



Appendix 11.4

Air Quality Monitoring Report – Development of Land East of Hemel Hempstead

Air Quality Environmental Impact Assessment

**Appendix 11.4 - Air Quality Monitoring Report - Development on Land
East of Hemel Hempstead**

Redbourn Road, Hemel Hempstead



1.0 INTRODUCTION

- 1.1.1 This Technical Appendix provides the air quality monitoring data undertaken by The Crown Estate for the development on Land East of Hemel Hempstead. This report was provided by the East Hemel Project Team to inform baseline studies and dispersion modelling in the Air Quality Chapter of the Environmental Statement. This should be read in conjunction with the Chapter and the other Technical Appendices.

The Crown Estate

Air Quality Monitoring Report

LAND EAST OF HEMEL HEMPSTEAD

temple

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1 Introduction

Temple Group Limited (Temple) has undertaken a nitrogen dioxide (NO₂) air quality monitoring survey for the Proposed Development at the land to the east of Hemel Hempstead, which is allocated for residential development by Saint Albans City and District Council (SACDC).

An Air Quality Chapter of an Environmental Statement ('ES Chapter'), which will include an assessment of air quality impacts is expected to take place to accompany an eventual planning application for the Site.

The NO₂ air quality monitoring exercise has thus been undertaken at roadside locations in the vicinity of the area where dispersion modelling is anticipated, and at a background location, to understand air quality away from the sources to be modelled.

This report summarises the method used to undertake the air quality monitoring and the study's findings.

2 Air Quality Monitoring Method

2.1 Method for determining NO₂ concentration

A three-month NO₂ diffusion tube survey was carried out in line with the Local Air Quality Management Technical Guidance (Department for Environment, Food and Rural Affairs (Defra), 2022) ('TG22'). Diffusion tubes are an indicative monitoring method with an uncertainty of approximately $\pm 25\%$. The tubes contain the chemical reagent triethanolamine (TEA) to absorb the pollutant to be measured from ambient air.

The diffusion tubes were supplied and analysed by Gradko International Limited (Gradko), a UKAS certified laboratory accredited to the AIR Proficiency Testing Scheme. The tubes were prepared with a known volume of 20% TEA in acetone.

A travel blank was also carried to and from the site during the installation and collection site visits to demonstrate that tubes from the batch were not contaminated before use, as a method of quality assurance.

In accordance with the Local Air Quality Management Technical Guidance 2022 (Department for Environment, Food and Rural Affairs, 2022) ('TG22'), the following method was followed in relation to processing data collected once all monitoring data were obtained:

1. The time-weighted average at each monitoring location was calculated as the tube changeover dates were not fully synchronised with the diffusion tube calendar;
2. Data were checked for obvious errors, such as spuriously low concentrations or where values appeared to be outliers due to potential tube contamination. No obvious errors were identified so no results were discounted;
3. It is anticipated that the air quality assessment may combine the results of this monitoring survey with monitoring undertaken by SACDC and Dacorum Borough Council (DBC, which covers almost all of Hemel Hempstead based on its current boundaries) to enable for models to be verified to confirm their accuracy. The latest year for which both councils have published air quality monitoring data at the time of writing is 2022. As there is known to be a general declining trend in annual mean NO₂ concentrations at roadside and background locations, the monitoring has been factored back using a projection factor applicable to each monitoring location;
4. Monitoring data were 'annualised' using 2022 calendar year data in accordance with TG22, which outlines a method for converting shorter monitoring periods to an equivalent annual mean concentration by calculating a factor representing the proportion of the period mean to the annual mean (averaged from multiple monitoring sites) and multiplying the monitored data by the calculated factor. Annualisation was undertaken using data at four background automatic monitoring

locations within 50 miles of the Site, affiliated to the AURN (Borehamwood Meadow Park; Haringey Priory Park South; North Kensington and Hillingdon);

5. To reduce bias, the applicable national bias adjustment factor (0.85) was applied to the annualised averaged monitoring results. This is because diffusion tubes are an indicative monitoring technique, they do not offer the same accuracy as an automatic chemiluminescent analyser, which could lead to results under- or over-reading (leading to negative or positive bias); and
6. The results from each of the duplicate monitoring locations were averaged.

2.2 Monitoring Locations

In accordance with TG22 guidance, seven sets of duplicate tubes; and one single tube; were installed at eight locations for a six-month period, between 8th March and 4th September 2024. They were either installed at background locations on or adjacent to Site; or adjacent to roads which may be used by traffic in the vicinity of the Site. **Figure 1** presents the locations at which NO₂ was monitored. A description of the monitoring locations is also provided in **Table 1**.

Figure 1: Map of Diffusion Tube Monitoring Locations



Note: The monitoring IDs above match those listed in Table 1 below.

Table 1: Diffusion Tube Monitoring Locations

Site ID	Site Name	Site Type	X	Y	Z	Distance from kerb (m)	Distance from road centreline (m) **
MP1	Field (eastern site boundary)	Background	510510	206101	1	N/A	N/A
MP2	Warwick Row***	Background	509138	206728	2.3	N/A	N/A
MP3	Leverstock Green Way	Roadside	508068	207205	2.19	1.0	6.5
MP4	Green Lane (south)	Roadside	508956	207599	2.07	4.1	7.9
MP5	Green Lane / A414 roundabout	Roadside	508925	207644	2.1	3.8	#
MP6	Green Lane (north)	Roadside	508946	208635	2.1*	2.0	8.3
MP7	Cherry Tree Lane***	Background	508451	209678	2	N/A	N/A
MP8	Hemel Hempstead Road	Roadside	509630	211021	2.34	1.2	4.9
Notes: * Height estimated. ** Estimate only using aerial satellite imagery; reliance should not be placed on these estimates for dispersion modelling in isolation. *** It should be noted that whilst this monitoring location is in close proximity to the kerb, the road is a single carriageway with relatively low AADT flows. Therefore, this location is considered to be representative of background concentrations. # This should be measured independently due to the traffic island affecting dispersion model setup.							

3 Results: NO₂ Concentrations

Table 1 summarises the laboratory analysis unadjusted and annualised and bias adjusted NO₂ concentrations.

The annual mean NO₂ AQO was not breached at any of the monitoring locations. As is typical, concentrations were lower at the background locations than roadside locations.

Table 1: Annual mean NO₂ concentrations at each of the monitoring locations considered (µg/m³)

Site ID	Annual mean NO ₂ concentrations (µg/m ³)						
	Time-weighted average mean	Projection factor type applied	Projection Factor	Concentration projected back to 2022	Annualised mean	Annualised, bias adjusted concentration	Final concentration
MP1a - Eastern boundary of Site, near southeastern corner	14.90	Background	1.12	16.71	20.61	17.51	17.20
MP1b - Eastern boundary of Site, near southeastern corner	14.37	Background	1.12	16.12	19.87	16.89	
MP2a - Warwick Row	8.61	Background	1.09	9.36	11.54	9.81	9.85
MP2b - Warwick Row	8.68	Background	1.09	9.43	11.63	9.89	
MP3a - Leverstock Green Way	22.05	Roadside (<10% HDV)	1.11	24.58	30.22	25.69	25.71
MP3b - Leverstock Green Way	22.09	Roadside (<10% HDV)	1.11	24.62	30.28	25.74	
MP4a - Green Lane (south)	25.94	Roadside (>10% HDV)	1.12	28.97	35.63	30.28	30.82
MP4b - Green Lane (south)	26.86	Roadside (>10% HDV)	1.12	29.99	36.88	31.35	
MP5a - A414/ Green Lane roundabout	27.58	Roadside (<10% HDV)	1.11	30.74	37.80	32.13	31.91
MP5b - A414/ Green Lane roundabout	27.19	Roadside (<10% HDV)	1.11	30.31	37.28	31.68	
MP6a - Green Lane (north)	15.20	Roadside (>10% HDV)	1.12	16.98	17.17	14.60	15.57
MP6b - Green Lane (north)	15.45	Roadside (>10% HDV)	1.12	17.25	19.46	16.54	
MP7a - Cherry Tree Lane	10.02	Background	1.09	10.90	12.29	10.45	10.45
MP7b - Cherry Tree Lane	10.03	Background	1.09	10.91	12.30	10.45	
MP8 - Hemel Hempstead Road	20.64	Roadside (<10% HDV)	1.11	23.01	26.14	22.22	22.22
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4 Summary

Temple has undertaken baseline nitrogen dioxide (NO₂) air quality monitoring using diffusion tubes at and around the Site. Monitoring was undertaken for a period of six months at locations representing both the background concentrations and concentrations adjacent to roads in the vicinity of the Site, which may be considered in an air quality assessment for the Proposed Development.

The annual mean NO₂ AQO was not breached at any of the monitoring locations. As expected, concentrations were lower at the background than roadside locations.