Ambient Air Quality Monitoring Results: Interim Report

Titnore Lane, West Durrington

Client: Compass Travel (Sussex) Limited

Reference: 5051-1r1

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Report Issue

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1.0 INTRODUCTION

1.1.1 Redmore Environmental was commissioned by Compass Travel (Sussex) Limited to undertake a programme of Ambient Air Quality Monitoring in support of a planning application for a bus depot on land off Titnore Lane, West Durrington.

1.1.2 A planning application for a bus depot and associated parking for circa 45 vehicles on land off Titnore Lane, West Durrington, has been submitted to Worthing Borough Council (WBC). Concerns have been raised by local residents in relation to existing pollution levels at the site. As such, WBC have requested that a programme of Air Quality Monitoring is undertaken at the site over a period of 3-months in order to evaulate baseline conditions.

1.1.3 An ambient air quality monitor was installed at the site on 27th March 2025 in order to address the requirement and has been operating continuously since installation. A summary of the monitoring methodology and results for the period 27th March 2025 to 1st May 2025 is provided in the following interim report.

2.0 SCOPE OF WORKS AND MONITORING METHODS

2.1 Monitoring Scope

2.1.1 An ambient air quality monitor was installed at the site on 27th March 2025 in order to allow quantification of baseline concentrations of the following pollutants:

- Particulate matter with an aerodynamic diameter of less than 10µm (PM_{10});
- Particulate matter with an aerodynamic diameter of less than 2.5µm ($PM_{2.5}$); and,
- Nitrogen dioxide (NO_2).

2.2 Monitoring Location

2.2.1 The bus depot is located on the southern section of an existing car park which is owned by the neighbouring Northbrook College. The monitor was installed on the north-eastern boundary of the car park, adjacent to the closest residential properties to the site which are located downwind of the depot with respect to prevailing meteorological conditions.

2.2.2 Further details of the monitoring location are provided in Table 1. Reference should be made to Figure 1 for a site layout plan and a visual representation of the monitoring position.

Table 1 Monitoring Location

Monitoring Location	NGR (m)	
	X	Y
Car park - north-eastern boundary	510453	103911

2.3 Monitoring Equipment

2.3.1 The monitoring is being undertaken using an EarthSense Zephyr air quality analyser. This instrument uses light-scattering optical particle counters to provide continuous measurement of PM_{10} and $PM_{2.5}$ concentrations in ambient air. NO_2 concentrations are measured using electrochemical sensors. The instrument features an internal data logger

and cellular GPS connections, which allow access to real-time air quality measurements and analysis tools.

2.3.2 Prior to deployment of the monitor, the system was checked to provide verification of sensor readings and to determine any adjustment required to optimise the accuracy of measurement data. In addition, the monitor was configured to measure PM_{10}, $PM_{2.5}$ and NO_2 concentrations at one-minute intervals with average levels logged every 1-hour. Following completion of system verification, installation of the monitor at the sampling location was undertaken by a trained technician.

2.3.3 The monitoring position and methodology were agreed with Nadeem Shad, Team Leader (Environmental Protection) at Adur District Council and WBC prior to installation. Following initial consultation, a daily log of site activities and qualitative observations of weather conditions was requested by Nadeem Shad. Reference should be made to Appendix 1 for the full log provided by the client.

3.0 AIR QUALITY LEGISLATION AND POLICY

3.1.1 The Air Quality Standards Regulations (2010) and subsequent amendments include Air Quality Limit Values (AQLVs) for the following pollutants:

- NO_2;
- Sulphur dioxide;
- Lead;
- PM_{10};
- $PM_{2.5}$;
- Benzene; and,
- Carbon monoxide.

3.1.2 Air Quality Target Values were also provided for several additional pollutants. It should be noted 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).

3.1.3 The Air Quality Strategy (AQS) was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published on 28th April 2023[1]. The document contains standards, objectives and measures for improving ambient air quality, including a number of Air Quality Objectives (AQOs). These are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedences over a specified timescale. These are generally in line with the AQLVs, although the requirements for the determination of compliance vary.

3.1.4 The Environmental Improvement Plan 2023[2] was published in January 2023, providing long term and Interim Targets in order to reduce population exposure to $PM_{2.5}$. The Concentration Target for 2040 was subsequently adopted in the Environmental Targets (Fine Particulate Matter) (England) Regulations (2023).

3.1.5 Table 2 presents the AQOs, Interim Target and Concentration Target for pollutants considered within this assessment.

[1] AQS: Framework for Local Authority Delivery, DEFRA, 2023.

[2] Environmental Improvement Plan 2023, DEFRA, 2023.

Table 2 Air Quality Objectives/ Interim Target/ Concentration Target

Pollutant	Air Quality Objective/ Interim Target/ Concentration Target	
	Concentration (µg/m³)	Averaging Period
NO_2	40	Annual mean
	200	1-hour mean, not to be exceeded on more than 18 occasions per annum
PM_{10}	40	Annual mean
	50	24-hour mean, not to be exceeded on more than 35 occasions per annum
$PM_{2.5}$	12[(a)]	Annual mean
	10[(b)]	Annual mean

Note: (a) Interim Target to be achieved by end of January 2028.
(b) Concentration Target to be achieved by 2040.

4.0 MONITORING RESULTS

4.1.1 A summary of the results for monitoring completed between 27th March 2025 and 1st May 2025 is provided in the following sections.

4.2 Nitrogen Dioxide

4.2.1 The minimum, maximum and average 1-hour mean NO_2 concentrations measured at the monitoring location over the sampling period are summarised in Table 3.

Table 3 Monitoring Results - 1-hour Mean NO_2 Concentrations

Measured 1-hour Mean NO_2 Concentration (µg/m³)		
Minimum	**Average**	**Maximum**
0.00	16.60	241.12

4.2.2 As indicated in Table 3, the average 1-hour mean NO_2 concentration measured over the sampling period was below the annual mean AQO of 40µg/m³.

4.2.3 It should be noted that the long-term AQO for NO_2 is based on an annual averaging period. The results shown in Table 3 represent 1-hour mean concentrations measured over a period of approximately 5-weeks. As such, the measured average NO_2 concentration is not currently directly comparable to the standard and long-term levels at the position may be higher or lower than the reported value. Annualisation of the monitoring data to allow direct comparison against the AQO will be undertaken following completion of the monitoring campaign.

4.2.4 As indicated in Table 3, the maximum 1-hour mean NO_2 concentration measured at the monitoring position over the sampling period was above 200µg/m³. Further analysis of the monitoring data indicated that 1-hour mean concentrations exceeded this level on two occasions during the sampling interval.

4.2.5 The short-term AQO for NO_2 allows for up to 18 exceedences of the criteria per annum. As such, the maximum result shown in Table 3 does not represent an exceedence of the standard. Further analysis of the monitoring data will be undertaken following completion

of the sampling campaign to allow full interpretation of measured 1-hour mean NO_2 concentrations and comparison against the short-term AQO.

4.3 Particulate Matter

4.3.1 The minimum, maximum and average 1-hour mean PM_{10} concentrations measured at the monitoring location over the sampling period are summarised in Table 4.

Table 4 Monitoring Results - 1-hour Mean PM_{10} Concentrations

Measured 1-hour Mean PM_{10} Concentration (µg/m³)		
Minimum	**Average**	**Maximum**
2.52	12.53	42.39

4.3.2 As indicated in Table 4, the average 1-hour mean PM_{10} concentration measured over the sampling period was below the annual mean AQO of 40µg/m³.

4.3.3 Similarly to NO_2, the long-term AQO for PM_{10} is based on an annual averaging period. The results shown in Table 4 represent 1-hour mean concentrations measured over a period of approximately 5-weeks. As such, the measured average PM_{10} concentration is not currently directly comparable to the standard and long-term levels at the position may be higher or lower than the reported value. Annualisation of the monitoring data to allow direct comparison against the AQO will be undertaken following completion of the monitoring campaign.

4.3.4 The minimum, maximum and average 24-hour mean PM_{10} concentrations measured at the monitoring location over the sampling period are summarised in Table 5.

Table 5 Monitoring Results - 24-hour Mean PM_{10} Concentrations

Measured 24-hour Mean PM_{10} Concentration (µg/m³)		
Minimum	**Average**	**Maximum**
3.27	12.40	24.01

4.3.5 As indicated in Table 5, the maximum 24-hour mean PM_{10} concentration measured at the monitoring position over the sampling period was below the short-term AQO of 50µg/m³ which allows for up to 35 exceedences of the criteria per annum. Further analysis of the

monitoring data will be undertaken following completion of the sampling campaign to allow full interpretation of measured 24-hour mean PM_{10} concentrations and comparison against the short-term AQO.

4.3.6 The minimum, maximum and average 1-hour mean $PM_{2.5}$ concentrations measured at the monitoring location over the sampling period are summarised in Table 6.

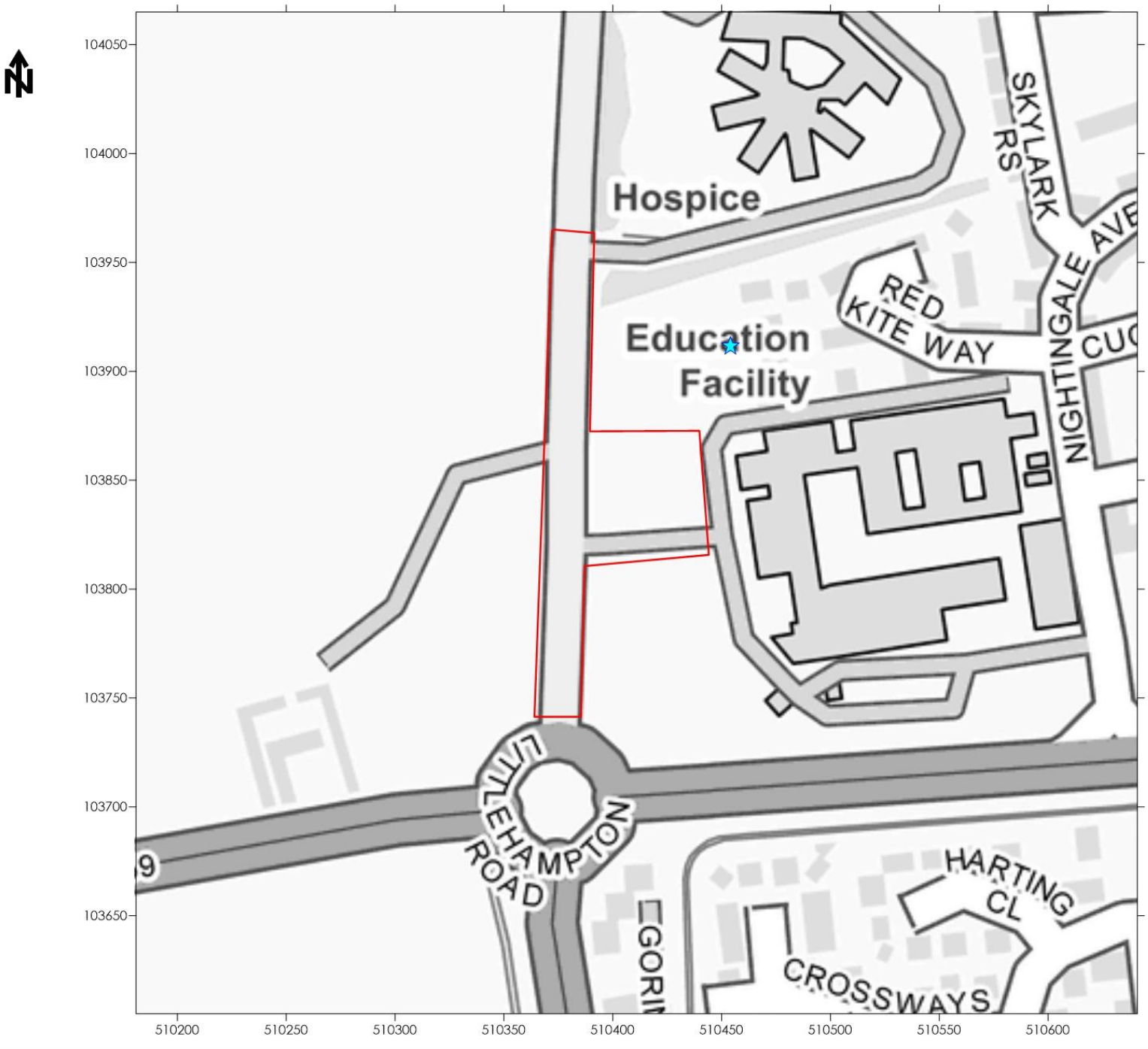
Table 6 Monitoring Results - 1-hour Mean $PM_{2.5}$ Concentrations

Measured 1-hour Mean $PM_{2.5}$ Concentration (µg/m³)		
Minimum	**Average**	**Maximum**
0.81	8.80	26.03

4.3.7 As shown in Table 6, the average 1-hour mean $PM_{2.5}$ concentration measured over the sampling period was below the current Interim and Concentration Targets of 12µg/m³ and 10µg/m³, respectively.

4.3.8 Similarly to NO_2 and PM_{10}, the Interim and Concentration Targets for $PM_{2.5}$ are based on an annual averaging period. The results shown in Table 6 represent 1-hour mean concentrations measured over a period of approximately 5-weeks. As such, the measured average $PM_{2.5}$ concentration is not currently directly comparable to the standards and long-term levels at the position may be higher or lower than the reported value. Annualisation of the monitoring data to allow direct comparison against the current Interim and Concentration Targets will be undertaken following completion of the monitoring campaign.

Figures



Legend

Site Boundary

Monitor

Title
Figure 1 - Site Location Plan and Monitoring Locations

Project
Air Quality Assessment
Titnore Lane, West Durrington

Project Reference
5051-1

Client
Compass Travel (Sussex) Limited

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Appendix 1 - Daily Log: Site Activity and Meteorological Observations

NORTHBROOK COLLEGE VEHICLE MOVEMENT LOG / WEATHER BN12 6NU

DATE	COMPASS	COLLEGE	COMMENTS	HALF TERM	WEATHER AM	WEATHER PM
MARCH						
Wed 26th	Buses depart 06.00*-08.00, return17.00-20.00	Staff/student cars arrive 08.00, leave 16.30				
Thurs 27th	Buses depart 06.00*-08.00, return17.00-20.00	Staff/student cars arrive 08.00, leave 16.30	The Arundel Restaurant lunch 12.00-14.30			
Fri 28th	Buses depart 06.00*-08.00, return17.00-20.00	Staff/student cars arrive 08.00, leave 16.30				
Sat 29th	Buses depart 06.00*-08.00, return17.00-20.00	No students, skeleton college staff				
Sun 30th	No movements					
Mon 31st	Buses depart 06.00*-08.00, return17.00-20.00	Staff/student cars arrive 08.00, leave 16.30				
APRIL						
Tues 1st	Buses depart 06.00*-08.00, return17.00-20.00	Staff/student cars arrive 08.00, leave 16.30				
Weds 2nd	Buses depart 06.00*-08.00, return17.00-20.00	Staff/student cars arrive 08.00, leave 16.30				
Thurs 3rd	Buses depart 06.00*-08.00, return17.00-20.00	Staff/student cars arrive 08.00, leave 16.30	The Arundel Restaurant lunch 12.00-14.30			
Fri 4th	Buses depart 06.00*-08.00, return17.00-20.00	Staff/student cars arrive 08.00, leave 16.30				
Sat 5th	Buses depart 06.00*-08.00, return17.00-20.00	No students, skeleton college staff				
Sun 6th	No movements					
Mon 7th	Buses depart 06.00*-09.30, return17.00-20.00	Skeleton college staff				
Tues 8th	Buses depart 06.00*-09.30, return17.00-20.00	Skeleton college staff				
Weds 9th	Buses depart 06.00*-09.30, return17.00-20.00	Skeleton college staff				
Thurs 10th	Buses depart 06.00*-09.30, return17.00-20.00	Skeleton college staff	The Arundel Restaurant lunch 12.00-14.30			
Fri 11th	Buses depart 06.00*-09.30, return17.00-20.00	Skeleton college staff	College used carpark in evening for theatre production			
Sat 12th	Buses depart 06.00*-09.30, return17.00-20.00	No students, skeleton college staff	College used carpark in evening for theatre production			
Sun 13th	No movements					
Mon 14th	Buses depart 06.00*-09.30, return17.00-20.00	Skeleton college staff				
Tues 15th	Buses depart 06.00*-09.30, return17.00-20.00	Skeleton college staff				
Weds 16th	Buses depart 06.00*-09.30, return17.00-20.00	Skeleton college staff				
Thurs 17th	Buses depart 06.00*-09.30, return17.00-20.00	Skeleton college staff	The Arundel Restaurant lunch 12.00-14.30			
Fri 18th	No movements		Bank holiday (Good Friday)			
Sat 19th	Buses depart 06.00*-09.30, return17.00-20.00	Skeleton college staff				
Sun 20th	No movements					
Mon 21st	No movements		Bank holiday (Easter Monday)			
Tues 22nd	Buses depart 06.00-08.00, return17.00-20.00	Staff/student cars arrive 08.00, leave 16.30				
Weds 23rd	Buses depart 06.00-08.00, return17.00-20.00	Staff/student cars arrive 08.00, leave 16.30			Cloudy	Cloudy
Thurs 24th	Buses depart 06.00-08.00, return17.00-20.00	Staff/student cars arrive 08.00, leave 16.30	The Arundel Restaurant lunch 12.00-14.30		Cloudy 13º w/s 5-7	Cloudy 14º w/s 6
Fri 25th	Buses depart 06.00-08.00, return17.00-20.00	Staff/student cars arrive 08.00, leave 16.30			Clear 12º w/s 7 (S/E)	Sunny 13º w/s 9 (S/E))
Sat 26th	Buses depart 06.00-08.00, return17.00-20.00	No students, skeleton college staff			Clear 13º w/s 8 (E-S/E)	Sunny 15º w/s 8 (S/E)
Sun 27th	No movements				Clear 13º w/s 4 (S)	Clear 16º w/s 9 (S/W)
Mon 28th	Buses depart 06.00-08.00, return17.00-20.00	Staff/student cars arrive 08.00, leave 16.30			Sunny 15º w/s 3 (S/E)	Sunny 17º w/s 6 (S-S/E)
Tues 29th	Buses depart 06.00-08.00, return17.00-20.00	Staff/student cars arrive 08.00, leave 16.30			Sunny 17º w/s 8 (E-S/E)	Sunny 21º w/s 10 (E-S/E)
Weds 30th	Buses depart 06.00-08.00, return17.00-20.00	Staff/student cars arrive 08.00, leave 16.30			Sunny 17º w/s 5 (E-S/E)	Sunny 20º w/s 7 (S/E)

* 1 buses leaves at 05.30
# some college evening classes