42	Derby Street	12.2	13097.0	2.9	44.6
L43	Derby Street	12.0	13099.0	2.9	44.4
L44	Derby Street	8.3	12996.0	2.8	47.2
L45	Derby Street	11.4	13204.0	2.9	45.3
L46	Derby Street	12.0	13135.0	3.0	49.7
L47	Derby Street	9.8	13091.0	3.0	43.6
L48	Derby Street	8.6	11101.0	2.8	20.0
L49	Derby Street	8.6	10600.0	2.7	20.0
L50	East Prescott Road	11.2	30557.0	3.2	14.8
L51	East Prescott Road	33.5	28064.0	3.2	48.0
L52	East Prescott Road	12.3	27253.0	3.0	56.7
L53	East Prescott Road	10.7	30976.0	3.2	53.2
L54	East Prescott Road	15.9	35269.0	3.3	8.7
L55	East Prescott Road	9.7	30032.0	3.1	43.7
L56	East Prescott Road	7.8	27332.0	3.1	43.2
L57	East Prescott Road	12.8	35288.0	3.3	42.8
L58	East Prescott Road	10.1	24210.0	3.0	47.1
L59	East Prescott Road	12.7	26272.0	3.1	37.0
L60	East Prescott Road	9.9	34820.0	3.3	52.4
L61	East Prescott Road	9.2	30537.0	3.2	61.2
L62	East Prescott Road	14.0	3281.0	1.2	15.8
L63	East Prescott Road	14.1	27150.0	3.2	44.1
L64	East Prescott Road	7.8	30754.0	3.2	33.8
L65	East Prescott Road	8.3	30048.0	3.1	21.2
L66	East Prescott Road	13.0	27252.0	3.1	11.6
L67	East Prescott Road	9.3	30459.0	3.2	41.3
L68	East Prescott Road	14.3	33874.0	3.2	18.0
L69	East Prescott Road	20.5	3592.0	1.2	15.8

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L70	East Prescot Road	18.8	3967.0	1.2	14.8
L71	East Prescot Road	18.0	4702.0	1.1	24.6
L72	East Prescot Road	14.5	34892.0	3.3	13.8
L73	East Prescot Road	15.8	32176.0	3.1	38.1
L74	East Prescot Road	7.1	33181.0	3.2	37.3
L75	East Prescot Road	20.8	4692.0	1.1	29.0
L76	East Prescot Road	15.6	28900.0	3.2	13.0
L77	East Prescot Road	9.5	18650.0	2.4	56.4
L78	East Prescot Road	10.7	32871.0	3.3	50.8
L79	East Prescot Road	14.7	28449.0	3.2	10.8
L80	East Prescot Road	25.3	28243.0	3.2	18.3
L81	East Prescot Road	12.9	5473.0	1.1	12.0
L82	East Prescot Road	13.8	33690.0	3.2	13.9
L83	East Prescot Road	13.7	33767.0	3.2	26.2
L84	East Prescot Road	13.1	32260.0	3.1	36.7
L85	East Prescot Road	11.9	6733.0	0.9	12.9
L86	East Prescot Road	12.3	26823.0	3.2	33.1
L87	East Prescot Road	10.8	6808.0	1.1	16.5
L88	East Prescot Road	11.4	27278.0	3.1	38.5
L89	East Prescot Road	20.9	30992.0	3.2	27.6
L90	East Prescot Road	7.7	30967.0	3.2	41.1
L91	East Prescot Road	9.5	24617.0	3.0	40.6
L92	East Prescot Road	11.1	28161.0	3.2	37.0
L93	East Prescot Road	10.3	33598.0	3.2	45.4
L94	East Prescot Road	9.7	30073.0	3.1	49.5
L95	East Prescot Road	10.9	27901.0	3.2	44.6
L96	East Prescot Road	8.9	32375.0	3.1	36.7
L97	East Prescot Road	9.7	35572.0	3.3	46.9
L98	East Prescot Road	12.8	27269.0	3.1	26.4
L99	East Prescot Road	8.6	30847.0	3.2	17.4
L100	East Prescot Road	16.1	34002.0	3.2	26.0
L101	East Prescot Road	15.6	27062.0	3.2	32.0
L102	East Prescot Road	11.4	27263.0	3.1	27.6
L103	East Prescot Road	14.8	26491.0	3.2	36.9
L104	East Prescot Road	8.8	29030.0	3.2	30.9

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L105	East Prescot Road	7.6	30717.0	3.2	36.5
L106	East Prescot Road	28.7	24207.0	3.0	18.6
L107	East Prescot Road	10.1	30711.0	3.2	43.9
L108	East Prescot Road	8.8	33371.0	3.2	38.8
L109	East Prescot Road	9.2	30672.0	3.2	24.3
L110	East Prescot Road	13.3	26408.0	3.2	33.0
L111	East Prescot Road	16.3	34922.0	3.3	12.4
L112	East Prescot Road	9.4	32112.0	3.3	54.6
L113	East Prescot Road	14.8	28563.0	3.2	21.4
L114	East Prescot Road	9.4	27041.0	3.1	56.1
L115	East Prescot Road	12.0	35357.0	3.3	28.6
L116	East Prescot Road	9.8	32815.0	3.2	36.1
L117	East Prescot Road	9.0	28690.0	3.2	48.5
L118	East Prescot Road	9.8	29581.0	3.2	41.7
L119	East Prescot Road	14.5	28863.0	3.2	8.7
L120	East Prescot Road	12.3	31181.0	3.3	42.2
L121	East Prescot Road	10.0	18656.0	2.4	56.7
L122	East Prescot Road	13.9	24073.0	3.0	47.2
L123	East Prescot Road	7.7	32989.0	3.2	35.4
L124	East Prescot Road	11.2	29222.0	3.2	30.2
L125	East Prescot Road	9.6	25473.0	3.1	55.3
L126	East Prescot Road	11.8	26741.0	3.0	56.1
L127	East Prescot Road	11.1	35431.0	3.3	50.2
L128	East Prescot Road	9.5	31919.0	3.2	61.6
L129	East Prescot Road	12.1	26849.0	3.2	34.3
L130	East Prescot Road	9.4	32353.0	3.1	13.6
L131	East Prescot Road	13.2	26240.0	3.1	33.1
L132	East Prescot Road	13.7	26274.0	3.1	33.7
L133	East Prescot Road	9.3	26688.0	3.1	32.8
L134	East Prescot Road	15.6	28351.0	3.2	5.0
L135	East Prescot Road	16.9	35238.0	3.3	43.2
L136	East Prescot Road	12.5	26809.0	3.2	38.2
L137	East Prescot Road	10.3	30239.0	3.1	48.8
L138	East Prescot Road	12.5	26962.0	3.2	34.6
L139	East Prescot Road	9.8	26629.0	3.0	57.0

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L140	East Prescott Road	15.7	30906.0	3.2	28.1
L141	East Prescott Road	9.9	30608.0	3.2	36.1
L142	East Prescott Road	11.0	30958.0	3.2	39.0
L143	East Prescott Road	10.0	35201.0	3.3	46.2
L144	East Prescott Road	9.7	27205.0	3.0	54.2
L145	East Prescott Road	9.2	33761.0	3.3	54.5
L146	East Prescott Road	9.4	33109.0	3.3	54.3
L147	East Prescott Road	9.1	29941.0	3.1	48.9
L148	East Prescott Road	9.2	30717.0	3.2	42.1
L149	East Prescott Road	14.7	29227.0	3.2	29.1
L150	East Prescott Road	9.6	23355.0	3.0	47.8
L151	East Prescott Road	11.1	27393.0	3.0	58.8
L152	East Prescott Road	9.4	35591.0	3.3	49.9
L153	Finch Lane	9.8	4704.0	1.1	10.5
L154	Finch Lane	12.5	4720.0	1.1	21.1
L155	Forest House Interchange	10.1	16778.0	2.4	34.5
L156	High Street	10.4	10294.0	2.7	39.5
L157	High Street	15.4	10481.0	2.7	40.4
L158	High Street	8.6	10244.0	2.7	39.6
L159	High Street	9.8	8565.0	2.7	27.0
L160	High Street	10.6	10454.0	2.7	56.3
L161	High Street	11.1	10377.0	2.7	42.7
L162	High Street	13.6	7514.0	2.8	35.0
L163	High Street	10.8	9805.0	2.7	37.2
L164	High Street	10.9	10424.0	2.7	40.0
L165	High Street	8.7	9479.0	2.7	35.9
L166	High Street	9.7	10072.0	2.7	37.3
L167	High Street	10.1	7657.0	2.7	25.5
L168	High Street	9.0	9122.0	2.7	30.0
L169	High Street	8.5	7953.0	2.7	22.1
L170	High Street	9.7	8221.0	2.7	26.7
L171	Hope Street	8.8	1157.0	1.8	30.6
L172	Hope Street	7.5	1156.0	1.8	21.6
L173	Hope Street	8.6	1154.0	1.8	17.6
L174	Huyton Lane	10.8	10414.0	1.0	20.5

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L175	Huyton Lane	7.7	10467.0	1.0	36.4
L176	Huyton Lane	21.6	10459.0	1.0	33.8
L177	Huyton Lane	8.9	10464.0	1.0	28.4
L178	Huyton Lane	7.9	10457.0	1.0	34.4
L179	Huyton Lane	12.8	10418.0	1.0	38.2
L180	Knowlsey Road Farm	12.9	45596.0	8.5	82.4
L181	Knowsley Lane	8.2	10100.0	1.0	49.9
L182	Knowsley Lane	8.1	10013.0	1.0	40.5
L183	Knowsley Lane	10.9	10263.0	1.0	46.5
L184	Knowsley Lane	19.4	10352.0	1.0	27.8
L185	Knowsley Lane	16.0	10352.0	1.0	49.5
L186	Knowsley Lane	7.5	9943.0	1.0	57.6
L187	Knowsley Lane	12.8	10382.0	1.0	42.4
L188	Knowsley Lane	8.6	10182.0	1.0	46.6
L189	Knowsley Lane	14.5	10349.0	1.0	47.8
L190	Knowsley Lane	7.8	10249.0	1.0	42.6
L191	Knowsley Lane	9.3	10212.0	1.0	28.2
L192	Knowsley Lane	10.1	10383.0	1.0	40.2
L193	Knowsley Lane	13.1	10355.0	1.0	40.2
L194	Knowsley Lane	10.9	10367.0	1.0	46.0
L195	Knowsley Lane	7.6	9949.0	1.0	57.0
L196	Knowsley Lane	16.2	10348.0	1.0	38.9
L197	Knowsley Lane	10.7	10273.0	1.0	46.5
L198	Knowsley Lane	7.9	10138.0	1.0	47.9
L199	Knowsley Lane	9.4	10279.0	1.0	48.2
L200	Knowsley Lane	9.8	10255.0	1.0	44.2
L201	Knowsley Lane	8.8	10226.0	1.0	29.4
L202	Knowsley Lane	10.9	10305.0	1.0	45.9
L203	Knowsley Lane	11.1	10383.0	1.0	20.7
L204	Knowsley Lane	7.5	9995.0	1.0	44.9
L205	Knowsley Lane	8.0	10193.0	1.0	39.8
L206	Knowsley Park Lane	11.8	838.0	1.9	25.4
L207	Knowsley Park Lane	6.1	848.0	1.9	26.8
L208	Knowsley Park Lane	6.7	858.0	1.9	27.5
L209	Liverpool Road	8.7	15597.0	2.2	56.5

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L210	Liverpool Road	11.9	23935.0	4.1	29.0
L211	Liverpool Road	9.3	11480.0	3.9	45.0
L212	Liverpool Road	9.7	15329.0	2.7	35.7
L213	Liverpool Road	20.2	23643.0	3.7	15.8
L214	Liverpool Road	9.9	19416.0	2.4	22.8
L215	Liverpool Road	9.4	19007.0	2.4	43.9
L216	Liverpool Road	11.9	24708.0	5.6	41.1
L217	Liverpool Road	10.6	15620.0	2.2	43.5
L218	Liverpool Road	8.8	28353.0	2.1	45.0
L219	Liverpool Road	10.4	17388.0	2.5	37.5
L220	Liverpool Road	10.8	15745.0	2.2	45.8
L221	Liverpool Road	15.4	18818.0	2.4	23.6
L222	Liverpool Road	9.2	19023.0	2.4	40.8
L223	Liverpool Road	25.5	24687.0	5.6	38.2
L224	Liverpool Road	11.7	23515.0	3.8	42.6
L225	Liverpool Road	9.1	20320.0	2.3	50.5
L226	Liverpool Road	15.4	17895.0	2.4	44.6
L227	Liverpool Road	9.8	18878.0	2.5	56.4
L228	Liverpool Road	9.0	18555.0	2.3	56.8
L229	Liverpool Road	9.9	16465.0	2.1	39.1
L230	Liverpool Road	10.7	23182.0	3.1	53.1
L231	Liverpool Road	16.3	12840.0	3.2	50.8
L232	Liverpool Road	11.2	18282.0	2.3	39.5
L233	Liverpool Road	8.0	28993.0	2.1	48.3
L234	Liverpool Road	12.5	18208.0	2.4	44.5
L235	Liverpool Road	14.1	24066.0	4.2	25.4
L236	Liverpool Road	9.0	24742.0	5.6	19.8
L237	Liverpool Road	9.7	24327.0	5.2	13.0
L238	Liverpool Road	12.8	24733.0	5.6	27.1
L239	Liverpool Road	14.3	23149.0	3.1	22.7
L240	Liverpool Road	14.8	23643.0	3.7	5.0
L241	Liverpool Road	9.8	17226.0	2.4	61.2
L242	Liverpool Road	9.6	14781.0	2.9	41.1
L243	Liverpool Road	8.6	17230.0	2.4	32.9
L244	Liverpool Road	9.2	18586.0	2.3	22.7

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L245	Liverpool Road	9.8	23206.0	3.2	48.2
L246	Liverpool Road	10.8	19107.0	2.4	43.1
L247	Liverpool Road	20.4	13056.0	3.1	37.7
L248	Liverpool Road	13.5	17965.0	2.2	26.4
L249	Liverpool Road	9.7	18962.0	2.5	54.5
L250	Liverpool Road	9.9	18635.0	2.4	50.3
L251	Liverpool Road	8.7	20031.0	2.3	30.3
L252	Liverpool Road	14.1	13038.0	3.1	44.7
L253	Liverpool Road	9.9	20868.0	2.3	41.7
L254	Liverpool Road	9.7	24480.0	5.3	35.2
L255	Liverpool Road	11.3	24102.0	4.2	14.1
L256	Liverpool Road	9.4	23185.0	3.2	49.4
L257	Liverpool Road	9.2	18824.0	2.4	52.9
L258	Liverpool Road	12.2	19783.0	2.6	40.0
L259	Liverpool Road	9.8	18931.0	2.5	52.7
L260	Liverpool Road	8.5	11684.0	3.9	17.3
L261	Liverpool Road	9.9	11920.0	3.7	45.7
L262	Liverpool Road	9.6	18617.0	2.4	65.5
L263	Liverpool Road	9.5	12458.0	3.6	37.5
L264	Liverpool Road	12.8	17973.0	2.3	51.3
L265	Liverpool Road	9.2	24010.0	4.7	51.0
L266	Liverpool Road	9.9	18255.0	2.5	44.5
L267	Liverpool Road	12.8	24118.0	4.3	5.1
L268	Liverpool Road	9.3	17986.0	2.3	58.6
L269	Liverpool Road	10.5	19199.0	2.4	37.9
L270	Liverpool Road	10.0	24487.0	5.6	50.2
L271	Liverpool Road	9.4	18602.0	2.3	40.7
L272	Liverpool Road	12.4	20858.0	2.3	44.6
L273	Liverpool Road	7.3	626.0	2.0	29.9
L274	Liverpool Road	4.8	627.0	2.0	27.3
L275	Liverpool Road	13.6	21379.0	2.3	39.2
L276	Liverpool Road	10.1	18943.0	2.5	53.7
L277	Liverpool Road	11.6	17777.0	2.5	36.3
L278	Liverpool Road	8.9	727.0	2.3	27.9
L279	Liverpool Road	11.3	17635.0	2.4	21.5

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L280	Liverpool Road	10.7	14922.0	2.7	57.8
L281	Liverpool Road	9.9	19181.0	2.4	47.3
L282	Liverpool Road	8.5	31311.0	2.1	45.6
L283	Liverpool Road	12.3	24271.0	4.4	21.4
L284	Liverpool Road	10.1	24436.0	5.3	47.3
L285	Liverpool Road	14.0	17878.0	2.4	37.3
L286	Liverpool Road	13.8	13114.0	3.1	53.6
L287	Liverpool Road	9.4	24741.0	5.7	51.7
L288	Liverpool Road	13.7	23502.0	3.6	41.0
L289	Liverpool Road	9.6	24762.0	5.6	18.7
L290	Liverpool Road	11.8	24320.0	4.5	11.3
L291	Liverpool Road	10.0	15726.0	2.2	15.3
L292	Liverpool Road	16.5	2306.0	1.3	14.5
L293	Liverpool Road	9.2	24280.0	5.1	39.9
L294	Liverpool Road	7.4	21282.0	2.3	43.7
L295	Liverpool Road	14.8	23943.0	4.1	6.7
L296	Liverpool Road	10.7	18841.0	2.4	55.3
L297	Liverpool Road	9.2	15569.0	2.8	27.4
L298	Liverpool Road	11.4	17539.0	2.5	38.7
L299	Liverpool Road	9.6	19663.0	2.4	40.2
L300	Liverpool Road	8.9	16240.0	2.1	45.4
L301	Liverpool Road	10.5	16433.0	2.1	23.0
L302	Liverpool Road	9.0	15599.0	2.7	56.9
L303	Liverpool Road	9.5	24295.0	5.2	45.8
L304	Liverpool Road	10.8	20000.0	2.3	41.7
L305	Liverpool Road	9.6	18620.0	2.4	55.8
L306	Liverpool Road	12.2	17967.0	2.2	12.6
L307	Liverpool Road	7.7	21222.0	2.3	55.5
L308	Liverpool Road	9.8	24815.0	5.7	43.9
L309	Liverpool Road	12.3	17953.0	2.4	34.8
L310	Liverpool Road	10.7	21801.0	2.3	38.0
L311	Liverpool Road	10.1	19137.0	2.4	35.7
L312	Liverpool Road	8.9	16517.0	2.6	30.1
L313	Liverpool Road	10.1	17902.0	2.2	52.6
L314	Liverpool Road	9.5	19741.0	2.6	22.1

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L315	Liverpool Road	10.8	20228.0	2.3	41.9
L316	Liverpool Road	11.5	23741.0	3.8	7.1
L317	Liverpool Road	9.9	21345.0	2.3	37.9
L318	Lordens Road	7.5	3033.0	1.5	24.9
L319	Lordens Road	6.7	3061.0	1.5	25.6
L320	Lordens Road	7.4	3169.0	1.4	28.1
L321	Lordens Road	8.9	3213.0	1.4	24.3
L322	Lordens Road	21.2	3227.0	1.3	17.5
L323	Lordens Road	7.8	3045.0	1.5	27.1
L324	Lordens Road	7.6	3034.0	1.5	38.5
L325	M57	16.9	19566.0	2.3	95.9
L326	M57	10.6	15707.0	2.4	62.1
L327	M57	14.1	88746.0	9.1	95.2
L328	M57	16.6	19881.0	2.3	92.0
L329	M57	8.9	17493.0	2.3	49.8
L330	Park Road	3.9	1030.0	1.8	10.0
L331	Park Road	3.9	1018.0	1.8	10.0
L332	Park Road	7.0	1049.0	1.8	24.1
L333	Pilch Lane	11.2	6702.0	1.1	17.4
L334	Pilch Lane	11.3	6754.0	1.1	32.1
L335	Prescot Bypass	8.3	10794.0	2.2	65.3
L336	Prescot Bypass	8.2	11817.0	2.1	60.3
L337	Prescot Bypass	25.6	11857.0	2.2	56.4
L338	Prescot Bypass	9.7	12129.0	2.1	49.5
L339	Prescot Bypass	11.8	11595.0	2.1	38.5
L340	Prescot Bypass	8.0	11198.0	2.0	48.8
L341	Prescot Bypass	9.9	10594.0	2.4	69.4
L342	Prescot Bypass	8.2	11377.0	2.0	60.2
L343	Prescot Bypass	11.1	11944.0	2.2	41.4
L344	Prescot Bypass	19.5	11854.0	2.2	37.7
L345	Prescot Bypass	11.1	11947.0	2.2	30.1
L346	Prescot Road	17.2	21239.0	3.6	44.4
L347	Prescot Road	11.7	20355.0	3.7	36.6
L348	Prescot Road	17.5	22511.0	3.5	36.5
L349	Prescot Road	9.4	19019.0	3.9	37.2

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L350	Prescot Road	13.1	23495.0	3.3	28.4
L351	Prescot Road	21.8	27723.0	3.2	18.6
L352	Prescot Road	13.6	23530.0	3.2	24.8
L353	Prescot Road	12.3	23695.0	3.5	16.5
L354	Prescot Road	9.5	25852.0	3.3	36.1
L355	Prescot Road	7.9	22852.0	3.4	32.9
L356	Prescot Road	12.4	20370.0	3.7	39.8
L357	Prescot Road	11.8	27823.0	3.2	33.8
L358	Prescot Road	11.3	27041.0	3.3	7.6
L359	Prescot Road	7.1	27121.0	3.3	9.2
L360	Prescot Road	8.4	18025.0	4.0	26.3
L361	Prescot Road	14.9	21610.0	3.6	36.2
L362	Prescot Road	8.2	22842.0	3.4	41.3
L363	Prescot Road	7.1	17277.0	4.1	39.0
L364	Prescot Road	10.0	19326.0	3.8	29.6
L365	Prescot Road	18.1	23338.0	3.4	52.9
L366	Prescot Road	16.9	22754.0	3.5	42.7
L367	Prescot Road	17.6	23030.0	3.4	35.1
L368	Prescot Road	13.8	21615.0	3.6	29.2
L369	Prescot Road	9.5	22180.0	3.6	37.5
L370	Prescot Road	9.5	26815.0	3.3	35.3
L371	Prescot Road	18.3	19422.0	3.8	39.0
L372	Prescot Road	9.6	27121.0	3.3	36.6
L373	Prescot Road	13.1	21624.0	3.6	44.6
L374	Prescot Road	9.7	22806.0	3.5	36.4
L375	Prescot Road	10.1	18142.0	4.0	36.2
L376	Prescot Road	11.8	28008.0	3.2	44.2
L377	Prescot Road	15.9	23249.0	3.3	30.0
L378	Prescot Road	11.4	27273.0	3.3	32.8
L379	Prescot Road	8.9	17464.0	4.1	33.0
L380	Primrose Drive	7.9	10608.0	1.6	28.5
L381	Primrose Drive	11.0	10607.0	1.6	25.6
L382	Primrose Drive	7.3	10647.0	1.6	43.3
L383	Primrose Drive	7.7	10638.0	1.6	42.7
L384	Primrose Drive	5.6	10608.0	1.6	25.6

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L385	Primrose Drive	7.2	10789.0	1.6	43.2
L386	Primrose Drive	7.4	10807.0	1.6	40.1
L387	Primrose Drive	12.2	10760.0	1.6	31.1
L388	Primrose Drive	7.6	11712.0	1.5	23.9
L389	Primrose Drive	7.4	10771.0	1.6	38.9
L390	Primrose Drive	7.0	10674.0	1.6	41.8
L391	Primrose Drive	7.8	10629.0	1.6	39.6
L392	Primrose Drive	9.3	10606.0	1.6	25.6
L393	Primrose Drive	10.1	10743.0	1.6	34.2
L394	Primrose Drive	7.3	10721.0	1.6	38.7
L395	Princess Drive	8.6	4420.0	1.4	24.2
L396	Princess Drive	6.6	4855.0	1.4	43.9
L397	Princess Drive	9.4	3599.0	1.4	47.2
L398	Princess Drive	7.4	2202.0	1.4	45.4
L399	Princess Drive	8.1	3895.0	1.4	47.0
L400	Princess Drive	6.9	5092.0	1.4	48.2
L401	Princess Drive	10.2	3343.0	1.4	44.1
L402	Princess Drive	8.6	2450.0	1.4	52.1
L403	Princess Drive	9.4	4316.0	1.4	24.7
L404	Princess Drive	7.4	4177.0	1.4	41.7
L405	Princess Drive	7.1	4884.0	1.4	47.7
L406	Princess Drive	8.1	2082.0	1.4	36.4
L407	Princess Drive	8.6	3357.0	1.3	48.5
L408	Princess Drive	9.7	3080.0	1.4	51.5
L409	Princess Drive	9.6	4918.0	1.4	33.8
L410	Princess Drive	6.8	4836.0	1.4	47.7
L411	Princess Drive	6.9	4254.0	1.4	34.3
L412	Princess Drive	15.7	4749.0	1.4	24.9
L413	Princess Drive	7.3	5025.0	1.4	43.2
L414	Princess Drive	12.3	4648.0	1.4	42.0
L415	Princess Drive	7.3	4037.0	1.4	45.9
L416	Princess Drive	5.9	4219.0	1.4	23.4
L417	Princess Drive	9.0	2409.0	1.4	49.0
L418	Princess Drive	13.7	4361.0	1.4	29.7
L419	Princess Drive	9.2	2765.0	1.4	50.9

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L420	Princess Drive	12.1	2564.0	1.4	52.0
L421	Princess Drive	20.7	4639.0	1.4	52.0
L422	Princess Drive	10.1	4721.0	1.4	44.9
L423	Princess Drive	7.9	4568.0	1.4	42.2
L424	Princess Drive	10.4	2758.0	1.4	53.3
L425	Princess Drive	7.7	4482.0	1.4	35.6
L426	Princess Drive	13.3	3771.0	1.4	48.8
L427	Princess Drive	9.1	2046.0	1.4	11.5
L428	Princess Drive	7.1	4901.0	1.4	40.2
L429	Princess Drive	8.3	4390.0	1.4	19.7
L430	Princess Drive	11.6	4376.0	1.4	26.5
L431	Princess Drive	7.5	4939.0	1.4	33.8
L432	Princess Drive	9.0	4935.0	1.4	20.3
L433	Princess Drive	6.9	4819.0	1.4	43.7
L434	Princess Drive	11.0	2495.0	1.4	46.6
L435	Princess Drive	11.6	3091.0	1.3	51.1
L436	Princess Drive	6.9	5055.0	1.4	43.7
L437	Princess Drive	11.2	3768.0	1.4	46.7
L438	Princess Drive	11.2	2097.0	1.4	6.0
L439	Princess Drive	7.0	4816.0	1.4	45.7
L440	Princess Drive	6.8	4954.0	1.4	48.4
L441	Princess Drive	11.3	3614.0	1.4	49.4
L442	Princess Drive	7.7	4695.0	1.4	44.0
L443	Princess Drive	9.8	2240.0	1.4	38.7
L444	Princess Drive	11.6	2006.0	1.4	27.7
L445	Princess Drive	8.1	4781.0	1.4	47.3
L446	Princess Drive	15.6	2005.0	1.4	7.6
L447	Princess Drive	16.4	2007.0	1.4	35.7
L448	Princess Drive	12.1	2050.0	1.4	5.0
L449	Queens Drive	31.7	28071.0	3.2	38.5
L450	Queens Drive	31.3	28074.0	3.2	42.6
L451	Queens Drive	33.1	27919.0	3.2	43.9
L452	Queens Drive	31.1	27928.0	3.2	44.3
L453	Queens Drive	11.8	28202.0	3.2	36.0
L454	Queens Drive	30.9	28248.0	3.2	42.2

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L455	Queens Drive	11.8	28060.0	3.2	42.5
L456	Queens Drive	31.7	28359.0	3.2	42.6
L457	Queens Drive	31.8	28207.0	3.2	42.5
L458	Saxby Road	7.4	3686.0	1.4	19.4
L459	Saxby Road	5.4	3607.0	1.4	20.2
L460	Saxby Road	20.2	3709.0	1.4	16.5
L461	Seth Powell Way	8.3	20699.0	4.6	32.0
L462	Seth Powell Way	9.9	25093.0	6.3	42.4
L463	Seth Powell Way	9.3	21316.0	5.5	42.4
L464	Seth Powell Way	10.2	25178.0	6.3	39.9
L465	Seth Powell Way	9.3	25368.0	6.3	30.9
L466	Seth Powell Way	8.1	24959.0	6.2	42.4
L467	Seth Powell Way	10.4	24576.0	5.6	16.4
L468	Seth Powell Way	9.0	22942.0	5.9	36.1
L469	Seth Powell Way	16.3	24612.0	5.6	28.2
L470	Seth Powell Way	14.0	24579.0	5.6	33.0
L471	Seth Powell Way	9.2	22346.0	5.7	42.1
L472	Seth Powell Way	13.2	20228.0	4.5	34.8
L473	Seth Powell Way	9.6	17930.0	4.5	36.4
L474	Seth Powell Way	7.8	14603.0	1.8	42.9
L475	Seth Powell Way	7.2	27767.0	6.7	40.9
L476	Seth Powell Way	10.1	17679.0	4.4	39.8
L477	Seth Powell Way	9.2	19499.0	5.0	36.9
L478	Southdean Road	5.5	3158.0	1.4	22.9
L479	Southdean Road	5.9	3467.0	1.4	23.8
L480	Southdean Road	5.4	3494.0	1.4	21.3
L481	Southdean Road	5.2	3258.0	1.4	21.4
L482	Southdean Road	5.1	3360.0	1.4	25.3
L483	St Helens Road	8.1	7139.0	2.7	42.1
L484	St Helens Road	7.6	6590.0	2.8	36.8
L485	St Helens Road	9.6	6397.0	2.9	22.9
L486	St Helens Road	9.1	5647.0	3.0	29.9
L487	St Helens Road	7.5	4460.0	3.4	35.6
L488	Stanley Crescent	5.3	974.0	1.8	15.0
L489	Stockbridge Lane	8.7	10035.0	1.0	38.7

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L490	Stockbridge Lane	5.9	10033.0	1.0	31.9
L491	Stockbridge Lane	6.1	10033.0	1.0	32.6
L492	Stockbridge Lane	8.3	10031.0	1.0	35.0
L493	Stockbridge Lane	15.9	10143.0	1.0	21.0
L494	Stockbridge Lane	10.4	10035.0	1.0	42.9
L495	Stockbridge Lane	14.0	10147.0	1.0	6.9
L496	Stockbridge Lane	10.7	10165.0	1.0	18.5
L497	Stockbridge Lane	11.3	10141.0	1.0	28.5
L498	Stockbridge Lane	8.5	9999.0	1.0	35.4
L499	Stockbridge Lane	8.9	10002.0	1.0	37.7
L500	Stockbridge Lane	7.2	10001.0	1.0	43.2
L501	Stockbridge Lane	9.2	10073.0	1.0	42.3
L502	Stockbridge Lane	7.1	10019.0	1.0	36.8
L503	Stockbridge Lane	9.5	9981.0	1.0	38.9
L504	Stockbridge Lane	10.7	9993.0	1.0	43.3
L505	Stockbridge Lane	16.1	10147.0	1.0	34.2
L506	Stockbridge Lane	9.1	10035.0	1.0	60.0
L507	Stockbridge Lane	11.7	10002.0	1.0	20.9
L508	Stockbridge Lane	8.6	10034.0	1.0	32.3
L509	Stockbridge Lane	7.5	10003.0	1.0	41.3
L510	Stockbridge Lane	8.8	9999.0	1.0	38.0
L511	Stockbridge Lane	9.7	10139.0	1.0	43.9
L512	Stockbridge Lane	8.6	9999.0	1.0	23.3
L513	Stockbridge Lane	14.9	10142.0	1.0	24.3
L514	Stockbridge Lane	8.5	9986.0	1.0	38.3
L515	Stockbridge Lane	11.6	9991.0	1.0	25.1
L516	Stockbridge Lane	10.3	9990.0	1.0	24.5
L517	Stockbridge Lane	11.8	9992.0	1.0	39.5
L518	Thomas Lane	8.1	9827.0	1.4	20.9
L519	Warrington Road	8.5	8062.0	2.6	38.1
L520	Warrington Road	8.2	7501.0	2.7	26.0
L521	Warrington Road	8.1	7472.0	2.7	21.9
L522	Warrington Road	11.3	8377.0	2.5	44.3
L523	Warrington Road	10.0	8262.0	2.6	41.5
L524	Warrington Road	10.9	7472.0	2.8	31.9

Road Link		Road Width (m)	24 Hour AADT Flow	HDV Pop (%)	Mean Vehicle Speed (km/hr)
L525	Warrington Road	11.0	8437.0	2.5	38.2
L526	Warrington Road	10.3	7764.0	2.6	38.2
L527	Warrington Road	9.5	7597.0	2.6	35.6
L528	Warrington Road	10.3	7460.0	2.7	33.8
L529	Warrington Road	10.3	7676.0	2.7	33.5
L530	Warrington Road	8.9	8958.0	2.5	37.1

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 2027 scenarios.

A summary of the 2027 traffic data is shown in Table B2.

Table B2: 2027 Traffic Data

Road Link		DM Scenario		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)	24 Hr AADT Flow	HDV Prop (%)
L1	1 Hope St	1153.0	1.8	1943.0	1.1
L2	1 Hope St	1163.0	1.8	33352.0	3.2
L3	224 Knowsley Ln	69422.0	9.8	25823.0	5.4
L4	24 Hope St	1180.0	1.8	7638.0	1.0
L5	27 Huyton Ln	82952.0	8.9	5638.0	1.2
L6	29 Eaton St	1196.0	1.8	5313.0	2.9
L7	31 Eaton St	1147.0	1.8	10929.0	0.9
L8	33 Hope St	1156.0	1.8	10934.0	0.9
L9	5 St Aidan's Grove	14985.0	3.1	8396.0	2.5
L10	66 The Ct	17709.0	4.3	1953.0	1.1
L11	77 Liverpool Rd	21746.0	2.3	22533.0	2.2
L12	77 Liverpool Rd	20974.0	2.3	4023.0	1.2
L13	77 Liverpool Rd	21743.0	2.3	4369.0	1.2
L14	77 Liverpool Rd	20778.0	2.3	14109.0	2.9
L15	77 Liverpool Rd	21536.0	2.3	36572.0	3.2
L16	77 Liverpool Rd	20955.0	2.3	35139.0	3.1
L17	8 St Josephs Cl	41595.0	8.3	29637.0	3.1
L18	8 St Josephs Cl	71415.0	9.9	32191.0	3.1
L19	9 George Hale Ave	26452.0	5.1	28230.0	3.1
L20	91 George Hale Ave	24729.0	4.7	29753.0	3.1
L21	99 Knowsley Ln	78068.0	10.2	30421.0	3.1

Road Link		DM Scenario		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)	24 Hr AADT Flow	HDV Prop (%)
L22	99 Knowsley Ln	79016.0	10.2	36521.0	3.2
L23	A57	17669.0	2.3	34363.0	3.2
L24	Ashbury Road	3233.0	1.4	11418.0	2.5
L25	Ashbury Road	3276.0	1.4	10039.0	2.4
L26	Blackmoor Drive	7070.0	1.1	11354.0	1.0
L27	Blackmoor Drive	7080.0	1.1	11183.0	1.0
L28	Blackmoor Drive	7023.0	1.1	11159.0	1.0
L29	Blue Bell Lane	10732.0	1.6	16333.0	2.5
L30	Brookside Avenue	10303.0	1.4	24634.0	3.7
L31	Brookside Avenue	10318.0	1.4	25193.0	4.1
L32	Burtree Road	3884.0	1.4	20165.0	2.3
L33	Burtree Road	3993.0	1.4	19878.0	2.3
L34	Callington Close	3641.0	1.4	19027.0	2.2
L35	Callington Close	3579.0	1.4	18672.0	2.3
L36	Callington Close	3579.0	1.4	25451.0	4.3
L37	Callington Close	3711.0	1.4	17453.0	2.0
L38	Carr Lane	725.0	2.0	17539.0	2.5
L39	Carr Lane	726.0	2.0	3878.0	1.2
L40	Derby Street	10989.0	2.7	11735.0	2.1
L41	Derby Street	847.0	1.9	22326.0	3.5
L42	Derby Street	13280.0	2.9	29003.0	3.1
L43	Derby Street	13283.0	2.9	22708.0	3.5
L44	Derby Street	13178.0	2.8	18499.0	3.9
L45	Derby Street	13389.0	2.9	11614.0	1.5
L46	Derby Street	13319.0	3.0	4179.0	1.1
L47	Derby Street	13274.0	3.0	5606.0	1.2
L48	Derby Street	11256.0	2.8	5422.0	1.2
L49	Derby Street	10748.0	2.7	3320.0	1.1
L50	East Prescot Road	30985.0	3.2	2823.0	1.0
L51	East Prescot Road	28457.0	3.2	29392.0	3.1
L52	East Prescot Road	27634.0	3.0	24053.0	5.7
L53	East Prescot Road	31409.0	3.2	4305.0	1.2
L54	East Prescot Road	35763.0	3.3	4094.0	1.1
L55	East Prescot Road	30452.0	3.1	4197.0	1.2
L56	East Prescot Road	27715.0	3.1	8029.0	2.4

Road Link		DM Scenario		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)	24 Hr AADT Flow	HDV Prop (%)
L57	East Prescott Road	35782.0	3.3	7472.0	2.5
L58	East Prescott Road	24549.0	3.0	7276.0	2.6
L59	East Prescott Road	26640.0	3.1	6516.0	2.7
L60	East Prescott Road	35307.0	3.3	1778.0	1.0
L61	East Prescott Road	30964.0	3.2	10966.0	0.9
L62	East Prescott Road	3327.0	1.2	10964.0	0.9
L63	East Prescott Road	27530.0	3.2	10963.0	0.9
L64	East Prescott Road	31185.0	3.2	10962.0	0.9
L65	East Prescott Road	30469.0	3.1	11075.0	0.9
L66	East Prescott Road	27634.0	3.1	10965.0	0.9
L67	East Prescott Road	30885.0	3.2	11079.0	0.9
L68	East Prescott Road	34349.0	3.2	11097.0	0.9
L69	East Prescott Road	3642.0	1.2	11073.0	0.9
L70	East Prescott Road	4023.0	1.2	10932.0	0.9
L71	East Prescott Road	4768.0	1.1	10931.0	0.9
L72	East Prescott Road	35381.0	3.3	11004.0	0.9
L73	East Prescott Road	32627.0	3.1	10950.0	0.9
L74	East Prescott Road	33645.0	3.2	10911.0	0.9
L75	East Prescott Road	4757.0	1.1	10922.0	0.9
L76	East Prescott Road	29305.0	3.2	11079.0	0.9
L77	East Prescott Road	18911.0	2.4	10965.0	0.9
L78	East Prescott Road	33331.0	3.3	10932.0	0.9
L79	East Prescott Road	28847.0	3.2	10965.0	0.9
L80	East Prescott Road	28638.0	3.2	10929.0	0.9
L81	East Prescott Road	5549.0	1.1	11071.0	0.9
L82	East Prescott Road	34161.0	3.2	10929.0	0.9
L83	East Prescott Road	34240.0	3.2	11074.0	0.9
L84	East Prescott Road	32712.0	3.1	10916.0	0.9
L85	East Prescott Road	6828.0	0.9	10920.0	0.9
L86	East Prescott Road	27198.0	3.2	10920.0	0.9
L87	East Prescott Road	6904.0	1.1	10922.0	0.9
L88	East Prescott Road	27660.0	3.1	10755.0	1.3
L89	East Prescott Road	31426.0	3.2	8965.0	2.4
L90	East Prescott Road	31401.0	3.2	8367.0	2.5
L91	East Prescott Road	24962.0	3.0	9285.0	2.3

Road Link		DM Scenario		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)	24 Hr AADT Flow	HDV Prop (%)
L92	East Prescot Road	28555.0	3.2	9167.0	2.3
L93	East Prescot Road	34068.0	3.2	8367.0	2.5
L94	East Prescot Road	30495.0	3.1	9345.0	2.3
L95	East Prescot Road	28292.0	3.2	8663.0	2.4
L96	East Prescot Road	32828.0	3.1	8494.0	2.4
L97	East Prescot Road	36070.0	3.3	8355.0	2.4
L98	East Prescot Road	27650.0	3.1	8573.0	2.5
L99	East Prescot Road	31279.0	3.2	9873.0	2.3
L100	East Prescot Road	34478.0	3.2	70212.0	9.7
L101	East Prescot Road	27440.0	3.2	1970.0	1.1
L102	East Prescot Road	27644.0	3.1	83742.0	8.8
L103	East Prescot Road	26862.0	3.2	1986.0	1.1
L104	East Prescot Road	29436.0	3.2	1937.0	1.1
L105	East Prescot Road	31147.0	3.2	1946.0	1.1
L106	East Prescot Road	24546.0	3.0	15775.0	3.0
L107	East Prescot Road	31141.0	3.2	18499.0	4.1
L108	East Prescot Road	33838.0	3.2	22536.0	2.2
L109	East Prescot Road	31102.0	3.2	21764.0	2.2
L110	East Prescot Road	26778.0	3.2	21568.0	2.3
L111	East Prescot Road	35411.0	3.3	22326.0	2.2
L112	East Prescot Road	32562.0	3.3	21745.0	2.2
L113	East Prescot Road	28963.0	3.2	42385.0	8.2
L114	East Prescot Road	27419.0	3.1	72205.0	9.8
L115	East Prescot Road	35852.0	3.3	27242.0	5.0
L116	East Prescot Road	33275.0	3.2	25519.0	4.5
L117	East Prescot Road	29092.0	3.2	78858.0	10.1
L118	East Prescot Road	29995.0	3.2	79806.0	10.1
L119	East Prescot Road	29268.0	3.2	18459.0	2.2
L120	East Prescot Road	31617.0	3.3	4066.0	1.1
L121	East Prescot Road	18917.0	2.4	7860.0	1.0
L122	East Prescot Road	24410.0	3.0	7870.0	1.0
L123	East Prescot Road	33451.0	3.2	7813.0	1.0
L124	East Prescot Road	29631.0	3.2	11522.0	1.5
L125	East Prescot Road	25830.0	3.1	11093.0	1.3
L126	East Prescot Road	27115.0	3.0	11108.0	1.3

Road Link		DM Scenario		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)	24 Hr AADT Flow	HDV Prop (%)
L127	East Prescott Road	35927.0	3.3	4674.0	1.2
L128	East Prescott Road	32366.0	3.2	4783.0	1.1
L129	East Prescott Road	27225.0	3.2	4431.0	1.2
L130	East Prescott Road	32806.0	3.1	4369.0	1.2
L131	East Prescott Road	26607.0	3.1	4501.0	1.2
L132	East Prescott Road	26642.0	3.1	1515.0	0.9
L133	East Prescott Road	27062.0	3.1	1516.0	0.9
L134	East Prescott Road	28748.0	3.2	11779.0	2.6
L135	East Prescott Road	35731.0	3.3	1637.0	1.0
L136	East Prescott Road	27184.0	3.2	14070.0	2.7
L137	East Prescott Road	30662.0	3.1	14073.0	2.7
L138	East Prescott Road	27339.0	3.2	13968.0	2.6
L139	East Prescott Road	27002.0	3.0	14179.0	2.8
L140	East Prescott Road	31339.0	3.2	14064.0	2.8
L141	East Prescott Road	31036.0	3.2	12046.0	2.6
L142	East Prescott Road	31391.0	3.2	11538.0	2.5
L143	East Prescott Road	35694.0	3.3	31775.0	3.1
L144	East Prescott Road	27586.0	3.0	29247.0	3.1
L145	East Prescott Road	34234.0	3.3	28424.0	2.9
L146	East Prescott Road	33573.0	3.3	32199.0	3.1
L147	East Prescott Road	30361.0	3.1	36553.0	3.2
L148	East Prescott Road	31148.0	3.2	31242.0	3.1
L149	East Prescott Road	29636.0	3.2	28505.0	3.0
L150	East Prescott Road	23681.0	3.0	25339.0	2.9
L151	East Prescott Road	27776.0	3.0	27430.0	3.1
L152	East Prescott Road	36089.0	3.3	36097.0	3.2
L153	Finch Lane	4770.0	1.1	31754.0	3.1
L154	Finch Lane	4786.0	1.1	4117.0	1.0
L155	Forest House Interchange	17013.0	2.4	28320.0	3.1
L156	High Street	10439.0	2.7	31975.0	3.1
L157	High Street	10628.0	2.7	31259.0	3.1
L158	High Street	10387.0	2.7	28424.0	3.0
L159	High Street	8685.0	2.7	31675.0	3.1
L160	High Street	10600.0	2.7	4432.0	1.0
L161	High Street	10523.0	2.7	4813.0	1.0

Road Link		DM Scenario		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)	24 Hr AADT Flow	HDV Prop (%)
L162	High Street	7619.0	2.8	5558.0	1.0
L163	High Street	9943.0	2.7	36171.0	3.2
L164	High Street	10570.0	2.7	33417.0	3.1
L165	High Street	9611.0	2.7	34435.0	3.1
L166	High Street	10213.0	2.7	5547.0	1.0
L167	High Street	7764.0	2.7	30095.0	3.1
L168	High Street	9249.0	2.7	19701.0	2.3
L169	High Street	8064.0	2.7	34121.0	3.2
L170	High Street	8336.0	2.7	29428.0	3.1
L171	Hope Street	1173.0	1.8	6339.0	1.0
L172	Hope Street	1172.0	1.8	34951.0	3.1
L173	Hope Street	1170.0	1.8	35030.0	3.1
L174	Huyton Lane	10560.0	1.0	33502.0	3.1
L175	Huyton Lane	10614.0	1.0	7618.0	0.8
L176	Huyton Lane	10606.0	1.0	27988.0	3.1
L177	Huyton Lane	10610.0	1.0	7694.0	1.0
L178	Huyton Lane	10603.0	1.0	28450.0	3.0
L179	Huyton Lane	10564.0	1.0	32216.0	3.1
L180	Knowlsey Road Farm	46234.0	8.5	25752.0	2.9
L181	Knowsley Lane	10241.0	1.0	29345.0	3.1
L182	Knowsley Lane	10153.0	1.0	34858.0	3.1
L183	Knowsley Lane	10406.0	1.0	31285.0	3.0
L184	Knowsley Lane	10497.0	1.0	29082.0	3.1
L185	Knowsley Lane	10497.0	1.0	33618.0	3.1
L186	Knowsley Lane	10082.0	1.0	36860.0	3.2
L187	Knowsley Lane	10527.0	1.0	28440.0	3.0
L188	Knowsley Lane	10324.0	1.0	32069.0	3.1
L189	Knowsley Lane	10494.0	1.0	35268.0	3.1
L190	Knowsley Lane	10393.0	1.0	28434.0	3.0
L191	Knowsley Lane	10355.0	1.0	27652.0	3.1
L192	Knowsley Lane	10529.0	1.0	30226.0	3.1
L193	Knowsley Lane	10500.0	1.0	31937.0	3.1
L194	Knowsley Lane	10512.0	1.0	25336.0	2.9
L195	Knowsley Lane	10088.0	1.0	31931.0	3.1
L196	Knowsley Lane	10492.0	1.0	34628.0	3.1

Road Link		DM Scenario		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)	24 Hr AADT Flow	HDV Prop (%)
L197	Knowsley Lane	10416.0	1.0	31892.0	3.1
L198	Knowsley Lane	10280.0	1.0	27568.0	3.1
L199	Knowsley Lane	10423.0	1.0	36201.0	3.2
L200	Knowsley Lane	10399.0	1.0	28209.0	3.0
L201	Knowsley Lane	10369.0	1.0	36642.0	3.2
L202	Knowsley Lane	10449.0	1.0	34065.0	3.1
L203	Knowsley Lane	10529.0	1.0	29882.0	3.1
L204	Knowsley Lane	10135.0	1.0	30785.0	3.1
L205	Knowsley Lane	10336.0	1.0	30058.0	3.1
L206	Knowsley Park Lane	849.0	1.9	32407.0	3.2
L207	Knowsley Park Lane	860.0	1.9	19707.0	2.3
L208	Knowsley Park Lane	870.0	1.9	25200.0	2.9
L209	Liverpool Road	15815.0	2.2	34241.0	3.1
L210	Liverpool Road	24270.0	4.1	26620.0	3.0
L211	Liverpool Road	11641.0	3.9	27905.0	2.9
L212	Liverpool Road	15543.0	2.7	36717.0	3.2
L213	Liverpool Road	23974.0	3.7	33156.0	3.2
L214	Liverpool Road	19688.0	2.4	28015.0	3.1
L215	Liverpool Road	19274.0	2.4	33596.0	3.1
L216	Liverpool Road	25054.0	5.6	27397.0	3.1
L217	Liverpool Road	15839.0	2.2	27432.0	3.1
L218	Liverpool Road	28750.0	2.1	27852.0	3.0
L219	Liverpool Road	17632.0	2.5	29538.0	3.1
L220	Liverpool Road	15965.0	2.2	27974.0	3.1
L221	Liverpool Road	19082.0	2.4	31452.0	3.0
L222	Liverpool Road	19290.0	2.4	28129.0	3.1
L223	Liverpool Road	25033.0	5.6	27792.0	2.9
L224	Liverpool Road	23844.0	3.8	32129.0	3.1
L225	Liverpool Road	20604.0	2.3	31826.0	3.1
L226	Liverpool Road	18146.0	2.4	32181.0	3.1
L227	Liverpool Road	19142.0	2.5	36484.0	3.2
L228	Liverpool Road	18814.0	2.3	28376.0	2.9
L229	Liverpool Road	16695.0	2.1	35024.0	3.2
L230	Liverpool Road	23506.0	3.1	31151.0	3.1
L231	Liverpool Road	13020.0	3.2	31938.0	3.1

Road Link		DM Scenario		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)	24 Hr AADT Flow	HDV Prop (%)
L232	Liverpool Road	18538.0	2.3	30426.0	3.1
L233	Liverpool Road	29399.0	2.1	24471.0	2.9
L234	Liverpool Road	18463.0	2.4	28566.0	2.9
L235	Liverpool Road	24403.0	4.2	36879.0	3.2
L236	Liverpool Road	25089.0	5.6	5560.0	1.0
L237	Liverpool Road	24668.0	5.2	5576.0	1.0
L238	Liverpool Road	25079.0	5.6	17803.0	2.3
L239	Liverpool Road	23473.0	3.1	11229.0	2.5
L240	Liverpool Road	23974.0	3.7	11177.0	2.5
L241	Liverpool Road	17468.0	2.4	9475.0	2.5
L242	Liverpool Road	14988.0	2.9	11390.0	2.5
L243	Liverpool Road	17471.0	2.4	11313.0	2.5
L244	Liverpool Road	18847.0	2.3	8409.0	2.5
L245	Liverpool Road	23531.0	3.2	10733.0	2.5
L246	Liverpool Road	19375.0	2.4	11360.0	2.5
L247	Liverpool Road	13239.0	3.1	10401.0	2.5
L248	Liverpool Road	18216.0	2.2	11003.0	2.5
L249	Liverpool Road	19227.0	2.5	8554.0	2.5
L250	Liverpool Road	18896.0	2.4	8854.0	2.5
L251	Liverpool Road	20312.0	2.3	9126.0	2.5
L252	Liverpool Road	13221.0	3.1	1963.0	1.1
L253	Liverpool Road	21160.0	2.3	1962.0	1.1
L254	Liverpool Road	24823.0	5.3	1960.0	1.1
L255	Liverpool Road	24440.0	4.2	11350.0	1.0
L256	Liverpool Road	23509.0	3.2	11404.0	1.0
L257	Liverpool Road	19088.0	2.4	11396.0	1.0
L258	Liverpool Road	20060.0	2.6	11400.0	1.0
L259	Liverpool Road	19196.0	2.5	11393.0	1.0
L260	Liverpool Road	11847.0	3.9	47024.0	8.4
L261	Liverpool Road	12087.0	3.7	11031.0	0.9
L262	Liverpool Road	18878.0	2.4	10943.0	0.9
L263	Liverpool Road	12632.0	3.6	11196.0	1.0
L264	Liverpool Road	18225.0	2.3	11287.0	1.0
L265	Liverpool Road	24346.0	4.7	11287.0	1.0
L266	Liverpool Road	18511.0	2.5	10872.0	0.9

Road Link		DM Scenario		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)	24 Hr AADT Flow	HDV Prop (%)
L267	Liverpool Road	24456.0	4.3	11317.0	1.0
L268	Liverpool Road	18237.0	2.3	11114.0	0.9
L269	Liverpool Road	19468.0	2.4	11284.0	1.0
L270	Liverpool Road	24830.0	5.6	11145.0	1.0
L271	Liverpool Road	18862.0	2.3	11319.0	1.0
L272	Liverpool Road	21150.0	2.3	11290.0	1.0
L273	Liverpool Road	635.0	2.0	11302.0	1.0
L274	Liverpool Road	636.0	2.0	10878.0	0.9
L275	Liverpool Road	21679.0	2.3	11282.0	1.0
L276	Liverpool Road	19209.0	2.5	11206.0	1.0
L277	Liverpool Road	18026.0	2.5	11070.0	0.9
L278	Liverpool Road	737.0	2.3	11213.0	1.0
L279	Liverpool Road	17882.0	2.4	11189.0	1.0
L280	Liverpool Road	15131.0	2.7	11239.0	1.0
L281	Liverpool Road	19449.0	2.4	11319.0	1.0
L282	Liverpool Road	31750.0	2.1	10925.0	0.9
L283	Liverpool Road	24611.0	4.4	11126.0	0.9
L284	Liverpool Road	24778.0	5.3	1639.0	1.0
L285	Liverpool Road	18128.0	2.4	1650.0	1.0
L286	Liverpool Road	13298.0	3.1	1660.0	1.0
L287	Liverpool Road	25087.0	5.7	16605.0	2.1
L288	Liverpool Road	23831.0	3.6	25060.0	3.9
L289	Liverpool Road	25109.0	5.6	12431.0	3.7
L290	Liverpool Road	24661.0	4.5	24764.0	3.6
L291	Liverpool Road	15946.0	2.2	20478.0	2.3
L292	Liverpool Road	2339.0	1.3	20064.0	2.3
L293	Liverpool Road	24620.0	5.1	25844.0	5.4
L294	Liverpool Road	21580.0	2.3	16629.0	2.1
L295	Liverpool Road	24278.0	4.1	29540.0	2.1
L296	Liverpool Road	19104.0	2.4	18422.0	2.4
L297	Liverpool Road	15787.0	2.8	16755.0	2.1
L298	Liverpool Road	17784.0	2.5	19872.0	2.3
L299	Liverpool Road	19938.0	2.4	20080.0	2.3
L300	Liverpool Road	16467.0	2.1	21394.0	2.3
L301	Liverpool Road	16663.0	2.1	18936.0	2.3

Road Link		DM Scenario		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)	24 Hr AADT Flow	HDV Prop (%)
L302	Liverpool Road	15818.0	2.7	19932.0	2.4
L303	Liverpool Road	24635.0	5.2	19604.0	2.2
L304	Liverpool Road	20280.0	2.3	17485.0	2.0
L305	Liverpool Road	18881.0	2.4	24296.0	3.0
L306	Liverpool Road	18218.0	2.2	13810.0	3.0
L307	Liverpool Road	21519.0	2.3	19328.0	2.2
L308	Liverpool Road	25162.0	5.7	30189.0	2.1
L309	Liverpool Road	18205.0	2.4	19253.0	2.3
L310	Liverpool Road	22107.0	2.3	25879.0	5.5
L311	Liverpool Road	19405.0	2.4	25458.0	5.0
L312	Liverpool Road	16749.0	2.6	25869.0	5.4
L313	Liverpool Road	18153.0	2.2	24263.0	3.0
L314	Liverpool Road	20017.0	2.6	24764.0	3.6
L315	Liverpool Road	20511.0	2.3	18258.0	2.3
L316	Liverpool Road	24074.0	3.8	15778.0	2.8
L317	Liverpool Road	21644.0	2.3	18261.0	2.3
L318	Lordens Road	3075.0	1.5	19637.0	2.2
L319	Lordens Road	3103.0	1.5	24321.0	3.1
L320	Lordens Road	3214.0	1.4	14029.0	2.9
L321	Lordens Road	3258.0	1.4	19006.0	2.1
L322	Lordens Road	3272.0	1.3	20017.0	2.4
L323	Lordens Road	3088.0	1.5	19686.0	2.3
L324	Lordens Road	3076.0	1.5	21102.0	2.2
L325	M57	19840.0	2.3	14011.0	2.9
L326	M57	15927.0	2.4	21950.0	2.2
L327	M57	89989.0	9.1	25613.0	5.1
L328	M57	20159.0	2.3	25230.0	4.1
L329	M57	17738.0	2.3	24299.0	3.1
L330	Park Road	1044.0	1.8	20850.0	2.5
L331	Park Road	1033.0	1.8	19986.0	2.4
L332	Park Road	1063.0	1.8	12637.0	3.6
L333	Pilch Lane	6796.0	1.1	12877.0	3.5
L334	Pilch Lane	6848.0	1.1	19668.0	2.3
L335	Prescot Bypass	10945.0	2.2	13422.0	3.4
L336	Prescot Bypass	11983.0	2.1	19015.0	2.2

Road Link		DM Scenario		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)	24 Hr AADT Flow	HDV Prop (%)
L337	Prescot Bypass	12023.0	2.2	25136.0	4.5
L338	Prescot Bypass	12298.0	2.1	19301.0	2.4
L339	Prescot Bypass	11757.0	2.1	25246.0	4.1
L340	Prescot Bypass	11355.0	2.0	20258.0	2.3
L341	Prescot Bypass	10743.0	2.4	25620.0	5.4
L342	Prescot Bypass	11536.0	2.0	19652.0	2.2
L343	Prescot Bypass	12111.0	2.2	21940.0	2.2
L344	Prescot Bypass	12019.0	2.2	1425.0	0.9
L345	Prescot Bypass	12115.0	2.2	1426.0	0.9
L346	Prescot Road	21536.0	3.6	22469.0	2.2
L347	Prescot Road	20640.0	3.7	19999.0	2.4
L348	Prescot Road	22826.0	3.5	18816.0	2.4
L349	Prescot Road	19285.0	3.9	1527.0	1.1
L350	Prescot Road	23824.0	3.3	15921.0	2.6
L351	Prescot Road	28112.0	3.2	20239.0	2.3
L352	Prescot Road	23859.0	3.2	32540.0	2.0
L353	Prescot Road	24027.0	3.5	25401.0	4.3
L354	Prescot Road	26214.0	3.3	25568.0	5.1
L355	Prescot Road	23172.0	3.4	18918.0	2.3
L356	Prescot Road	20655.0	3.7	14088.0	2.9
L357	Prescot Road	28213.0	3.2	25877.0	5.5
L358	Prescot Road	27420.0	3.3	24621.0	3.4
L359	Prescot Road	27501.0	3.3	25899.0	5.5
L360	Prescot Road	18277.0	4.0	16736.0	2.1
L361	Prescot Road	21912.0	3.6	3129.0	1.0
L362	Prescot Road	23161.0	3.4	25410.0	4.9
L363	Prescot Road	17519.0	4.1	22370.0	2.2
L364	Prescot Road	19596.0	3.8	25068.0	3.9
L365	Prescot Road	23665.0	3.4	19894.0	2.3
L366	Prescot Road	23072.0	3.5	16577.0	2.7
L367	Prescot Road	23353.0	3.4	18574.0	2.4
L368	Prescot Road	21918.0	3.6	20728.0	2.3
L369	Prescot Road	22491.0	3.6	17257.0	2.0
L370	Prescot Road	27190.0	3.3	16608.0	2.5
L371	Prescot Road	19694.0	3.8	25425.0	5.0

Road Link		DM Scenario		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)	24 Hr AADT Flow	HDV Prop (%)
L372	Prescot Road	27501.0	3.3	21070.0	2.2
L373	Prescot Road	21927.0	3.6	19671.0	2.3
L374	Prescot Road	23125.0	3.5	19008.0	2.1
L375	Prescot Road	18396.0	4.0	22309.0	2.2
L376	Prescot Road	28400.0	3.2	25952.0	5.5
L377	Prescot Road	23574.0	3.3	18995.0	2.3
L378	Prescot Road	27655.0	3.3	22897.0	2.2
L379	Prescot Road	17709.0	4.1	20195.0	2.3
L380	Primrose Drive	10757.0	1.6	18943.0	2.1
L381	Primrose Drive	10755.0	1.6	20807.0	2.5
L382	Primrose Drive	10796.0	1.6	21301.0	2.3
L383	Primrose Drive	10787.0	1.6	24864.0	3.7
L384	Primrose Drive	10757.0	1.6	22434.0	2.2
L385	Primrose Drive	10940.0	1.6	3865.0	1.2
L386	Primrose Drive	10958.0	1.6	3893.0	1.2
L387	Primrose Drive	10910.0	1.6	4004.0	1.1
L388	Primrose Drive	11876.0	1.5	4048.0	1.1
L389	Primrose Drive	10922.0	1.6	4062.0	1.1
L390	Primrose Drive	10824.0	1.6	3866.0	1.2
L391	Primrose Drive	10778.0	1.6	20630.0	2.2
L392	Primrose Drive	10754.0	1.6	16717.0	2.3
L393	Primrose Drive	10893.0	1.6	90779.0	9.0
L394	Primrose Drive	10871.0	1.6	20949.0	2.2
L395	Princess Drive	4482.0	1.4	18528.0	2.2
L396	Princess Drive	4923.0	1.4	1834.0	1.0
L397	Princess Drive	3649.0	1.4	1823.0	1.0
L398	Princess Drive	2233.0	1.4	1853.0	1.0
L399	Princess Drive	3950.0	1.4	7586.0	1.0
L400	Princess Drive	5163.0	1.4	12773.0	2.0
L401	Princess Drive	3389.0	1.4	12813.0	2.1
L402	Princess Drive	2484.0	1.4	13088.0	1.9
L403	Princess Drive	4377.0	1.4	12547.0	2.0
L404	Princess Drive	4235.0	1.4	12145.0	1.9
L405	Princess Drive	4952.0	1.4	11533.0	2.2
L406	Princess Drive	2111.0	1.4	12326.0	1.9

Road Link		DM Scenario		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)	24 Hr AADT Flow	HDV Prop (%)
L407	Princess Drive	3404.0	1.3	12901.0	2.1
L408	Princess Drive	3123.0	1.4	12809.0	2.1
L409	Princess Drive	4987.0	1.4	12905.0	2.1
L410	Princess Drive	4904.0	1.4	21430.0	3.6
L411	Princess Drive	4314.0	1.4	23616.0	3.4
L412	Princess Drive	4816.0	1.4	20075.0	3.7
L413	Princess Drive	5095.0	1.4	24614.0	3.2
L414	Princess Drive	4713.0	1.4	28902.0	3.1
L415	Princess Drive	4093.0	1.4	24649.0	3.1
L416	Princess Drive	4278.0	1.4	24817.0	3.3
L417	Princess Drive	2443.0	1.4	27004.0	3.2
L418	Princess Drive	4422.0	1.4	23962.0	3.3
L419	Princess Drive	2804.0	1.4	21445.0	3.6
L420	Princess Drive	2600.0	1.4	28210.0	3.2
L421	Princess Drive	4704.0	1.4	28291.0	3.2
L422	Princess Drive	4787.0	1.4	19067.0	3.8
L423	Princess Drive	4632.0	1.4	22702.0	3.5
L424	Princess Drive	2796.0	1.4	23951.0	3.3
L425	Princess Drive	4545.0	1.4	18309.0	3.9
L426	Princess Drive	3823.0	1.4	20386.0	3.7
L427	Princess Drive	2075.0	1.4	24455.0	3.3
L428	Princess Drive	4970.0	1.4	23862.0	3.3
L429	Princess Drive	4452.0	1.4	24143.0	3.3
L430	Princess Drive	4437.0	1.4	23281.0	3.4
L431	Princess Drive	5008.0	1.4	27980.0	3.2
L432	Princess Drive	5004.0	1.4	20484.0	3.7
L433	Princess Drive	4887.0	1.4	28291.0	3.2
L434	Princess Drive	2530.0	1.4	22717.0	3.5
L435	Princess Drive	3134.0	1.3	23915.0	3.4
L436	Princess Drive	5125.0	1.4	19186.0	3.8
L437	Princess Drive	3820.0	1.4	29190.0	3.1
L438	Princess Drive	2127.0	1.4	24364.0	3.2
L439	Princess Drive	4884.0	1.4	28445.0	3.2
L440	Princess Drive	5024.0	1.4	11547.0	1.5
L441	Princess Drive	3665.0	1.4	11545.0	1.5

Road Link		DM Scenario		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)	24 Hr AADT Flow	HDV Prop (%)
L442	Princess Drive	4761.0	1.4	11586.0	1.5
L443	Princess Drive	2271.0	1.4	11577.0	1.5
L444	Princess Drive	2034.0	1.4	11547.0	1.5
L445	Princess Drive	4848.0	1.4	11730.0	1.5
L446	Princess Drive	2033.0	1.4	11748.0	1.5
L447	Princess Drive	2035.0	1.4	11700.0	1.5
L448	Princess Drive	2079.0	1.4	12666.0	1.4
L449	Queens Drive	28464.0	3.2	11712.0	1.5
L450	Queens Drive	28467.0	3.2	11568.0	1.5
L451	Queens Drive	28310.0	3.2	11544.0	1.5
L452	Queens Drive	28319.0	3.2	11683.0	1.5
L453	Queens Drive	28597.0	3.2	11661.0	1.5
L454	Queens Drive	28644.0	3.2	5272.0	1.2
L455	Queens Drive	28453.0	3.2	5713.0	1.2
L456	Queens Drive	28756.0	3.2	4439.0	1.1
L457	Queens Drive	28602.0	3.2	3023.0	1.0
L458	Saxby Road	3737.0	1.4	4740.0	1.1
L459	Saxby Road	3657.0	1.4	5953.0	1.2
L460	Saxby Road	3761.0	1.4	3274.0	1.1
L461	Seth Powell Way	20989.0	4.6	5167.0	1.2
L462	Seth Powell Way	25444.0	6.3	5025.0	1.2
L463	Seth Powell Way	21614.0	5.5	5742.0	1.2
L464	Seth Powell Way	25530.0	6.3	2901.0	1.0
L465	Seth Powell Way	25723.0	6.3	4194.0	1.1
L466	Seth Powell Way	25308.0	6.2	3913.0	1.1
L467	Seth Powell Way	24920.0	5.6	5777.0	1.2
L468	Seth Powell Way	23263.0	5.9	5694.0	1.2
L469	Seth Powell Way	24956.0	5.6	5104.0	1.2
L470	Seth Powell Way	24923.0	5.6	5885.0	1.2
L471	Seth Powell Way	22659.0	5.7	5503.0	1.2
L472	Seth Powell Way	20511.0	4.5	4883.0	1.1
L473	Seth Powell Way	18181.0	4.5	5068.0	1.1
L474	Seth Powell Way	14808.0	1.8	3233.0	1.1
L475	Seth Powell Way	28156.0	6.7	5212.0	1.2
L476	Seth Powell Way	17927.0	4.4	3594.0	1.1

Road Link		DM Scenario		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)	24 Hr AADT Flow	HDV Prop (%)
L477	Seth Powell Way	19772.0	5.0	3390.0	1.1
L478	Southdean Road	3203.0	1.4	5494.0	1.2
L479	Southdean Road	3515.0	1.4	5577.0	1.2
L480	Southdean Road	3543.0	1.4	3586.0	1.1
L481	Southdean Road	3304.0	1.4	5335.0	1.2
L482	Southdean Road	3407.0	1.4	4613.0	1.1
L483	St Helens Road	7239.0	2.7	2865.0	1.0
L484	St Helens Road	6682.0	2.8	5760.0	1.2
L485	St Helens Road	6486.0	2.9	5242.0	1.2
L486	St Helens Road	5726.0	3.0	5227.0	1.2
L487	St Helens Road	4523.0	3.4	5798.0	1.2
L488	Stanley Crescent	988.0	1.8	5794.0	1.2
L489	Stockbridge Lane	10176.0	1.0	5677.0	1.2
L490	Stockbridge Lane	10174.0	1.0	3924.0	1.1
L491	Stockbridge Lane	10173.0	1.0	5915.0	1.2
L492	Stockbridge Lane	10172.0	1.0	4610.0	1.1
L493	Stockbridge Lane	10285.0	1.0	2917.0	1.0
L494	Stockbridge Lane	10175.0	1.0	5674.0	1.2
L495	Stockbridge Lane	10289.0	1.0	5814.0	1.2
L496	Stockbridge Lane	10307.0	1.0	4455.0	1.1
L497	Stockbridge Lane	10283.0	1.0	5551.0	1.2
L498	Stockbridge Lane	10139.0	1.0	3061.0	1.0
L499	Stockbridge Lane	10142.0	1.0	2824.0	1.0
L500	Stockbridge Lane	10141.0	1.0	2825.0	1.0
L501	Stockbridge Lane	10214.0	1.0	2869.0	1.0
L502	Stockbridge Lane	10160.0	1.0	29254.0	3.1
L503	Stockbridge Lane	10121.0	1.0	29257.0	3.1
L504	Stockbridge Lane	10132.0	1.0	29100.0	3.1
L505	Stockbridge Lane	10289.0	1.0	29109.0	3.1
L506	Stockbridge Lane	10175.0	1.0	29387.0	3.1
L507	Stockbridge Lane	10142.0	1.0	29434.0	3.1
L508	Stockbridge Lane	10175.0	1.0	29243.0	3.1
L509	Stockbridge Lane	10144.0	1.0	29546.0	3.1
L510	Stockbridge Lane	10139.0	1.0	4527.0	1.1
L511	Stockbridge Lane	10281.0	1.0	4447.0	1.2

Road Link		DM Scenario		DS Scenario	
		24 Hr AADT Flow	HDV Prop (%)	24 Hr AADT Flow	HDV Prop (%)
L512	Stockbridge Lane	10139.0	1.0	4551.0	1.1
L513	Stockbridge Lane	10284.0	1.0	21779.0	4.4
L514	Stockbridge Lane	10126.0	1.0	26234.0	6.1
L515	Stockbridge Lane	10130.0	1.0	22404.0	5.3
L516	Stockbridge Lane	10130.0	1.0	26320.0	6.1
L517	Stockbridge Lane	10132.0	1.0	26513.0	6.1
L518	Thomas Lane	9965.0	1.4	26098.0	6.1
L519	Warrington Road	8175.0	2.6	25710.0	5.4
L520	Warrington Road	7606.0	2.7	25746.0	5.4
L521	Warrington Road	7577.0	2.7	25713.0	5.4
L522	Warrington Road	8495.0	2.5	23449.0	5.5
L523	Warrington Road	8377.0	2.6	21301.0	4.3
L524	Warrington Road	7577.0	2.8	18971.0	4.3
L525	Warrington Road	8555.0	2.5	15598.0	1.7
L526	Warrington Road	7873.0	2.6	28946.0	6.5
L527	Warrington Road	7704.0	2.6	18717.0	4.2
L528	Warrington Road	7565.0	2.7	20562.0	4.8
L529	Warrington Road	7783.0	2.7	3993.0	1.1
L530	Warrington Road	9083.0	2.5	4333.0	1.2

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 12.0) released in December 2023, which incorporates updated COPERT v5.6 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.8.1) provided by DEFRA, which is the method detailed within LAQM.TG(22).

Meteorological Data

Meteorological data used in this assessment was taken from Liverpool John Lennon Airport meteorological station over the period 1st January 2023 to 31st December 2023 (inclusive).

Liverpool John Lennon Airport meteorological station is located at approximate NGR: (343511, 382189) which is approximately 10.54km South of the Proposed Development. Liverpool John Lennon Airport 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, DM/DS scenario, as well as conditions at the Liverpool John Lennon Airport meteorological station are summarised in Table B3.

Table B3: Utilised Roughness Lengths

Scenario	Roughness Length (m)	ADMS Description
Verification, DM and DS Scenarios	1.0	Cities, woodlands
Liverpool John Lennon Airport	0.5	Parkland, open suburbia

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, DM/DS scenario, as well as conditions at the Liverpool John Lennon Airport 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
Liverpool John Lennon Airport	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 2027 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.

Table B5: Predicted Background Pollutant Concentrations for Monitoring Locations

Monitoring Location	DEFRA Grid Square	Pollutant	2023 Predicted Background Concentration ($\mu\text{g}/\text{m}^3$)
B10	(341500, 391500)	NO _x	18.8607
		NO ₂	13.9682
		PM ₁₀	12.7402

Monitoring Location	DEFRA Grid Square	Pollutant	2023 Predicted Background Concentration ($\mu\text{g}/\text{m}^3$)
		PM _{2.5}	7.8778
B9	(340500, 391500)	NO _x	20.4007
		NO ₂	14.9644
		PM ₁₀	12.6166
		PM _{2.5}	7.7875
B8	(339500, 391500)	NO _x	21.6781
		NO ₂	15.8029
		PM ₁₀	13.5876
		PM _{2.5}	8.4079
P1a P1b	(345500, 392500)	NO _x	20.2582
		NO ₂	14.932
		PM ₁₀	14.7889
		PM _{2.5}	8.0605
P2a P2b	(346500, 392500)	NO _x	18.0233
		NO ₂	13.433
		PM ₁₀	13.7519
		PM _{2.5}	8.1912
P3a P3b	(346500, 392500)	NO _x	18.0233
		NO ₂	13.433
		PM ₁₀	13.7519
		PM _{2.5}	8.1912

Table B6 displays the predicted background concentrations by DEFRA used in the operational phase assessment for the sensitive receptor locations.

Table B6: Predicted Background Pollutant Concentrations at Sensitive Receptors

Sensitive Receptor	DEFRA Grid Square	Pollutant	2023 Predicted Background Concentration ($\mu\text{g}/\text{m}^3$)
R1	(342500, 392500)	NO _x	14.2735
		NO ₂	10.8622
		PM ₁₀	12.3596
		PM _{2.5}	7.7452
R2	(342500, 392500)	NO _x	14.2735
		NO ₂	10.8622
		PM ₁₀	12.3596
		PM _{2.5}	7.7452
R3	(342500, 392500)	NO _x	14.2735

Sensitive Receptor	DEFRA Grid Square	Pollutant	2023 Predicted Background Concentration ($\mu\text{g}/\text{m}^3$)
		NO ₂	10.8622
		PM ₁₀	12.3596
		PM _{2.5}	7.7452
R4	(342500, 392500)	NO _x	14.2735
		NO ₂	10.8622
		PM ₁₀	12.3596
		PM _{2.5}	7.7452
		NO _x	14.2735
		NO ₂	10.8622
R5	(342500, 392500)	PM ₁₀	12.3596
		PM _{2.5}	7.7452
		NO _x	14.2735
		NO ₂	10.8622
		PM ₁₀	12.3596
		PM _{2.5}	7.7452
R6	(342500, 392500)	NO _x	14.2735
		NO ₂	10.8622
		PM ₁₀	12.3596
		PM _{2.5}	7.7452
		NO _x	14.2735
		NO ₂	10.8622
R7	(342500, 392500)	PM ₁₀	12.3596
		PM _{2.5}	7.7452
		NO _x	14.2735
		NO ₂	10.8622
		PM ₁₀	12.3596
		PM _{2.5}	7.7452
R8	(342500, 392500)	NO _x	14.2735
		NO ₂	10.8622
		PM ₁₀	12.3596
		PM _{2.5}	7.7452
		NO _x	14.2735
		NO ₂	10.8622
R9	(342500, 392500)	PM ₁₀	12.3596
		PM _{2.5}	7.7452
		NO _x	14.2735
		NO ₂	10.8622
		PM ₁₀	12.3596
		PM _{2.5}	7.7452
R10	(342500, 392500)	NO _x	14.2735
		NO ₂	10.8622
		PM ₁₀	12.3596
		PM _{2.5}	7.7452
		NO _x	14.2735
		NO ₂	10.8622
R11	(342500, 392500)	PM ₁₀	12.3596
		PM _{2.5}	7.7452
		NO _x	14.2735
		NO ₂	10.8622
		PM ₁₀	12.3596
		PM _{2.5}	7.7452
R12	(342500, 392500)	NO _x	14.2735

Sensitive Receptor	DEFRA Grid Square	Pollutant	2023 Predicted Background Concentration ($\mu\text{g}/\text{m}^3$)
		NO ₂	10.8622
		PM ₁₀	12.3596
		PM _{2.5}	7.7452
R13	(342500, 392500)	NO _x	14.2735
		NO ₂	10.8622
		PM ₁₀	12.3596
		PM _{2.5}	7.7452
R14	(342500, 392500)	NO _x	14.2735
		NO ₂	10.8622
		PM ₁₀	12.3596
		PM _{2.5}	7.7452
R15	(342500, 392500)	NO _x	14.2735
		NO ₂	10.8622
		PM ₁₀	12.3596
		PM _{2.5}	7.7452
R16	(342500, 392500)	NO _x	14.2735
		NO ₂	10.8622
		PM ₁₀	12.3596
		PM _{2.5}	7.7452

2023 background concentrations for each receptor location have been used for the sensitivity analysis. The results of this are detailed in Appendix D.

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 2023, using traffic data, meteorological data and monitoring results from this year.

KMBC undertakes periodic monitoring of NO₂ concentrations at 6 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)
B10	37.7	36.837
B9	32.0	18.027
B8	20.72	14.642
P1a P1b	14.71	7.717
P2a P2b	15.24	9.804
P3a P3b	26.98	9.173

The monitored and modelled NO_x Road contribution concentrations were compared, and this indicated that a verification factor of **1.3011** 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

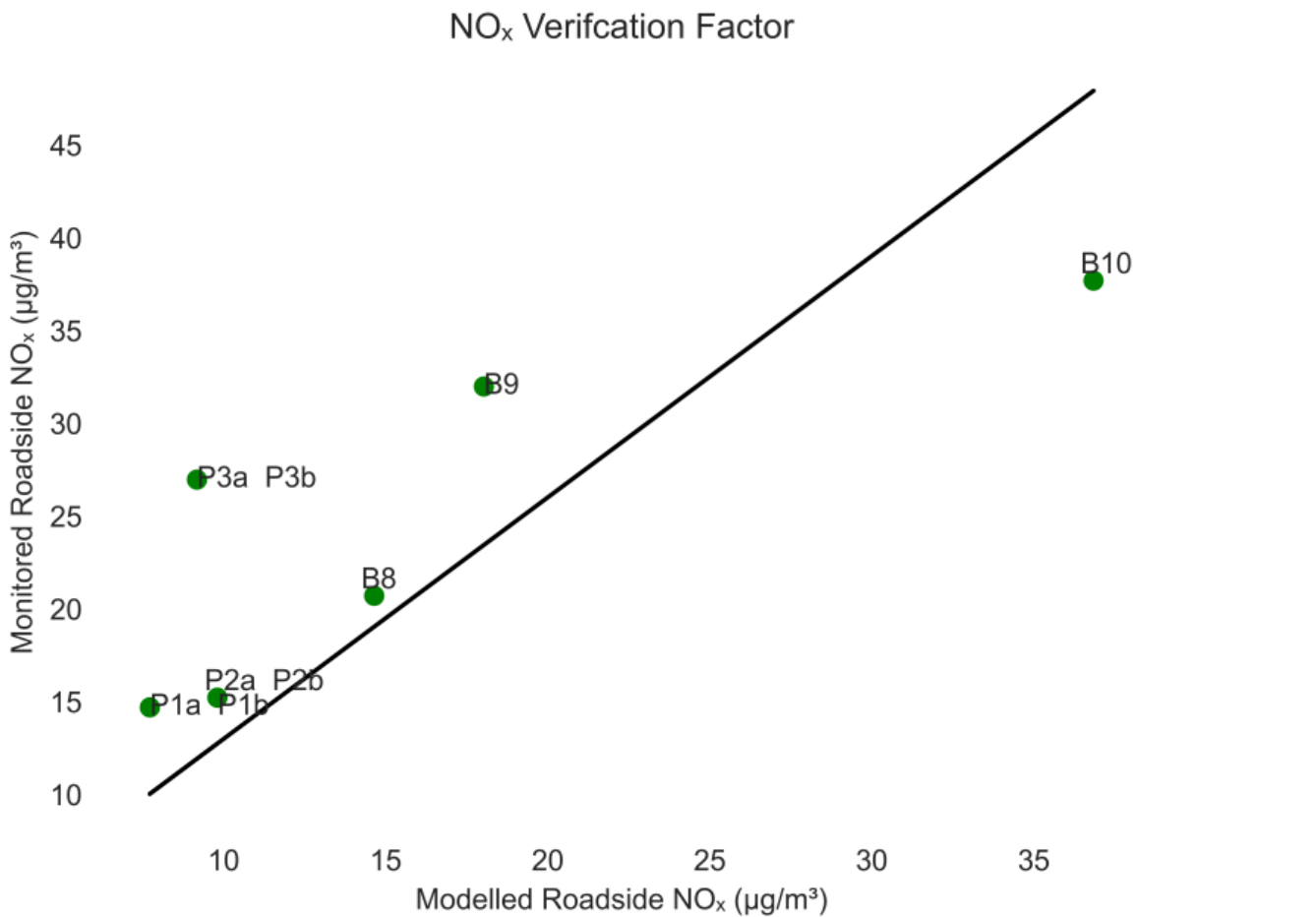


Table B8 presents the monitored annual mean NO₂ concentrations and the adjusted modelled total NO₂ concentration based on the above verification factor. Exceedances of the annual mean NO₂ AQO are highlighted in **bold**.

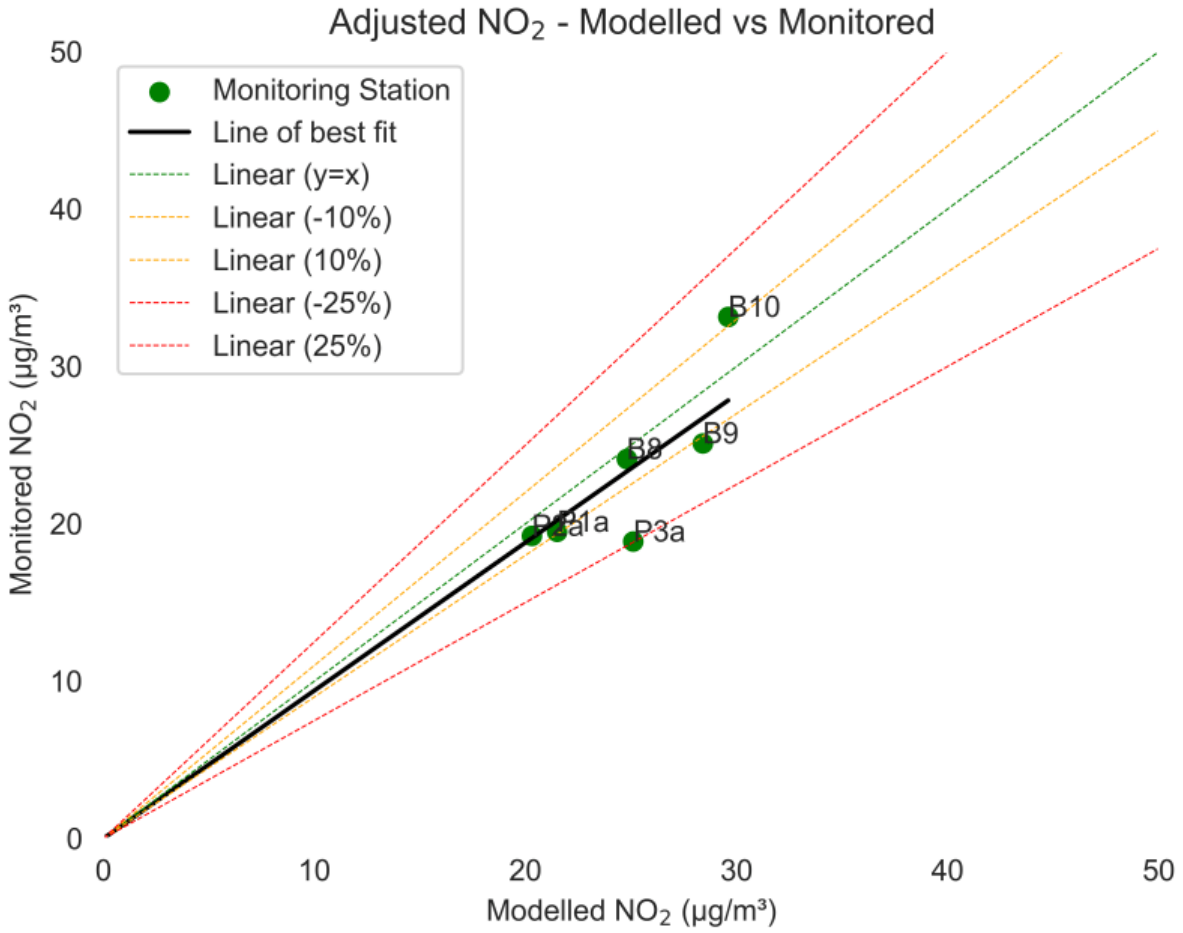
Table B8: NO₂ Concentrations

Site ID	Monitored Road NO ₂ Concentration (µg/m ³)	Adjusted Modelled Road NO ₂ Concentration (µg/m ³)	% Difference ((Monitored - Modelled)/Monitored) * 100
B10	29.6	33.148	-11.99%
B9	28.4	25.114	11.57%
B8	24.8	24.123	2.73%
P1a P1b	21.5	19.492	9.34%
P2a P2b	20.3	19.233	5.26%
P3a P3b	25.1	18.873	24.81%

As demonstrated in Table B8, the percentage difference between modelled and monitored concentrations is deemed acceptable and is less than 25% in all but 6 cases, and less than or equal to 10% at 3 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



APPENDIX C: ASSESSMENT RESULTS

Predicted Concentrations at Sensitive Receptors

Nitrogen Dioxide (NO₂)

Annual mean NO₂ concentrations were predicted for 2027 DM and DS scenarios and are summarised in Table C1.

Table C1: Predicted Annual Mean NO₂ Concentrations

Receptors		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		DM	DS	Change
R1	55 Ashbury Rd, Liverpool L14 8UX, UK	11.54	11.61	0.07
R2	3 Ashbury Rd, Liverpool L14 8UX, UK	11.77	11.9	0.13
R3	226 Southdean Rd, Liverpool L14 8UW, UK	11.72	11.84	0.12
R4	194 Southdean Rd, Liverpool L14 8UW, UK	11.77	11.9	0.13
R5	140 Lordens Rd, Liverpool L14 8UA, UK	11.54	11.62	0.08
R6	47 Saxby Rd, Liverpool L14 9NS, UK	11.75	11.87	0.12
R7	118 Lordens Rd, Liverpool L14 8UA, UK	11.63	11.73	0.1
R8	545 Princess Dr, Liverpool L14 9NA, UK	11.72	11.84	0.12
R9	521A Princess Dr, Liverpool L14 9NA, UK	11.64	11.74	0.1
R10	503 Princess Dr, Liverpool L14 9NA, UK	11.76	11.89	0.13
R11	476 Princess Dr, Liverpool L14 9NF, UK	11.59	11.68	0.09
R12	510B Princess Dr, Liverpool L14 9NG, UK	11.62	11.71	0.09
R13	58 Burtree Rd, Liverpool L14 8XH, UK	11.77	11.9	0.13
R14	552 Princess Dr, Liverpool L14 9NQ, UK	11.66	11.76	0.1
R15	455 Princess Dr, Liverpool L14 8XE, UK	11.5	11.57	0.07
R16	398 Princess Dr, Liverpool L14 8XQ, UK	11.37	11.42	0.05

As indicated in Table C1, annual mean NO₂ concentrations were below the relevant AQO at all receptor locations considered.

Predicted impacts on annual mean NO₂ concentrations are summarised in Table C2.

Table C2: Predicted NO₂ Impacts

Receptor	% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R1	0.175	75% or Less than AQO	Negligible
R2	0.325	75% or Less than AQO	Negligible
R3	0.3	75% or Less than AQO	Negligible

Receptor		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R4	194 Southdean Rd, Liverpool L14 8UW, UK	0.325	75% or Less than AQO	Negligible
R5	140 Lordens Rd, Liverpool L14 8UA, UK	0.2	75% or Less than AQO	Negligible
R6	47 Saxby Rd, Liverpool L14 9NS, UK	0.3	75% or Less than AQO	Negligible
R7	118 Lordens Rd, Liverpool L14 8UA, UK	0.25	75% or Less than AQO	Negligible
R8	545 Princess Dr, Liverpool L14 9NA, UK	0.3	75% or Less than AQO	Negligible
R9	521A Princess Dr, Liverpool L14 9NA, UK	0.25	75% or Less than AQO	Negligible
R10	503 Princess Dr, Liverpool L14 9NA, UK	0.325	75% or Less than AQO	Negligible
R11	476 Princess Dr, Liverpool L14 9NF, UK	0.225	75% or Less than AQO	Negligible
R12	510B Princess Dr, Liverpool L14 9NG, UK	0.225	75% or Less than AQO	Negligible
R13	58 Burtree Rd, Liverpool L14 8XH, UK	0.325	75% or Less than AQO	Negligible
R14	552 Princess Dr, Liverpool L14 9NQ, UK	0.25	75% or Less than AQO	Negligible
R15	455 Princess Dr, Liverpool L14 8XE, UK	0.175	75% or Less than AQO	Negligible
R16	398 Princess Dr, Liverpool L14 8XQ, UK	0.125	75% or Less than AQO	Negligible

As indicated in Table C2, impacts on annual mean NO₂ concentrations as a result of road vehicle exhaust emissions associated with the development were predicted to be not significant at all receptor locations. It is therefore considered that the overall impacts as a result of the proposed development are **negligible**. Further justifications are discussed in Section 5.2.3 of the main report.

Particulate Matter (PM₁₀)

Annual mean PM₁₀ concentrations were predicted for 2027 DM and DS scenarios and are summarised Table C3.

Table C3: Predicted Annual Mean PM₁₀ Concentrations

Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		DM	DS	Change
R1	55 Ashbury Rd, Liverpool L14 8UX, UK	12.637	12.67	0.032
R2	3 Ashbury Rd, Liverpool L14 8UX, UK	12.735	12.792	0.057
R3	226 Southdean Rd, Liverpool L14 8UW, UK	12.716	12.768	0.052

Receptor		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		DM	DS	Change
R4	194 Southdean Rd, Liverpool L14 8UW, UK	12.739	12.796	0.058
R5	140 Lordens Rd, Liverpool L14 8UA, UK	12.646	12.68	0.034
R6	47 Saxby Rd, Liverpool L14 9NS, UK	12.731	12.785	0.054
R7	118 Lordens Rd, Liverpool L14 8UA, UK	12.69	12.735	0.044
R8	545 Princess Dr, Liverpool L14 9NA, UK	12.744	12.801	0.057
R9	521A Princess Dr, Liverpool L14 9NA, UK	12.71	12.76	0.05
R10	503 Princess Dr, Liverpool L14 9NA, UK	12.76	12.82	0.06
R11	476 Princess Dr, Liverpool L14 9NF, UK	12.686	12.73	0.044
R12	510B Princess Dr, Liverpool L14 9NG, UK	12.701	12.749	0.048
R13	58 Burtree Rd, Liverpool L14 8XH, UK	12.74	12.797	0.057
R14	552 Princess Dr, Liverpool L14 9NQ, UK	12.711	12.758	0.047
R15	455 Princess Dr, Liverpool L14 8XE, UK	12.639	12.675	0.035
R16	398 Princess Dr, Liverpool L14 8XQ, UK	12.583	12.609	0.025

As indicated in Table C3, annual mean PM₁₀ concentrations were below the relevant AQO at all receptor locations considered.

Predicted impacts on annual mean PM₁₀ concentrations are summarised in Table C4.

Table C4: Predicted PM₁₀ Impacts

Receptor		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R1	55 Ashbury Rd, Liverpool L14 8UX, UK	0.081	75% or Less than AQO	Negligible
R2	3 Ashbury Rd, Liverpool L14 8UX, UK	0.142	75% or Less than AQO	Negligible
R3	226 Southdean Rd, Liverpool L14 8UW, UK	0.131	75% or Less than AQO	Negligible
R4	194 Southdean Rd, Liverpool L14 8UW, UK	0.144	75% or Less than AQO	Negligible
R5	140 Lordens Rd, Liverpool L14 8UA, UK	0.085	75% or Less than AQO	Negligible
R6	47 Saxby Rd, Liverpool L14 9NS, UK	0.135	75% or Less than AQO	Negligible
R7	118 Lordens Rd, Liverpool L14 8UA, UK	0.11	75% or Less than AQO	Negligible
R8	545 Princess Dr, Liverpool L14 9NA, UK	0.143	75% or Less than AQO	Negligible
R9	521A Princess Dr, Liverpool L14 9NA, UK	0.126	75% or Less than AQO	Negligible

Receptor		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R10	503 Princess Dr, Liverpool L14 9NA, UK	0.149	75% or Less than AQO	Negligible
R11	476 Princess Dr, Liverpool L14 9NF, UK	0.111	75% or Less than AQO	Negligible
R12	510B Princess Dr, Liverpool L14 9NG, UK	0.12	75% or Less than AQO	Negligible
R13	58 Burtree Rd, Liverpool L14 8XH, UK	0.142	75% or Less than AQO	Negligible
R14	552 Princess Dr, Liverpool L14 9NQ, UK	0.118	75% or Less than AQO	Negligible
R15	455 Princess Dr, Liverpool L14 8XE, UK	0.088	75% or Less than AQO	Negligible
R16	398 Princess Dr, Liverpool L14 8XQ, UK	0.063	75% or Less than AQO	Negligible

As indicated in Table C4, impacts on annual mean PM₁₀ concentrations as a result of road vehicle exhaust emissions associated with the development were predicted to be not significant. It is therefore considered that the overall impacts as a result of the proposed development are **negligible**. Further justifications are discussed in Section 5.2.3 of the main report.

Particulate Matter (PM_{2.5})

Annual mean PM_{2.5} concentrations were predicted for 2027 DM and DS scenarios and are summarised Table C5.

Table C5: Predicted Annual Mean PM_{2.5} Concentrations

Receptors		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		DM	DS	Change
R1	55 Ashbury Rd, Liverpool L14 8UX, UK	7.893	7.91	0.017
R2	3 Ashbury Rd, Liverpool L14 8UX, UK	7.943	7.972	0.029
R3	226 Southdean Rd, Liverpool L14 8UW, UK	7.932	7.96	0.027
R4	194 Southdean Rd, Liverpool L14 8UW, UK	7.944	7.974	0.03
R5	140 Lordens Rd, Liverpool L14 8UA, UK	7.897	7.914	0.018
R6	47 Saxby Rd, Liverpool L14 9NS, UK	7.94	7.968	0.028
R7	118 Lordens Rd, Liverpool L14 8UA, UK	7.92	7.942	0.023
R8	545 Princess Dr, Liverpool L14 9NA, UK	7.947	7.977	0.03
R9	521A Princess Dr, Liverpool L14 9NA, UK	7.93	7.956	0.026
R10	503 Princess Dr, Liverpool L14 9NA, UK	7.956	7.987	0.031
R11	476 Princess Dr, Liverpool L14 9NF, UK	7.917	7.94	0.023
R12	510B Princess Dr, Liverpool L14 9NG, UK	7.925	7.95	0.025
R13	58 Burtree Rd, Liverpool L14 8XH, UK	7.945	7.974	0.029
R14	552 Princess Dr, Liverpool L14 9NQ, UK	7.931	7.955	0.025

Receptors		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		DM	DS	Change
R15	455 Princess Dr, Liverpool L14 8XE, UK	7.893	7.911	0.018
R16	398 Princess Dr, Liverpool L14 8XQ, UK	7.863	7.876	0.013

As indicated in Table C3, annual mean PM_{2.5} concentrations were below the relevant AQO at all receptor locations considered.

Predicted impacts on annual mean PM_{2.5} concentrations are summarised in Table C6.

Table C6: Predicted PM_{2.5} Impacts

Receptors		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R1	55 Ashbury Rd, Liverpool L14 8UX, UK	0.042	75% or Less than AQO	Negligible
R2	3 Ashbury Rd, Liverpool L14 8UX, UK	0.074	75% or Less than AQO	Negligible
R3	226 Southdean Rd, Liverpool L14 8UW, UK	0.068	75% or Less than AQO	Negligible
R4	194 Southdean Rd, Liverpool L14 8UW, UK	0.074	75% or Less than AQO	Negligible
R5	140 Lordens Rd, Liverpool L14 8UA, UK	0.044	75% or Less than AQO	Negligible
R6	47 Saxby Rd, Liverpool L14 9NS, UK	0.07	75% or Less than AQO	Negligible
R7	118 Lordens Rd, Liverpool L14 8UA, UK	0.057	75% or Less than AQO	Negligible
R8	545 Princess Dr, Liverpool L14 9NA, UK	0.074	75% or Less than AQO	Negligible
R9	521A Princess Dr, Liverpool L14 9NA, UK	0.065	75% or Less than AQO	Negligible
R10	503 Princess Dr, Liverpool L14 9NA, UK	0.078	75% or Less than AQO	Negligible
R11	476 Princess Dr, Liverpool L14 9NF, UK	0.057	75% or Less than AQO	Negligible
R12	510B Princess Dr, Liverpool L14 9NG, UK	0.063	75% or Less than AQO	Negligible
R13	58 Burtree Rd, Liverpool L14 8XH, UK	0.073	75% or Less than AQO	Negligible
R14	552 Princess Dr, Liverpool L14 9NQ, UK	0.062	75% or Less than AQO	Negligible
R15	455 Princess Dr, Liverpool L14 8XE, UK	0.046	75% or Less than AQO	Negligible

Receptors		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R16	398 Princess Dr, Liverpool L14 8XQ, UK	0.033	75% or Less than AQO	Negligible

As indicated in Table C6, impacts on annual mean PM_{2.5} concentrations as a result of road vehicle exhaust emissions associated with the development were predicted to be not significant. It is therefore considered that the overall impacts as a result of the proposed development are **negligible**. Further justifications are discussed in Section 5.2.3 of the main report.

APPENDIX D: SENSITIVITY ANALYSIS RESULTS

Predicted Concentrations at Sensitive Receptors – 2023 Emissions

Sensitivity analysis was undertaken to assess associated road vehicle exhaust emissions impacts based on the use of 2027 traffic data using 2023 emission factors. The use of 2023 emission factors assumes that vehicle emission factors will not improve in line with current predictions and future emission factors will remain consistent with those predicted for the baseline year. This ensures a worst-case scenario.

The results are detailed in the following Sections.

Nitrogen Dioxide (NO₂)

Annual mean NO₂ concentrations were predicted for 2023 DM and DS scenarios and are summarised in Table D1.

Table D1: Predicted Annual Mean NO₂ Concentrations

Potential Impact		Predicted Annual Mean NO ₂ Concentration (µg/m ³)		
		DM	DS	Change
R1	55 Ashbury Rd, Liverpool L14 8UX, UK	13.9	14.01	0.11
R2	3 Ashbury Rd, Liverpool L14 8UX, UK	14.26	14.46	0.2
R3	226 Southdean Rd, Liverpool L14 8UW, UK	14.18	14.36	0.18
R4	194 Southdean Rd, Liverpool L14 8UW, UK	14.26	14.46	0.2
R5	140 Lordens Rd, Liverpool L14 8UA, UK	13.9	14.02	0.12
R6	47 Saxby Rd, Liverpool L14 9NS, UK	14.22	14.41	0.19
R7	118 Lordens Rd, Liverpool L14 8UA, UK	14.04	14.19	0.15
R8	545 Princess Dr, Liverpool L14 9NA, UK	14.18	14.36	0.18
R9	521A Princess Dr, Liverpool L14 9NA, UK	14.05	14.2	0.15
R10	503 Princess Dr, Liverpool L14 9NA, UK	14.24	14.44	0.2
R11	476 Princess Dr, Liverpool L14 9NF, UK	13.96	14.11	0.15
R12	510B Princess Dr, Liverpool L14 9NG, UK	14.01	14.16	0.15
R13	58 Burtree Rd, Liverpool L14 8XH, UK	14.26	14.46	0.2
R14	552 Princess Dr, Liverpool L14 9NQ, UK	14.08	14.23	0.15
R15	455 Princess Dr, Liverpool L14 8XE, UK	13.82	13.94	0.12
R16	398 Princess Dr, Liverpool L14 8XQ, UK	13.63	13.71	0.08

As indicated in Table D1, annual mean NO₂ concentrations were below the relevant AQO at all receptor locations considered.

Predicted impacts on annual mean NO₂ concentrations are summarised in Table D2.

Table D2: Predicted NO₂ Impacts

Potential Impact		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R1	55 Ashbury Rd, Liverpool L14 8UX, UK	0.275	75% or Less than AQO	Negligible
R2	3 Ashbury Rd, Liverpool L14 8UX, UK	0.5	75% or Less than AQO	Negligible
R3	226 Southdean Rd, Liverpool L14 8UW, UK	0.45	75% or Less than AQO	Negligible
R4	194 Southdean Rd, Liverpool L14 8UW, UK	0.5	75% or Less than AQO	Negligible
R5	140 Lordens Rd, Liverpool L14 8UA, UK	0.3	75% or Less than AQO	Negligible
R6	47 Saxby Rd, Liverpool L14 9NS, UK	0.475	75% or Less than AQO	Negligible
R7	118 Lordens Rd, Liverpool L14 8UA, UK	0.375	75% or Less than AQO	Negligible
R8	545 Princess Dr, Liverpool L14 9NA, UK	0.45	75% or Less than AQO	Negligible
R9	521A Princess Dr, Liverpool L14 9NA, UK	0.375	75% or Less than AQO	Negligible
R10	503 Princess Dr, Liverpool L14 9NA, UK	0.5	75% or Less than AQO	Negligible
R11	476 Princess Dr, Liverpool L14 9NF, UK	0.375	75% or Less than AQO	Negligible
R12	510B Princess Dr, Liverpool L14 9NG, UK	0.375	75% or Less than AQO	Negligible
R13	58 Burtree Rd, Liverpool L14 8XH, UK	0.5	75% or Less than AQO	Negligible
R14	552 Princess Dr, Liverpool L14 9NQ, UK	0.375	75% or Less than AQO	Negligible
R15	455 Princess Dr, Liverpool L14 8XE, UK	0.3	75% or Less than AQO	Negligible
R16	398 Princess Dr, Liverpool L14 8XQ, UK	0.2	75% or Less than AQO	Negligible

As indicated in Table D2, impacts on annual mean NO₂ concentrations as a result of road vehicle exhaust emissions associated with the development were predicted to be not significant. It is therefore considered that the overall impacts as a result of the proposed development are negligible. Further justifications are discussed in Section 5.2.3 of the main report.

Particulate Matter (PM₁₀)

Annual mean PM₁₀ concentrations were predicted for 2023 DM and DS scenarios and are summarised Table D3.

Table D3: Predicted Annual Mean PM₁₀ Concentrations

Potential Impact		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		DM	DS	Change
R1	55 Ashbury Rd, Liverpool L14 8UX, UK	12.959	12.993	0.034
R2	3 Ashbury Rd, Liverpool L14 8UX, UK	13.061	13.121	0.06
R3	226 Southdean Rd, Liverpool L14 8UW, UK	13.041	13.096	0.055
R4	194 Southdean Rd, Liverpool L14 8UW, UK	13.065	13.126	0.06
R5	140 Lordens Rd, Liverpool L14 8UA, UK	12.968	13.003	0.036
R6	47 Saxby Rd, Liverpool L14 9NS, UK	13.057	13.113	0.057
R7	118 Lordens Rd, Liverpool L14 8UA, UK	13.014	13.06	0.046
R8	545 Princess Dr, Liverpool L14 9NA, UK	13.069	13.129	0.06
R9	521A Princess Dr, Liverpool L14 9NA, UK	13.034	13.087	0.053
R10	503 Princess Dr, Liverpool L14 9NA, UK	13.087	13.149	0.063
R11	476 Princess Dr, Liverpool L14 9NF, UK	13.009	13.055	0.046
R12	510B Princess Dr, Liverpool L14 9NG, UK	13.024	13.075	0.05
R13	58 Burtree Rd, Liverpool L14 8XH, UK	13.066	13.126	0.06
R14	552 Princess Dr, Liverpool L14 9NQ, UK	13.035	13.084	0.049
R15	455 Princess Dr, Liverpool L14 8XE, UK	12.96	12.997	0.037
R16	398 Princess Dr, Liverpool L14 8XQ, UK	12.901	12.928	0.026

As indicated in Table D3, annual mean PM₁₀ concentrations were below the relevant AQO at all receptor locations considered.

Predicted impacts on annual mean PM₁₀ concentrations are summarised in Table D4.

Table D4: Predicted PM₁₀ Impacts

Potential Impact		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R1	55 Ashbury Rd, Liverpool L14 8UX, UK	0.085	75% or Less than AQO	Negligible
R2	3 Ashbury Rd, Liverpool L14 8UX, UK	0.149	75% or Less than AQO	Negligible
R3	226 Southdean Rd, Liverpool L14 8UW, UK	0.138	75% or Less than AQO	Negligible
R4	194 Southdean Rd, Liverpool L14 8UW, UK	0.151	75% or Less than AQO	Negligible
R5	140 Lordens Rd, Liverpool L14 8UA, UK	0.089	75% or Less than AQO	Negligible
R6	47 Saxby Rd, Liverpool L14 9NS, UK	0.142	75% or Less than AQO	Negligible

Potential Impact		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R7	118 Lordens Rd, Liverpool L14 8UA, UK	0.116	75% or Less than AQO	Negligible
R8	545 Princess Dr, Liverpool L14 9NA, UK	0.15	75% or Less than AQO	Negligible
R9	521A Princess Dr, Liverpool L14 9NA, UK	0.131	75% or Less than AQO	Negligible
R10	503 Princess Dr, Liverpool L14 9NA, UK	0.157	75% or Less than AQO	Negligible
R11	476 Princess Dr, Liverpool L14 9NF, UK	0.116	75% or Less than AQO	Negligible
R12	510B Princess Dr, Liverpool L14 9NG, UK	0.126	75% or Less than AQO	Negligible
R13	58 Burtree Rd, Liverpool L14 8XH, UK	0.149	75% or Less than AQO	Negligible
R14	552 Princess Dr, Liverpool L14 9NQ, UK	0.123	75% or Less than AQO	Negligible
R15	455 Princess Dr, Liverpool L14 8XE, UK	0.092	75% or Less than AQO	Negligible
R16	398 Princess Dr, Liverpool L14 8XQ, UK	0.066	75% or Less than AQO	Negligible

As indicated in Table D4, impacts on annual mean PM₁₀ concentrations as a result of road vehicle exhaust emissions associated with the development were predicted to be not significant. It is therefore considered that the overall impacts as a result of the proposed development are negligible. Further justifications are discussed in Section 5.2.3 of the main report.

Particulate Matter (PM_{2.5})

Annual mean PM_{2.5} concentrations were predicted for 2023 DM and DS scenarios and are summarised Table D5.

Table D5: Predicted Annual Mean PM_{2.5} Concentrations

Potential Impact		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		DM	DS	Change
R1	55 Ashbury Rd, Liverpool L14 8UX, UK	8.223	8.241	0.018
R2	3 Ashbury Rd, Liverpool L14 8UX, UK	8.277	8.308	0.032
R3	226 Southdean Rd, Liverpool L14 8UW, UK	8.266	8.295	0.029
R4	194 Southdean Rd, Liverpool L14 8UW, UK	8.278	8.31	0.032
R5	140 Lordens Rd, Liverpool L14 8UA, UK	8.227	8.245	0.019
R6	47 Saxby Rd, Liverpool L14 9NS, UK	8.274	8.304	0.03
R7	118 Lordens Rd, Liverpool L14 8UA, UK	8.251	8.276	0.024
R8	545 Princess Dr, Liverpool L14 9NA, UK	8.28	8.312	0.032
R9	521A Princess Dr, Liverpool L14 9NA, UK	8.262	8.289	0.028

Potential Impact		Predicted Annual Mean PM ₁₀ Concentration (µg/m ³)		
		DM	DS	Change
R10	503 Princess Dr, Liverpool L14 9NA, UK	8.29	8.323	0.033
R11	476 Princess Dr, Liverpool L14 9NF, UK	8.248	8.273	0.025
R12	510B Princess Dr, Liverpool L14 9NG, UK	8.256	8.283	0.027
R13	58 Burtree Rd, Liverpool L14 8XH, UK	8.279	8.311	0.032
R14	552 Princess Dr, Liverpool L14 9NQ, UK	8.262	8.289	0.026
R15	455 Princess Dr, Liverpool L14 8XE, UK	8.222	8.242	0.019
R16	398 Princess Dr, Liverpool L14 8XQ, UK	8.19	8.204	0.014

As indicated in Table D3, annual mean PM_{2.5} concentrations were below the relevant AQO at all receptor locations considered.

Predicted impacts on annual mean PM_{2.5} concentrations are summarised in Table D6.

Table D6: Predicted PM_{2.5} Impacts

Potential Impact		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R1	55 Ashbury Rd, Liverpool L14 8UX, UK	0.045	75% or Less than AQO	Negligible
R2	3 Ashbury Rd, Liverpool L14 8UX, UK	0.079	75% or Less than AQO	Negligible
R3	226 Southdean Rd, Liverpool L14 8UW, UK	0.073	75% or Less than AQO	Negligible
R4	194 Southdean Rd, Liverpool L14 8UW, UK	0.08	75% or Less than AQO	Negligible
R5	140 Lordens Rd, Liverpool L14 8UA, UK	0.047	75% or Less than AQO	Negligible
R6	47 Saxby Rd, Liverpool L14 9NS, UK	0.075	75% or Less than AQO	Negligible
R7	118 Lordens Rd, Liverpool L14 8UA, UK	0.061	75% or Less than AQO	Negligible
R8	545 Princess Dr, Liverpool L14 9NA, UK	0.079	75% or Less than AQO	Negligible
R9	521A Princess Dr, Liverpool L14 9NA, UK	0.07	75% or Less than AQO	Negligible
R10	503 Princess Dr, Liverpool L14 9NA, UK	0.083	75% or Less than AQO	Negligible
R11	476 Princess Dr, Liverpool L14 9NF, UK	0.061	75% or Less than AQO	Negligible
R12	510B Princess Dr, Liverpool L14 9NG, UK	0.067	75% or Less than AQO	Negligible

Potential Impact		% Change in Concentration Relative to AQO	Long Term Average Concentration	Impact
R13	58 Burtree Rd, Liverpool L14 8XH, UK	0.079	75% or Less than AQO	Negligible
R14	552 Princess Dr, Liverpool L14 9NQ, UK	0.066	75% or Less than AQO	Negligible
R15	455 Princess Dr, Liverpool L14 8XE, UK	0.049	75% or Less than AQO	Negligible
R16	398 Princess Dr, Liverpool L14 8XQ, UK	0.035	75% or Less than AQO	Negligible

As indicated in Table D6, impacts on annual mean PM_{2.5} concentrations as a result of road vehicle exhaust emissions associated with the development were predicted to be negligible. It is therefore considered that the overall impacts as a result of the proposed development are not significant. Further justifications are discussed in Section 5.2.3 of the main report.

APPENDIX E: 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 E1.

Table E1: Construction Dust - Magnitude of Emission

Magnitude	Activity	Criteria
Large	Demolition	<ul style="list-style-type: none"> ● 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

Magnitude	Activity	Criteria
	Earthworks	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Total building volume greater than 75,000m³ On site concrete batching Sandblasting
	Trackout	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Total building volume 12,000m³ to 75,000m³ Potentially dusty construction material Demolition activities 6m to 12m above ground level
	Earthworks	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Total building volume 18,000m³ to 110,000m³ Potentially dusty construction material (e.g. concrete) On site concrete batching
	Trackout	<ul style="list-style-type: none"> 20 to 50 HDV trips per day Moderately dusty surface material (e.g. high clay content) Unpaved road length 50m to 100m
Small	Demolition	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Total building volume less than 18,000m³ Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	<ul style="list-style-type: none"> <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 E2.

Table E2: Examples of Factors Defining Sensitivity of an Area

Sensitivity	Examples	
	Human Receptors	Ecological Receptors
High	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Internationally or nationally designated site e.g. Special Area of Conservation
Medium	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Nationally designated site e.g. Sites of Special Scientific Interest
Low	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • 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 E3.

Table E3: 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

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

Table E4 outlines the sensitivity of the area to human health impacts.

Table E4: 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
		1 - 10	Medium	Low	Low	Low
	28 - 32µg/m ³	More than 10	Medium	Low	Low	Low
		1 - 10	Low	Low	Low	Low
	24 - 28µg/m ³	More than 10	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low
Less than 24µg/m ³	More than 10	Low	Low	Low	Low	
	1 - 10	Low	Low	Low	Low	
Low	-	More than 1	Low	Low	Low	Low

Table E5 outlines the sensitivity of the area to ecological impacts.

Table E5: 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

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

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

Table E6: 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 E7 outlines the risk category from earthworks and construction activities.

Table E7: 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 E8 outlines the risk category from trackout.

Table E8: 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'.