

Table 16: Additional Area Sensitivity Factors to Potential Dust Impacts

Guidance	Comment
The likelihood of concurrent dust generating activity on nearby sites.	A review of the planning portal did not indicate any major development proposals likely to result in concurrent dust generation in the vicinity of the site.
Pre-existing screening between the source and the receptors.	There is no significant existing screening, but the site is adjacent to buildings to the east.
Conclusions drawn from analysing local meteorological data which accurately represent the area: and if relevant the season during which works will take place.	The predominant wind bearing at the site is from the south-west on general principle as shown in Figure 6 . As such, receptors to the north-east of the boundary are most likely to be affected by dust releases.
Conclusions drawn from local topography.	There is no topographical constraint to dust dispersion.
Duration of the potential impact, as a receptor may become more sensitive over time.	Currently it is unclear as to the duration of the construction phase. However, it is possible that it will extend over couple of years.
Any known specific receptor sensitivities which go beyond the classifications given in the document.	No specific receptor sensitivities identified during the baseline assessment.

5.2.8 Based on the criteria shown in **Table 7**, the sensitivity of the receiving environment to potential dust impacts was determined as **high**. This was because of residential properties nearby the development site.

5.2.9 The sensitivity of the receiving environment to specific potential dust impacts, based on the criteria shown in Section 3.2, is shown in **Table 17**.

Table 17: Sensitivity of the Surrounding Area to Potential Dust Impacts

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

5.2.10 The potential risk of dust impacts at the identified receptors is considered in the following Sections.

Step 2

Demolition

- 5.2.11 Demolition will be undertaken at the start of the construction phase. It is estimated that the building volume to be demolished is approx. less than 20, 000 m³. In accordance with the criteria outlined in **Table 6**, the magnitude of potential dust emissions from demolition is therefore **small**.
- 5.2.12 **Table 17** indicates the sensitivity of the area to dust soiling effects on people and property is **high**. In accordance with the criteria outlined in **Table 11**, the development is considered to be a **medium** risk site for dust soiling as a result of demolition.
- 5.2.13 **Table 17** indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outline in **Table 11**, the development is considered to be a **negligible** risk site for human health impacts as a result of demolition.

Earthworks

- 5.2.14 Earthworks will primarily involve excavating material, haulage, tipping and stockpiling, as well as site levelling and landscaping. The proposed development site covers an area less than 2,500 m². In accordance with the criteria outlined in **Table 6**, the magnitude of potential dust emissions from earthworks is therefore **small**.
- 5.2.15 **Table 17** indicates the sensitivity of the area to dust soiling effects on people and property is **high**. In accordance with the criteria outlined in **Table 12**, the development is considered to be a **low**-risk site for dust soiling as a result of earthworks.
- 5.2.16 **Table 17** indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in **Table 12**, the development is considered to be a **negligible** risk site for human health impacts as a result of earthworks.

Construction

- 5.2.17 Due to the size of the extension the total building volume is likely to be between 25,000 - 100,000 m³. In accordance with the criteria outlined in **Table 6**, the magnitude of potential dust emissions from construction is therefore **medium**.
- 5.2.18 **Table 17** indicates the sensitivity of the area to dust soiling effects on people and property is **high**. In accordance with the criteria outlined in **Table 12**, the development is considered to be a **medium**-risk site for dust soiling as a result of construction activities.

- 5.2.19 **Table 17** indicates the sensitivity of the area to human health impacts is **low**. In accordance with the criteria outlined in **Table 12**, the development is considered to be a **low** risk site for human health impacts as a result of construction activities.

Trackout

- 5.2.20 Based on the site area, it is anticipated that the unpaved road length will be less than 50 m. In accordance with the criteria outlined in **Table 6**, the magnitude of potential dust emissions from trackout is therefore **small**.
- 5.2.21 **Table 17** indicates the sensitivity of the area to dust soiling effects on people and property is **high**. In accordance with the criteria outlined in **Table 13**, the development is considered to be a **low**-risk site for dust soiling as a result of trackout activities.
- 5.2.22 **Table 17** indicates the sensitivity of the area to human health impacts is **medium**. In accordance with the criteria outlined in **Table 13**, the development is considered to be a **negligible** risk site for human health impacts as a result of trackout activities.

Summary of the Risk of Dust Effects

- 5.2.23 A summary of the risk from each dust generating activity is provided in **Table 18**.

Table 18: Unmitigated Dust Risks During Construction				
Potential Impact	Unmitigated Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Low	Medium	Low
Human Health	Negligible	Negligible	Low	Negligible

- 5.2.24 As indicated in **Table 18**, the potential risk of dust soiling is **low** from earthworks, and Trackout, but **medium** from demolition and construction activities. The potential risk of human health effects is therefore **negligible** from demolition, earthworks, and Trackout, but **low** from construction activities.
- 5.2.25 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.

Step 3

- 5.2.26 The IAQM guidance¹⁵ provides potential mitigation measures to reduce impacts as a result of fugitive dust emissions during the construction phase. These have been adapted for the development site as summarised in **Table 19**. These may be reviewed prior to the commencement of construction works and incorporated into a Construction Environmental Management Plan if required by the LA.

Table 19: Fugitive Dust Emission Mitigation Measures	
Issue	Control Measure
Communications	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, which may include measures to control other emissions, approved by the LA.
Site management	Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. Make the complaints log available to the LA upon request. Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the logbook.
Monitoring	Carry out regular site inspections, record inspection results, and make an inspection log available to the LA upon request. Increase the frequency of site inspections when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.
Site preparation	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. Avoid site runoff of water or mud. Keep site fencing, barriers and scaffolding clean using wet methods. Remove materials that have the potential to produce dust from site as soon as possible. Cover, seed or fence stockpiles to prevent wind whipping.
Operating vehicle/machinery and sustainable travel	Ensure all vehicles switch off engines when stationary - no idling vehicles. Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
Operations	Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques. Ensure an adequate water supply on the site for effective dust suppression, using non-potable water where possible and appropriate. Use enclosed chutes and conveyors and covered skips.

¹⁵ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

Table 19: Fugitive Dust Emission Mitigation Measures

Issue	Control Measure
	Minimise drop heights and use fine water sprays 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	No bonfires or burning of waste materials.
Demolition	Ensure effective water suppression is used during demolition operations. Avoid explosive blasting, using appropriate manual or mechanical alternatives. Bag and remove any biological debris or damp down such material before demolition.
Earthworks	Re-vegetate earthworks and exposed areas/soil stockpiles to stabilises 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. Only remove secure covers in small areas during work and not all at once.
Construction	Avoid scabbling (roughening of concrete surfaces) if possible. Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out. Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos.
Trackout	Use water-assisted dust sweepers on the access and local roads (if required). Avoid dry sweeping of large areas. Ensure vehicles entering and leaving the site are covered to prevent escape of materials during transport. Implement a wheel washing system, if required.

Step 4

- 5.2.27 Assuming the relevant mitigation measures outlined in **Table 19** are implemented, the residual impacts from all dust generating activities is predicted to be **not significant**, in accordance with the IAQM guidance¹⁶.

5.3 Operational Phase

- 5.3.1 Ambient concentrations were predicted over the area NGR: 511390, 180785, to 511440, 180825. One Cartesian grid was used within the model to produce data suitable for contour plotting using the Surfer software package.

¹⁶ Guidance on the Assessment of Dust from Demolition and Construction V1.1, IAQM, 2016.

5.3.2 It should be noted that although the grid only covered the proposed site, road links were extended in order to ensure the impact of all relevant vehicle emissions in the vicinity of the site were considered.

5.3.3 **Figure 5** shows a graphical representation of the road link locations

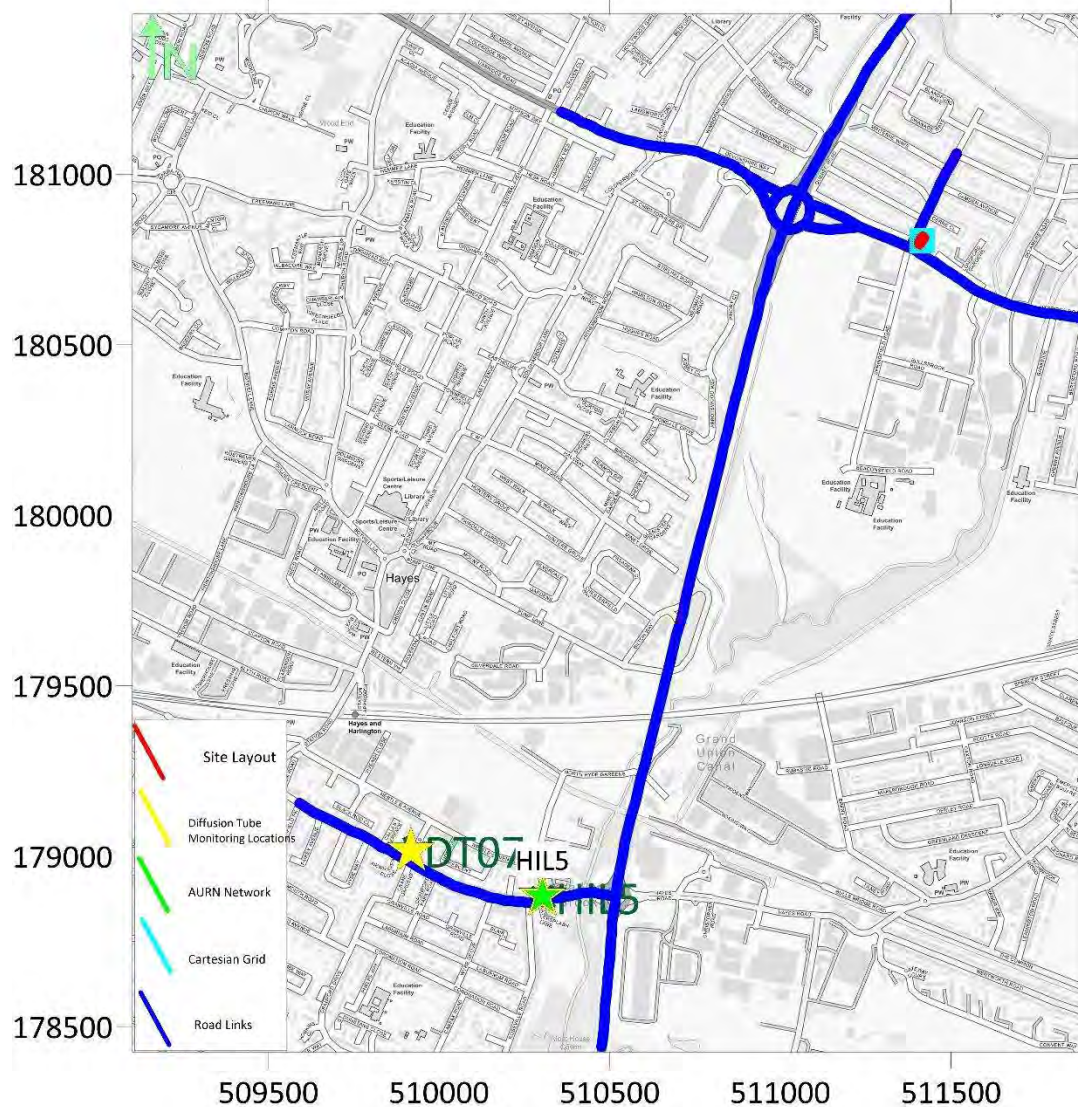


Figure 5: Graphical representation of the road link locations

Traffic Flow Data

5.3.4 Traffic data used for this assessment including verification of the model are 24-hour Annual Average Daily Traffic (AADT) and fleet composition as HDV proportion. Traffic data of Springfield Road was used for Brooks Road and for a robust information along with other traffic data links, these links were obtained from the Department for Transport (DfT). The DfT web tool enables the user to view and download traffic flows on every link of the 'A' road and

motorway network, as well as the selected minor roads, in Great Britain for the years 1999 to 2020. It should be noted that the DfT web tool is referenced in DEFRA guidance as being a suitable source of data for air quality assessments and it is therefore considered to provide a reasonable estimate of traffic flows in the vicinity of the site.

5.3.5 The baseline traffic data was converted to the development opening year utilising factors obtained from TEMPRO (version 7.2 and 6.2). This software package has been developed by the DfT to calculate future traffic growth throughout the UK.

5.3.6 Road widths were estimated from aerial photography and the UK highway design standards. A summary of the traffic data used in the assessment is provided in **Table 20**.

Table 20: Traffic Data						
Link		24-hour AADT Flow		HDV Prop . of Fleet (%)	Mean Vehicle Speed (km/h)	Road Width (m)
		2019	2023			
L1	A4020 Uxbridge Road	27,102	27,977	4.22	35	19.5
L2	Uxbridge Road	27,102	27,977	4.22	30	22.9
L3	Uxbridge Road	27,102	27,977	4.22	25	24.2
L4	Uxbridge Road	27,102	27,977	4.22	15	25.5
L5	Brookside Road	10,272	10,631	4.55	35	11.2
L6	Brookside Road	10,272	10,631	4.55	25	10.8
L7	Uxbridge Road	27,102	27,977	4.22	25	23.5
L8	Uxbridge Road	27,102	27,977	4.22	30	24.2
L9	Uxbridge Road Northbound	13,551	14,010	4.22	25	11.5
L10	Roundabout Parkway	46,642	48,117	4.22	30	18.5
L11	Uxbridge Road Southbound	13,551	14,010	4.22	25	12.2
L12	Uxbridge Road Westbound	15,632	16,155	3.27	20	9.2
L13	Uxbridge Road Eastbound	15,632	16,155	3.27	25	11.5
L14	A4020 Uxbridge Road	31,264	32,267	3.27	20	19.5
L15	Uxbridge Road	31,264	32,267	3.27	30	18.5
L16	Uxbridge Road Westbound	31,264	32,267	3.27	40	18.2
L17	The Parkway Northbound	51,445	53,067	2.31	30	18.5
L18	The Parkway	51,445	53,067	2.31	25	19.2
L19	A312 The Parkway	63377	65,366	4.75	30	21.5
L20	The Parkway	63377	65,366	4.75	40	19.5
L21	The Parkway/ North Hyde Garden	63377	65,366	4.75	30	19.2
L22	The Parkway	63377	65,366	4.75	25	21.2

Table 20: Traffic Data

Link		24-hour AADT Flow		HDV Prop . of Fleet (%)	Mean Vehicle Speed (km/h)	Road Width (m)
		2019	2023			
L23	A312 The Parkway	58381	60,216	6.86	20	21.5
L24	The Parkway Southbound	58381	60,216	6.86	35	19.5
L25	North Hyde Road/ Water Splash	13695	14,158	4.34	20	13.2
L26	North Hyde Road/ Cranford Road	13695	14,158	4.34	25	10.5
L27	North Hyde Road Westbound	17500	18,080	4.33	20	15.2

Emission Factors

- 5.3.7 Emission factors for each link were calculated using the relevant traffic flows and the Emissions Factor Toolkit (version 11.0). This has been produced by DEFRA and incorporates with EFT v10.
- 5.3.8 It should be noted that the default fleet projections in EFT v11.0 are based on fleet growth assumptions which were current before the Covid-19 outbreak in the UK. In consequence, default fleet outputs from the tool do not reflect short- or longer-term impacts on emissions in 2020 and beyond resulting from behavioural change during the national or local lockdowns.
- 5.3.9 There is current uncertainty over NO₂ concentrations within the UK, with the implementation of new emission standards not resulting in the previously expected reduction in roadside levels. Therefore, 2019 emission factors were utilised in preference to the future year in order to provide robust concentration predictions. As predictions for 2019 were verified, it is considered the results are an indication of worst-case concentrations during the operation of the proposals.

Meteorological Data

- 5.3.10 Meteorological data used in the assessment was taken from London Heathrow airport meteorological station over the period 1st January 2019 to 31st December 2019 (inclusive). The meteorological station is located at NGR: 507726, 177177, which is approximately 5 km southeast of the site. It is anticipated that conditions would be reasonably similar over a distance of this magnitude. The data was therefore considered suitable for an assessment of this nature.

5.3.11 All meteorological records used in the assessment were provided by David Harvey, (ADM) Ltd, which is an established distributor of data within the UK.

5.3.12 **Figure 6** shows a wind rose of the utilised meteorological data.

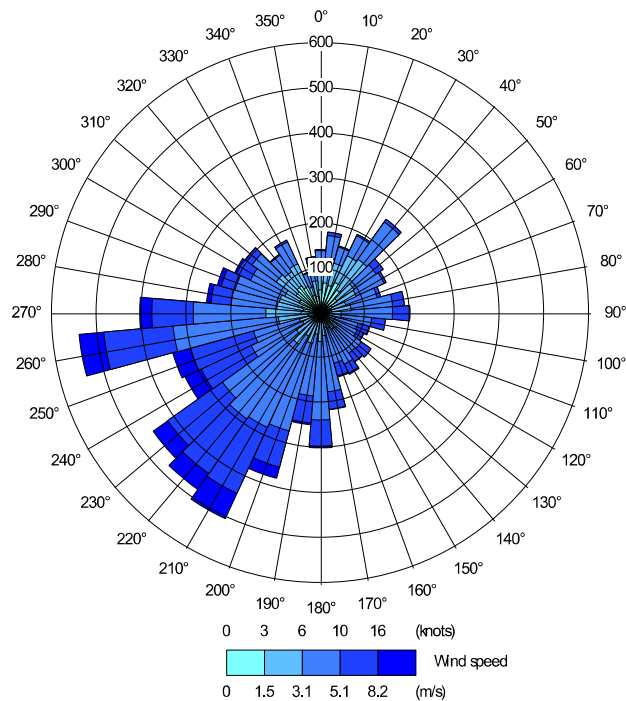


Figure 6: Wind rose of the utilised meteorological data

Roughness Length

5.3.13 The z_0 is a modelling parameter applied to allow consideration of surface height roughness elements. A spatially varying z_0 file generated from Corine Land Use data was included in the model to represent changes in land use throughout the modelling extents. This ensured a greater level of detail than the utilisation of a fixed z_0 value for the entire area.

5.3.14 A z_0 of 1.5 m was used to describe the dispersion and meteorological site. This is considered appropriate for the morphology of the area and is suggested within ADMS-Roads as being suitable for Large Urban Areas.

Monin-Obukhov Length

5.3.15 The Monin-Obukhov length provides a measure of the stability of the atmosphere. A minimum Monin-Obukhov length of 100m was used to describe the modelling extents and meteorological site. This is considered appropriate for the nature of both areas and is suggested within ADMS-Roads as being suitable for large conurbations > 1million.

Background Concentrations

- 5.3.16 Annual mean NO₂ and PM₁₀ background concentrations for use in the assessment were taken from the DEFRA mapping study for the grid square containing the site, as shown in **Table 5**. However as required diffusion tube (LH31) was used to represent background concentration at the site.
- 5.3.17 Similar to emission factors, background concentrations from 2019 were utilised in preference to the future year. This provided a robust assessment and is likely to overestimate pollutant concentrations during the operation of the proposals.

NO_x to NO₂ Conversion

- 5.3.18 Predicted annual mean NO_x concentrations were converted to NO₂ concentrations using the spreadsheet (version 8.1) provided by DEFRA, which is the method detailed within DEFRA guidance¹⁷.

Verification

- 5.3.19 The predicted results from a dispersion model may differ from measures concentrations for many 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.
- 5.3.20 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.
- 5.3.21 For the purpose of the assessment model verification was undertaken for 2019 using traffic data, meteorological data and monitoring results from this year.
- 5.3.22 LBH undertook monitoring of NO₂ concentrations at several monitoring locations but out of these, two suitable locations have been chosen within the modelling extents during 2019. Some nearside diffusion tubes were discounted due to lack of traffic data availability and due to its geographical location and nearby exhaustive road emissions. The results were

¹⁷ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

obtained and the road contributions to total NO_x concentrations calculated following the methodology contained within DEFRA guidance¹⁸. The monitored annual mean NO₂ concentrations and calculated road NO₂ concentrations are summarised in **Table 21**.

Table 21: NO ₂ Verification - Monitoring Results			
	Monitoring Site	Monitored NO ₂ Concentration (µg/m ³)	Modelled NO ₂ Concentration (µg/m ³)
HL07	Harold Avenue (first lamp post on left)	36.90	29.09
HIL5	Hillingdon Hayes	37.50	35.88

5.3.23 The annual mean road NO_x concentrations predicted from the dispersion model and the calculated 2019 road NO_x monitoring results are summarised in **Table 22**.

Table 22: NO _x Verification - Modelling Results			
	Monitoring Site	Calculated Road NO _x Concentration (µg/m ³)	Modelled Road NO _x Concentration (µg/m ³)
HL07	Harold Avenue (first lamp post on left)	9.27	4.19
HIL5	Hillingdon Hayes	18.43	8.34

5.3.24 The monitored and modelled road NO_x concentrations were graphed and the equation of the trendline based on linear regression through zero is calculated. A verification factor of **2.2099** was required to be applied to all road NO_x modelling results, as shown in **Figure 7**.

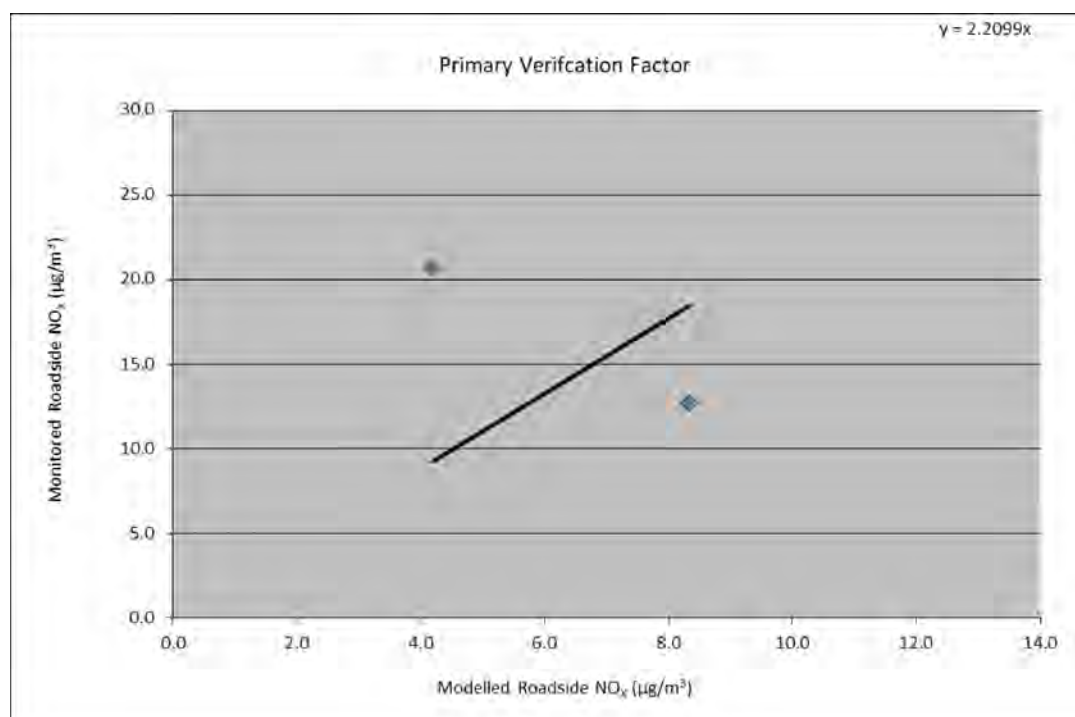


Figure 7: NO_x Primary factor

¹⁸ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

5.3.25 Monitoring of PM₁₀ concentrations is not undertaken in the vicinity of roads included within the assessment extents. The NO_x verification factor was therefore used to adjust model predictions of these species in accordance with DEFRA guidance¹⁹.

¹⁹ Local Air Quality Management Technical Guidance (TG16), DEFRA, 2018.

6 ASSESSMENT

6.1.1 The proposals have the potential to cause the exposure of future occupants to elevated pollution levels. Dispersion modelling was therefore undertaken with the inputs described in Section 5.3 to quantify air quality conditions at the site. This is outlined further in the following sections.

6.2 Nitrogen Dioxide

NO₂ Concentration at 1.5 m

6.2.1 The results of the dispersion modelling indicated that, annual mean NO₂ concentrations were below the AQO level of 60 ug/m³ at the ground floor ss shown in **Figure 8**. The maximum level at the front boundary was 45.65 µg/m³.

6.2.2 The annual mean NO₂ concentrations at rear double bedroom units was predicted to be above the AQO of 40 µg/m³. The maximum level at the rear boundary was 40.44 µg/m³.

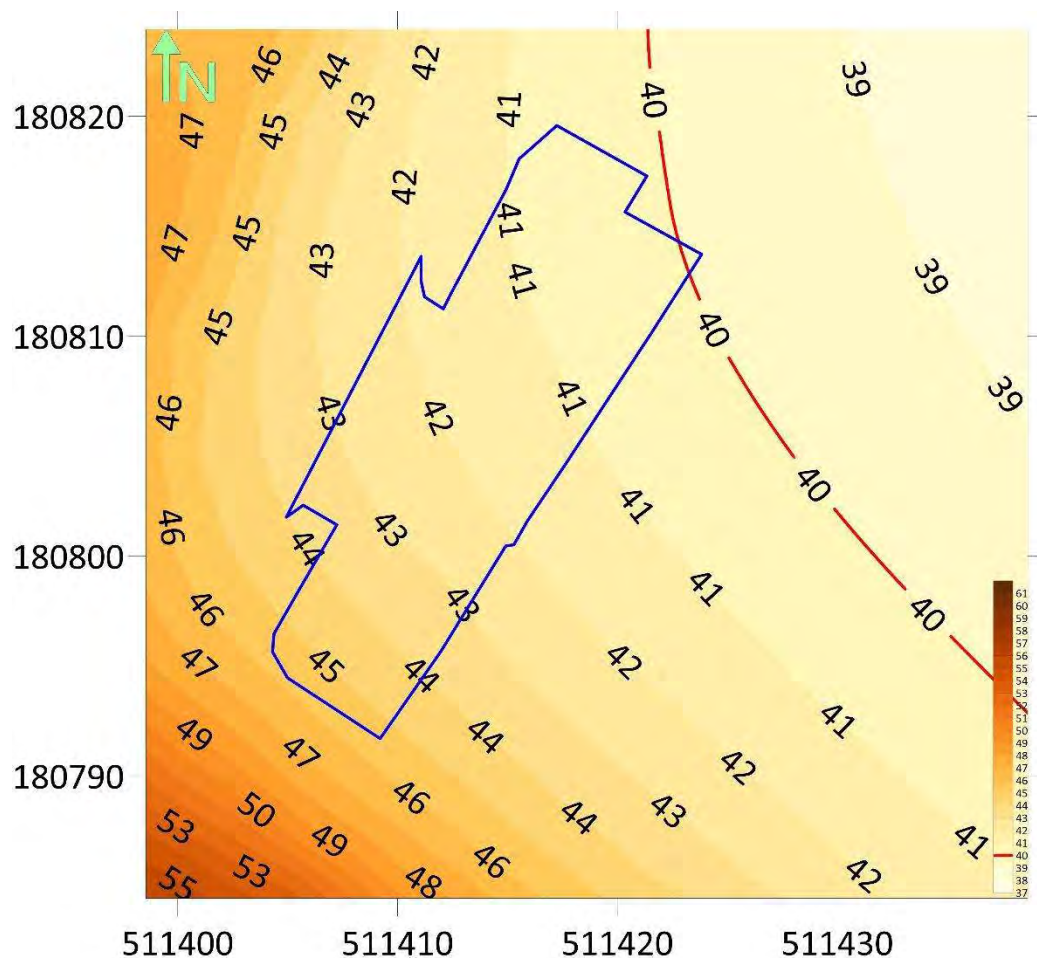


Figure 8: Predicted Annual Mean NO₂ Concentrations at Ground Floor

NO₂ Concentration at 4.5 m

- 6.2.3 Due to residential units above the commercial facility, dispersion modelling was undertaken at 4.5m. The modelling results indicated that annual mean NO₂ concentrations were below the AQO levels for rear units but 2-bed residential unit facing Uxbridge Road had maximum concentration of 42.91 ug/m³ as shown in **Figure 9**. Further away from the site boundary facing main road, pollutant concentration decreases gradually.

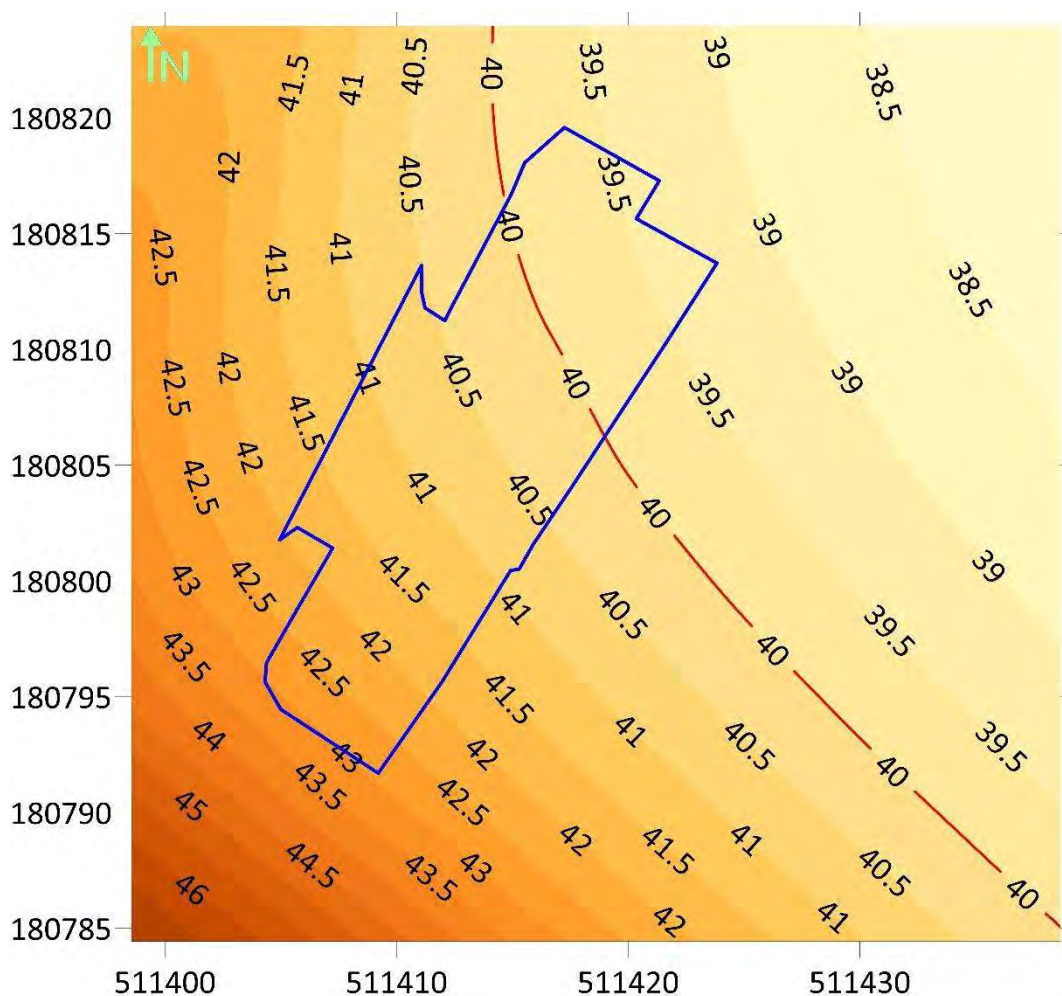


Figure 9: Predicted Annual Mean NO₂ Concentrations at 1st Floor

6.3 Particulate Matter

PM₁₀ Concentration at the development

- 6.3.1 The results of the dispersion modelling indicated that annual mean PM₁₀ concentrations were predicted to be below the AQO of 40 µg/m³ across the site, As shown in **Figure 10**. The maximum level at the boundary was 18.93 µg/m³.

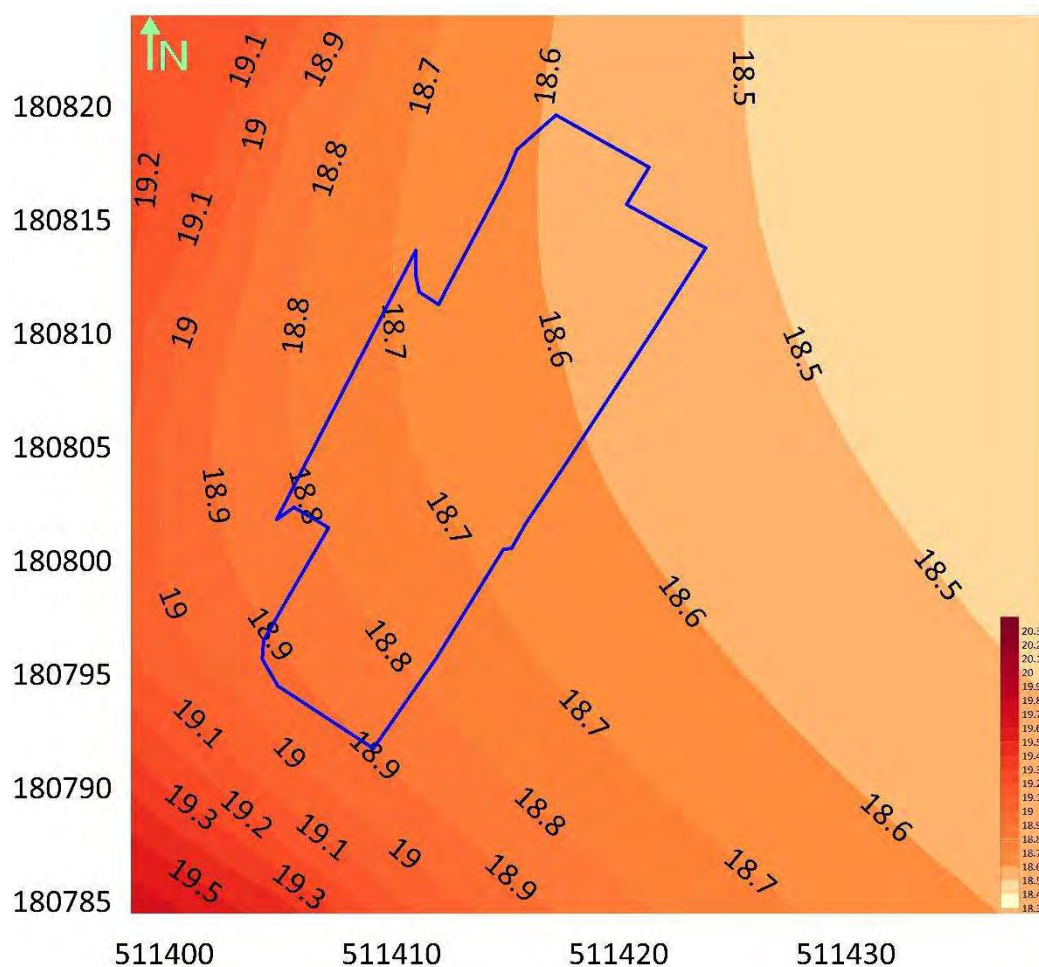


Figure 10: Predicted Annual Mean PM₁₀ Concentrations

- 6.3.2 Based on the assessment results, future occupants are predicted to be exposed to annual mean NO₂ concentrations above the relevant AQOs at the site. PM₁₀ are below the AQO levels, no further assessment was required at higher levels as air quality levels improve with altitudes. Hence, with reference to increased NO₂ concentration results, a short-term diffusion tube monitoring at the site is recommended for more realistic results.

7 AIR QUALITY NEUTRAL ASSESSMENT

7.1.1 Introduction

7.1.2 The London Local Plan includes Policy S1 “*development proposals must be at least Air Quality Neutral*”, to ensure proposed developments in London do not degrade air quality in areas where there are exceedances in AQOs of the EU limit values. As such, the Air Quality Neutral Planning Support²⁰ (AQNPS) has been published in 2014 which provides a methodology to conduct an ‘air quality neutral assessment’ by predicting potential emissions from a development including from building and transport and comparing with the emission benchmark values.

7.1.1 Developments that do not exceed these benchmarks are considered as ‘air quality neutral’, whilst, where the benchmark is exceeded then mitigation is required to offset any excess in emissions at site.

7.1.2 The air quality neutral policy focuses on NO_x and PM₁₀ emissions. The main components that should be considered in the Air Quality Neutral calculations are emissions from the energy sources used within the building, and emissions from the vehicles associated with the buildings use.

7.1.3 Building emissions benchmarks are outlined for NO_x and PM₁₀ for all land use classes by AQNPS and are presented in **Table 23**. This development comes under land use class A1 and C3.

Table 23: Building Emission Benchmarks by Land Use Category		
Land Use Class	NO _x (g/m ²)	PM ₁₀ (g/m ²)
A1 (Retail)	22.60	1.29
A3-A5 (Restaurants, drinking establishments, hot food takeaway)	75.2	4.32
A2, B1 (Financial/professional services/business)	30.80	1.77
B2-B7 (General industrial)	36.60	2.95
B8 (Storage and distribution)	23.60	1.90
C1 (Hotels)	70.90	4.07
C2 (Residential institutions)	68.50	5.97
C3 (Residential dwellings)	26.20	2.28
D1 (a) (Medical and health services)	43.00	2.74
D1 (b) (Crèche, day centres etc.)	75.00	4.30

²⁰ Air Quality Consultants and Environ; Air Quality Neutral Planning Support Update: GLA 80371, April 2014

Table 23: Building Emission Benchmarks by Land Use Category

Land Use Class	NO _x (g/m ²)	PM ₁₀ (g/m ²)
D1 (c-h) (Schools, libraries, places of worship etc.)	31.00	1.78
D2 (a-d) (Cinemas, concert halls etc.)	90.30	5.18
D2 (e) (Swimming pools, gymnasium etc.)	284.00	16.30

- 7.1.4 The Air Quality Neutral assessment has been carried out using AQNPS methodology and information about the development.

7.2 Building Emissions

- 7.2.1 As the heat and power demands will be met using an Air Source Heat Pumps (ASHP) system, there will be no NO_x or PM₁₀ emissions from the building that would impact on local air quality.

7.3 Road Transport Emissions

- 7.3.1 The Transport Emissions Benchmarks (TEBs) are based on the number of car trips generated by different land-use classes, together with the associated trip lengths and vehicle emission rates.
- 7.3.2 The AQNPS²¹ sets out the TEBs defined by a series of land use class for both NO_x and PM₁₀ as presented in **Table 24**.

Table 24: Transport Emissions Benchmarks (TEBs)

Land use		London Central Activity Zone (CAZ)	Inner	Outer
Retail (A1)	NO _x (g/m ² /annum)	169	219	249
Office (B1)		1.27	11.4	68.5
Residential (C3)	NO _x (g/dwelling/annum)	234	558	1553
Retail (A1)	PM ₁₀ (g/m ² /annum)	29.3	39.3	42.9
Office (B1)		0.22	2.05	11.8
Residential (C3)	PM ₁₀ (g/dwelling/annum)	40.7	100	267

- 7.3.3 The proposal is a mixed-use development with area up to 410 m² of development, comprising:

²¹ Air Quality Consultants and Environ; Air Quality Neutral Planning Support Update: GLA 80371, April 2014

- Ground floor: Retail unit and residential up to 220 m² (Class A1/C3);
- First floor: residential up to 206 m² (Class C3);
- The roof: residential up to 206 m² (Class C3);

7.3.4 Transport Emission Benchmark (TEB) has been calculated for NO_x and PM₁₀ as shown in **Table 25**.

Table 25: Calculation of the Benchmarked Transport Emissions (kg/annum)					
Land use (m ²)	Number of units / GIA m ²	Transport Emissions Benchmark (g/m ² or dwelling/annum)		Benchmarked Emissions (kg/annum)	
		NO _x	PM ₁₀	NO _x	PM ₁₀
Residential (C3)	9	1553	267	13.97	2.40
Retail (A1)	220 m ²	249	42.9	54.78	9.43
Development Total Transport Emission (kg/annum)				68.75	11.83

7.3.5 As shown in **Table 25**, based on the TEBs, the calculated total benchmarked transport emissions for the Development are 68.75 kg NO_x/annum and 11.83 kg PM₁₀/annum.

7.3.6 The total transport emissions for the residential and retail unit of the development have been calculated as shown in **Table 28** based on trip distance and emission factors as set out within the AQNPS document (**Table 26**, **Table 27**).

Table 26: Average Distance Travelled by Car per Trip			
Land use (m ²)	Distance (km/m ² /annum)		
	CAZ	Inner	Outer
Retail (A1)	9.3	5.9	5.4
Office (B1)	3.0	7.7	10.8
Residential (C3)	4.3	3.7	11.4

Table 27: Emission Factors			
Pollutant	g/vehicle-km		
	CAZ	Inner	Outer
NO _x	0.4224	0.370	0.353
PM ₁₀	0.0733	0.0665	0.0606

Table 28: Calculation of the Transport Emissions (kg/annum)							
Land use (m ²)	Trips per day	Trips per annum	Average Distance per trip	Distance travelled km/annum	Emission Factors (g/vehicle km)	Transport Emission (kg/annum)	
						NO _x	PM ₁₀
Residential (C3)	18	6,570	11.4	74,898	NO _x : 0.353	26.43	4.53
Retail (A1)	25	9,125	5.4	49,275	PM ₁₀ : 0.0606	17.39	2.98
Total transport Emissions						43.82	7.51

7.3.7 The total Transport Emissions for NO_x (43.82 kgNO_x/annum) are lower than the Transport Benchmark NO_x Emissions (68.75 kgNO_x/annum). Similarly, the Total Transport Emissions for PM₁₀ (7.51 kgPM₁₀/annum) are lower than the Transport Benchmark PM₁₀ Emissions (11.83 kgPM₁₀/annum). Therefore, the Development is considered to be 'Air Quality Neutral' in relation to transport emissions, and no further mitigation measures would be required.

7.4 Summary

7.4.1 Potential emissions from the development were assessed in order to determine compliance with the air quality neutral requirements of the London Plan. The results have indicated that the Development is considered to be 'Air Quality Neutral' in relation to both building and transport emissions.

7.4.2 In accordance with the SPG, no further action will be required either by on-site mitigation measures or by off-setting.

8 EXPOSURE ASSESSMENT

8.1.1 To assess the significance of the exposure of future users to air pollution and the levels of mitigation required, Air Pollution Exposure Criteria (APEC) has been used as shown in **Table 29**. These criteria have been published in the London Council's guidance for air quality assessments²².

Table 29: London Councils Air Pollution Exposure Criteria (APEC)				
Level	Applicable Range (NO ₂)	Applicable Range (PM ₁₀)	Recommendation	
A	>5% below national objective	Annual Mean >5% below national objective 24 hour mean >1 day less than the national objective	No air quality grounds for refusal; however, mitigation of any emissions should be considered.	
B	Between 5% below or above national objective	Annual Mean Between 5% below or above national objective 24 hour mean Between 1 day above or below the national objective	May not be sufficient air quality grounds for refusal, however appropriate mitigation must be considered e.g., maximise distance from pollution source, proven ventilation systems, parking considerations, winter gardens, internal layout considered and internal pollutant emissions minimised.	
C	>5% above national objective	Annual Mean >5% above national objective 24 hour mean >1 day more than the national objective	Refusal on air quality grounds should be anticipated, unless the Local Authority has a specific policy enabling such land use and ensure best endeavours to reduce exposure are incorporated. Worker exposure in commercial/industrial land uses should be considered further. Mitigation measures must be presented with air quality assessment, detailing anticipated outcomes of mitigation measures.	

8.1.2 The predicted annual mean NO₂ and PM₁₀ concentrations were assessed against the relevant APEC Level. Since the predicted annual mean of PM₁₀ and NO₂ (for retail unit) are likely to be less than 5% below AQO which falls into APEC Level A, the development site is deemed suitable for the future users, however, the predicted annual mean NO₂ are likely to be more than 5% above AQO which falls into APEC Level C. Therefore, as mentioned above, a short-term diffusion tube monitoring at the site is recommended to reduce uncertainty related to the model's input NO₂ background concentrations data. Furthermore,

²² London Councils Air Quality and Planning Guidance; Revised version- January 2007.

mitigations have been recommended to reduce the impacts of the development on air quality.

8.1.3 It should be noted that a robust assessment was undertaken using 2019 emission factors for the opening year of the project. Therefore, in light of current NO_x decline ratios, we are confident that air quality in future is likely to improve within area.

8.1.4 Following the APEC guide and site being in Focus area, some site-specific recommendations are proposed and summarised below.

8.1.5 Measures suggested for this development are set for reducing emissions from transport as outlined below:

- travel plan;
- secure cycle storage;
- car club scheme;
- using green infrastructure, in particular trees, to absorb dust and other pollutants;
- ventilation strategy;
- contributing funding to measures, including those identified in air quality action plans and low emission strategies, designed to offset the impact on air quality arising from new development

8.1.6 By application of above mitigation measures, the development will contribute to improve air quality within the area.

9 CONCLUSIONS

- 9.1.1 NoiseAir Limited have carried out an AQA in support of a mixed-use development at 152-154 Uxbridge Road, Uxbridge, UB4 0JH.
- 9.1.2 The proposals may result in exposure of future residents to poor air quality. As such, an AQA was undertaken in order to determine baseline conditions at the site, consider its suitability and identify constraints to the proposed end-use.
- 9.1.3 During the construction phase of the development there is the potential for air quality impacts as a result of fugitive dust emissions from the site. These were assessed in accordance with the IAQM methodology. Assuming good practice dust control measures are implemented, the residual significance of potential air quality impacts from dust generated by demolition, earthworks, construction and trackout activities was predicted to be **not significant**.
- 9.1.4 Dispersion modelling was undertaken in order to quantify pollutant concentrations at the site and to predict air quality impacts as a result of additional traffic generated as a result of the proposals. Results were subsequently verified using monitoring results obtained from LBH.
- 9.1.5 The results of the dispersion modelling assessment indicated that predicted PM₁₀ concentrations were below the relevant AQOs at all locations across the proposed site. Predicted concentration NO₂ for the retail unit were below standard AQO level of 60 ug/ m³, and therefore falls under APEC- “A”. However, for residential units, predicted concentration was above the AQO limits and hence mitigations are proposed. The location is therefore considered suitable for the proposed use with the inclusion of mitigation methods to protect future users from poor air quality.
- 9.1.6 The air quality neutral assessment has identified the development is considered to be ‘Air Quality Neutral’ in relation to both building and transport emissions. Thus, no further action will be required.

APPENDIX A - REPORT LIMITATIONS

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APPENDIX B - GLOSSARY

Air Quality Limit Value	Legally binding parameters defined in European Union air quality legislation that must not be exceeded. Limit values are set for individual pollutants and are a combination of a concentration value, an averaging time over which it is measured, the number of exceedences allowed per year, and a date by which it must be achieved.
Air Quality Management Area	An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives.
Air Quality Objective	The name given to the maximum ambient pollutant concentration that is not to be exceeded either without exception or within a permitted number of exceedences over a specified timescale for a pollutant outlined in the national Air Quality Strategy.
Air Quality Strategy	A national government document which contains standards, objectives and measures for improving ambient air quality.
Annual Average Daily Traffic	The number of traffic movements on a given road in a 24-hour period as an average across one year.
Background Concentration	The pollutant concentration assumed to represent baseline concentrations in the atmosphere across the modelled area.
Heavy Duty Vehicle	Vehicles with a gross weight of greater than 3.5 tonnes.
Monin-Obukhov Length	A measure of the stability of the atmosphere
Roughness Length	A measure of the surface roughness of the area

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