Slough Trading Estate

Air Quality Sensor Network Summary Report

(November 2023 - May 2024)

On behalf of **Segro Limited**

Project Ref: 33312071200 | Rev: Summary_Rev1 | Date: June 2024

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Document Control Sheet

Project Name: **Slough Trading Estate**

Project Ref: **33312071200 / 1001**

Report Title: **Air Quality Monitoring Summary – Month 1-7**

Doc Ref: **Summary_Rev1**

Date: **June 2024**

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For and on behalf of Stantec UK Limited				

Revision	Date	Description	Prepared	Reviewed	Approved
Draft	June 2024	Draft report for client comment	WS/JD	PB	PB
Rev1	June 2024	Issued following client review	WS/JD	PB	PB

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1 Introduction

1.1.1 Segro Limited has deployed an air quality sensor network across the Slough Trading Estate (STE) in order to gain an understanding of air quality conditions across the STE and to inform the New Simplified Planning Zone (SPZ).

1.1.2 This air quality sensor network was installed between November 2023 and January 2024 and Stantec UK Limited (Stantec) have been commissioned to review and analyse the data.

1.1.3 From November 2023 to May 2024, Stantec have completed monthly sensor network reviews focussing on the NO_2 and $PM_{2.5}$ concentrations in the STE. These reports are referred to in Section 7 – 'Further Analysis of Monitoring Data'.

1.1.4 This report presents an overview of the air quality sensor network, a summary of the monitoring results of nitrogen dioxide (NO_2) and particulate matter with an aerodynamic diameter <2.5μm ($PM_{2.5}$) for the monitoring period between 01-11-2023 and 31-05-2024 and investigation of the monitoring results.

1.1.5 Analysis has been completed using R Studio (v4.3.2) software with the OpenAir package (v. 2.18-0) (Carslaw and Ropkins, 2023). Trend analysis has been undertaken for temporal variations (diurnal, day of the week) as well as spatially considering onsite activities to identify potential influences.

2 STE Sensor Network

2.1 STE AQ Sensor Network

2.1.1 A network of forty Vortex *'VTX Air'* Air Quality Sensors have been installed across the STE as shown in **Figure 1**. The Sensors have been installed at locations to provide a geographical distribution across the STE (within the confines of available power supply), the sensors have been installed at a height of 3-5 m from ground level on existing CCTV poles with available power and access.

2.1.2 **Table 2-1** below presents the installation timeline for the deployment.

Table 2-1: Sensor Installation Dates

Sensor	Location	Installation Date
SN-0838	Post east of 515 Ipswich Road (Protyre)	30/10/2023
SN-0847	Post north of junction of Galvin Road with access road to rear of 630 Ajax Avenue	17/01/2024
SN-0867	Post north of 111 Whitby Road (Big Yellow Self Storage)	27/10/2023
SN-0883	Post east of 845 Plymouth Road (the Tyre Shop)	26/10/2023
SN-0966	Post north of 470 Malton Avenue (Virtus London 9)	27/10/2023
SN-0978	Post north of 418 Montrose Avenue (Iceland Supermarket)	01/11/2023
SN-0983	Post south of 763 Henley Road	03/11/2023
SN-0985	Post east of 145-147 Farnham Road (Poundland)	16/01/2024
SN-0991	Post on the junction between Bath Road and Galvin Road	02/11/2023
SN-0997	Post on the junction between Oxford Avenue and Dundee Road	30/10/2023
SN-1001	Post north of junction between Edinburgh Avenue and Sykes Road	30/10/2023
SN-1005	Post on Berkshire Avenue southwest of 163 Bestobell Road (PartsPlus)	31/10/2023
SN-1006	Post north of junction between Banbury Avenue and Dundee Road	27/10/2023
SN-1012	Post southeast of junction between Buckingham Avenue and Dover Road	17/01/2024
SN-1014	Post on Ipswich Road, east of 260 Bath Road	31/10/2023
SN-1026	Post at northern end of Dundee Road	30/10/2023
SN-1028	Post east of Unit 1 95-98 Farnham Road (Crown Decorating Centre)	27/10/2023
SN-1034	Post west of junction between Galvin Road and Ajax Avenue	17/01/2024
SN-1035	Post south of 241 Gresham Road	31/10/2023
SN-1073	Post north of 343 Edinburgh Avenue (Cromwell Tools)	30/10/2023
SN-1090	Post south of junction of Ipswich Road and Dover Road	30/10/2023
SN-1144	Post west of 415 Perth Avenue (KARL STORZ Endoscopy (UK) Ltd)	31/10/2023
SN-1155	Post north of junction between Bath Road and Leigh Road	16/11/2023
SN-1201	Post in car park of 300 Bath Road	27/10/2023
SN-1202	Post between 208 and 210 Bath Road	02/11/2023
SN-1219	Post east of 551 Fairlie Road (Robert Walpole and Partners)	01/11/2023
SN-1234	Post northeast of junction between Ajax Avenue and Leigh Road	18/01/2024
SN-1252	Post at junction of Dover Road and Bedford Avenue	17/01/2024
SN-1264	Post south of 501 Ipswich Road	30/10/2023

Sensor	Location	Installation Date
SN-1294	Post southwest of junction between Buckingham Avenue and Leigh Road	03/11/2023
SN-1314	Post north of 456 Yarmouth Road (Johnstone's Decorating Centre)	27/10/2023
SN-1317	Post north of junction of Banbury Avenue and Oxford Avenue	27/10/2023
SN-1328	Post east of junction of Henley Road and Buckingham Avenue	02/11/2023
SN-1538	Post on Plymouth Road, south of 830 Yeovil Road (Ragus Sugars)	26/10/2023
SN-1600	Post east of 381 Sykes Road (HR Owen Bodyworks)	10/10/2023
SN-1607	Post southwest of 200 Bath Road	02/11/2023
SN-1608	Post northeast of junction of Liverpool Road and Buckingham Avenue	17/01/2024
SN-1610	Post north of 93-95 Whitby Road (Paintseal Europe Ltd)	27/10/2023
SN-1643	Post northwest of junction of Ipswich Road and Bath Road	31/10/2023
SN-1646	Post southeast of junction of Buckingham Avenue and Hamilton Road	31/10/2023

2.1.3 **Table 2-2** below presents the dates that sensors were offline, primarily due to communication interruptions and overall data capture has been considered within the data analysis.

Table 2-2: Sensor Outage Dates

Sensor	Offline Periods	
SN-0838	18/01/2024 – 14/02/2024	
SN-0867	05/04/2024	
SN-0883	25/02/2024 – 29/02/2024	
SN-0978	01/04/2024 – 09/04/2024	
SN-0997	03/11/2024 – 19/11/2023	31/05/2024
SN-1001	16/11/2023 – 19/11/2023	
SN-1005	29/03/2024 – 08/04/2024	
SN-1006	03/11/2023 – 19/11/2023	31/05/2024
SN-1026	03/11/2023 – 19/11/2023	31/05/2024
SN-1028	26/11/2023 – 17/01/2024	
SN-1073	16/11/2023 – 19/11/2023	
SN-1090	18/01/2024 – 14/02/2024	
SN-1144	07/03/2024 – 10/03/2024	
SN-1155	17/11/2023 – 15/01/2024	
SN-1202	01/11/2023	
SN-1234	09/04/2024 – 14/04/2024	
SN-1264	18/01/2024 – 14/02/2024	
SN-1317	19/03/2024 – 14/04/2024	16/04/2024 – 28/04/2024
SN-1600	16/11/2023 – 19/11/2023	
SN-1610	05/04/2024-	

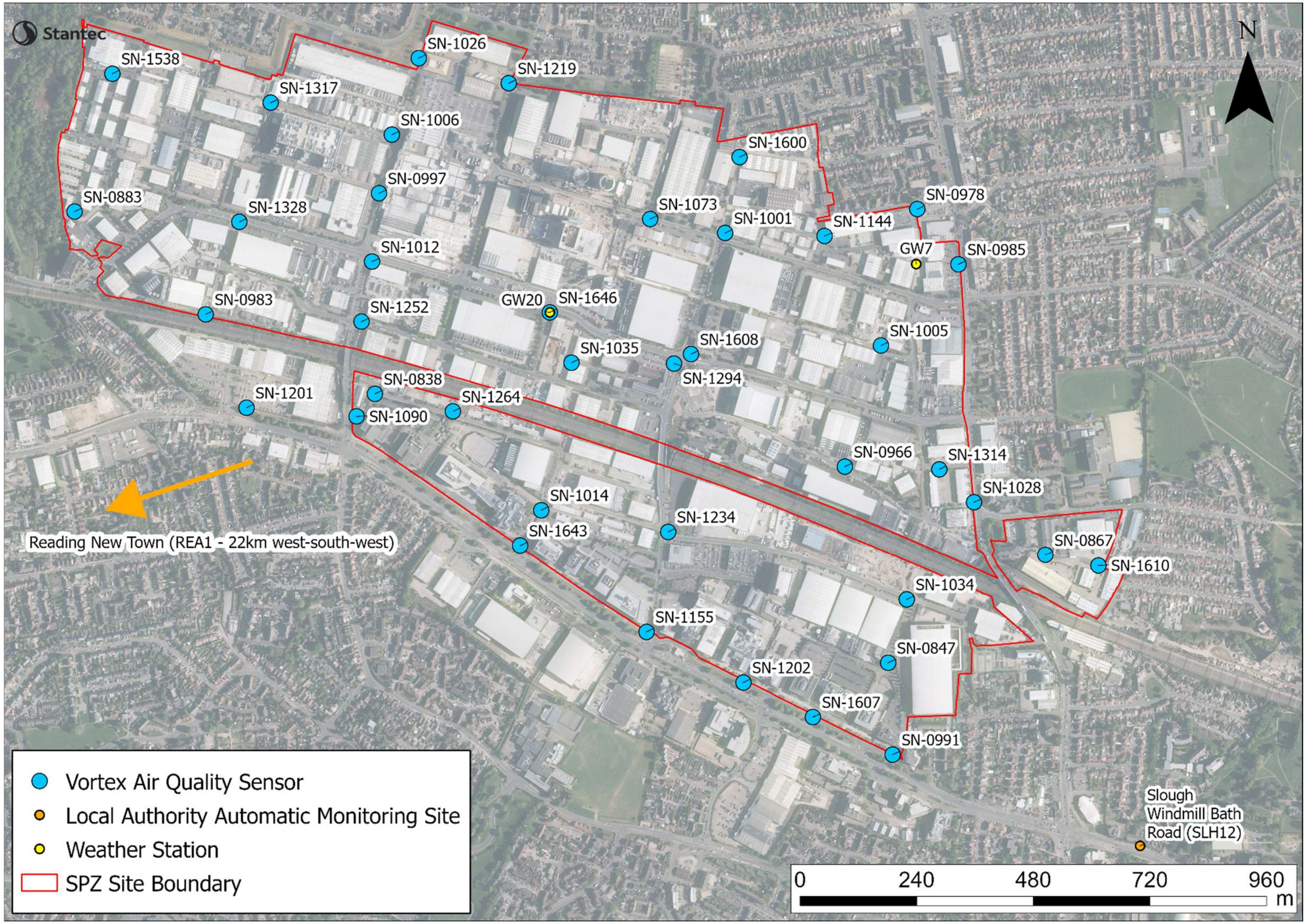

Figure 1: Air Quality Sensor Monitoring Locations in the STE.

2.2 Vortex Air Quality Sensor Specification

2.2.1 Sensor technology for monitoring of the concentration of air pollutants is relatively mature and has a key advantage that air quality sensors can be located on lampposts or other infrastructure and can provide useful data as to the trends and ranges of pollutant concentrations. It should be noted that the advantages as regards cost and practicality of sensor-based air quality monitoring technology does come with lower accuracy due to sensor interferences (other gases, temperature and humidity) and sensor drift; but the value of the large quantity of data can outweigh these limitations, subject to careful interpretation.

2.2.2 The monitoring results from the sensors should therefore not be seen as a way to identify formal compliance with regulatory limits (Air Quality Objectives) due to both limitations of the sensor technology and siting. The analysis of the sensor data should therefore focus on trends and variation to provide insight and information on sources and real-time exposure.

2.2.3 The Vortex Air sensors detect the concentrations of the following pollutants:

- Particulate Matter (PM_{10} and $PM_{2.5}$) – This is undertaken via optical light scattering. These optical counters detect the amplitude of the light scattered by interaction with particles by use of a single particle photodetector. The scattered intensity is proportional to the size of any individual particle in the sampling chamber.
- Nitrogen Dioxide (NO_2) – This is undertaken via electrochemical cells. This is a standard, low cost method of detection. It measures the concentration of a target gas by using oxidation or reduction reactions to generate a positive or negative current flow through an external circuit. These are however prone to varying performance in terms of sensitivity, selectivity, response time and operating life.
- Ozone (O_3) – Also undertaken via electrochemical cells. This is useful for apportioniNO_2/NO ratios for the calculation of NO_2 concentrations.

2.2.4 The sensors detect the concentrations continuously and 1-minute averages are uploaded from each Sensor via a Mesh Network (128-bit AES encryption) to the Vortex VTX Air Data Portal. The data can then be viewed as a live dashboard or downloaded for individual or groups of sensors to enable further processing and analysis.

2.2.5 The raw sensor output data is calibrated against individual calibration factors for each electrochemical cell determined by 2-week colocation study and algorithms are applied to account for temperature and humidity interferences.

2.2.6 The technical specification for the VTX Air sensors is provided in **Appendix B** and **Table 2-33** displays sensor characteristics for the VTX Air.

Table 2-33: Vortex Air Sensor Characteristics

	$PM_{2.5}$	PM_{10}	NO_2	O_3
Measurement Range	1 to 999 µg/m^3	1 to 1999 µg/m^3	0-20 ppm	0-20 ppm
Resolution	1 µg/m^3	1 µg/m^3	0.05 ppb (0.1µg/m^3)	0.05 ppb (0.1 µg/m^3)
Measurement Accuracy	Max (±2 µg/m$^{3)}$	Max (±5 µg/m$^{3)}$	Max (±4 µg/m^3, ±2ppb)	Max (±2 µg/m^{3,} ±2ppb
Precision R^2	>0.9	>0.9	>0.9	>0.85
90% Confidence Interval	4 µg/m^3	6 µg/m^3	3.6 ppb (7µg/m^3)	5 ppb (10 µg/m^3)

2.2.7 The VTX Air has, for its $PM_{2.5}$ measurement, MCERTS certification of Indicative Ambient Particulate Monitors for quality. This requires that the monitor is suitable under the following conditions as per the accreditation:

> *"For qualitative measurements: Providing qualitative measurement data for the analysis of particulate pollution trends, and source identification studies based for example on pollution roses etc. Such application can rely on instrument factory calibration only.*
>
> *For quantitative measurements: Providing measurement data with the uncertainty defined for indicative instruments (+/- 50%). This can be achieved on condition that each instrument used for measurement has been calibrated on the specific site where monitoring is taking place against a standard reference method for a period of two weeks and the resulting slope and intercept have been used for instrument calibration. Using non-standard filters and procedures for this purpose is not acceptable. To maintain the validity of data this calibration has to be repeated at least every twelve months or when the instrument is moved to a different site."*

2.3 Onsite Meteorological Monitoring

2.3.1 Two meteorological stations (Vantage Vue) have also been deployed to ascertain contemporaneous weather conditions (which can influence both emissions, reactions and dispersion of pollutants) with a connected data dashboard (Weatherlink).

2.3.2 The meteorological stations measure the following parameters:

- Temperature; (°C)
- Humidity (relative %);
- Wind Chill and Heat Index (°C);
- Barometric Pressure (hPa)
- Wind Speed and Direction (mph and compass direction); and
- Rainfall (mm).

3 Summary of Nitrogen Dioxide (NO_2) Results

3.1 STE Network Average - NO_2 Concentration

3.1.1 **Figure 2** presents the STE network daily average and rolling mean NO_2 concentrations (red line) from November to May against concentrations from a nearby automatic monitoring site ('Slough Windmill Bath Road' [SWBR] as shown in **Figure 1**) (blue line). The SWBR site is defined as an 'urban traffic' site and is within the AQMA No.3 declared by SBC for exceedances of the annual average NO_2 AQO and is therefore considered indicative of concentrations close to Bath Road.

3.1.2 As can be seen in **Figure 2**, the rolling mean STE Network average NO_2 concentration was between 10 - 15 µg/m^3 for the whole time period, staying consistently below the rolling mean for SWBR by between approximately 5 µg/m^3 and 20 µg/m^3.

3.2 STE Network Average - Trend Analysis

3.2.1 **Figure 3** displays a comparison between the STE Network average NO_2 concentration against date from SWBR.

3.2.2 The monitored NO_2 concentrations at the SWBR monitor demonstrate the expected diurnal trend of a roadside site, with morning and evening 'rush hour' peaks and considerably lower concentrations overnight (and during the 'inter-peak' period i.e 10am to 3pm) due to the lower traffic levels. These lower concentrations are also seen on weekends due to the lower traffic levels.

3.2.3 In using this dataset as a comparator, trends in the sensor data that are due to background (regional and transboundary inputs, secondary formation etc) as well as local road traffic influences can be identified. If a trend is not seen within the SWBR data but is evident within the sensor data, this could imply a more local source.

3.2.4 The average NO_2 concentrations across the STE (red line) follow the same diurnal pattern as the SWBR monitor (blue line), with the 'rush hour' peaks and lower levels overnight and during the inter-peak period. However, the STE average data clearly demonstrates a lower average concentration and a less pronounced diurnal influence especially in the PM period.

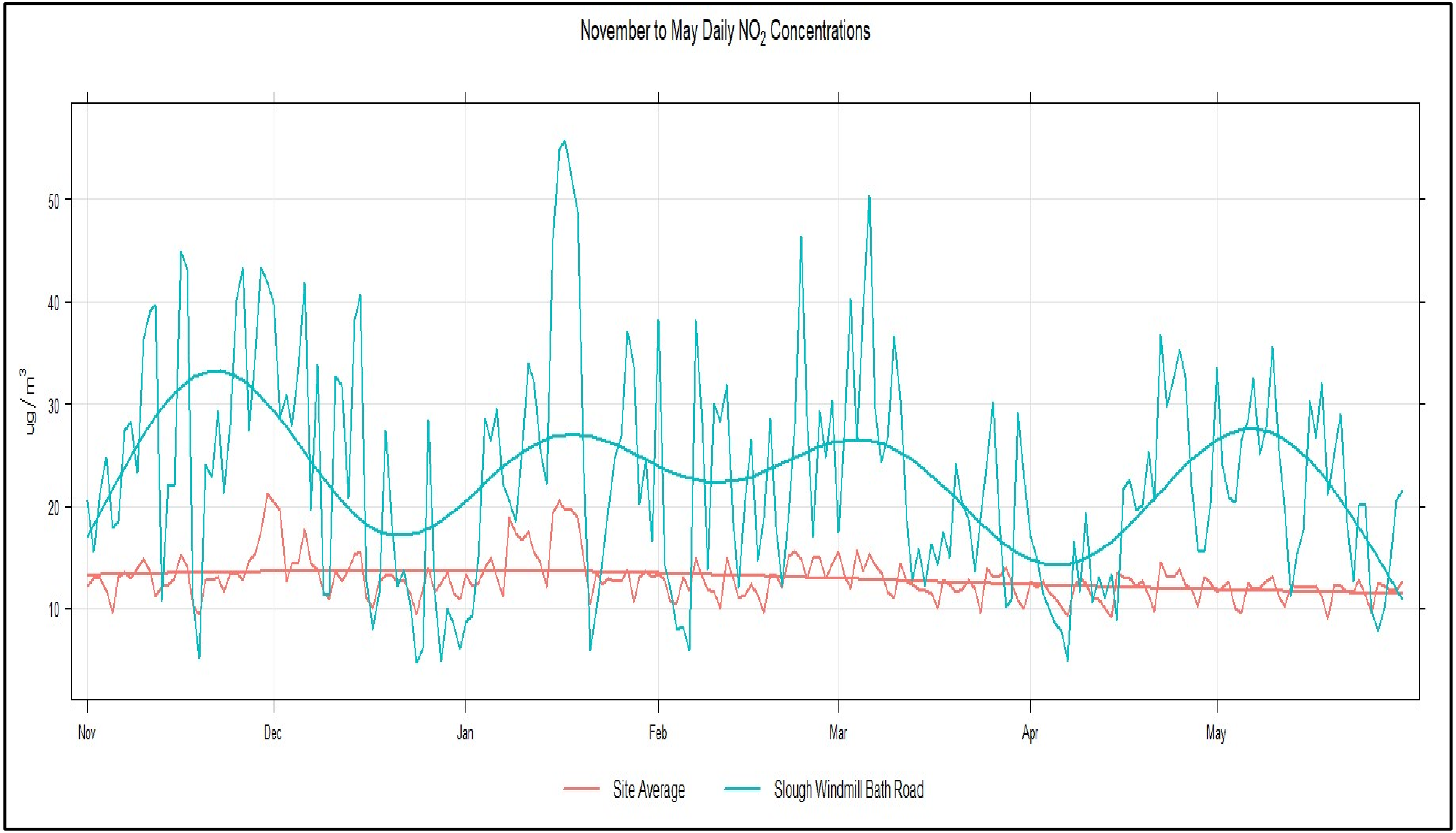

Figure 2: STE Network averaged and Slough Windmill Bath Road NO_2 concentrations (daily average and rolling mean)

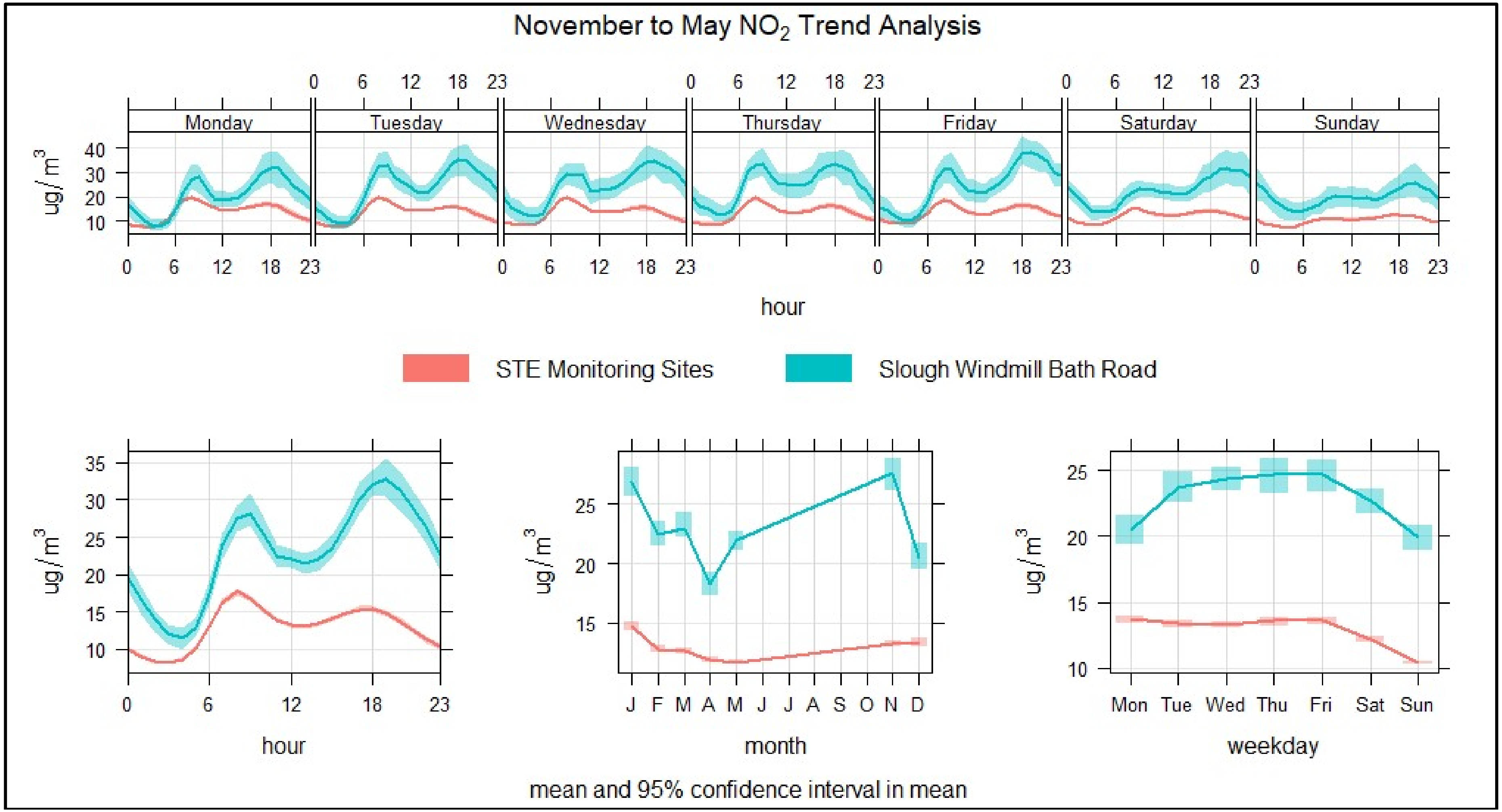

Figure 3: STE Network Averaged NO_2 Concentrations

Graphs present: (a) Day of Week Variation, (b) Mean Hour of Day Variation (c) Combined hour of day and day of week and (d) Monthly Variation

3.3 Individual Sensor Data

3.3.1 Analysis (trend analysis and diurnal plots) of the data from each individual sensor has been undertaken each month and reported in the separate monthly reports. **Table 3-1** below provides a summary of the monitored concentrations and data capture for each sensor and SWBR.

Table 3-1: NO_2 Concentration Summary

Sensor	NO_2 Concentration Summary (µg/m^3)			Number of Hourly Averages above Defra's AQI Level 1 of 67 µg/m^3	Number of Daily Averages above the WHO 24 Hour AQG Level of 25 µg/m^3	Data Capture (%)
	Period Average	Hourly Maximum	Daily Maximum			
SN-0838	14.7	49.6	23.2	0	0	85.3
SN-0847	15.1	43.6	21.0	0	0	98.7
SN-0867	16.7	72.2	42.8	3	29	98.2
SN-0883	8.6	25.7	11.8	0	0	96.3
SN-0966	9.5	23.5	12.0	0	0	98.7
SN-0978	11.8	40.5	26.0	0	1	94.5
SN-0983	11.4	27.7	15.2	0	0	98.7
SN-0985	8.7	24.3	11.4	0	0	98.8
SN-0991	7.8	28.0	17.1	0	0	98.6
SN-0997	11.6	40.8	26.0	0	4	90.2
SN-1001	16.5	49.8	39.4	0	21	96.2
SN-1005	9.7	31.6	14.7	0	0	93.4
SN-1006	9.2	26.1	15.8	0	0	90.1
SN-1012	11.0	29.5	15.0	0	0	98.8
SN-1014	12.2	42.7	28.7	0	3	99.0
SN-1026	7.6	17.0	11.7	0	0	89.8
SN-1028	12.8	52.6	23.0	0	0	73.7
SN-1034	13.9	63.0	28.9	0	3	99.2
SN-1035	11.8	85.1	46.8	3	5	98.8
SN-1073	10.9	65.8	34.3	0	6	96.7
SN-1090	17.5	51.9	31.0	0	9	85.2
SN-1144	8.3	27.7	13.1	0	0	96.1
SN-1155	21.8	57.7	39.4	0	34	84.4
SN-1201	9.9	35.9	20.4	0	0	98.7
SN-1202	9.2	27.2	11.7	0	0	98.7
SN-1219	7.5	29.5	13.5	0	0	98.0
SN-1234	9.3	28.3	14.6	0	0	93.6
SN-1252	11.8	36.9	19.4	0	0	99.1
SN-1264	13.8	75.8	29.4	2	2	85.2
SN-1294	14.4	50.8	36.5	0	5	98.8
SN-1314	22.1	49.9	33.2	0	34	99.1
SN-1317	17.5	61.4	38.0	0	7	79.5
SN-1328	16.8	45.2	30.1	0	19	99.1
SN-1538	15.9	47.1	31.4	0	11	98.7
SN-1600	16.0	46.9	22.1	0	0	96.3
SN-1607	7.8	34.3	22.2	0	0	99.1

Sensor	NO_2 Concentration Summary (µg/m³)			Number of Hourly Averages above Defra's AQI Level 1 of 67 µg/m³	Number of Daily Averages above the WHO 24 Hour AQG Level of 25 µg/m³	Data Capture (%)
	Period Average	Hourly Maximum	Daily Maximum			
SN-1608	11.3	36.9	18.7	0	0	99.1
SN-1610	9.4	19.4	12.2	0	0	98.1
SN-1643	17.3	64.5	40.6	0	10	98.7
SN-1646	25.9	67.4	38.2	1	115	98.8
SWBR	23.0	110.0	55.8	74	86	-

3.3.2 As shown in **Table 3-1**, all hourly average concentrations were below the WHO hourly NO_2 AQG (of 200 µg/m³) and with regards to Defra's AQI, only SN-0867, SN-1035, SN-1264 and SN-1646 (along with SWBR) recorded any hourly average concentrations that exceeded AQI Level 1 (of 67 µg/m³).

3.3.3 Across all sensors, all the daily mean concentrations were below the WHO Interim Target 2 of 50 µg/m³. Whilst 18 out of the 40 sensors in the STE network recorded daily averages above the WHO 24 Hour AQG Level of 25 µg/m³, all but SN-1646 recorded less days above the WHO 24 Hour AQG Level than SWBR.

3.3.4 SN-1035 recorded the highest hourly concentration across the time period of 85.1 µg/m³ however SWBR had a higher maximum hourly concentration at 110.0 µg/m³.

3.3.5 SN-1646 had an overall higher average NO_2 concentration than SWBR and whilst the hourly and daily maximum at SN-1646 were lower than at SWBR. SN-1646 also had more daily average above the WHO 24-hour AQG but far less hourly average above Defra's AQI-1.

3.3.6 More detailed investigation of episodes that indicate potential greater influence from local sources is included in Section 7 of this report which focusses on particular trends that have been identified (in the monthly reports) or where measured concentrations within the STE sensor network significantly exceed those measured at SWBR.

3.3.7 Overall, it is considered that this data (along with the monthly analysis) indicates that within the STE NO_2 concentrations are influenced by road traffic (with sensors closer to busy roads showing correlation to measurements at SWBR) as well as other local and regional sources to a variable degree.

4 Review of Particulate Matter ($PM_{2.5}$) Results

4.1 $PM_{2.5}$ STE Network Average

4.1.1 **Figure 4** presents the STE network daily average (red line) $PM_{2.5}$ concentrations from November to May against concentrations from a nearby automatic monitoring site (‘Reading New Town [RNT] as shown in **Figure 1**). Reading New Town has been chosen due to Maidenhead Bridge Road (the closest $PM_{2.5}$ monitoring station) not having sufficient data capture.

4.1.2 As shown in **Figure 4**, $PM_{2.5}$ concentrations across the STE are generally very low apart from at certain pollution episodes, with the rolling mean STE Network average $PM_{2.5}$ concentration not exceeding 5 µg/m^3. In comparison to the concentrations from RNT the STE stays consistently below for both the daily average and the rolling mean, generally mirroring the rises and falls.

4.2 STE Network Average - $PM_{2.5}$ Trend Analysis

4.2.1 **Figure 5** displays a comparison between the STE Network averaged $PM_{2.5}$ concentration against the concentration measured at RNT.

4.2.2 The RNT site is defined as a ‘urban background’ site and can be considered representative of an urban site located away from major roadways. The monitored $PM_{2.5}$ concentrations at the RNT monitor demonstrate the highest concentrations after the evening ‘rush hour’, peaking at around 22:00. These elevated concentrations are then sustained overnight and through the morning ‘rush hour’ with lower concentrations between approximately 9:00 and 17:00.

4.2.3 In using this dataset as a comparator, trends in the sensor data that are due to background (regional and transboundary inputs, secondary formation etc) as well as local road traffic influences can be identified. If a trend is not seen within the RNT data but is evident within the sensor data, this could imply a more local source.

4.2.4 The average $PM_{2.5}$ concentration across the STE follows similar diurnal patterns as the RNT monitor, with highest concentrations through the night but peaking in the early morning around 04:00 rather than around 22:00 at a much lower average concentration. The average concentration across the period is very low at ~3 µg/m^3 compared to ~7 µg/m^3 at RNT.

4.2.5 It can be inferred that the $PM_{2.5}$ concentrations in the STE mainly had a regional influence due to the STE and RNT lines showing almost identical profiles and trends but with the STE at the consistently lower level.

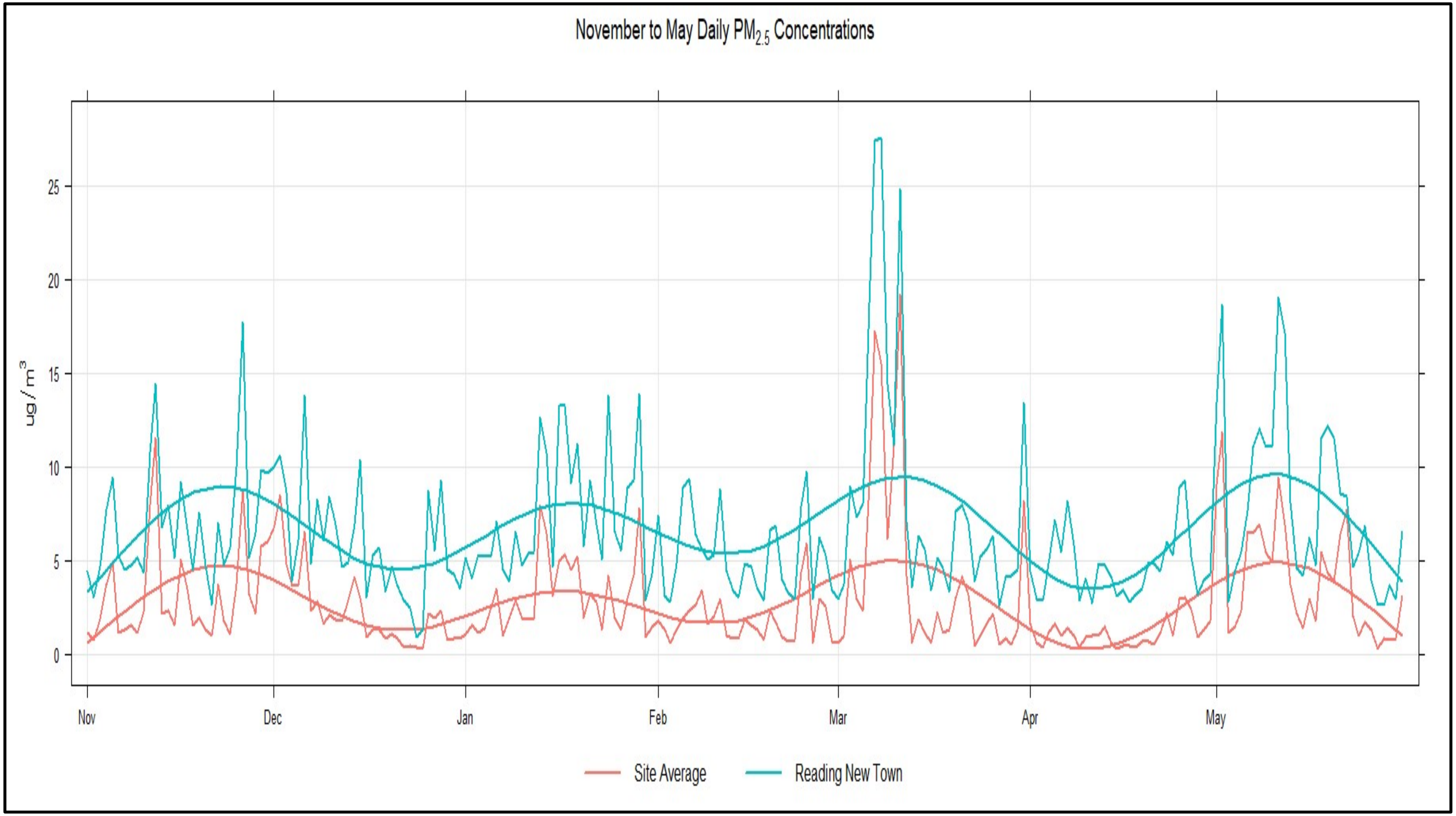

Figure 4: STE Network averaged and Reading New Town $PM_{2.5}$ concentrations (daily average and rolling mean)

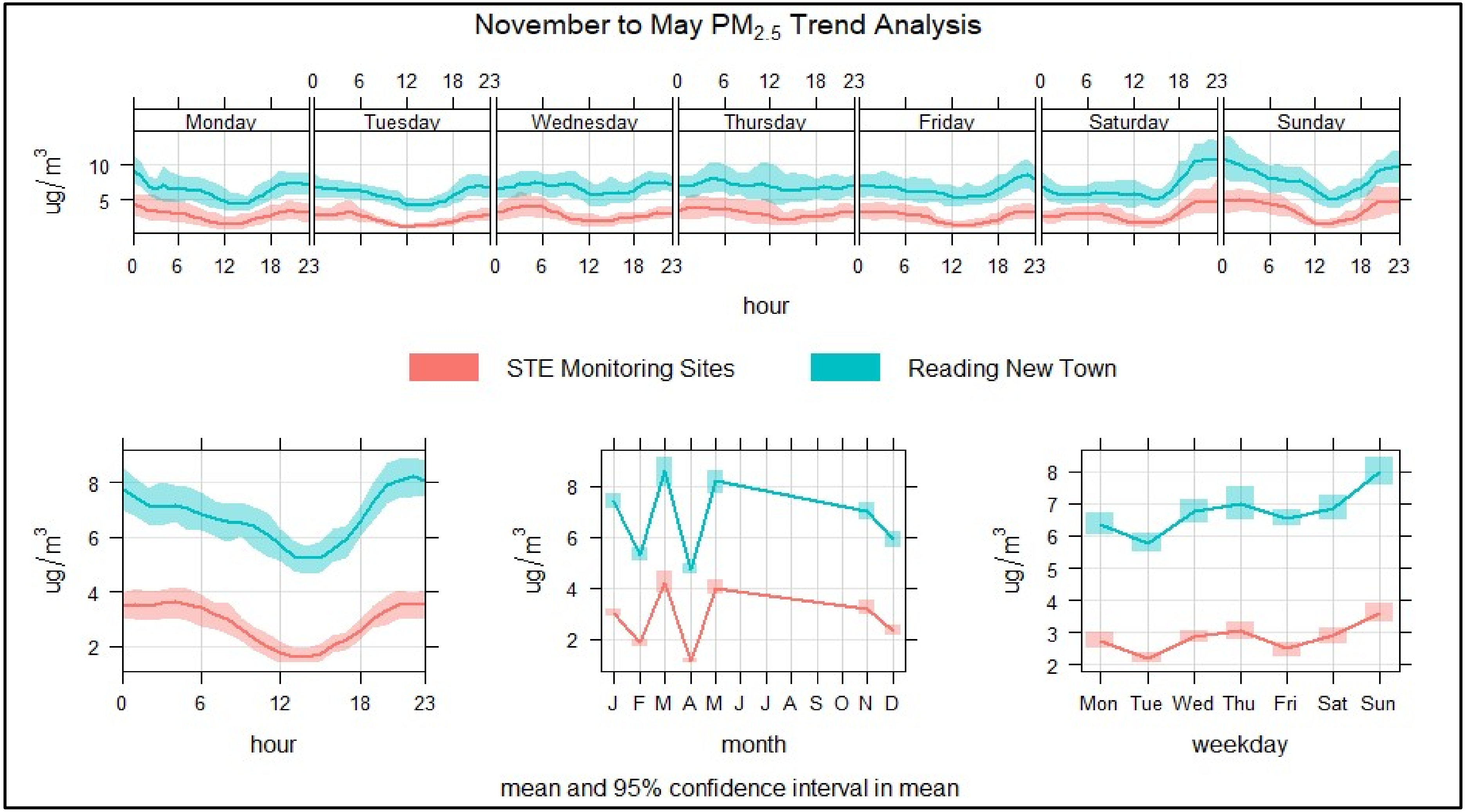

Figure 5: STE Network Averaged $PM_{2.5}$ Concentrations

Graphs present: (a) Day of Week Variation, (b) Mean Hour of Day Variation (c) Combined hour of day and day of week and (d) Monthly Variation

4.3 Individual Sensor Data and Trends

4.3.1 Analysis (trend analysis and diurnal plots) of the data from each individual sensor has been undertaken each month and reported in the separate monthly reports. **Table 4-1** below provides a summary of the monitored concentrations and data capture for each sensor for each sensor and RNT.

Table 4-1 - $PM_{2.5}$ Concentration Summary

Sensor	$PM_{2.5}$ Concentration Summary ($\mu g/m^3$)			Number of Daily Averages above Defra's AQI Level 1 of 11 $\mu g/m^3$	Number of Daily Averages above the WHO 24 Hour AQG Level of 15 $\mu g/m^3$	Data Capture (%)
	Period Average	Hourly Maximum	Daily Maximum			
SN-0838	2.5	48.0	20.1	4	2	85.3
SN-0847	3.1	33.3	20.0	6	3	98.7
SN-0867	2.5	64.3	20.9	4	3	98.2
SN-0883	2.2	191.4	23.6	4	3	96.3
SN-0966	0.5	10.3	4.0	0	0	98.7
SN-0978	3.5	55.9	19.8	7	3	94.5
SN-0983	2.8	44.2	20.4	5	2	98.7
SN-0985	2.8	26.3	17.4	4	1	98.8
SN-0991	2.6	38.0	19.8	5	1	98.6
SN-0997	0.2	5.1	2.5	0	0	90.2
SN-1001	2.9	41.3	28.5	5	3	96.2
SN-1005	3.7	47.7	22.7	10	4	93.4
SN-1006	2.6	32.2	19.8	4	1	90.1
SN-1012	2.5	27.2	18.5	4	2	98.8
SN-1014	2.3	38.3	17.6	4	3	99.0
SN-1026	3.1	33.6	21.1	5	3	89.8
SN-1028	3.2	73.5	20.2	6	3	73.7
SN-1034	3.0	26.9	18.6	4	1	99.2
SN-1035	3.0	37.2	23.7	6	2	98.8
SN-1073	2.9	30.5	19.3	6	3	96.7
SN-1090	2.3	39.6	14.4	3	0	85.2
SN-1144	1.5	24.5	10.2	0	0	96.1
SN-1155	4.0	47.0	29.2	11	5	84.4
SN-1201	4.1	61.4	32.2	14	8	98.7
SN-1202	2.4	47.7	17.1	5	1	98.7
SN-1219	3.0	56.1	25.5	6	3	98.0
SN-1234	3.9	46.6	31.0	9	5	93.6
SN-1252	2.8	37.9	25.7	5	3	99.1
SN-1264	2.7	39.3	26.3	5	2	85.2
SN-1294	2.5	30.2	18.1	4	3	98.8
SN-1314	4.6	47.9	22.9	26	11	99.1
SN-1317	3.1	129.7	20.3	4	2	79.5
SN-1328	2.3	28.5	19.3	4	1	99.1
SN-1538	2.3	39.3	18.2	4	1	98.7

Sensor	$PM_{2.5}$ Concentration Summary (µg/m³)			Number of Daily Averages above Defra's AQI Level 1 of 11 µg/m³	Number of Daily Averages above the WHO 24 Hour AQG Level of 15 µg/m³	Data Capture (%)
	Period Average	Hourly Maximum	Daily Maximum			
SN-1600	3.7	106.3	46.1	13	7	96.3
SN-1607	4.3	50.8	25.7	16	7	99.1
SN-1608	3.0	37.1	19.6	5	3	99.1
SN-1610	4.6	72.6	31.8	29	18	98.1
SN-1643	3.2	42.8	21.5	7	3	98.7
SN-1646	2.8	30.6	19.9	4	3	98.8
RNT	6.8	44.1	27.6	27	8	-

4.3.2 As shown in **Table 4-1**, all sensors in the STE network (along with RNT) other than SN-0966, SN-0997 and SN-1144 had daily average concentrations above the DEFRA AQI Level 1 (of 11 µg/m³) and 36 out of the 40 sensors in the STE network recorded daily averages above the WHO 24-Hour AQG Level of 15 µg/m³. However, only SN1314 and SN-1610 recorded a higher number of days above the 24-Hour AQG Level than RNT.

4.3.3 None of the sensors in the STE had a higher average $PM_{2.5}$ concentration than RNT and SN-1600 recorded the highest daily average concentration of 46.1 µg/m³ which is higher than the maximum daily average concentration at RNT of 27.6 µg/m³.

4.3.4 More detailed investigation of episodes that indicate potential greater influence from local sources is included in Section 7 of this report which focusses on particular trends that have been identified (in the monthly reports) or where measured concentrations within the STE sensor network significantly exceed those measured at RNT.

4.3.5 Overall, it is considered that this data (along with the monthly analysis) indicates that within the STE $PM_{2.5}$ concentrations are primarily influenced by regional sources and concentrations are below those measured at RNT.

5 Review of Particulate Matter (PM_{10}) Results

5.1 PM_{10} STE Network Average

5.1.1 **Figure 6** presents the STE network daily average (red line) PM_{10} concentrations against concentrations from a nearby automatic monitoring site ('Slough Windmill Bath Road' [SWBR] as shown in **Figure 1**) (blue line). The SWBR site is defined as an 'urban traffic' site and is within the AQMA No.3 declared by SBC for exceedances of the annual average NO_2 AQO and is therefore considered indicative of concentrations within the urban area close to Bath Road.

5.1.2 As shown in **Figure 6**, PM_{10} concentrations across the STE are low throughout the time period apart from at certain pollution episodes such as at the beginning of May, with the rolling mean STE network average PM_{10} concentration not exceeding 15 $\mu g/m^3$. In comparison to the concentrations from SWBR the STE generally had lower concentrations for both the daily average and the rolling mean, generally mirroring the rises and falls.

5.2 STE Network Average – PM_{10} Trend Analysis

5.2.1 **Figure 7** displays a comparison between the STE network averaged PM_{10} concentration against the concentration measured at SWBR.

5.2.2 The monitored PM_{10} concentrations at the SWBR monitor demonstrate the highest concentrations around the evening 'rush hour', peaking at between 18:00 and 19:00. These concentrations then decrease overnight until around 03:00 before they increase again.

5.2.3 In using this dataset as a comparator, trends in the sensor data that are due to background (regional and transboundary inputs, secondary formation etc) as well as local road traffic influences can be identified. If a trend is not seen within the SWBR data but is evident within the sensor data, this could imply a more local source.

5.2.4 The average PM_{10} concentrations across the STE network exhibit an opposing diurnal trend to the SWBR monitor, with the STE network average decreasing from the morning 'rush hour' and then increasing to the evening 'rush hour'. Despite these differences the concentrations at the STE are consistently lower than at SWBR.

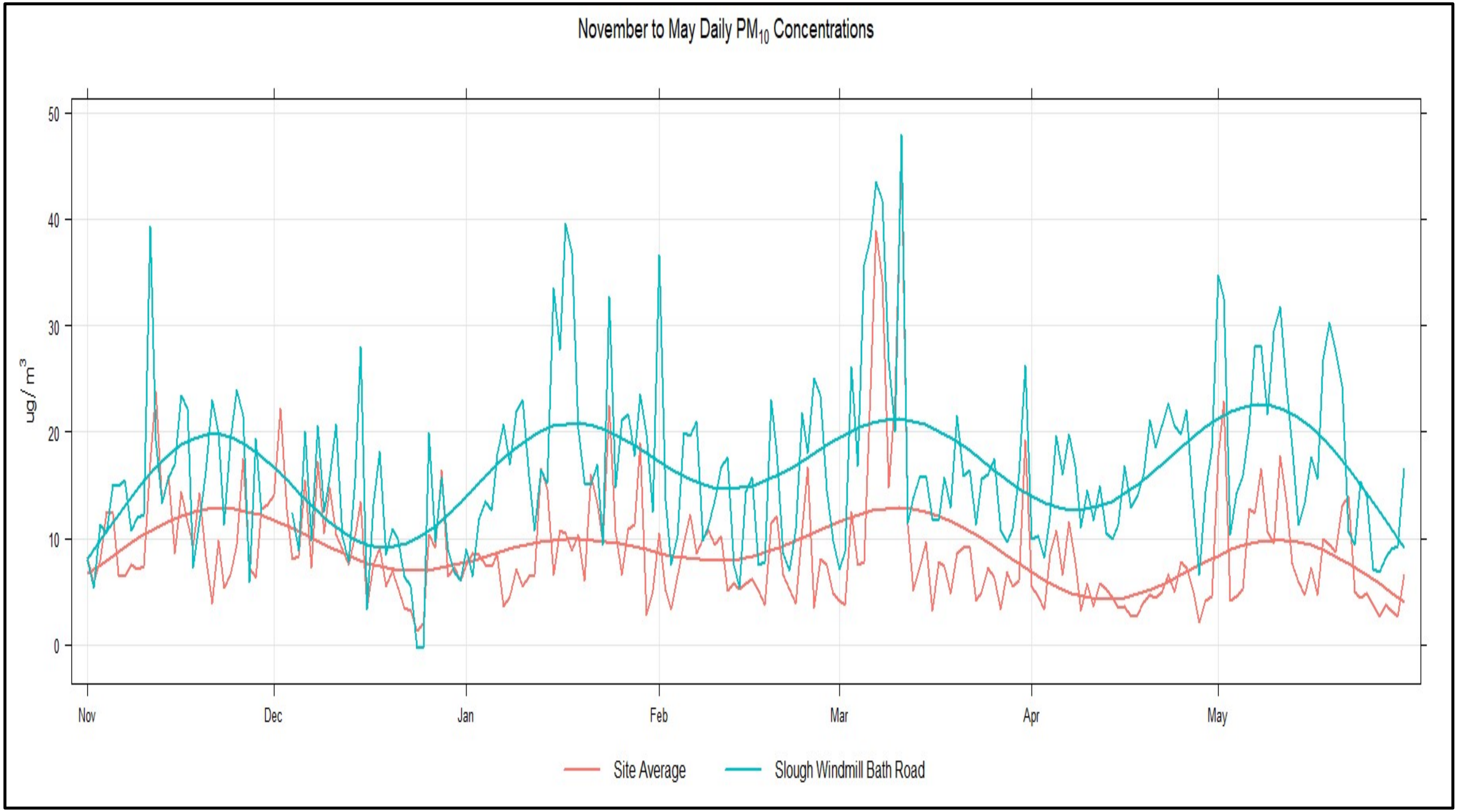

Figure 6: STE Network averaged and Slough Windmill Bath Road PM_{10} concentrations (daily average and rolling mean)

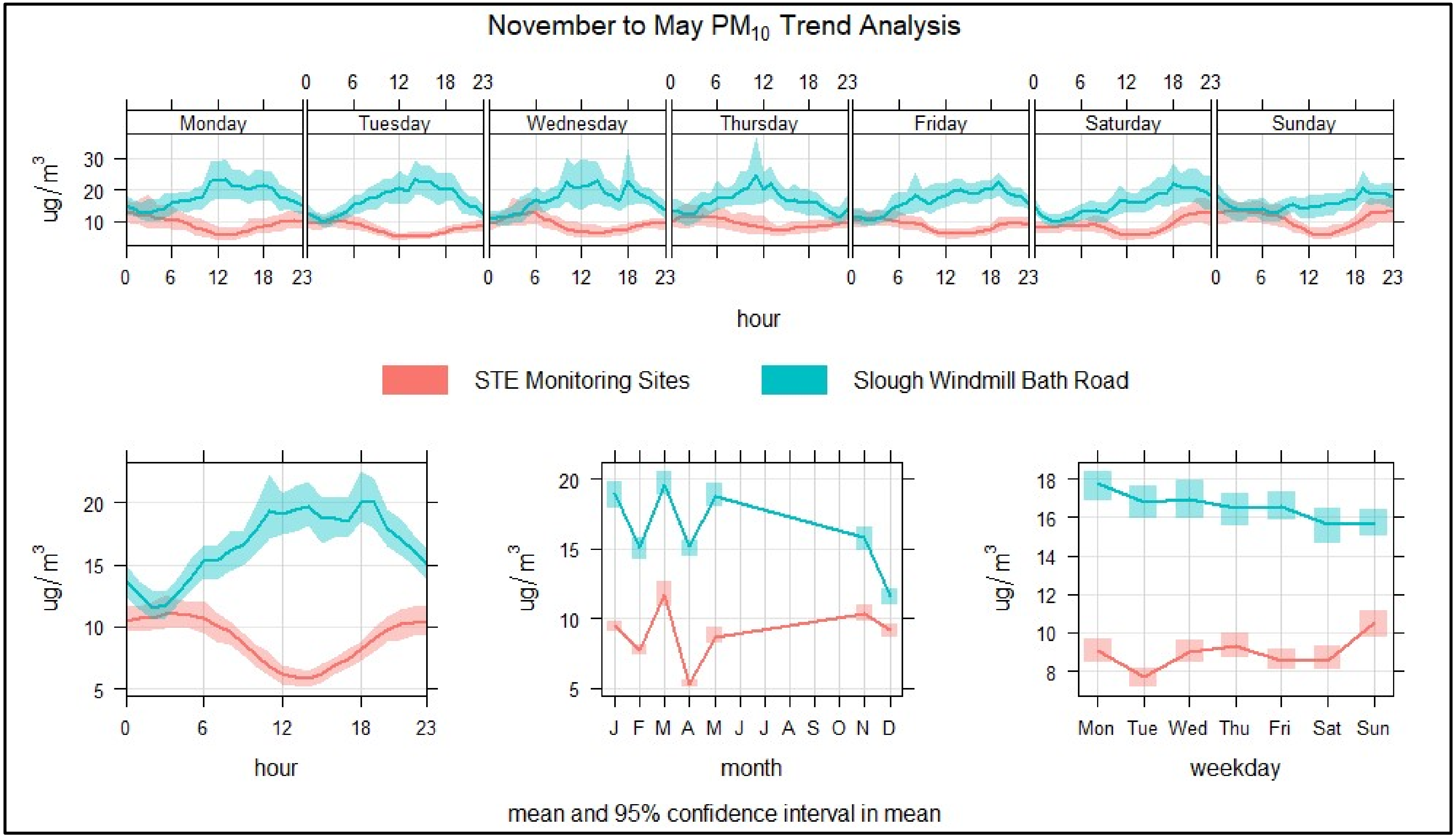

Figure 7: STE Network Averaged PM_{10} Concentrations

Graphs present: (a) Day of Week Variation, (b) Mean Hour of Day Variation (c) Combined hour of day and day of week and (d) Monthly Variation

5.3 Individual Sensor Data and Trends

5.3.1 Analysis (trend analysis and diurnal plots) of the data from each individual sensor has been undertaken each month and reported in the separate monthly reports. **Table 5-1** below provides a summary of the monitored concentrations and data capture for each sensor for each sensor and SWBR.

Table 5-1 – PM_{10} Concentrations Summary

Sensor	PM_{10} Concentration Summary (µg/m³)			Number of Daily Averages above Defra's AQI Level 1 of 16 µg/m³	Number of Daily Averages above the WHO 24 Hour AQG Level of 45 µg/m³	Data Capture (%)
	Period Average	Hourly Maximum	Daily Maximum			
SN-0838	9.5	128.2	47.7	21	1	85.3
SN-0847	8.0	73.6	41.5	12	0	98.7
SN-0867	7.8	114.0	49.5	14	1	98.2
SN-0883	6.9	1480.0	172.4	12	1	96.3
SN-0966	2.0	25.4	7.6	0	0	98.7
SN-0978	11.0	100.0	49.9	31	1	94.5
SN-0983	8.2	103.2	42.9	17	0	98.7
SN-0985	8.9	84.1	46.9	12	1	98.8
SN-0991	8.0	82.4	46.9	17	1	98.6
SN-0997	1.1	13.5	7.6	0	0	90.2
SN-1001	10.0	111.2	63.2	26	2	96.2
SN-1005	10.4	195.3	52.0	25	2	93.4
SN-1006	10.0	95.8	49.8	23	1	90.1
SN-1012	8.8	111.6	43.4	15	0	98.8
SN-1014	8.2	75.6	42.7	15	0	99.0
SN-1026	9.3	93.7	50.6	21	1	89.8
SN-1028	9.3	133.4	47.4	16	1	73.7
SN-1034	9.9	83.4	49.2	17	1	99.2
SN-1035	8.5	138.9	52.0	21	1	98.8
SN-1073	8.9	83.3	46.7	19	2	96.7
SN-1090	7.6	78.9	35.4	17	0	85.2
SN-1144	5.4	49.7	25.5	7	0	96.1
SN-1155	11.8	155.0	57.1	26	3	84.4
SN-1201	13.0	118.6	60.5	47	3	98.7
SN-1202	7.9	91.6	39.2	21	0	98.7
SN-1219	10.3	121.2	52.6	31	3	98.0
SN-1234	11.8	115.0	59.1	21	3	93.6
SN-1252	10.0	96.9	51.6	17	3	99.1
SN-1264	9.4	107.1	59.7	20	1	85.2
SN-1294	8.1	81.0	44.3	17	0	98.8
SN-1314	11.8	88.2	51.5	40	1	99.1
SN-1317	11.2	268.1	49.3	34	1	79.5
SN-1328	6.9	80.4	47.2	10	1	99.1
SN-1538	8.2	83.9	46.8	16	1	98.7
SN-1600	7.6	113.6	50.3	15	1	96.3

Sensor	PM_{10} Concentration Summary (µg/m^3)			Number of Daily Averages above Defra's AQI Level 1 of 16 µg/m^3	Number of Daily Averages above the WHO 24 Hour AQG Level of 45 µg/m^3	Data Capture (%)
	Period Average	Hourly Maximum	Daily Maximum			
SN-1607	11.7	96.5	49.5	43	1	99.1
SN-1608	8.4	145.2	45.9	13	2	99.1
SN-1610	12.8	137.3	49.8	54	2	98.1
SN-1643	11.1	125.3	53.6	40	1	98.7
SN-1646	8.5	84.4	46.0	18	1	98.8
SWBR	16.6	185.5	47.9	92	1	-

5.3.2 As shown in **Table 5-1** all sensors in the STE along with SWBR other than SN-0966 and SN-0997 had daily average concentrations above Defra AQI Level 1 (of 16 µg/m^3). Along with SWBR, 31 out of the 40 sensors in the STE recorded daily averages above the WHO 24-Hour AQG Level of 45 µg/m^3 from November to May.

5.3.3 None of the sensors in the STE network had a higher average PM_{10} concentration than measured at SWBR and whilst SN-0883 recorded the highest daily average concentration across the time period of 172.4 µg/m^3 in the STE however, this is considered likely to have ben related to a fault with the sensor.

5.3.4 More detailed investigation of episodes that indicate potential greater influence from local sources is included in Section 7 of this report which focusses on particular trends that have been identified (in the monthly reports) or where measured concentrations within the STE sensor network significantly exceed those measured at SWBR.

5.3.5 Overall, it is considered that this data (along with the monthly analysis) indicates that within the STE PM_{10}- concentrations are primarily influenced by regional sources with local sources also contributing to varying degrees.

5.4 Correlation between PM_{10} and $PM_{2.5}$

5.4.1 Concentrations $PM_{2.5}$ and PM_{10} are inherently linked as $PM_{2.5}$ is a subset of PM_{10}; however they primarily have different sources and therefore differences in the relationship between them can indicate potential source types.

5.4.2 **Figure 8** and **Figure 9** indicate that PM_{10} concentrations in the STE have a strong correlation with the $PM_{2.5}$ concentrations with the same pollution episodes evident but at more elevated concentrations.

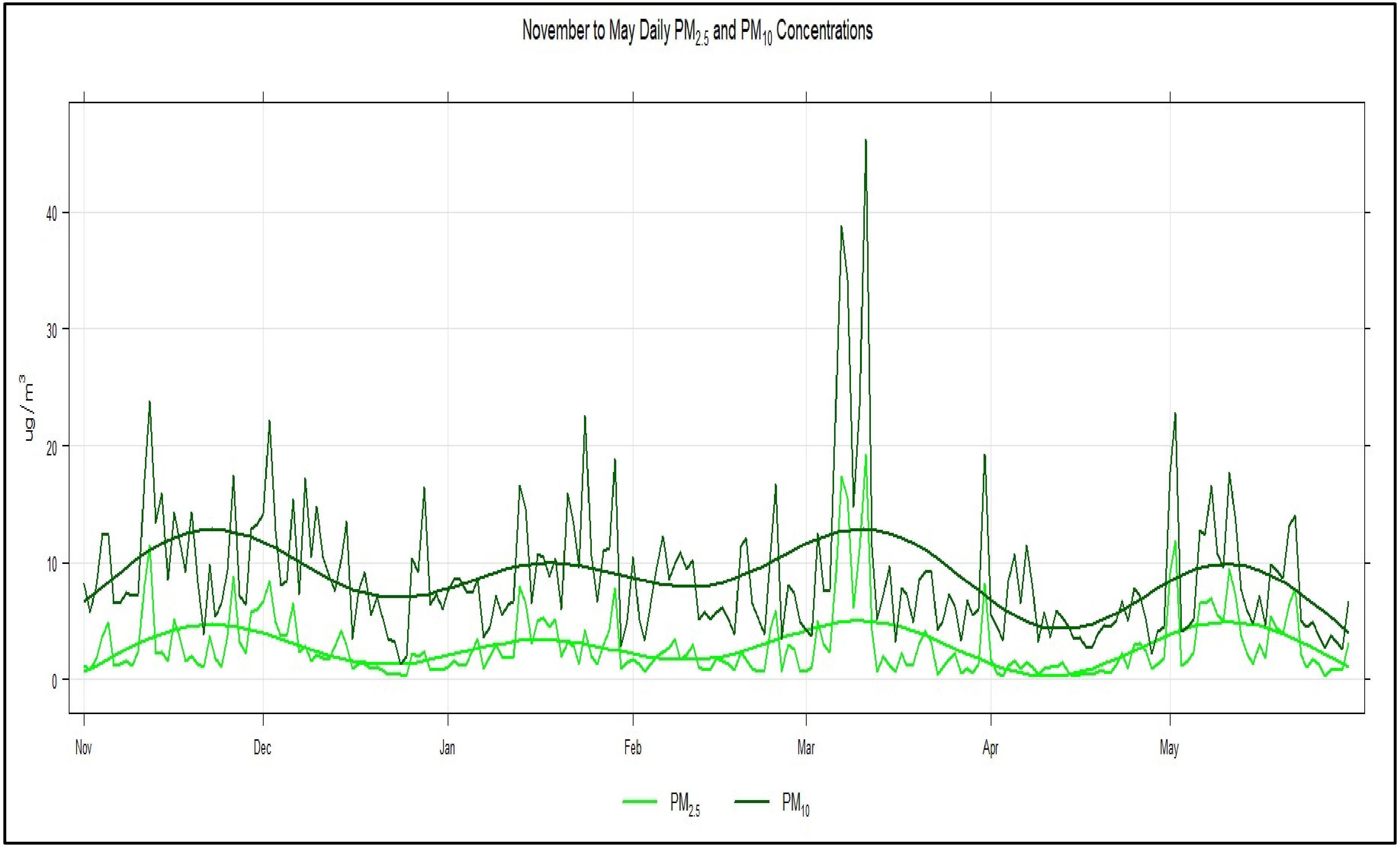

Figure 8: STE Network averaged $PM_{2.5}$ and PM_{10} concentrations (daily average and rolling mean)

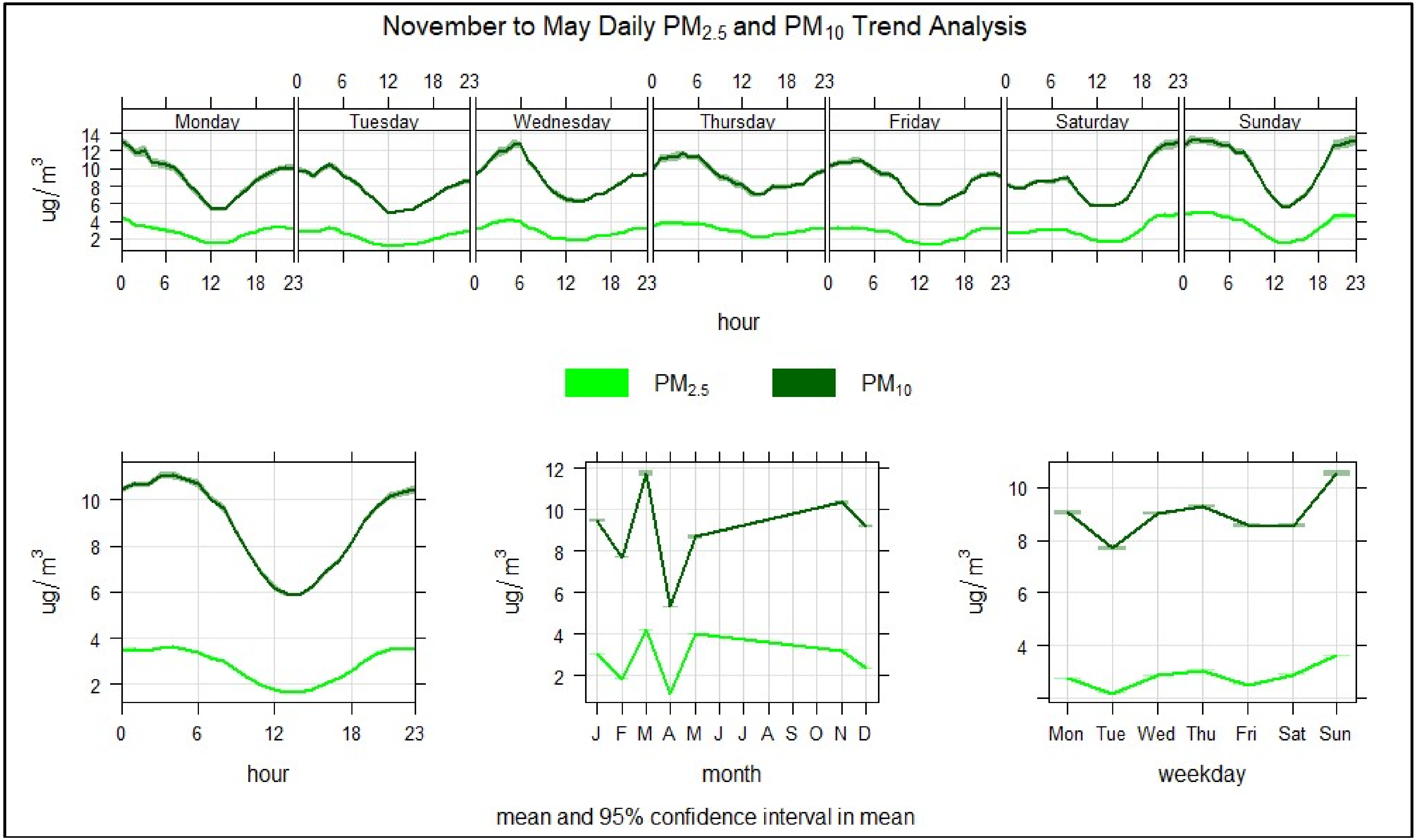

Figure 9: Site Averaged $PM_{2.5}$ and PM_{10} Concentrations
Graphs present: (a) Day of Week Variation, (b) Mean Hour of Day Variation (c) Combined hour of day and day of week and (d) Monthly Variation

6 Meteorological Data

6.1 Temperature

6.1.1 **Figure 10** below presents the average daily temperature for both meteorological sites over the from November to May. As expected, since the winter months the average temperature has been increasing.

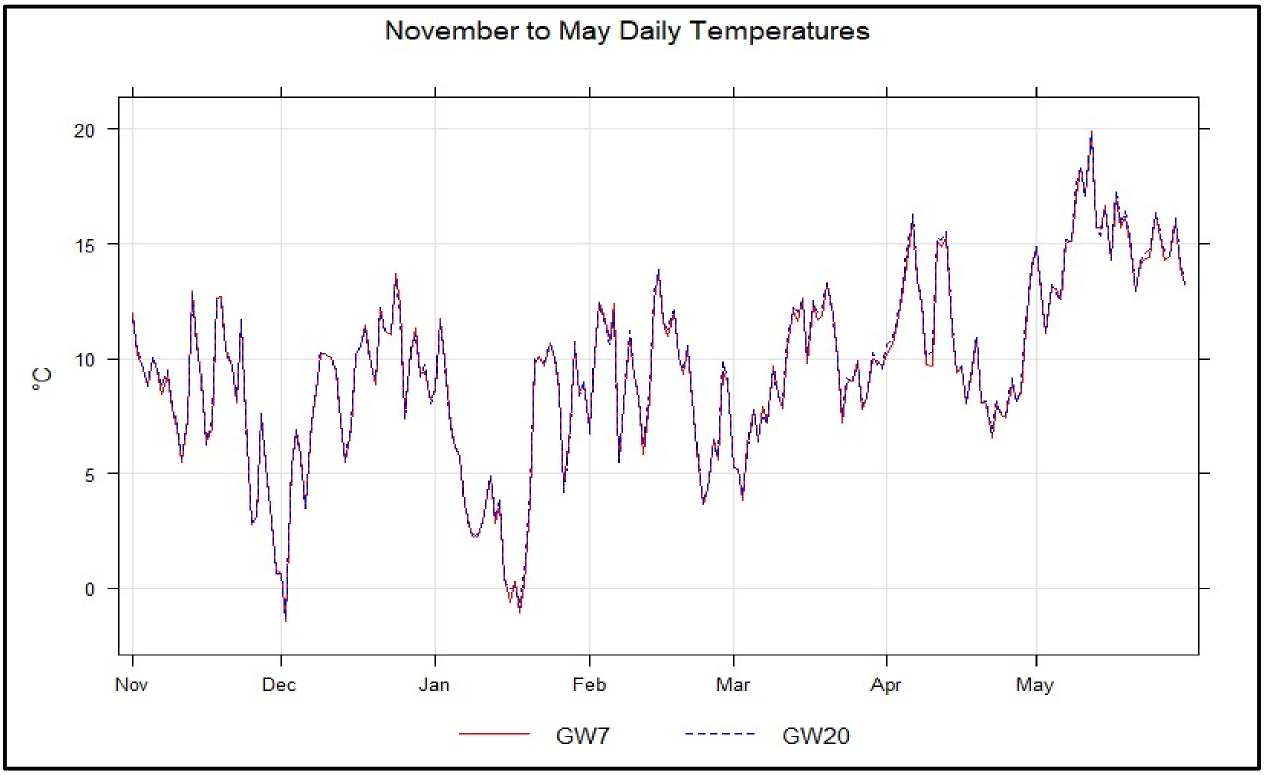

Figure 10: Temperature at the two on-site meteorological stations from November to May

6.2 Wind Climate

6.2.1 Wind data is important as it can allow trajectory analysis to show movement and dispersion (or lack of) pollutants overtime. **Figure 11** and **Figure 12** present windroses for both onsite weather stations using 15-minute average measurements and **Figure 13** and **Figure 14** present windroses using the maximum windspeed measurements.

6.2.2 When comparing the wind data from the two onsite weather stations to each other and to **Figure 15** (which presents a windrose for the same period at London Heathrow), it is clear that there is a substantial difference in both wind speed and direction.

6.2.3 The London Heathrow meteorological station is located within the Airport and at 10m above ground level (as required by the Met Office and aviation requirements) and whilst the STE weather stations are positioned on CCTV poles (upto 5m above ground level) they are subject to the influence of nearby buildings, specifically:

- GW07 is located within 5m to a taller building to the southwest; and
- GW20 is located at a similar height to a building <10m to the southeast and taller buildings within 50m to the southwest.

6.2.4 The data from the onsite weather stations is therefore considered to be a result of localised complex airflows and shielding from the urban environment and only representative of the location they are mounted in.

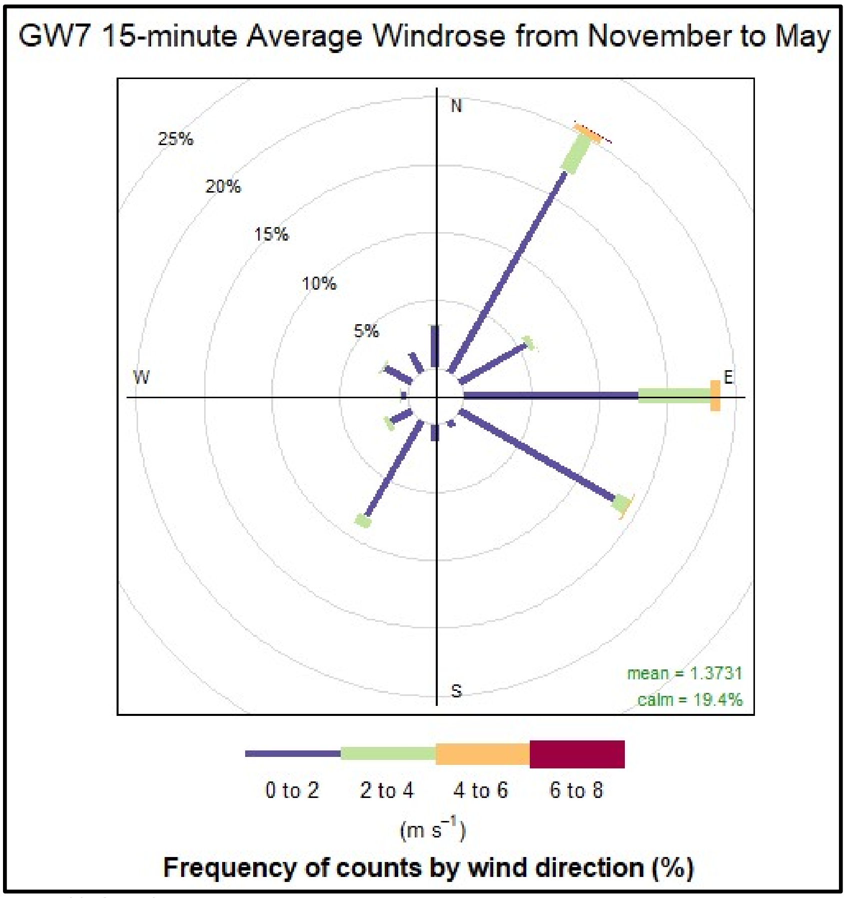

Figure 11: GW7 15-minute Average Windrose

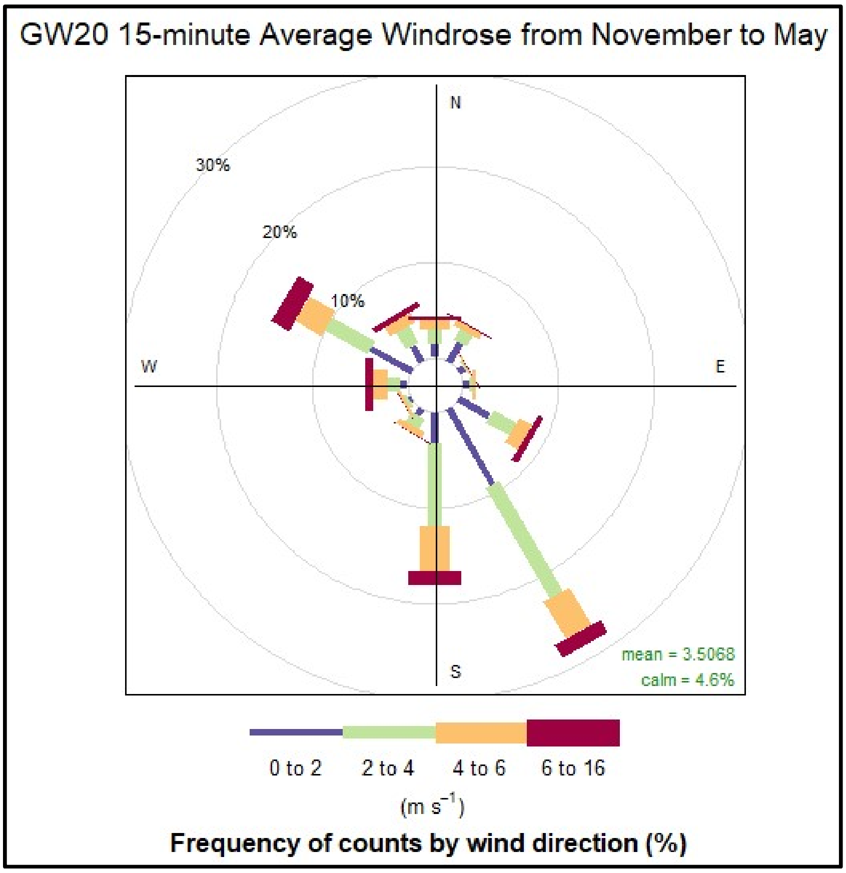

Figure 12: GW20 15-minute Average Windrose

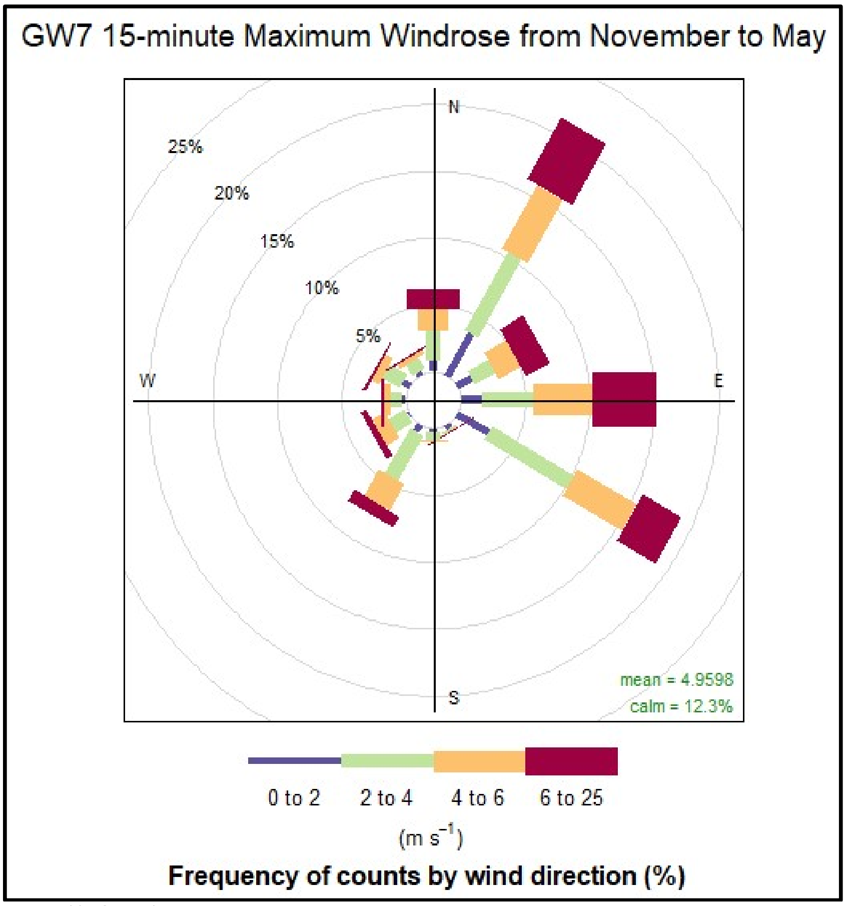

Figure 13: GW7 15-minute Maximum Windrose

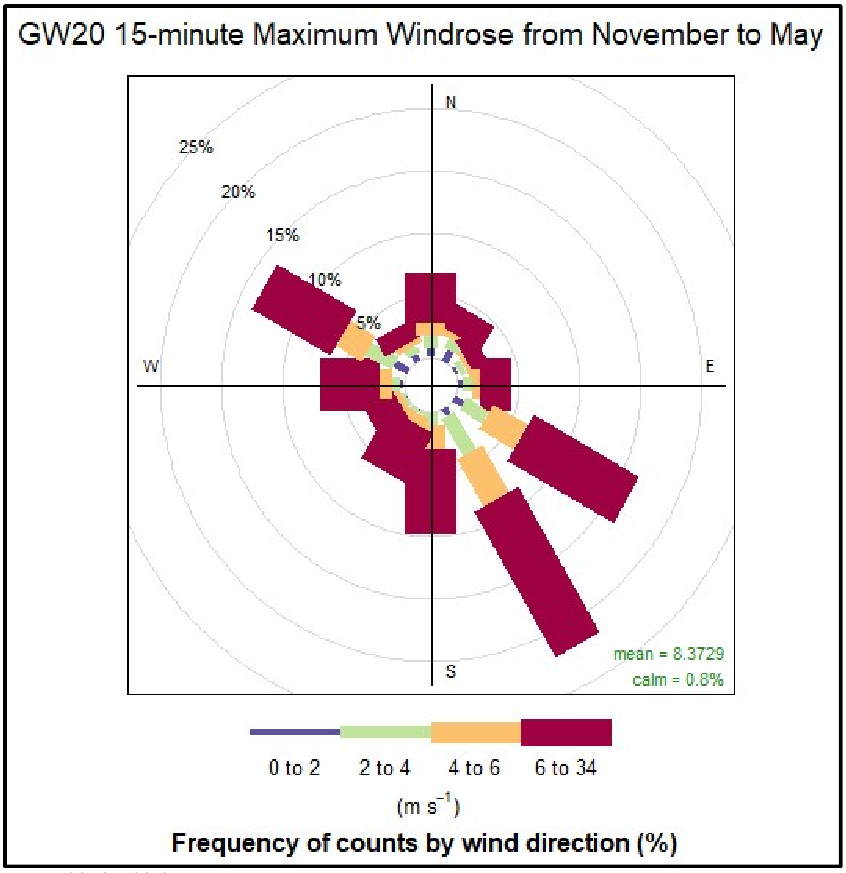

Figure 14: GW20 15-minute Maximum Windrose

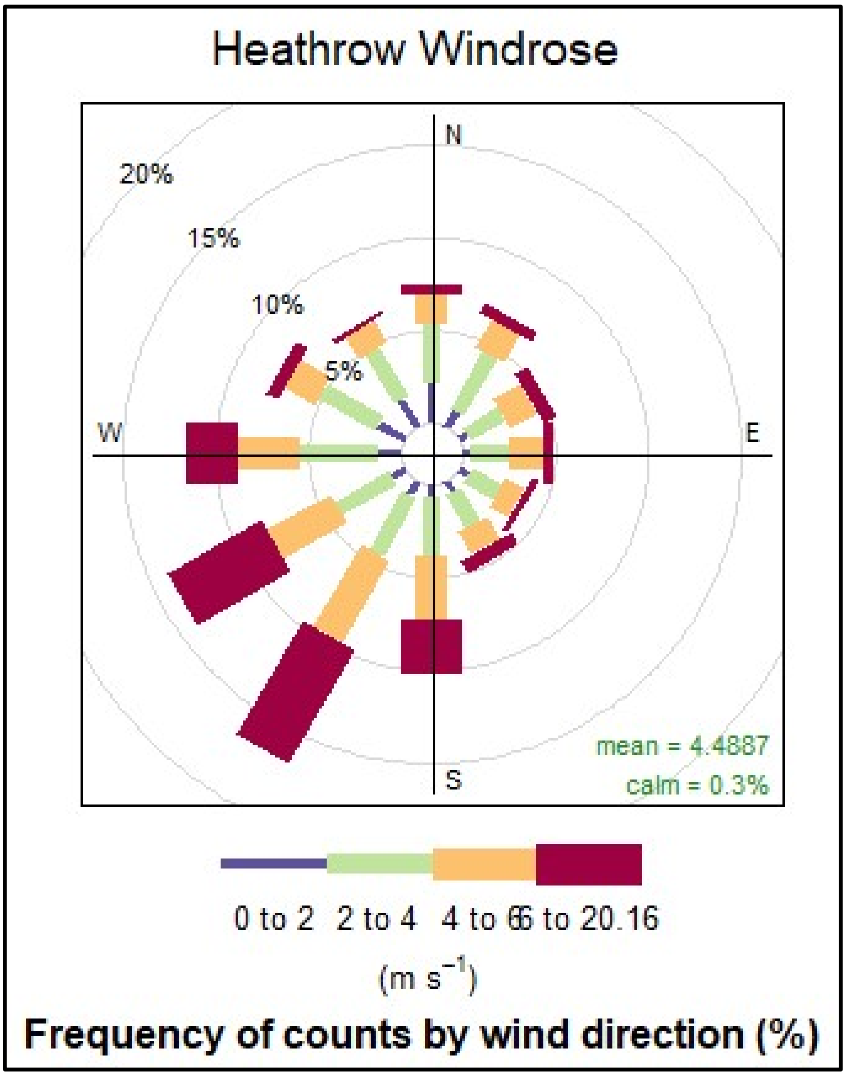

Figure 15: Heathrow Windrose

7 Further Analysis of Monitoring Data

7.1 Introduction

7.1.1 Further investigation has focussed on occasions where the measured concentration at an individual sensors results in an AQI that exceeds that of nearby real-time analysers of deviates significantly from expected trends; the 'events' investigated summarised in **Table 7-1**.

Table 7-1 – Overview of Sesnors/Periods analysed further

Sensors of Interest	Dates	Event
NO_2		
SN-0867	Throughout monitoring period (November – May)	High NO_2 Friday Evening Peak, later than traffic peak (around 8 – 10pm).
SN-1001, SN-1014, SN-1035, SN-1073, SN-1294 and SN-1646	Last Week of November	Elevated NO_2 throughout the week.
SN-1646	Month of December, Thursdays and Fridays	Elevated peaks in December and morning peak throughout monitoring period, especially on Thursdays/Fridays.
SN-1090	Weekday AM 'rush hour', December	Peaks in weekday AM and generally throughout December.
SN-0978, SN-0997, SN-1001, SN-1014, SN-1035, SN-1073, SN-1201, SN-1317, SN-1328, SN-1538, SN-1607 and SN-1643	January 8th – 22nd (referred to as second and third week of January)	Elevated NO_2 across the period.
SN-1001, SN-1014 SN-1090, SN-1155, SN-1294, SN-1317, SN-1643 and SN-1646	February 22nd – 29th (referred to as final week of February)	Elevated NO_2 in final week of February
SN-0847, SN-1001, SN-1034, SN-1090, SN-1252, SN-1294, SN-1314, SN-1317, SN-1600 and SN-1643	March 11th – 24th (referred to as second two weeks of March) and various periods through April	Generally elevated NO_2, some interesting peaks.
SN-1073	April	Strong evening 'rush hour' peaks through the month.
SN-0867, SN-1073 and SN-1264, SN-1028 and SN-1201.	April 26th.	Strong evening peak on this date.
SN-1314	Throughout monitoring period (November – May)	Strong AM 'rush hour' peak, and elevated concentrations throughout.
SN-0867, SN-1028, SN-1034	Several days during May	Elevated AM and PM peaks
$PM_{2.5}$ & PM_{10}		
All Sensors	November 5th/6th, weekend of November 12th	Corresponding regional events: Bonfire Night, Diwali.
All Sensors	March 6th – 12th	Regional uplift from March 6th – 12th.
SN-1202	15-17th Nov	Slightly elevated $PM_{2.5}$, some high hourly peaks.
SN-1600	January 1st – February 5th.	Multiple strong $PM_{2.5}$ hourly peaks.

7.2 Delayed Friday Evening Peaks in NO_2 at SN-0867

7.2.1 Sensor SN-0867 has exhibited some elevated concentrations in the evening, trend analysis of the entire operational period to date (27/10/2023 – 31/05/2024) is shown below in **Figure 16.**

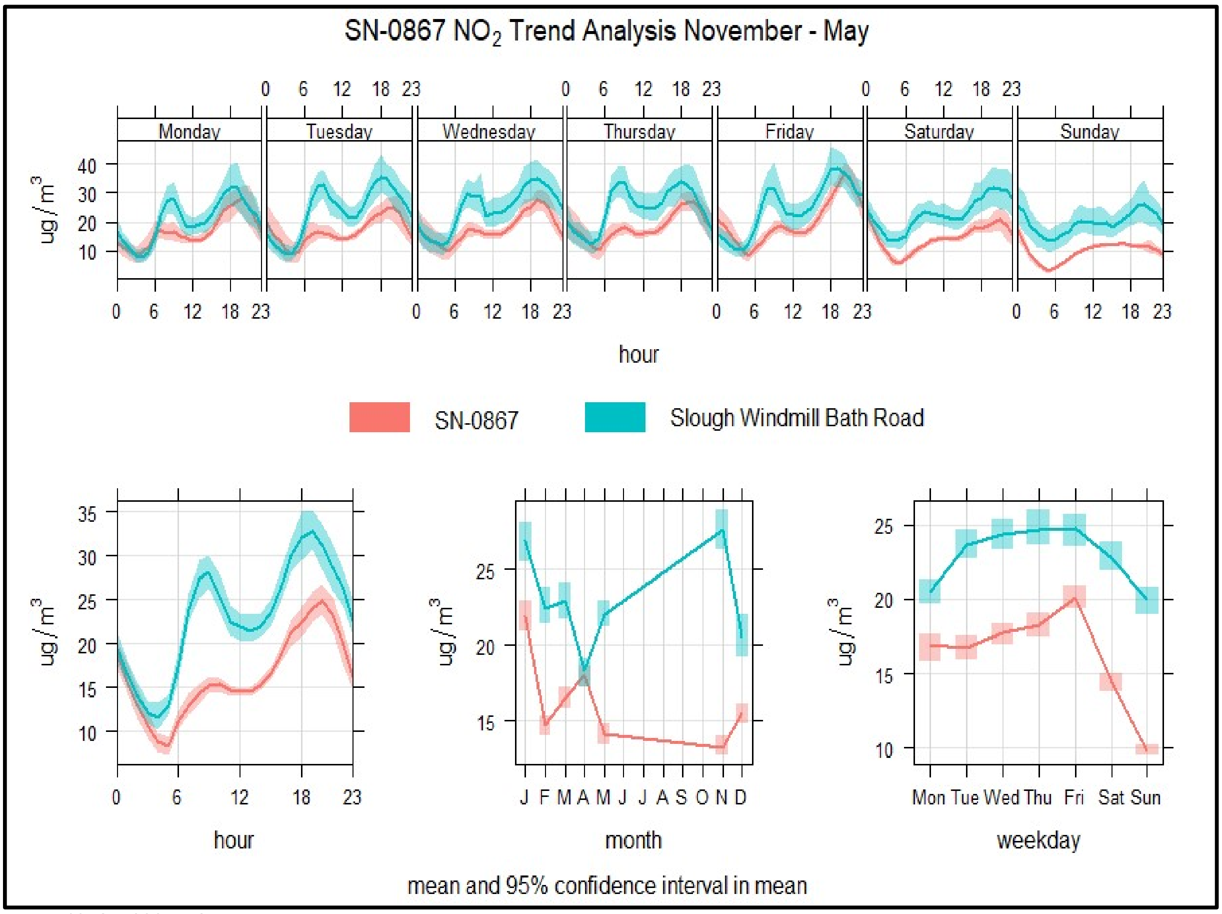

Figure 16: SN-0867 NO_2 Trend Analysis November - May

7.2.2 Comparison with SWBR indicates that the similar diurnal trends are present, and both sensors show highest average concentrations on Friday evenings. The evening peak at SWBR occurs at around 6-7pm, whereas the SN-0867 sensor exhibits a later peak around 8-10pm, and SN-0867 exhibits a much stronger PM peak than AM peak. This trend is particularly evident during the first few weeks of November (**Figure 17**).

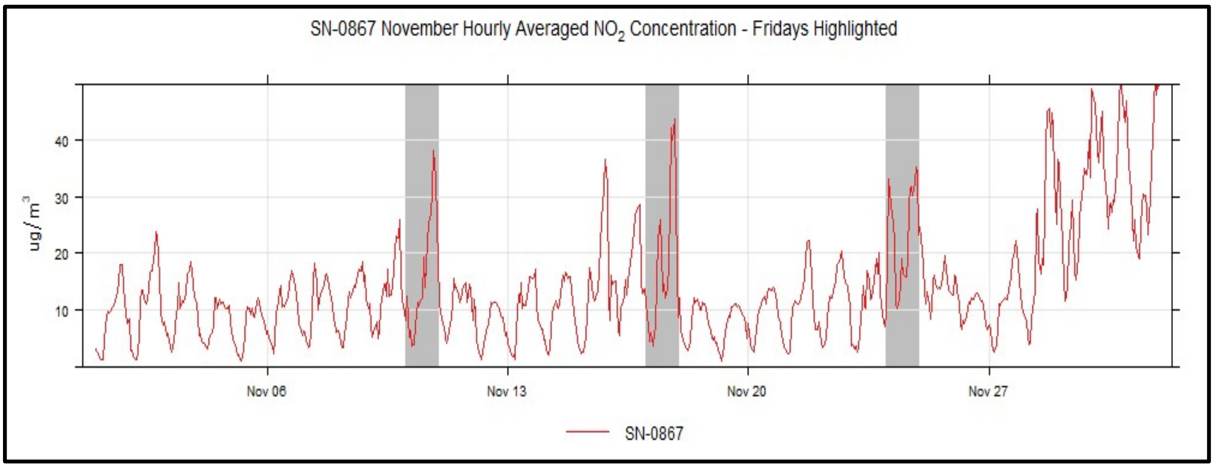

Figure 17: SN-0867 November Hourly Averaged NO_2 Concentrations with Fridays Highlighted

7.2.3 Analysis of traffic counts recorded by an on-site automatic traffic counter (ATC) on the access portion of Whitby Road indicates that there is no significant rise in traffic late in the evenings at this location. There is a clear rise in traffic throughout the day, with the highest counts generally recorded in the mid-late afternoon, around 4 – 6pm. Furthermore, sensor SN-1610 is located further along the same road and does not demonstrate any of the same PM peaks, only a minor AM peak in line with the AM rush hour.

7.2.4 The location of SN-0867 and recordings from nearby sensors imply a local source of pollution outside of normal traffic contributing to this evening peak, such as idling vehicles nearby or on-site activity.

7.2.5 While there are instances of elevated NO_2 levels on Fridays at SN-0867, the hourly maximum concentration from between November and May was 72.2 μg/m^3 which does not exceed the DAQI level 2 of 134 μg/m^3 and is below the maximum hourly concentration measured at SWBR.

7.3 End of November - NO_2 Peaks at a Number of Sensors

7.3.1 A number of sensors, particularly those in the centre of STE, demonstrated elevated concentrations through the final week of November. Sensors noted to have recorded this increase were; SN-1001, SN-1014, SN-1035, SN-1073, SN-1294 and SN-1646, referred to in this section as Sensors of Interest (SOI) and shown in **Figure 18**.

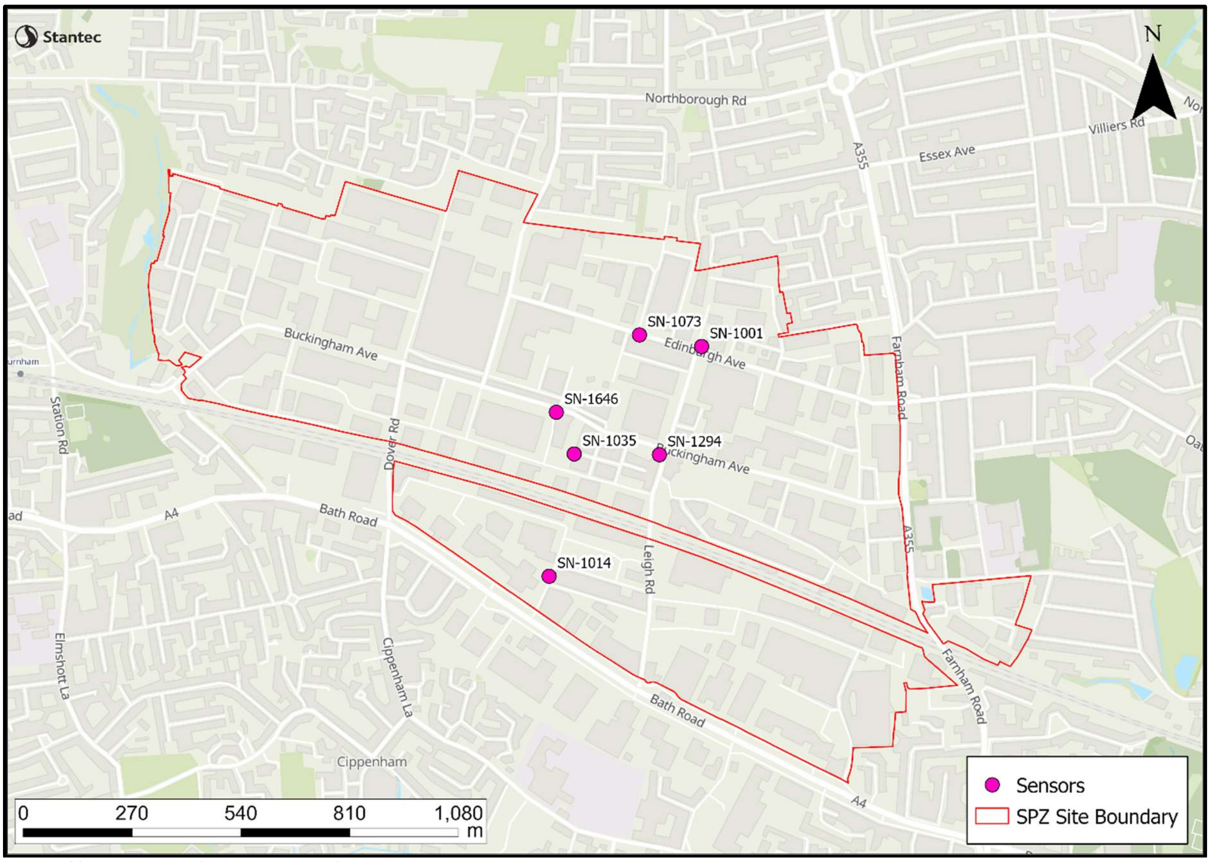

Figure 18: Locations of the sensors referred to in this section
Contains OS data © Crown Copyright and database right 2024. Contains data from OS Zoomstack

7.3.2 The average concentration at these SOI as well as the STE network average and roadside comparator SWBR through November are presented in **Figure 19**.

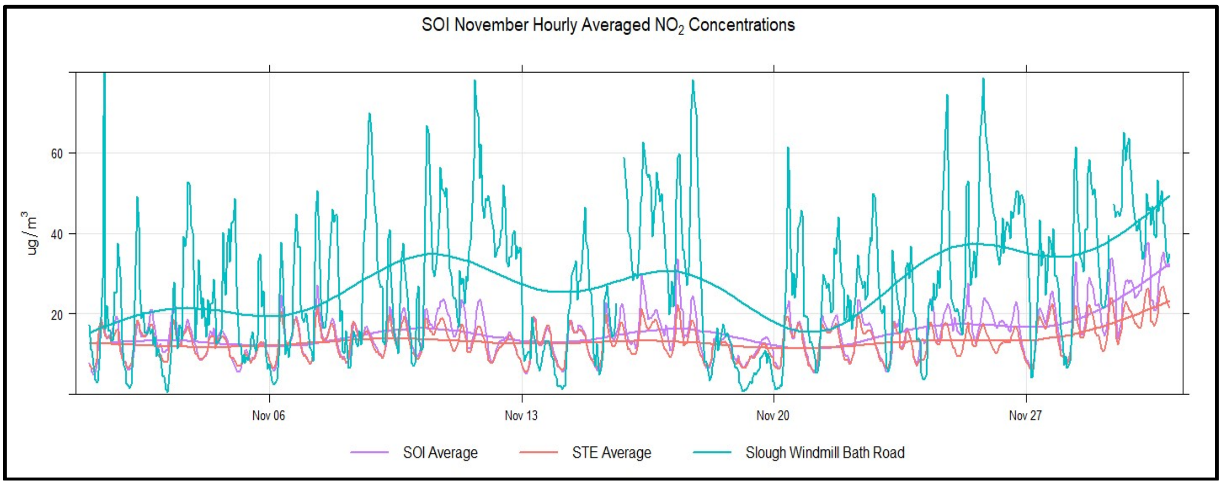

Figure 19: SOI November Hourly Averaged NO_2 Concentrations

7.3.3 There is a clear rise in NO_2 concentrations through the final week of the month as both the SOI group and STE averages rise to above 20 µg/m^3, but concentrations remain well below the SWBR comparator site.

7.3.4 Analysis of traffic counts at arterial roads through the STE indicate no evidence of an uplift in traffic on the STE through the final week of November when compared with the first three weeks of the month, meaning that widespread increases in traffic are not a likely cause for this uplift.

7.3.5 Temperature data from the on-site weather stations as presented in **Figure 20**, demonstrates a significant drop in temperatures through the final week of November. Ambient temperature can influence NO_2 concentrations due to a number of factors including changes to travel behaviour, increased need for heating in buildings (on-site and off-site), changes to atmospheric chemistry and dispersion of pollutants.

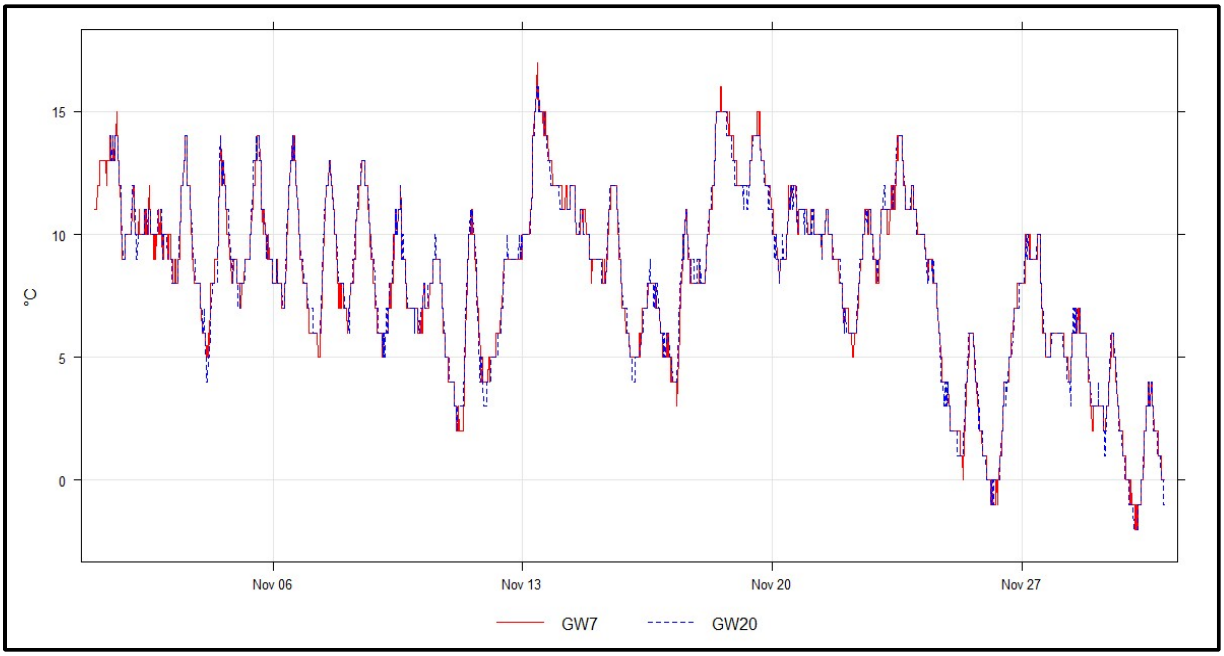

Figure 20: GW7 and GW20 November Temperatures

7.3.6 Due to the widespread nature of this event, occurring at many sensors, it is considered likely that no one local source is responsible for this event, and meteorological and atmospheric conditions (i.e. lower temperature) are considered to be the most likely main cause of this uplift.

7.3.7 While there are instances of elevated NO_2 levels towards the end of November at the SOI's, their rolling mean on **Figure 19** stays consistently below SWBR's rolling mean and all of their hourly average concentrations in November are below the WHO hourly NO_2 AQG (of 200 µg/m^3) and DAQI Level 1 of 67 µg/m^3.

7.4 SN-1646: Elevated AM Peak NO_2 Concentrations

7.4.1 Sensor SN-1646 has exhibited elevated NO_2 concentrations compared to the STE network average throughout the monitoring period, including both elevated levels throughout December, and a strong Friday AM peak which far exceeds that observed at SWBR.

7.4.2 **Figure 21** presents the trend analysis plot for SN-1646 for the entire monitoring period, with a strong AM peak shown across all weekdays, with an especially strong peak on Fridays which exceeds that recorded at SWBR. Fridays exhibit elevated average NO_2 concentrations, at 31 µg/m^3, compared to the next highest average on Wednesdays/Thursdays, which is below 28 µg/m^3.

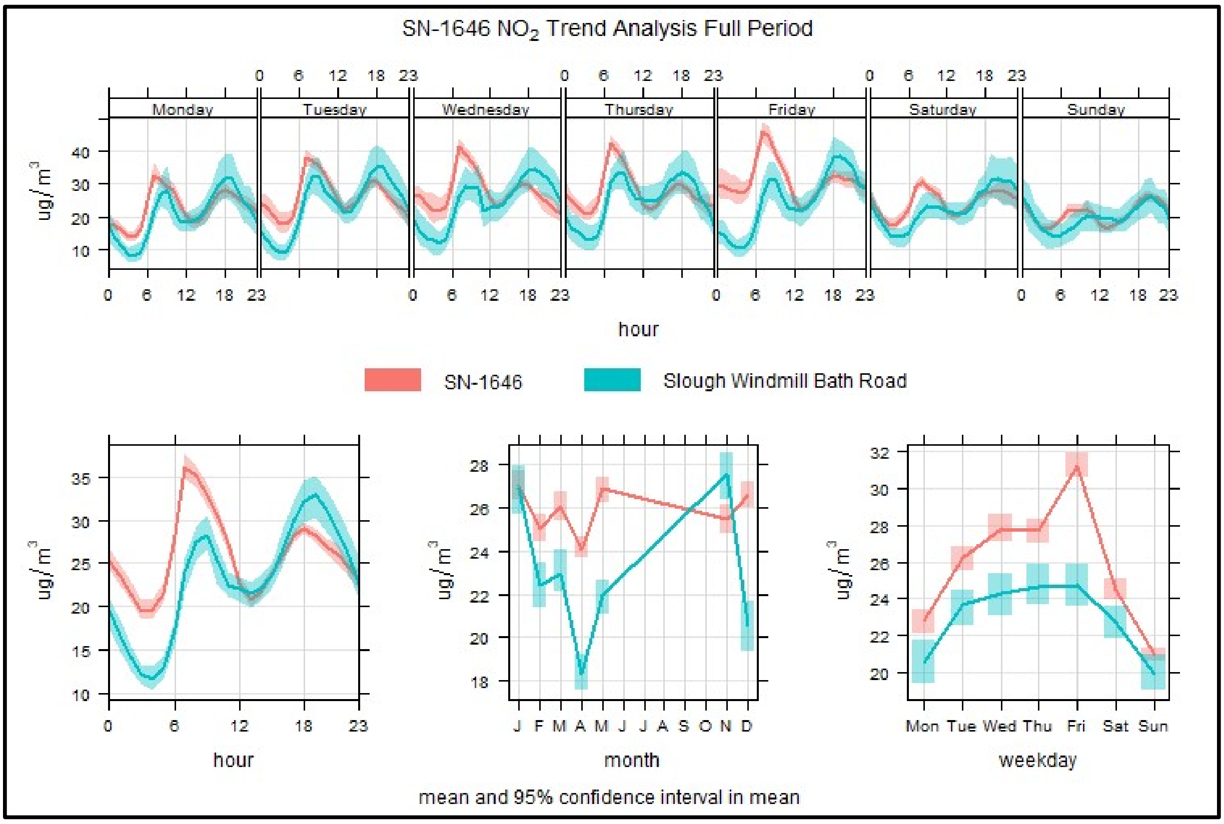

Figure 21: SN-1646 NO_2 Trend Analysis Full Period

7.4.3 Analysis of local traffic from an ATC counter on Buckingham Avenue (approx. 800 m from SN-1646 which is considered representative of traffic along Buckingham Avenue) indicates that diurnal changes in traffic flow remains consistent throughout the week, with the AM rush hour peak seeing slightly less traffic on Mondays and Fridays on average.

7.4.4 Therefore, the traffic diurnal trends do not correlate with monitored NO_2 concentrations, and it is considered that increases in concentrations at SN-1646 are influenced by other on-site sources, especially during the AM peak.

7.4.5 While there are instances of elevated NO_2 levels on Friday mornings at SN-1646, the hourly maximum concentration from between November and May was 67.4 µg/m^3 which does not exceed the DAQI level 2 of 134 µg/m^3 and is below the maximum hourly concentration measured at SWBR.

7.5 SN-1090: Weekday AM Peak NO_2 Concentrations

7.5.1 The December monthly monitoring report noted increased concentrations at SN-1090, located on Dover Road. **Figure 22** compares SN-1090 to the roadside comparator SWBR, which sees a significant influence from traffic. Through the first half of the month, concentrations are generally higher at SWBR, while the second half of the month exhibits higher concentrations generally at SN-1090.

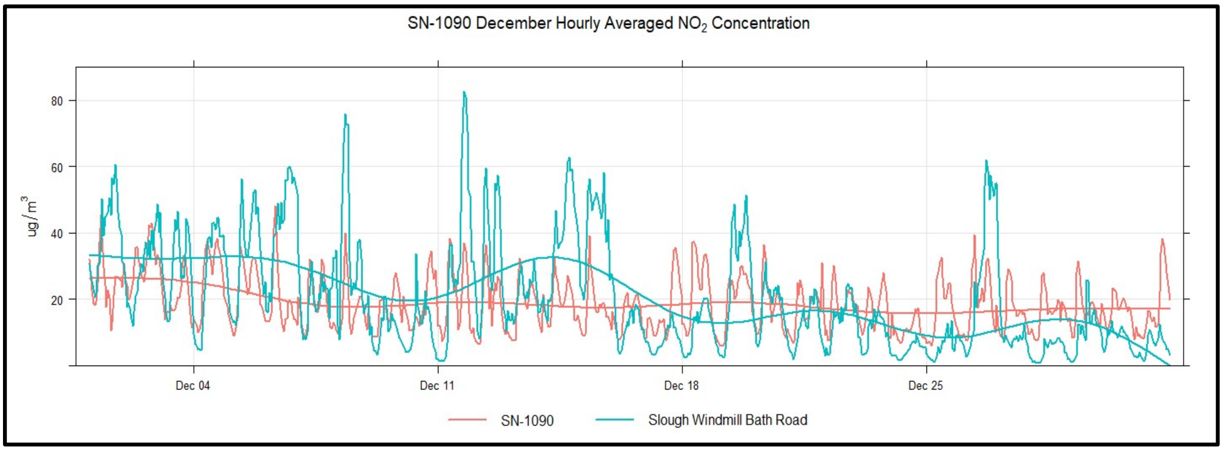

Figure 22: SN-1090 December Hourly Averaged NO_2 Concentrations

7.5.2 **Figure 23** presents the trend analysis of SN-1090 through December, as well as SWBR and the STE network average. NO_2 concentrations at SWBR are generally slightly higher than those observed at SN-1090 through December, but there is a strong AM peak at SN-1090.

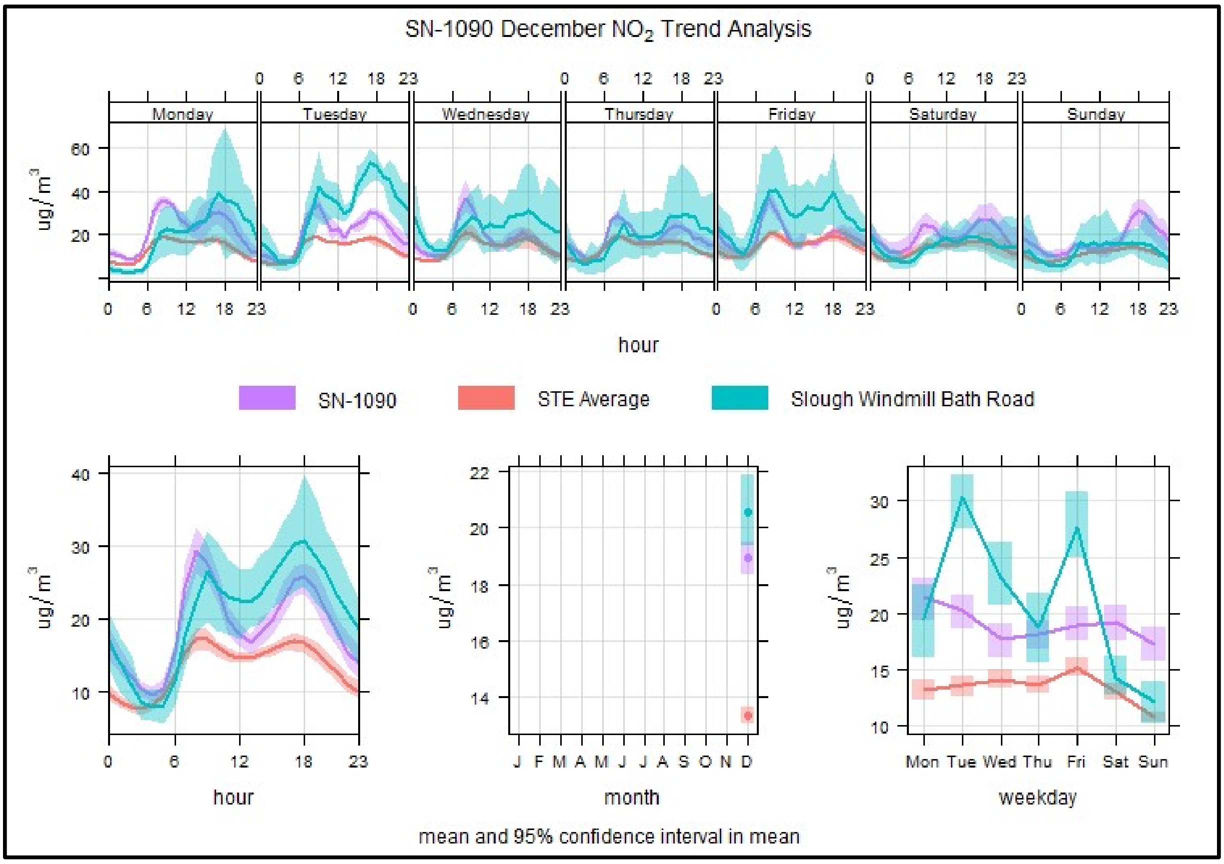

Figure 23: SN-1090 December NO_2 Trend Analysis

7.5.3 Analysis of traffic data from an ATC on Dover Road, near the junction with Bath Road, indicates a strong AM rush hour peak and a smaller PM rush hour peak on weekdays, in line with the typical daily profile observed in NO_2 concentrations at SN-1090. Dover Road is a key site access route which could explain the slightly earlier nature of the AM peak.

7.5.4 There was, however, no significant uplift (or decrease) in traffic counts throughout December. There is also no significant uplift in traffic on Sunday evenings, ruling out road traffic as a cause for the smaller peak observed.

7.5.5 It is therefore considered likely that road traffic plays a significant role in NO_2 concentrations at SN-1090, especially in the AM rush hour. There is however no evidence that the Sunday evening peak at this site is due to traffic.

7.5.6 While there are instances of elevated NO_2 levels around the morning 'rush hour' at SN-1090, the hourly maximum concentration from between November and May was 51.9 $\mu g/m^3$ which does not exceed the DAQI level 1 of 67 $\mu g/m^3$ and is below the maximum hourly concentration measured at SWBR.

7.6 Elevated NO_2 Concentrations - Second and Third Weeks of January

7.6.1 A number of sensors showed elevated levels of NO_2 through the second and third week of January. These included: SN-0978, SN-0997, SN-1001, SN-1014, SN-1035, SN-1073, SN-1201, SN-1317, SN-1328, SN-1538, SN-1607 and SN-1643, here referred to as the SOI and are shown in **Figure 24**.

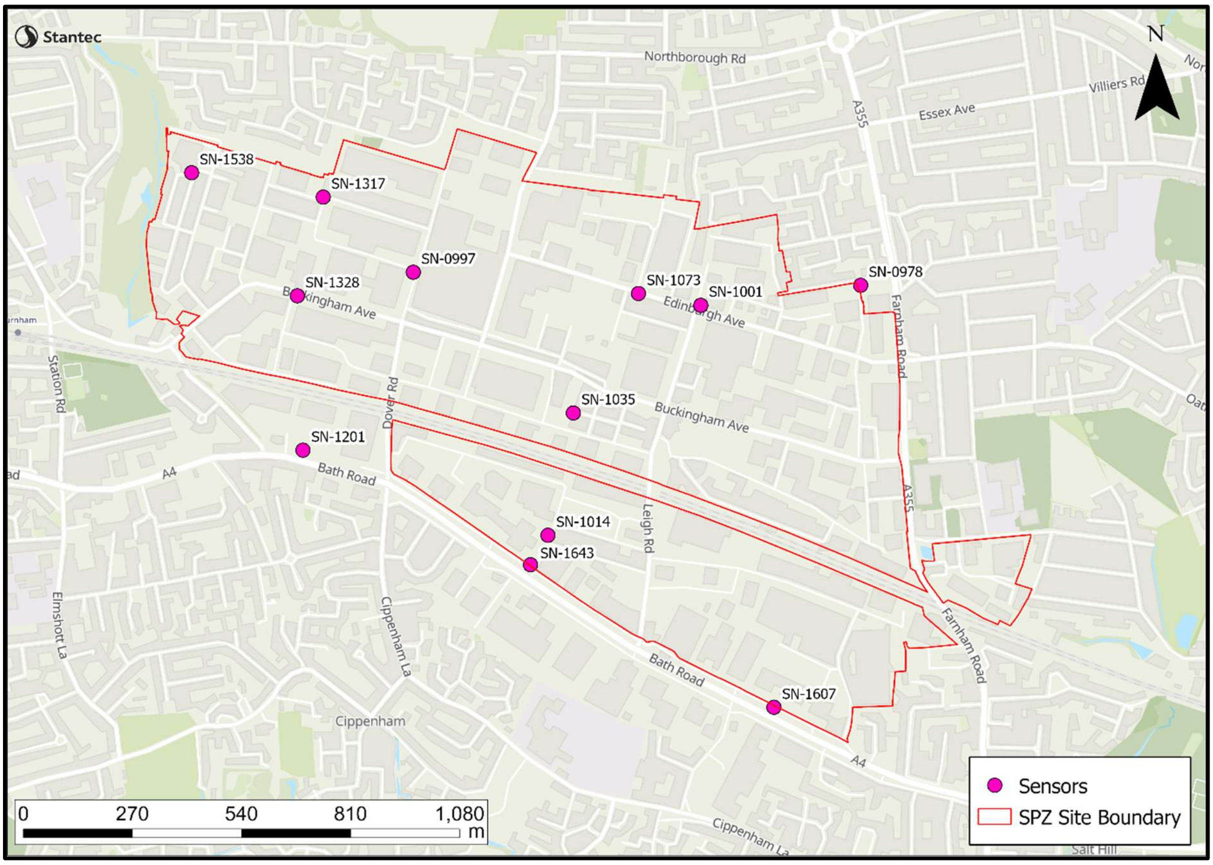

Figure 24: Locations of the sensors referred to in this section
Contains OS data © Crown Copyright and database right 2024. Contains data from OS Zoomstack

7.6.2 Figure 25 compares the average of the SOI, the STE and SWBR through the month of January.

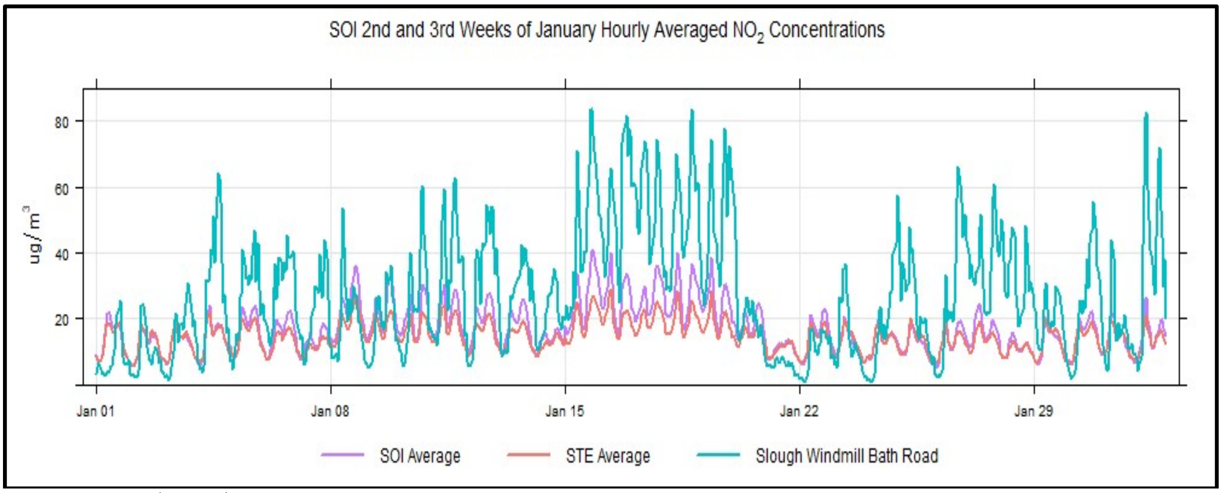

Figure 25: SOI 2nd and 3rd Weeks of January Hourly Averaged NO_2 Concentrations

7.6.3 There are elevated concentrations at the SOI, slightly above the STE average, but remaining well below that shown at SWBR in a period of elevated concentrations at all monitoring sites.

The third week (Jan 15th – Jan 22) especially saw significantly increased concentrations at SWBR throughout Monday - Friday, with many hourly peaks of upto 80 µg/m^3 seen throughout this week, which was not reflected at nearly the same extent at the SOI, or at the STE average.

7.6.4 Analysis of traffic data from ATCs on key arterial STE roads (Buckingham Avenue and Dover Road, used as an indicator of wider traffic flows on the whole STE), demonstrates no evidence of a significant increase in traffic flows compared to the average of the monitoring period.

7.6.5 **Figure 26** presents temperature data from on-site weather stations GW7 and GW20, through January. There was a clear drop in temperature in the second and third week of the month which correlates with increased NO_2 concentrations seen across the network, especially at SWBR, which is particularly clear in the week commencing 15th January at the roadside comparator shown on **Figure 25** .

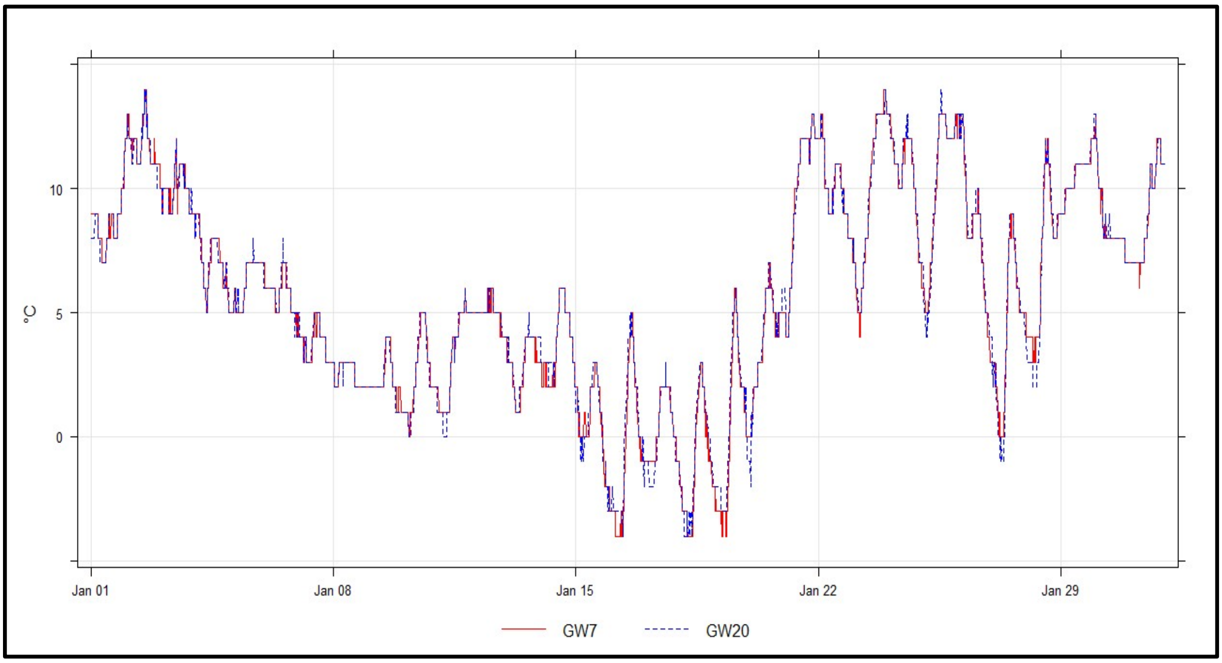

Figure 26: GW7 and GW20 January Temperatures

7.6.6 It is therefore considered that these elevated NO_2 concentrations are primarily associated with meteorological conditions and lower ambient temperatures which can influence NO_2 concentrations due to a number due to a number of factors including changes to travel behaviour, increased need for heating in buildings (on-site and off-site), changes to atmospheric chemistry and dispersion of pollutants.

7.6.7 While there are instances of elevated NO_2 levels in the second and third weeks of January at the SOI's, their rolling mean on **Figure 25** generally stays below SWBR's rolling mean. The hourly average concentrations at the SOIs in January are below the WHO hourly NO_2 AQG of 200 µg/m^3 and all but SN-1035 are below the DAQI Level 1 of 67 µg/m^3.

7.7 Elevated NO_2 Concentrations - Final Week of February

7.7.1 A number of sensors demonstrated elevated levels of NO_2 through much of February, and especially in the final week. These are the following: SN-1001, SN-1014 SN-1090, SN-1155, SN-1294, SN-1317, SN-1643 and SN-1646, referred to in the following paragraphs as the SOI and Shown in **Figure 27**. These are all roadside sites, generally located along major roads within the STE.

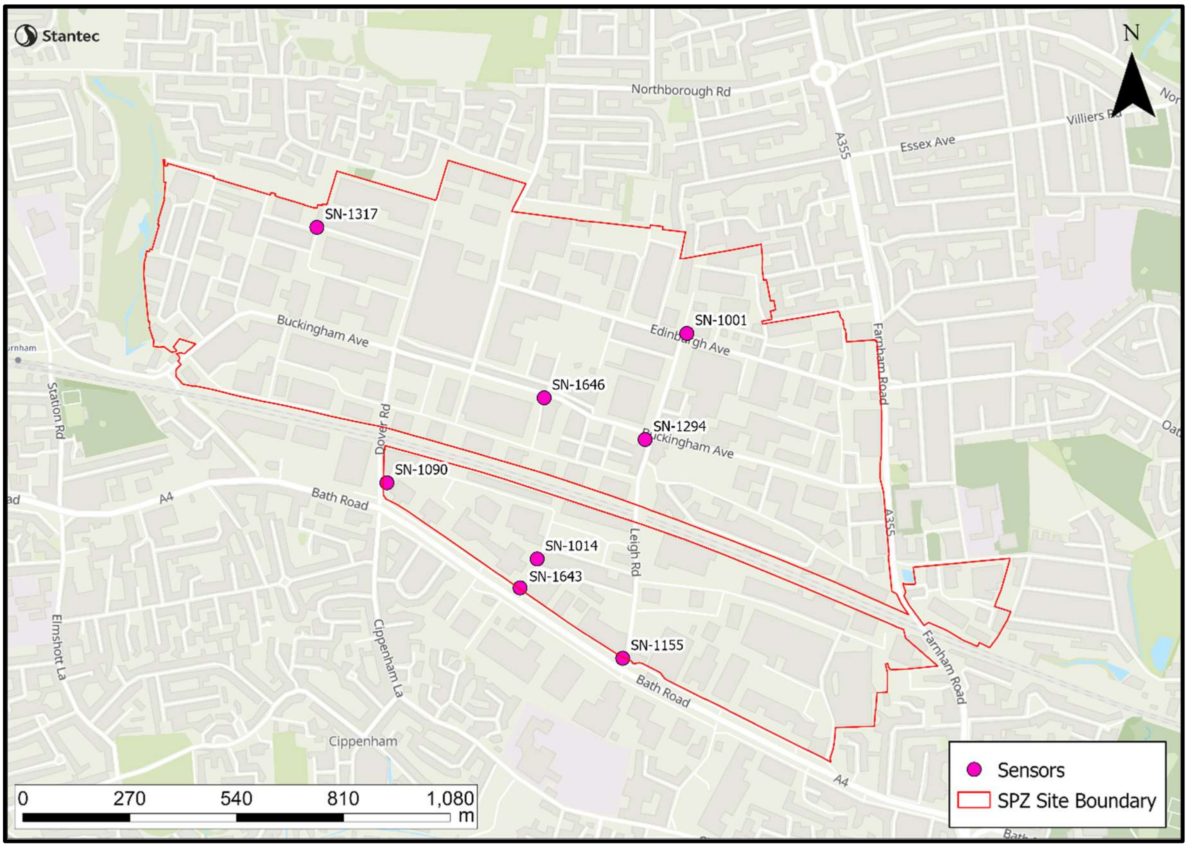

Figure 27: Locations of the sensors referred to in this section
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7.7.2 **Figure 28** presents the average concentration for the SOI, STE and at the roadside comparator SWBR. There are slightly elevated concentrations at the SOI in the final week of the month, and the SOI are consistently above the STE average, while remaining generally below the concentrations observed at SWBR through the month. There are also a number of peaks observed at SWBR which are not reflected to the same extent at the SOI, or the STE network.

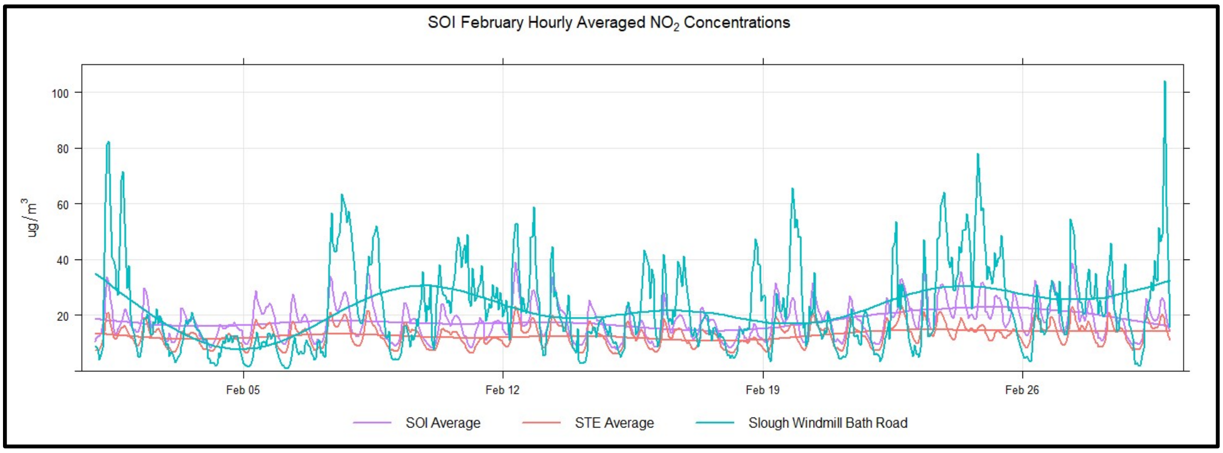

Figure 28: SOI February Hourly Averaged NO_2 Concentrations

7.7.3 Analysis of traffic counts on Dover Road indicates that there was a marginal uplift in traffic, particularly at the AM rush-hour peak, at the STE through the final week of February (compared to average flows for November – May) but this is not considered to explain the increase in NO_2 concentrations.

7.7.4 **Figure 29** presents the average temperatures recorded at on-site weather stations and shows that the final week of February and a drop in temperature is evident during this period.

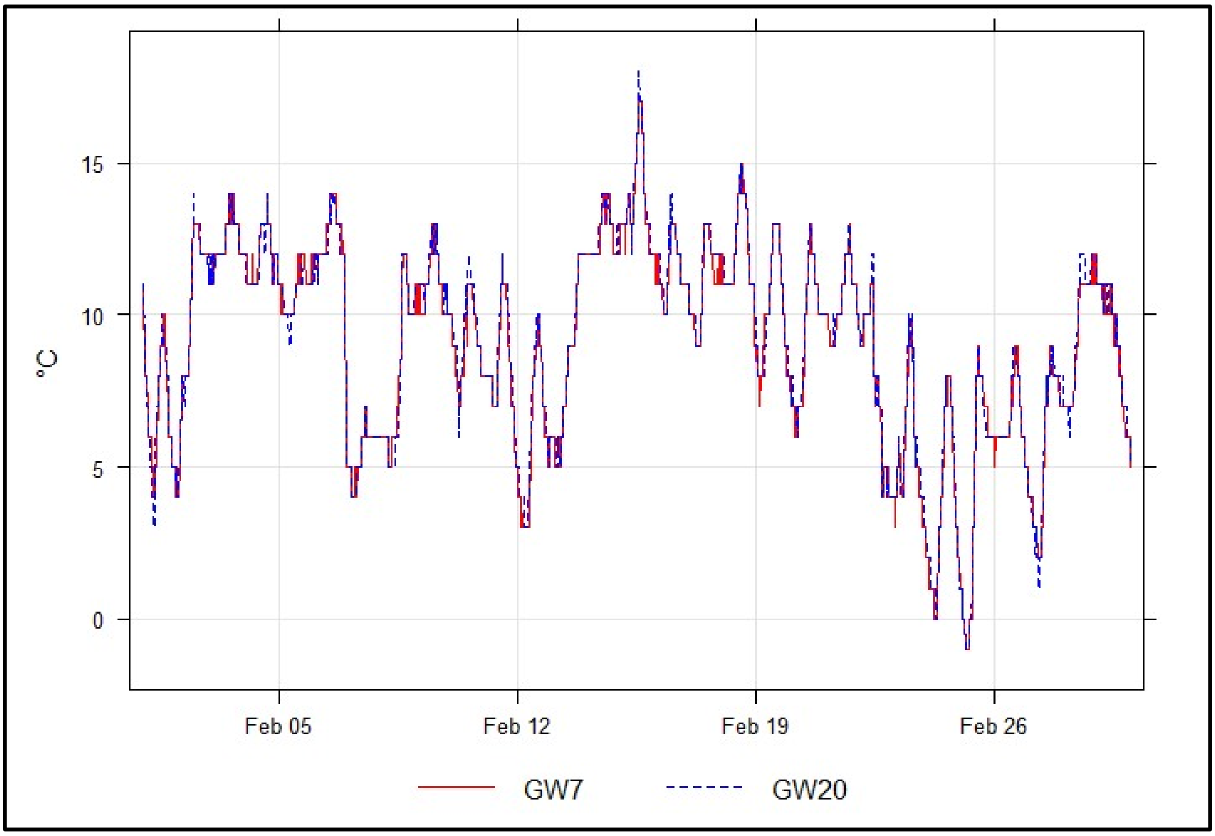

Figure 29: GW7 and GW20 February Temperatures

7.7.5 Overall, it is considered that a rise in NO_2 concentrations at sensors which are geographically spread in such a way is not likely to constitute a singular local pollution source and more likely to be associated with meteorological conditions. Lower ambient temperature can influence NO_2 concentrations due to a number of factors including changes to travel behaviour, increased need for heating in buildings (on-site and off-site), changes to atmospheric chemistry and dispersion of pollutants.

7.7.6 While there are instances of elevated NO_2 levels in the final week of February at the SOI's, their rolling mean on **Figure 28** stays below SWBR's rolling mean for the whole of the week. Also, all hourly average concentrations are below the WHO hourly NO_2 AQG of 200 µg/m^3 and the Defra AQI Level 1 of 67 µg/m^3 for the final week.

7.8 Elevated NO_2 Concentrations - Periods during March and April

7.8.1 Through March and April, particularly the 2nd and 3rd week of March, and at various points throughout April, certain sensors observed slightly increased NO_2 concentrations. These include: SN-0847, SN-1001, SN-1034, SN-1090, SN-1252, SN-1294, SN-1314, SN-1317, SN-1600 and SN-1643, referred to in this section as SOI and shown in **Figure 30** below.

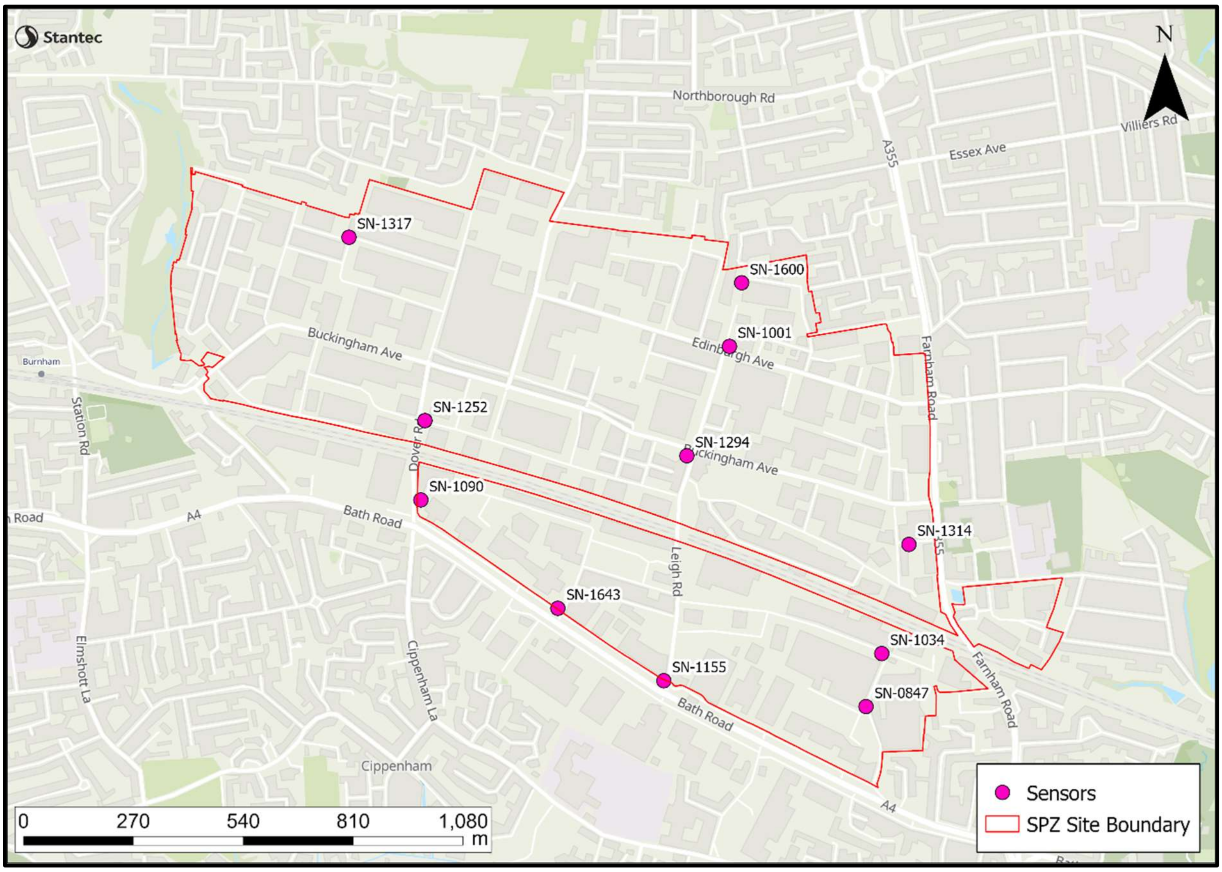

Figure 30: Locations of the sensors referred to in this section

7.8.2 **Figure 31** presents the average measures NO_2 concentration for the SOI, the STE network average, and the roadside comparator SWBR. The SOI are largely below SWBR on average, apart from at some points such as during the second week of March and first week of April.

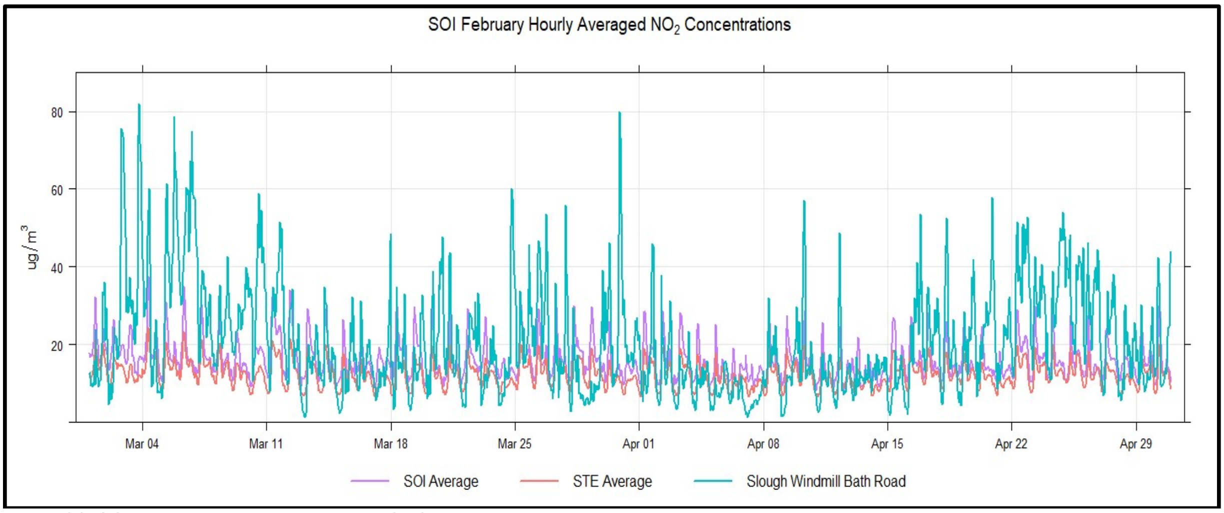

Figure 31: SOI February Hourly Averaged NO_2 Concentrations

7.8.3 **Figure 32** presents the trend analysis of the SOI, with the STE average and SWBR, for the second and third week of March (11th – 24th). There is a strong AM peak at the SOI, which slightly exceeds that shown at SWBR, although the strong AM peak is largely in-time with the roadside comparator.

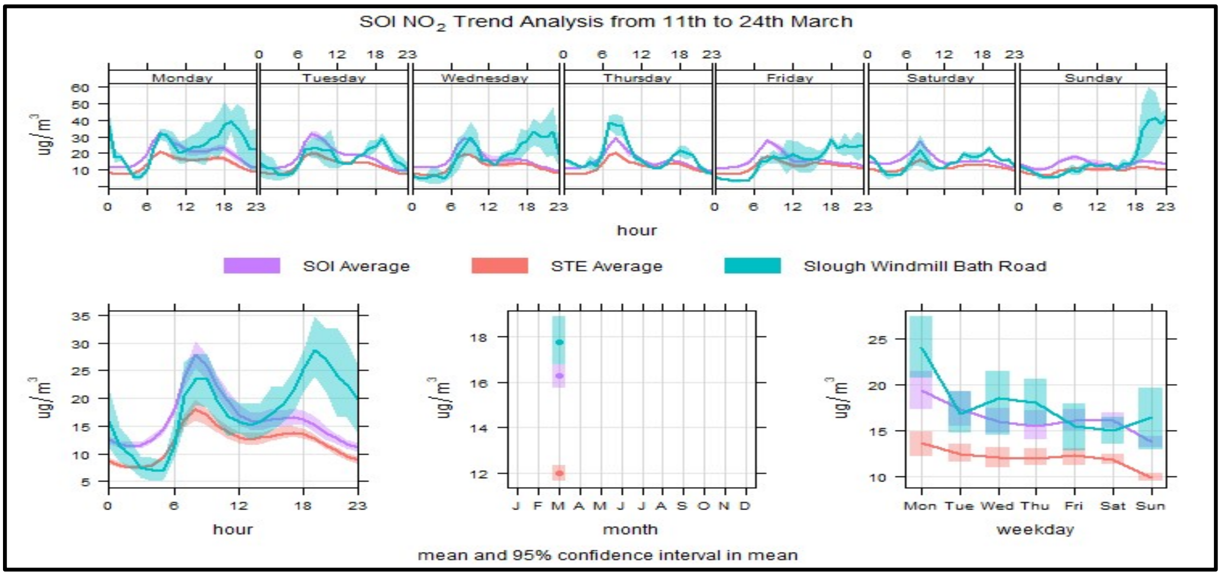

Figure 32: SOI NO2 Trend Analysis from 11th to 24th March

7.8.4 **Figure 33** presents the trend analysis of the SOI, with the STE average and SWBR, for April. The SOI again show an AM peak, which is slightly delayed but still within the rush hour and show a similar diurnal trend to that shown during March, and the wider STE network.

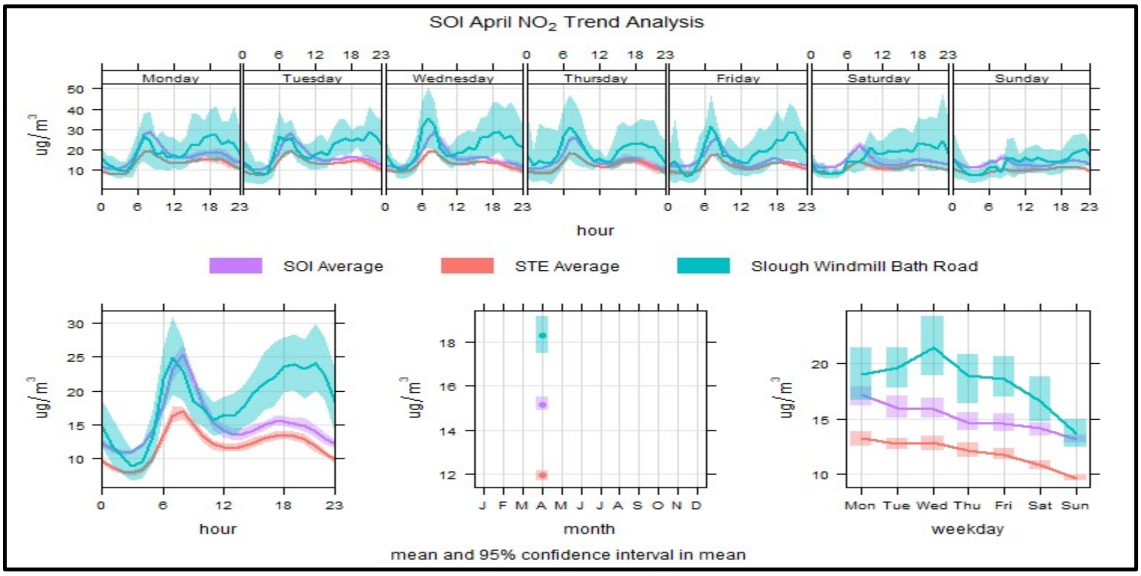

Figure 33: SOI April NO_2 Trend Analysis

7.8.5 Analysis of traffic from STE arterial roads Dover Road and Buckingham Avenue indicates no evidence of a significant uplift in traffic from normal levels over March and April.

7.8.6 Therefore, it is considered unlikely that these peaks were caused by sustained significant increases in road traffic. and it is considered that increases in concentrations are influenced by other on-site sources, especially during the AM peak.

7.8.7 These events across the STE remained generally well below NO_2 levels seen at roadside comparator SWBR and are not considered significant as hourly averaged concentrations remained well below DEFRA Hourly AQI Level 1 of 67 µg/m^3.

7.9 SN-1073- PM Peak NO_2 Concentrations during April

7.9.1 The April monitoring report noted some strong PM peaks at SN-1073**. Figure 34** presents the hourly average NO_2 concentration at SN-1073, as well as the STE Average and SWBR. There are a number of strong peaks which exceed that shown at the roadside comparator, although average concentrations are generally comparable to, or lower than, SWBR.

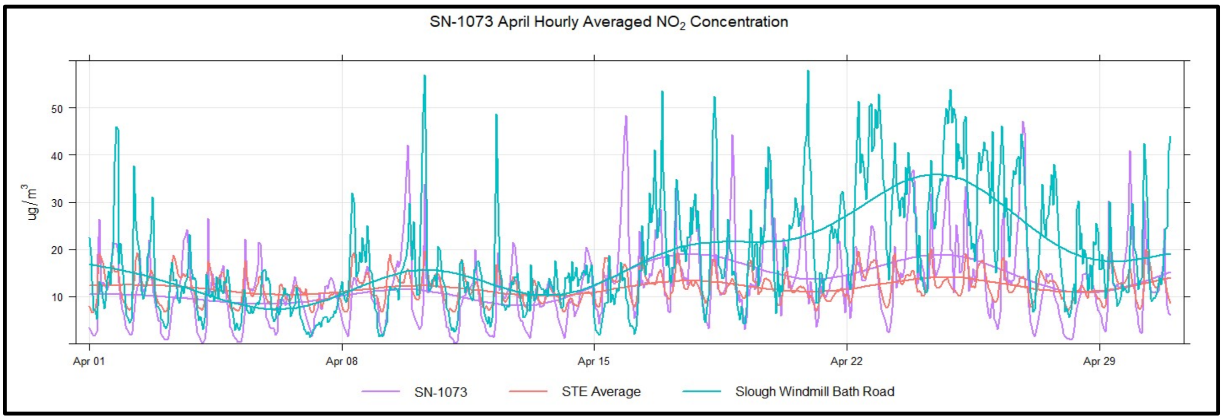

Figure 34: SN-1073 April Hourly Averaged NO_2 Concentration

7.9.2 **Figure 35** presents the trend analysis during April for SN-1073 compared to the STE network average and roadside comparator SWBR. The AM rush hour peak at SN-1073 is lower than the STE average, and significantly below that observed at SWBR, while the PM peak approaches the level of SWBR, at just over 20 µg/m^3.

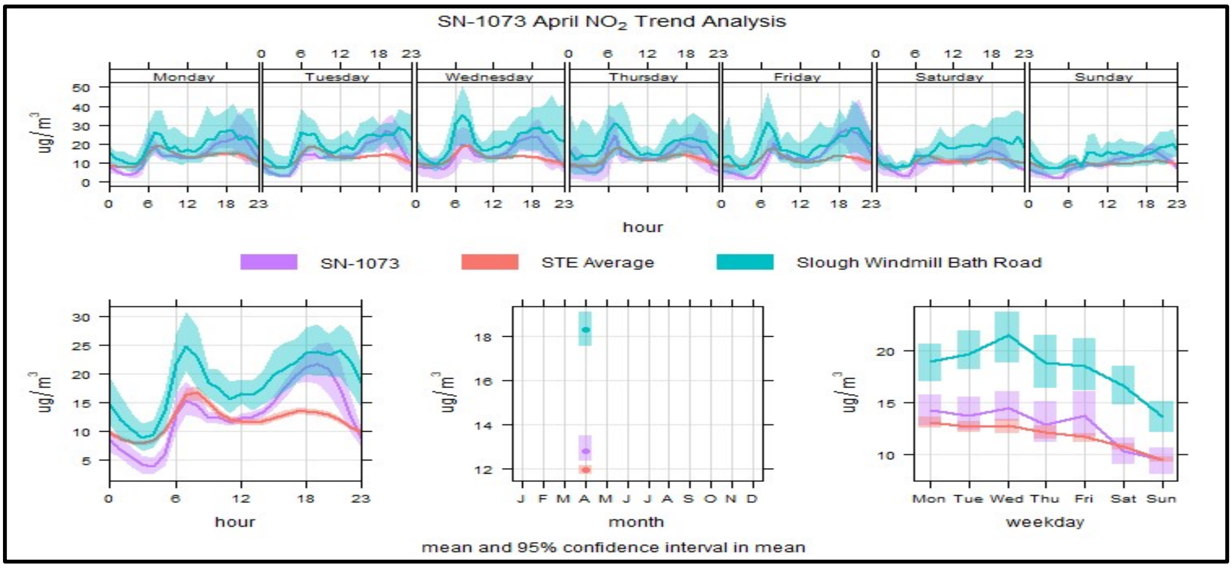

Figure 35: SN-1073 April NO_2 Trend Analysis

7.9.3 Analysis of traffic counts from an ATC sensor on Edinburgh Avenue (approx. 500 m from SN-1073) indicates that there was no significant uplift in traffic flows during April. Furthermore, there was no significant change in temperature, and this trend is not replicated at any other sensor on the STE network.

7.9.4 It is therefore considered most likely that a local non-traffic source was responsible for peaks in NO_2 concentrations recorded at SN-1073 during April.

7.9.5 While there are instances of elevated NO_2 levels around the evening 'rush hour' in April at SN-1073, the hourly maximum concentration from between November and May was 65.8 µg/m^3 which does not exceed the DAQI level 1 of 67 µg/m^3 and is below the maximum hourly concentration measured at SWBR.

7.10 Various Sensors: April 26th Elevated NO_2 during Evening Peak

7.10.1 A number of sensors demonstrated a strong PM peak late in the evening of Friday April 26th. These included SN-0867, SN-1073 and SN-1264, and to a lesser extent, SN-1028 and SN-1201, referred to in this section as the SOI and shown in **Figure 36** below.

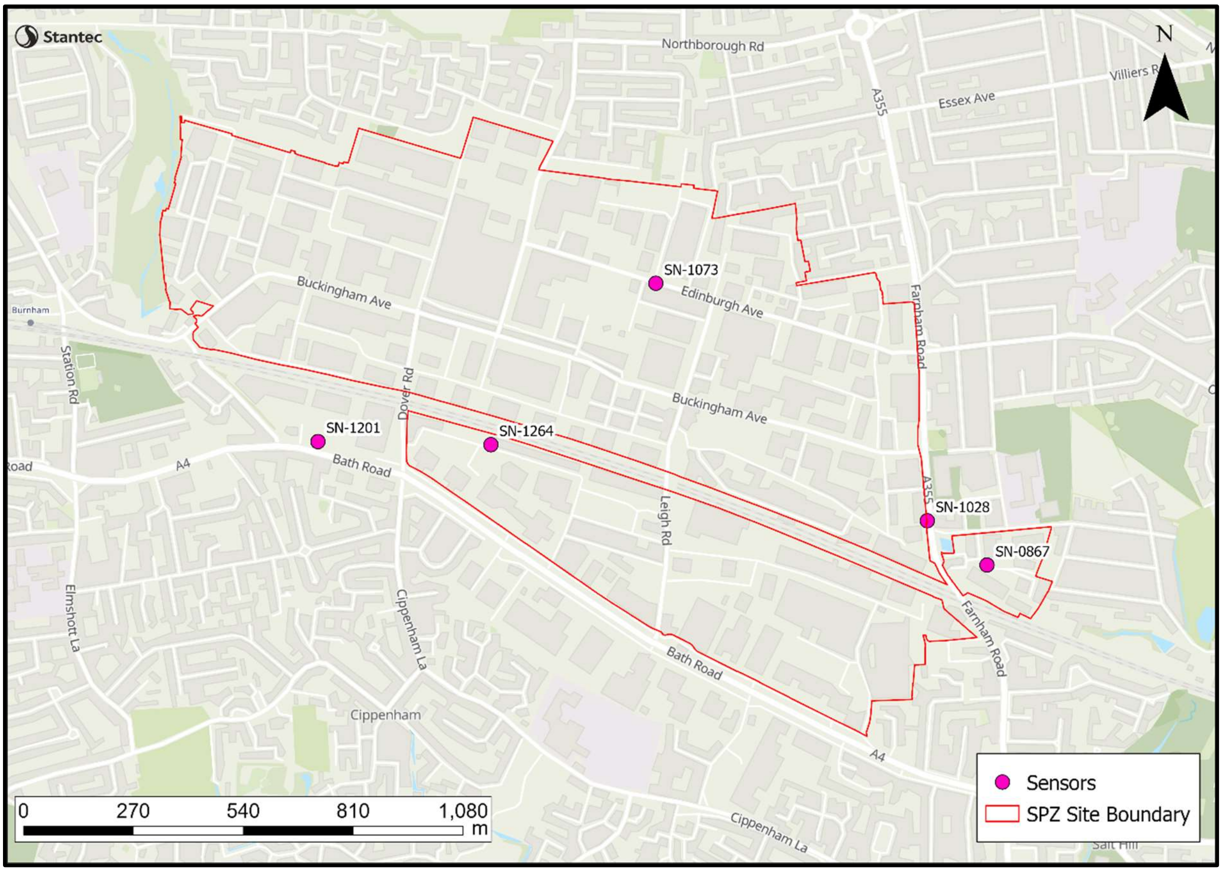

Figure 36: Locations of the sensors referred to in this section
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7.10.2 **Figure 37** presents the hourly averaged NO_2 concentrations over the month at the SOI, the STE network average, and at SWBR. There are clear increases at the SOI at a few points throughout the month, with a strong peak on April 26th.

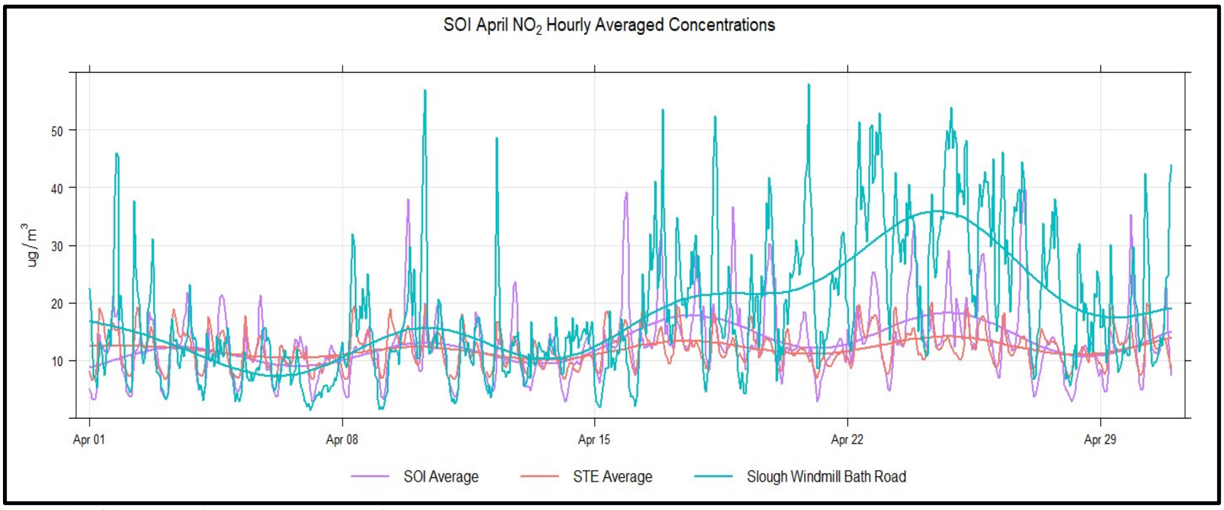

Figure 37: SOI April NO_2 Hourly Averaged Concentrations

7.10.3 **Figure 38** present the trend analysis of the SOI compared to the STE network average and the roadside comparator site SWBR for the final week of April. There is a strong PM peak at the SOI sensors which significantly exceeds the STE average, but remains below the levels observed at SWBR. This PM peak at the SOI occurs later in the day (around 8 – 10pm), than a typical traffic rush hour.

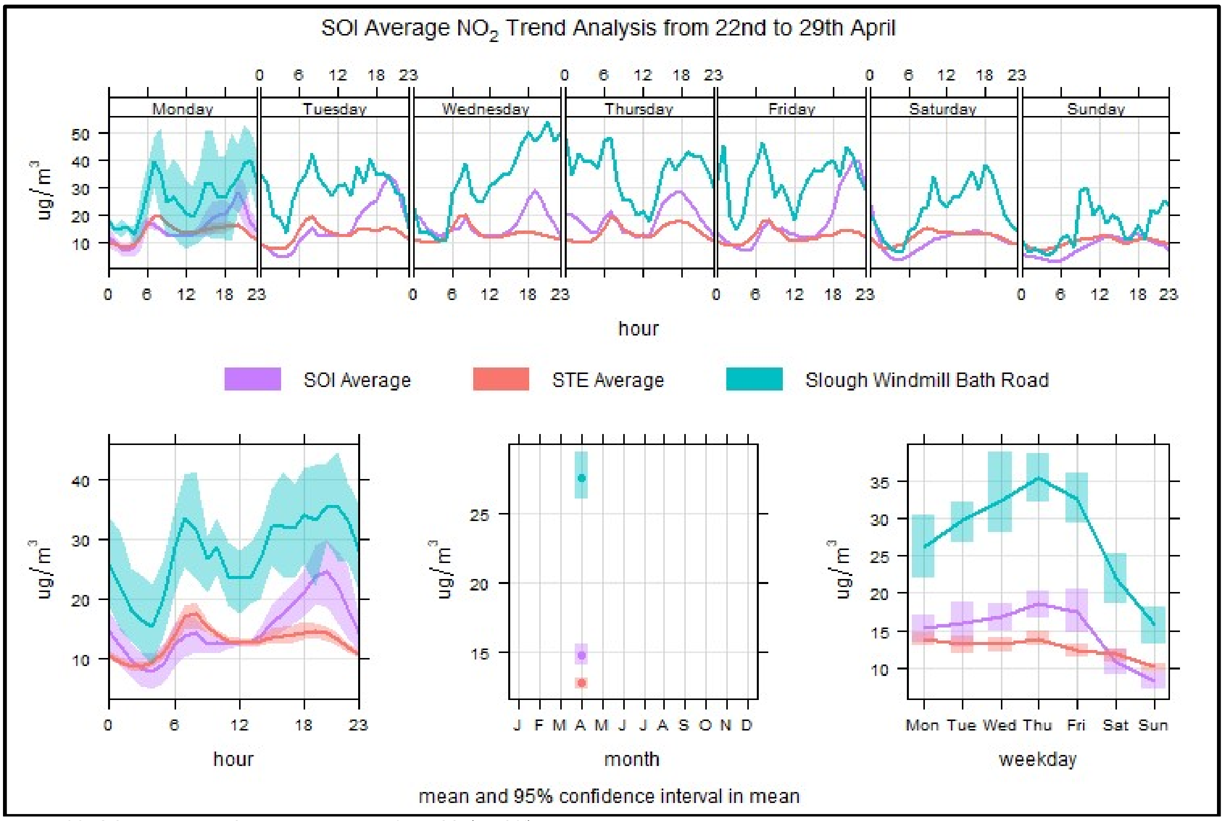

Figure 38: SOI Average NO_2 Trend Analysis from 22nd to 29th April

7.10.4 Analysis of traffic counts from local ATCs on Whitby Road and Edinburgh Avenue, on which some of the SOI are located, indicates no evidence of unusual evening peak in traffic on April 26th.

7.10.5 It is therefore considered most likely that a local non-traffic source was responsible for peaks in NO_2 concentrations recorded at the SOI on the 26th April.

7.10.1 Despite the elevated NO_2 levels on the afternoon of the 26th April at the SOIs. The hourly average concentrations at the SOIs in April were all below the WHO hourly NO_2 AQG of 200 μg/m^3 and the DAQI Level 1 of 67 μg/m^3.

7.11 SN-1314 –Elevated NO_2 Concentrations during Monitoring Period

7.11.1 SN-1314 has exhibited elevated NO_2 concentrations throughout the monitoring period, which have exceeded what may be expected from a sensor on a minor road. **Figure 39** below presents the trend analysis of the full monitoring period (01/11/2023 – 31/05/2024) at this site, compared to the STE average and SWBR.

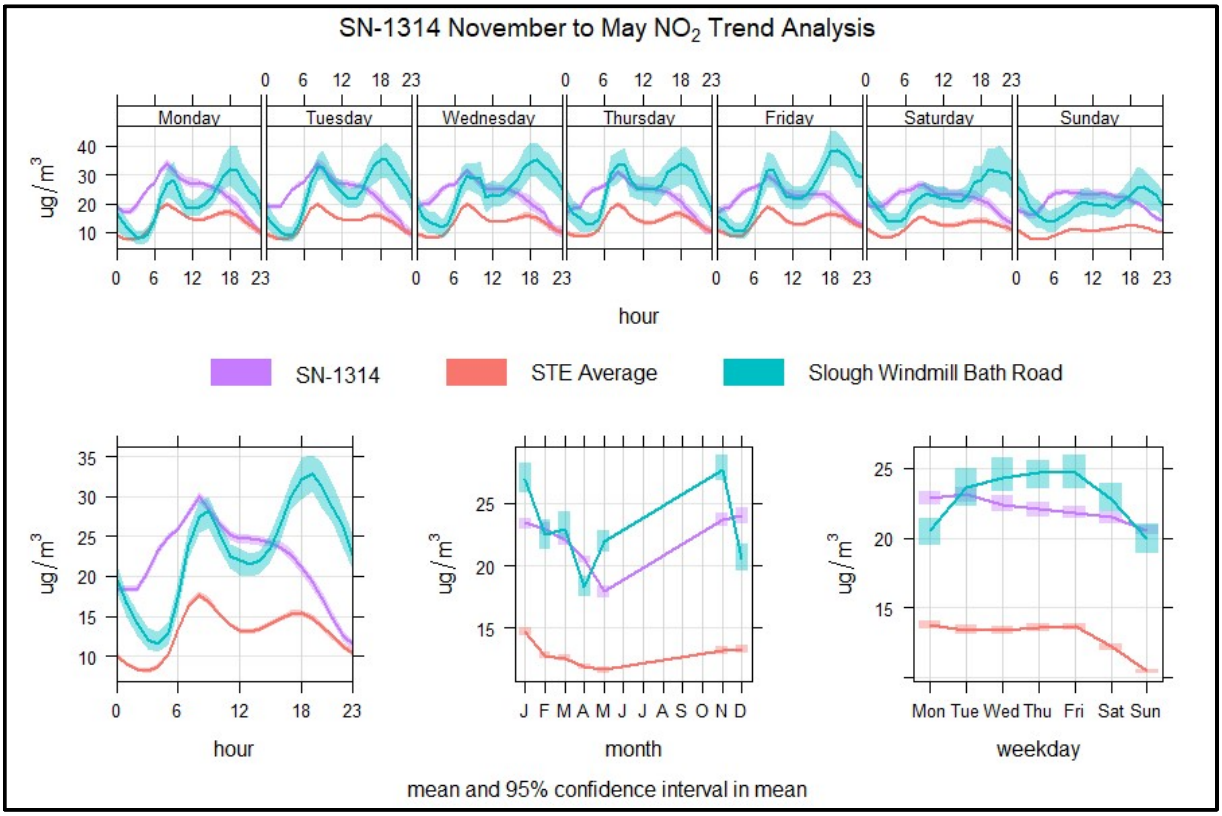

Figure 39: SN-1314 November to May NO_2 Trend Analysis

7.11.2 SN-1314 demonstrates a strong diurnal trend, with a strong AM peak which on average exceeds that seen at SWBR, by the most on Mondays. This has been confirmed by site staff as likely being influenced by its location at the trade park (449-460 Farnham Road) which is busy with customer deliveries on Mondays.

7.11.3 Although no nearby on-site ATCs are available to investigate traffic trends, the timings of the AM and PM peaks are highly consistent with road traffic, with a stronger AM peak and smaller, yet still significant, PM peak observed at this sensor at around 9am and 5pm respectively.

7.11.4 Therefore, it is considered likely that vehicles associated with the trade park are the predominant source of NO_2 at SN-1314 particularly during the AM period. Average concentrations at this sensor are in line with the roadside comparator SWBR on average.

7.11.5 While there are instances of elevated NO_2 levels on Monday mornings at SN-1314, the hourly maximum concentration between November and May was 49.9 µg/m^3 which does not exceed the DAQI level 1 of 67 µg/m^3 and is below the maximum hourly concentration measured at SWBR.

7.12 May NO_2 Peaks at southeastern extent

7.12.1 Throughout May, several sensors exhibited elevated peaks in concentration; SN-0867, SN-1028 and SN-1034, here referred to as the SOI, are all located towards the southeast of the STE in **Figure 40.**

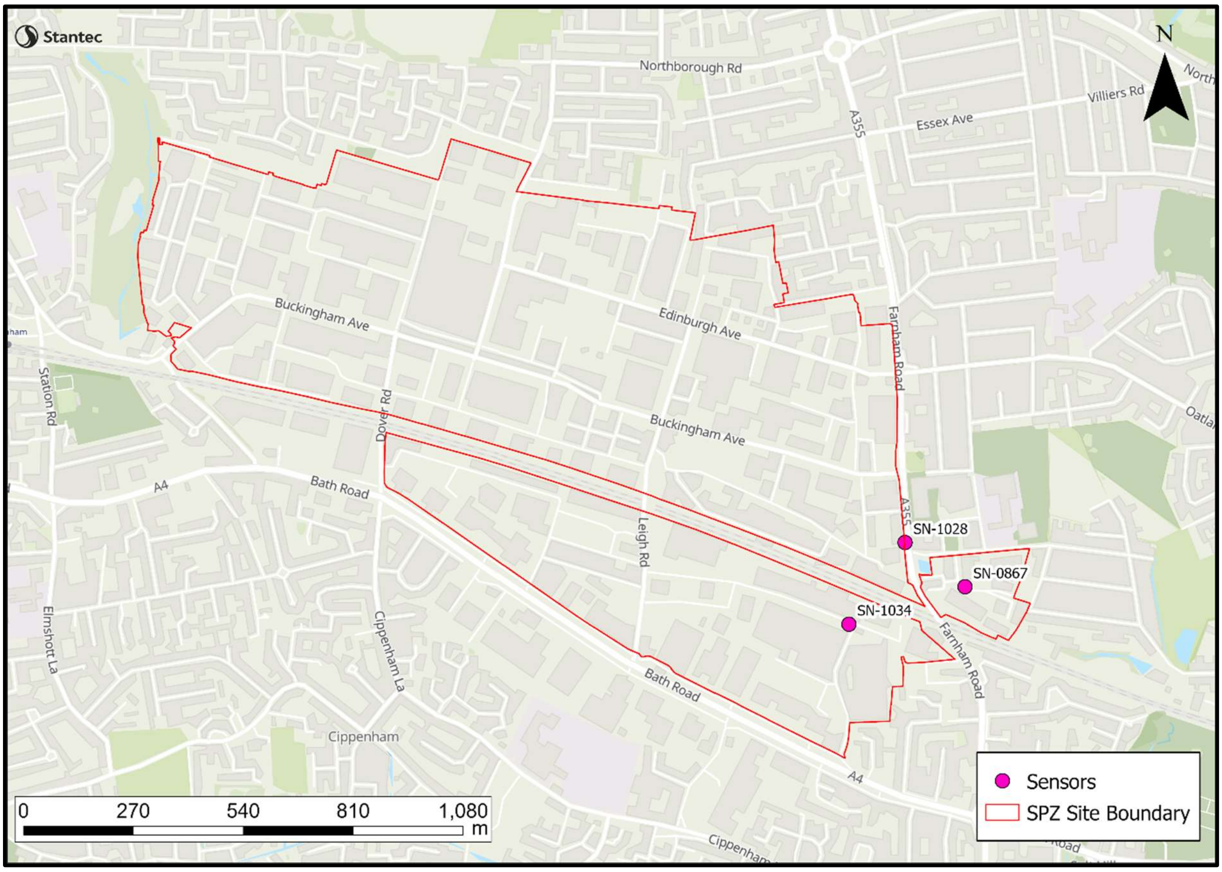

Figure 40: Locations of the sensors referred to in this section
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7.12.2 **Figure 41** presents the NO_2 concentrations at these sites individually plotted over the month of May, which indicates that the peaks at SN-0867 and SN-1028 are generally aligned, while SN-1034 indicates a different profile of peaks in concentrations.

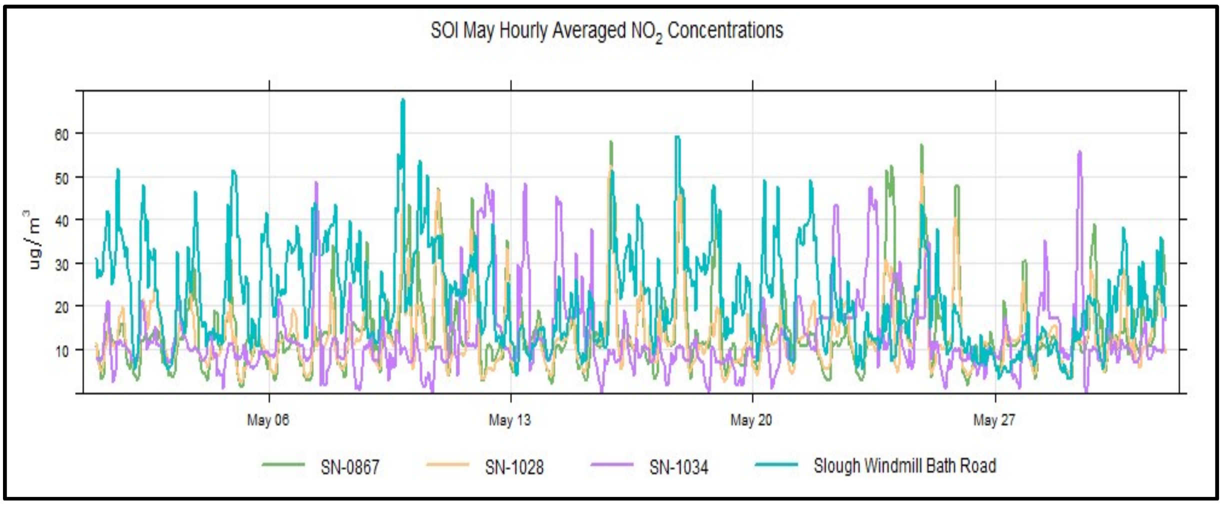

Figure 41: SOI May Hourly Averaged NO_2 Concentrations

7.12.3 **Figure 42** presents the trend analysis of the SOI, compared with the STE network average, and SWBR site. There are late PM peaks at two of the SOI, with SN-0867, as previously noted in this report, having a strong PM peak on a Friday, later than would be expected to occur from diurnal traffic. This peak is also observed at a similar time, and to a lesser extent, at SN-1028, and both sites see this peak significantly on Friday and Saturday evening.

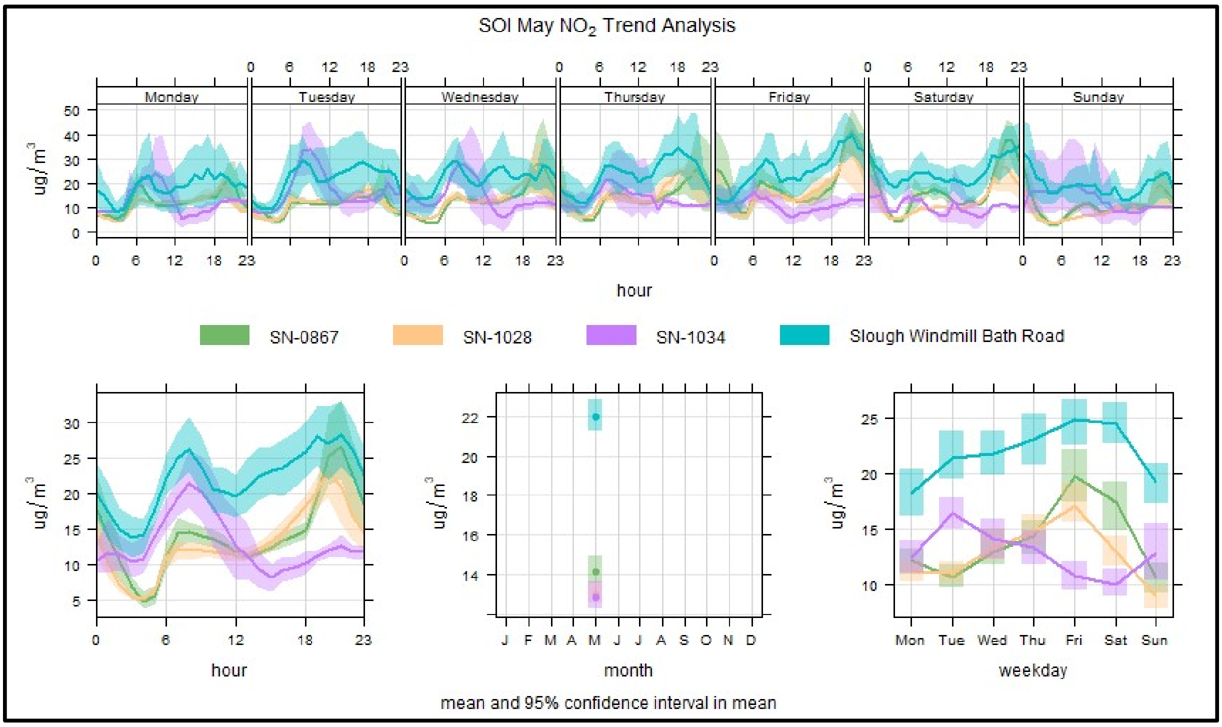

Figure 42: SOI May NO2 Trend Analysis

7.12.4 SN-1034, however, demonstrates a strong AM peak, which remains below SWBR on average throughout the month. There is a minor PM peak which is later than a typical PM rush-hour peak, but remains below that observed at SWBR.

7.12.5 Analysis of local traffic from an ATC counter on Whitby Road indicates that there was no significant uplift in traffic flows during May that could have impacted SN-0867.

7.12.6 It is therefore considered most likely that a local non-traffic source was responsible for peaks in NO_2 concentrations recorded at the SOI during May.

7.12.7 All hourly concentrations observed at SN-1028 and SN-1034 have been below the DEFRA AQI Level 1 of 67 µg/m^3, while SN-0867 has an hourly maximum concentration of 72.2 µg/m^3, which is within the DEFRA Hourly AQI Level 2 of 68 – 134 µg/m^3, and all maximum hourly concentrations recorded are below that observed at SWBR.

7.13 November Regional $PM_{2.5}$ and PM_{10}: Bonfire Night & Diwali

7.13.1 Bonfire Night (November 5th and nearby weekends) and Diwali (12th November 2023) are commonly associated with bonfires and firework displays, which can cause emissions of both $PM_{2.5}$ and PM_{10}.

7.13.2 **Figure 43** and **Figure 44** present **t**he STE average $PM_{2.5}$ and PM_{10} concentrations respectively from October 30th – November 12th, as well as the regional comparator RNT.

7.13.3 The influence of both 'bonfire night' and Diwali celebrations is evident in both the measured $PM_{2.5}$ and PM_{10} concentrations both within the STE and regionally, as would be expected. Whilst the RNT comparator demonstrated similar peaks during both events, the STE network average was considerably higher in the evening of the 12th November.

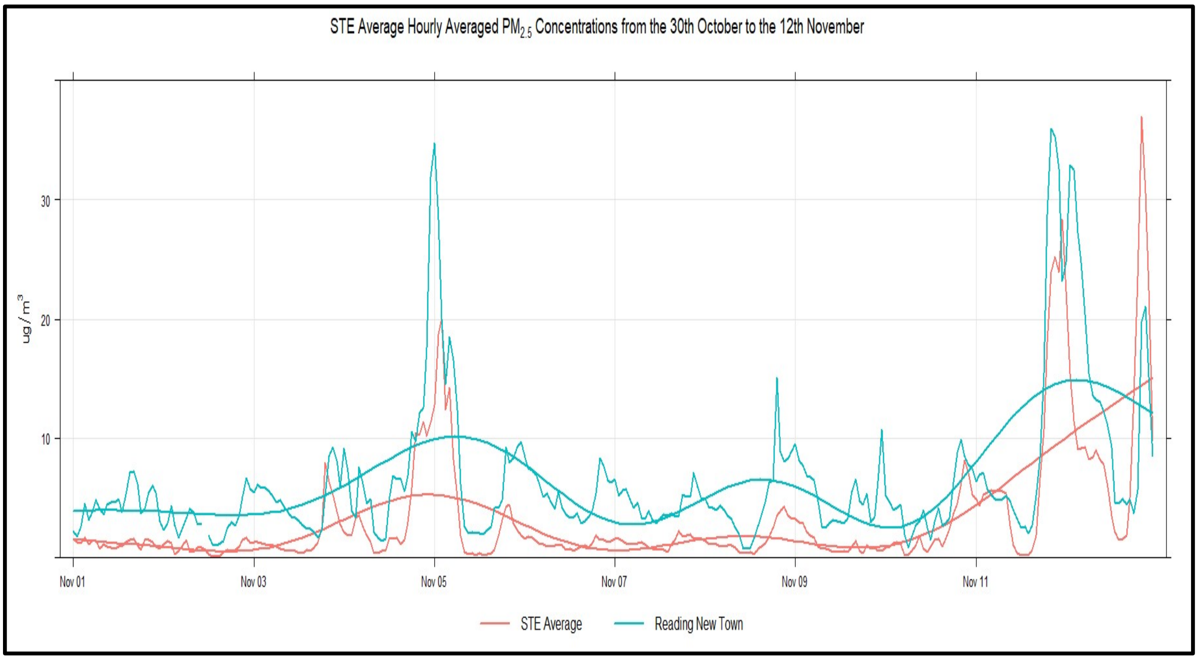

Figure 43: STE Average Hourly Averaged $PM_{2.5}$ Concentrations from the 30th October to the 12th November

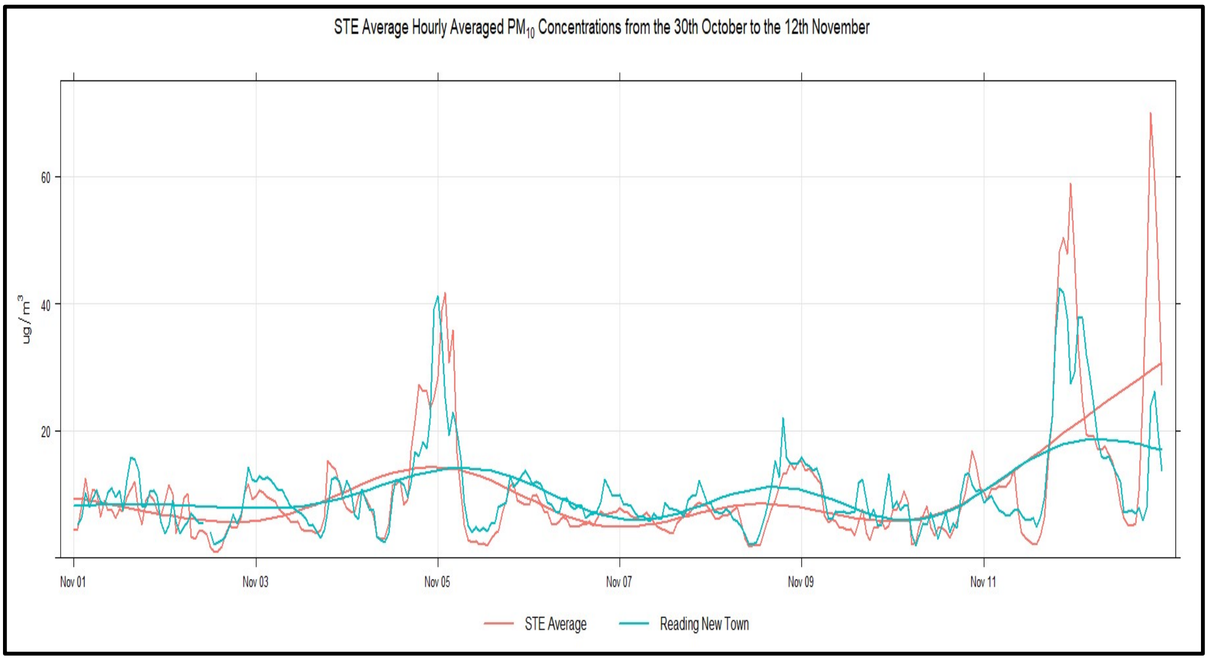

Figure 44: STE Average Hourly Averaged PM_{10} Concentrations from the 30th October to the 12th November

7.14 March Regional $PM_{2.5}$ and PM_{10} Events

7.14.1 As discussed in the March monthly monitoring report for the STE network, March demonstrated episodes of elevated $PM_{2.5}$ throughout the month, particularly from the 6th to the 12th. **Figure 45** presents hourly averaged $PM_{2.5}$ concentrations at the STE network, and the regional comparator RNT across the month.

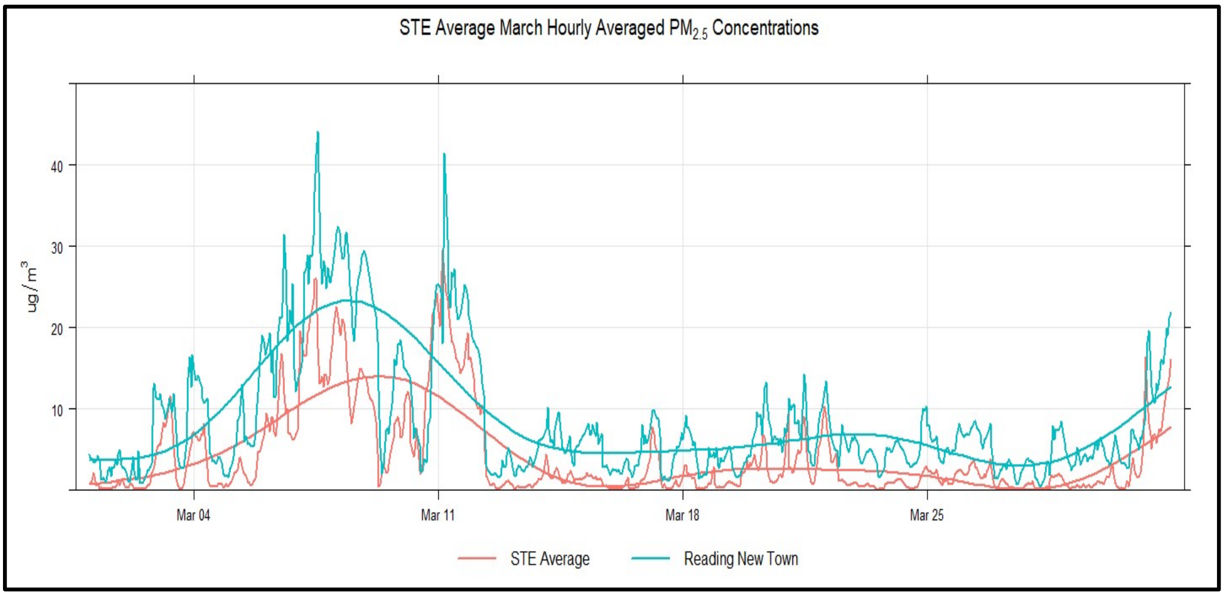

Figure 45: STE Average March Hourly Averaged $PM_{2.5}$ Concentrations

7.14.2 All peaks shown at the STE network are below those shown at RNT, and the profile through the event, and wider month, are comparable, with the STE sites showing lower levels, meaning that a regional event is considered most likely to be the cause.

7.15 SN-1202 – November 15th – 17th Elevated $PM_{2.5}$

7.15.1 **Figure 46** presents the hourly $PM_{2.5}$ concentrations across the month for SN-1202, as well as the STE average and regional comparator Reading New Town. The peaks on November 5 and the weekend of November 11-13th are aligned with Bonfire Night and Diwali respectively (discussed in the previous section of this report), but the peaks on November 15-17 are not seen to the same extent across the STE, or at the regional comparator RNT.

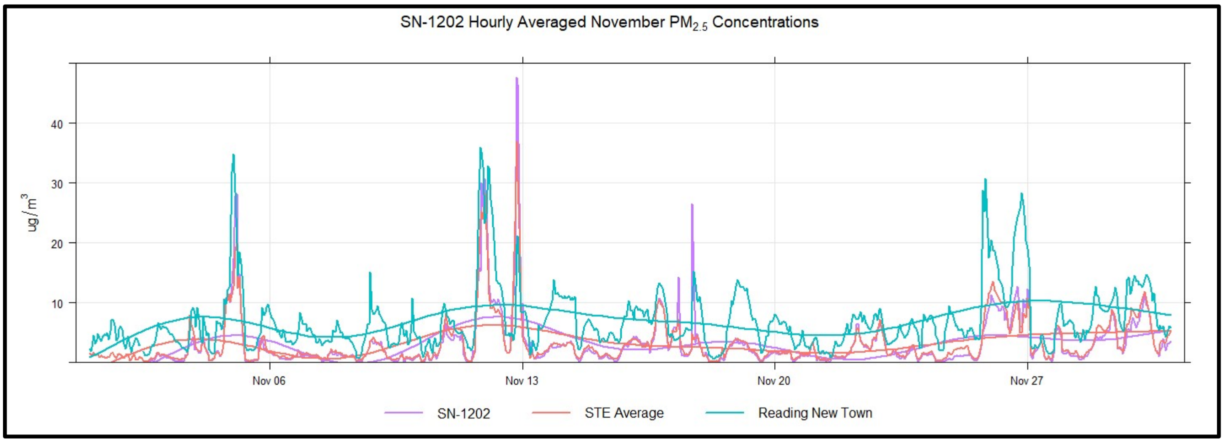

Figure 46: SN-1202 Hourly Averaged November $PM_{2.5}$ Concentrations

7.15.2 **Figure 47** presents the trend analysis of the week commencing November 13th at SN-1202, Reading New Town and the STE network average. The general profile of SN-1202 is in line with the STE average, and well below the RNT monitor for the majority of the week, apart from on Friday, which sees a strong AM and PM peak, at approximately 8am and 5pm respectively.

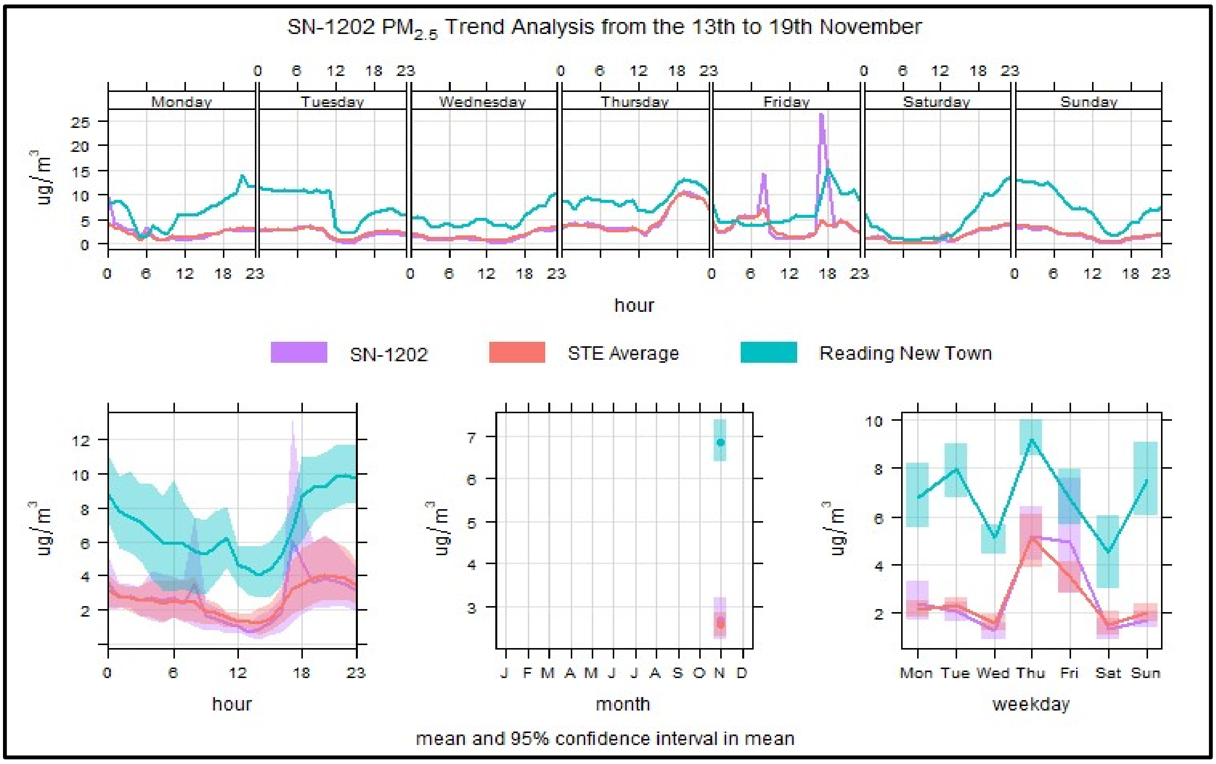

Figure 47: SN-1202 $PM_{2.}$ Trend Analysis from the 13th to 19th November

7.15.3 It is likely that this is a short-term, localised pollution source which has not been identified or seen since in the data. As the daily average for this site did not exceed the DEFRA Daily AQI Level 2 of 13-23 µg/m³ here or through the monitoring period as a whole, that this event is not considered significant.

7.16 SN-1600: End of January, beginning of February peaks

7.16.1 SN-1600 exhibited elevated concentrations of $PM_{2.5}$ and PM_{10} during January and early February which exceeded the STE average, as shown in **Figure 48** and **Figure 49** below. SN-1600 recorded maximum hourly average concentrations in excess of 100 µg/m^3 for $PM_{2.5}$ and 110 µg/m^3 for PM_{10} and consistently exceeded the regional comparator and the STE average during this period.

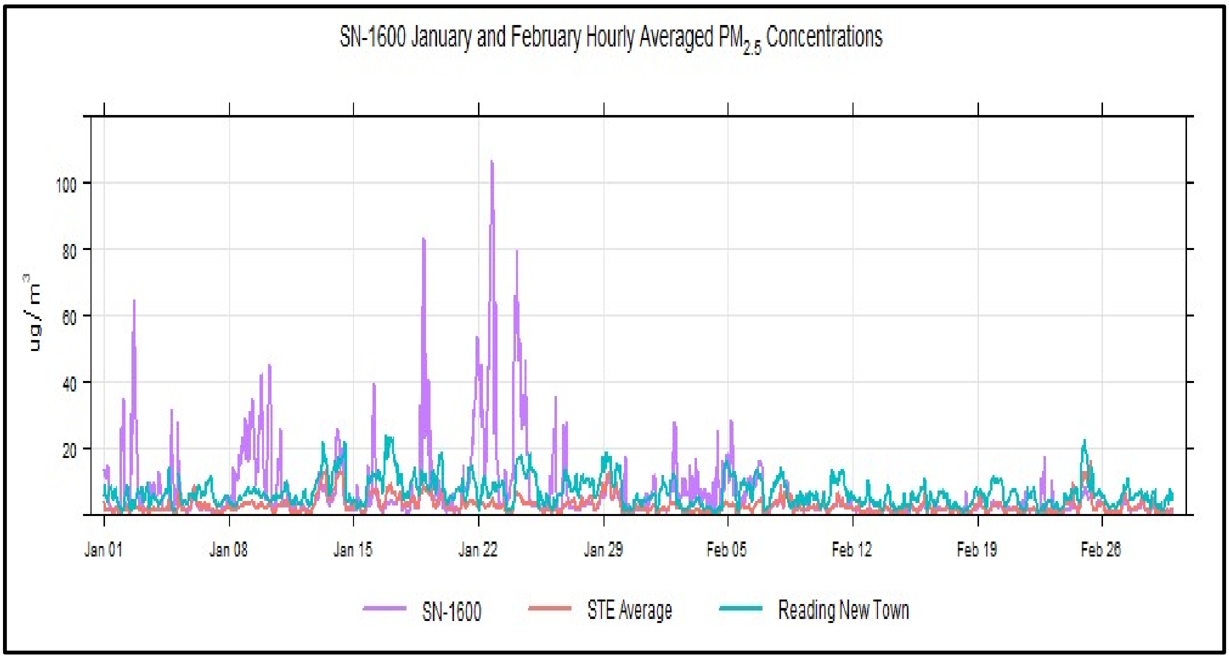

Figure 48: SN-1600 January and February Hourly Averaged $PM_{2.5}$ Concentrations

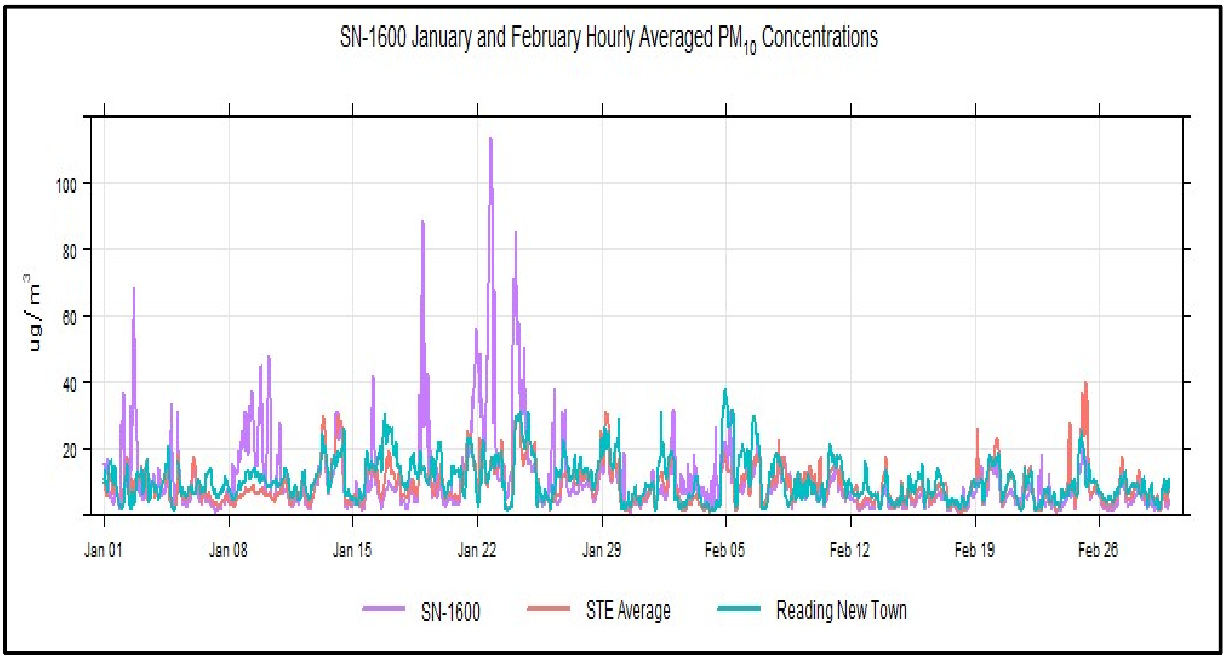

Figure 49: SN-1600 January and February Hourly Averaged PM_{10} Concentrations

7.16.2 It is important to note that the measured $PM_{2.5}$ and PM_{10} concentrations are broadly comparable, indicating that the vast majority of particulate matter was $PM_{2.5}$, with approximately 105 µg/m^3 as the highest hourly peak on January 22nd for $PM_{2.5}$, compared with the equivalent of approximately 115 µg/m^3 for PM_{10}.

7.16.3 **Figure 50** below present the $PM_{2.5}$ trend analysis for SN-1600 from January 1st – February 5th, along with Reading New Town and the STE network average. While the regional comparator and the STE network average show strong correlation, the $PM_{2.5}$ concentration measured at SN-1600 deviates and is generally elevated overnight.

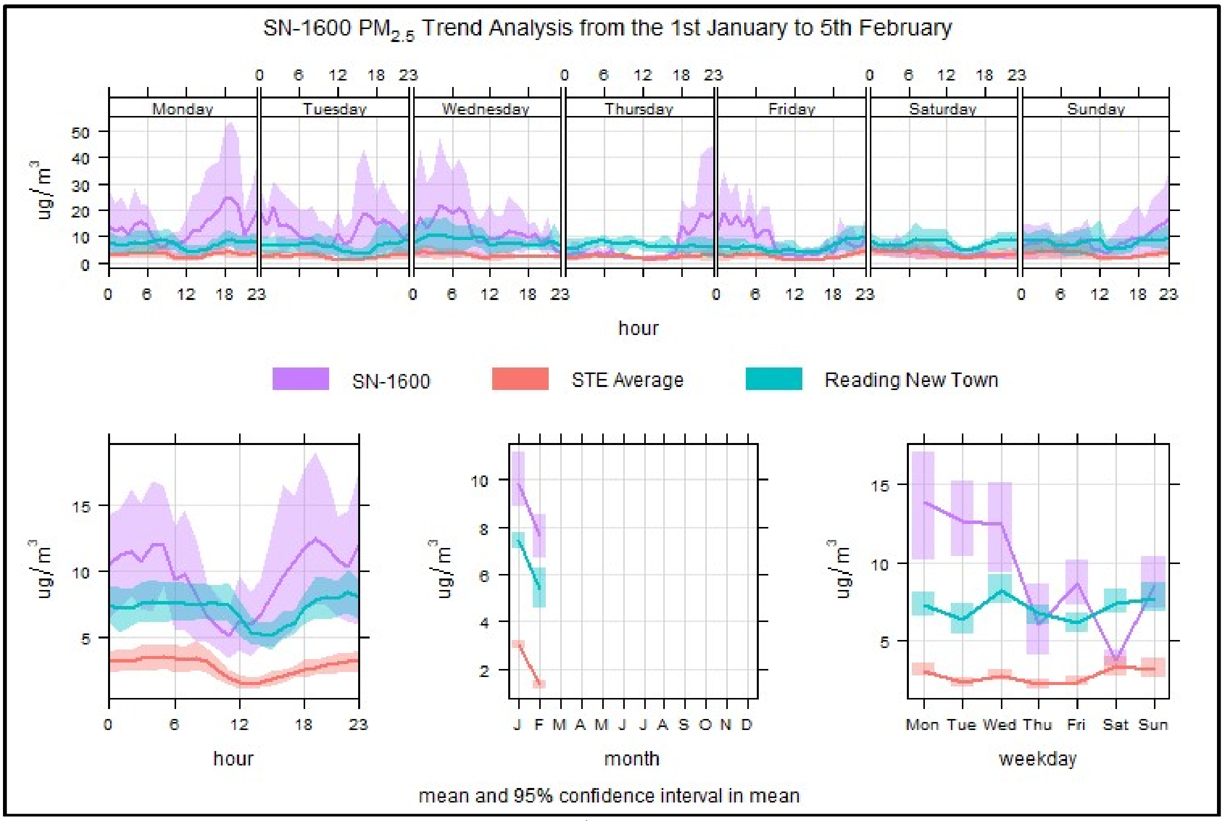

Figure 50: SN-1600 $PM_{2.5}$ Trend Analysis from the 1st January to 5th February

7.16.4 Given the highly localised nature of this event, its overnight occurrence and high proportion of $PM_{2.5}$ it is considered likely to be associated with a nearby poorly controlled combustion source.

7.16.5 While there are instances of elevated $PM_{2.5}$ levels at the end of January/start of February at SN-1600, the daily maximum across this time period did not exceed the WHO Interim Target 3 of 50 µg/m^3 or the DAQI Level 5 of 47 µg/m^3, and outside of this short episode of pollution over approximately 4-5 weeks, there have been no other events outside of this period over the monitoring period of November – May.

8 Summary and Conclusions

8.1.1 Segro Limited has deployed an air quality sensor network across the Slough Trading Estate (STE) in order to gain an understanding of air quality conditions across the STE and to inform the New SPZ.

8.1.2 This report presents an overview of the air quality sensor network and analysis of the monitoring results of nitrogen dioxide (NO_2) and particulate matter with an aerodynamic diameter <2.5µm ($PM_{2.5}$) and <10µm (PM_{10}) for the monitoring period between 01-11-2023 and 31-05-2024.

8.1.3 In terms of NO_2, the STE average concentration is consistently lower than at Slough Windmill Bath Road (SWBR) and also demonstrates a similar diurnal trend but at lower concentrations. All hourly average concentrations are below the WHO hourly NO_2 AQG (of 200 µg/m^3) and the majority of sensors have no hourly averages above the Daily Air Quality Index (DAQI) Level 1. All concentrations are also below the 24-hour mean interim WHO AQG of 50 µg/m^3.

8.1.4 With regards to $PM_{2.5}$, the STE average concentration is consistently lower than at Reading New Town (RNT) but still demonstrates the same regional pollution episodes. The STE average also demonstrates a similar diurnal trend to RNT but at lower concentrations. Despite none of the sensors having higher averages than RNT, only SN-0966, SN-0997 and SN-1144 had no daily average concentrations above the DAQI Level 1. 36 out of the 40 sensors in the STE recorded daily averages above the WHO 24-Hour AQG Level but only SN1314 and SN-1610 recorded more days above the 24-Hour AQG Level than RNT.

8.1.5 In relation to PM_{10}, the STE average concentration is consistently lower than at SWBR but still demonstrates the same regional pollution episodes. The STE average shows an opposite diurnal trend to SWBR at lower concentrations. Despite none of the sensors having higher averages than SWBR, only SN-0966 and SN-0997 had no daily average concentrations above the DAQI Level 1. 31 out of the 40 sensors in the STE recorded daily averages above the WHO 24-Hour AQG Level but there were zero days across the time period where the STE site average is greater than 50 µg/m^3.

8.1.6 PM_{10} concentrations in the STE have a strong correlation with $PM_{2.5}$ concentrations and as a result the same pollution episodes are visible but at higher concentrations.

8.1.7 A number of events (outlined in **Section 7**) have been investigated at various sensors where measured concentrations deviate significantly from the STE average or anticipated trend.

8.1.8 This has identified a number of locations where on occasion the influence of on-site road traffic (associated with both the STEs arterial roads and more localised traffic likely linked to plot level activity) and other sources is evident in the measured NO_2 concentrations.

8.1.9 Analysis of PM_{10} and $PM_{2.5}$ events indicates that the majority of variation in PM concentrations are reflected at a regional level at comparator monitors. Potential on-site (or local) influences are very limited both spatially and temporally.

References

BSI (2023, PAS 4023:2023. Selection, deployment and quality control of low-cost air quality sensor systems in outdoor ambient air – Code of practice.

Carslaw, D.C and Ropkins, K. (2023) 'openair — An R package for air quality data analysis'. Environmental Modelling & Software, 27-28(0), 52-61

Department for Environment, Food and Rural Affairs (DEFRA) (2022). '*Local Air Quality Management Technical Guidance (TG22)*'. August 2022.

Department for Environment, Food and Rural Affairs (DEFRA) (no date) 'Daily Air Quality Index'. Available at: https://uk-air.defra.gov.uk/air-pollution/daqi. (Accessed: 07/06/2024)

Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

Environment Act 1995, Part IV.

Environment Agency (2017). '*Performance Standards for Indicative Ambient Particulate Monitors*'. Version 4.

Statutory Instrument 2000, No 921, '*The Air Quality (England) Regulations 2000'* HMSO, London.

Statutory Instrument 2002, No 3034, '*The Air Quality (England) (Amendment) Regulations 2002'* HMSO, London.

Statutory Instrument 2010, No. 1001, '*The Air Quality Standards Regulations 2010'* HMSO, London.

Statutory Instrument 2016, No. 1184, '*The Air Quality Standards (Amendment) Regulations 2016*' HMSO, London.

Statutory Instruments 2019, No. 74, 'The Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019' HMSO, London

Statutory Instruments 2020, No. 131, 'The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020' HMSO, London

Appendix A Relevant Air Quality Benchmarks

In order to provide context to the measurement results, the following benchmarks have been considered, although not directly applicable due to differing averaging periods and monitoring locations.

A.1 Regulatory Thresholds

A.1.1 The Air Quality (England) Regulations 2000 (AQR) defined National Air Quality Objectives (NAQOs, a combination of concentration-based thresholds, averaging periods and compliance dates) for a limited range of pollutants. Subsequent amendments were made to the AQR in 2001 and 2002 to incorporate 'limit values' and 'target values' for a wider range of pollutants as defined in European Union (EU) Directives.

A.1.2 These amendments were consolidated by the Air Quality Standards Regulations 2010 (AQSR) (with subsequent amendments most notably in 2016 and for the devolved administrations), which transposed the EU's Directive on ambient air quality and cleaner air for Europe (2008/50/EC).

A.1.3 Following the Transition Period after the UK's departure from the EU in January 2020, the Air Quality (Amendment of Domestic Regulations) (EU Exit) Regulations 2019 (and subsequent amendments for the devolved administrations) have amended the AQ Standards Regulations 2010 to reflect the fact that the UK has left the EU. The Environment (Miscellaneous Amendments) (EU Exit) Regulations 2020 amended the $PM_{2.5}$ limit value in the AQSR to 20 $\mu g/m^3$.

A.1.4 The relevant NAQOs for this report are shown in **Appendix Table 1**. It should be noted that monthly mean results in exceedance of the annual mean NAQO NO_2 and $PM_{2.5}$ do not equate to exceedances of the annual mean NAQO.

Appendix Table 1: Relevant Air Quality Objectives

Pollutant	Time Period	NAQOs	Source
NO_2	1-hour mean	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	NAQO and AQSR limit value
	Annual mean	40 $\mu g/m^3$	NAQO and AQSR limit value
$PM_{2.5}$	Annual mean	20 $\mu g/m^3$	NAQO and AQSR limit value
PM_{10}	24-hour mean	50 $\mu g/m^3$ not to be exceeded more than 35 times a year	NAQO and AQSR limit value
	Annual mean	40 $\mu g/m^3$	NAQO and AQSR limit value

A.2 WHO Guidelines

A.2.1 Whilst the relevant NAQO's and AQSR's present the concentration maximums required by legislation, the World Health Organisation (WHO) have presented Air Quality Guideline (AQG) levels for countries to work on minimising their emissions, shown in **Appendix Table 2**.

Appendix Table 2: Relevant WHO Air Quality Guidelines

Pollutant	Time Period	Interim Target				AQG Level
NO_2	1-hour mean	-	-	-	-	200
	24-hour mean	120	50	-	-	25
	Annual mean	40	30	20	-	10
$PM_{2.5}$	Annual mean	35	25	15	10	5
	24-hour mean	75	50	37.5	25	15
PM_{10}	Annual mean	70	50	20	20	15
	24-hour mean	150	100	75	50	45

A.3 DEFRA's Air Quality Index

A.3.1 DEFRA's Daily Air Quality Index provides health advice to the public which is based on the hourly mean concentration for NO_2 and the daily mean concentration for $PM_{2.5}$. The concentrations are grouped into indexes from 1 to 10 (1 being low and 10 being very high) and these are then divided into four bands which recommend actions and health advice (Low, Moderate, High and Very High) (**Appendix Table 3, Appendix Table 4, Appendix Table 6**and **Appendix Table 6)** (DEFRA, 2024).

Appendix Table 3: DEFRA NO_2 Daily Air Quality Index

Index	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Band	Low	Low	Low	Moderate	Moderate	Moderate	High	High	High	Very High
µg/m³ (hourly)	0-67	68-134	135-200	201-267	268-334	335-400	401-467	468-534	535-600	601 or more

Appendix Table 4: DEFRA $PM_{2.5}$ Daily Air Quality Index

Index	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Band	Low	Low	Low	Moderate	Moderate	Moderate	High	High	High	Very High
µg/m³ (daily)	0-11	12-23	24-35	36-41	42-47	48-53	54-58	59-64	65-70	71 or more

Appendix Table 5: DEFRA PM_{10} Daily Air Quality Index

Index	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Band	Low	Low	Low	Moderate	Moderate	Moderate	High	High	High	Very High
µg/m³ (daily)	0-16	17-33	34-50	51-58	59-66	67-75	76-83	84-91	92-100	101 or more

Appendix Table 6: DAQI Recommended Actions and Health Advice

Air Pollution Banding	Value	Accompanying health messages for at-risk individuals*	Accompanying health messages for the general population
Low	1-3	**Enjoy** your usual outdoor activities.	**Enjoy** your usual outdoor activities.
Moderate	4-6	Adults and children with lung problems, and adults with heart problems**, who experience symptoms**, should **consider reducing** strenuous physical activity, particularly outdoors.	**Enjoy** your usual outdoor activities.
High	7-9	Adults and children with lung problems, and adults with heart problems, should **reduce** strenuous physical exertion, particularly outdoors, and particularly if they experience symptoms. People with asthma may find they need to use their reliever inhaler more often. Older people should also **reduce** physical exertion.	Anyone experiencing discomfort such as sore eyes, cough or sore throat should **consider reducing** activity, particularly outdoors.
Very High	10	Adults and children with lung problems, adults with heart problems, and older people, should **avoid** strenuous physical activity. People with asthma may find they need to use their reliever inhaler more often.	**Reduce** physical exertion, particularly outdoors, especially if you experience symptoms such as cough or sore throat.

Appendix B Vortex 'VTX Air' Air Quality Sensor Technical Specification