



Sussex Annual Air Quality Monitoring Report 2022

Sussex Air Quality Partnership / East Sussex County Council

June 2023

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Executive Summary

Bureau Veritas UK Ltd has been commissioned by East Sussex County Council on behalf of the Sussex local authorities who are part of the Sussex Air Quality Partnership to manage, provide support and report on air quality monitoring data collected from the Sussex Air Quality Network.

Sussex Annual Air Quality Monitoring Report - Overview

This report provides an overview of the monitoring data collected from the Sussex Air Quality Network air quality monitoring stations (AQMS) during 2022.

Overall, the data capture was good across the network during 2022; most of the analysers that were in operation for the whole year met the 90% data capture. The reasons for lower capture rate at certain sites are discussed in Chapter 2.

All network sites, that achieved the necessary data capture, met the Particulates (PM₁₀), nitrogen dioxide (NO₂) Air Quality Strategy (AQS) objectives. With regard to the Fine Particulates (PM_{2.5}) (2040 target) objective, two sites were above the annual mean 10 µg/m³ objective.

As seen each year there were many days of 'Moderate' ozone (O₃) - recorded at the three network sites monitoring for this pollutant. The three sites measured 'High' levels over 7 days in 2022, however no 'Very High' days were recorded in 2022.

'Moderate' PM₁₀ and PM_{2.5} levels were measured at all of the measurement sites across 2022. 'High' levels of PM₁₀ were recorded at eight sites and five PM_{2.5} sites. In addition, 'Very High' levels of PM₁₀ were recorded at seven sites and five PM_{2.5} sites during 2022.

There were no occurrences of 'Moderate' sulphur dioxide (SO₂) or 'Moderate' NO₂ levels recorded during the year.

The annual mean concentrations for PM₁₀, PM_{2.5} and NO₂ showed a downward trend between 2018 and 2022. Annual mean concentrations of O₃ across the network have been relatively constant since 2018.

1. Sussex Air Quality Network

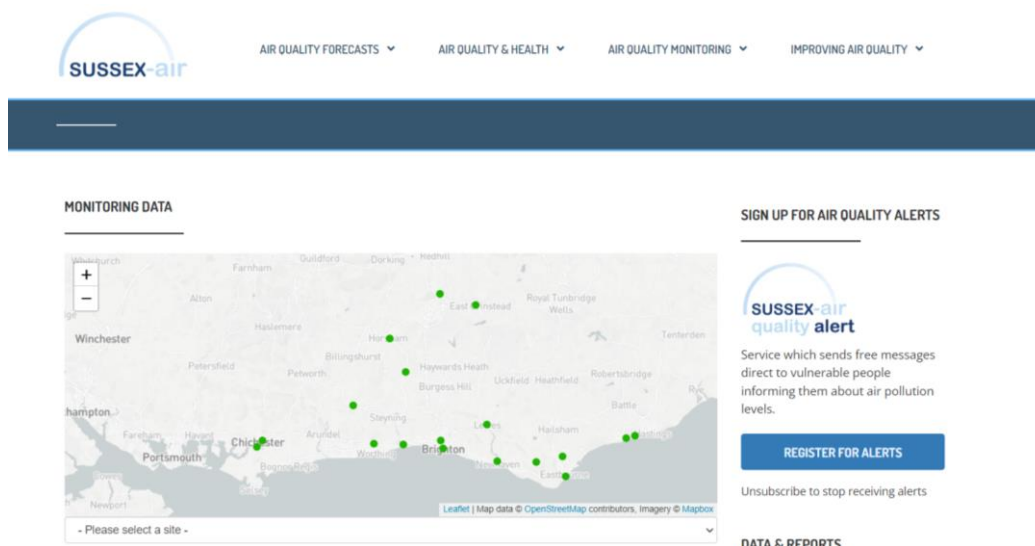
The Sussex Air Quality Network (“network”) was established in 1995 to support the local authorities across Sussex in their duties to monitor and report air quality under the Local Air Quality Management (LAQM) framework requirements.

The network was developed by the Sussex Air Quality Partnership (“Sussex-air”), which is made up from the Sussex local authorities and Public Health bodies. The members of Sussex Air Quality Partnership are:

- Adur District Council
- Arun District Council
- Brighton and Hove City Council
- Chichester District Council
- Crawley Borough Council
- Eastbourne Borough Council
- East Sussex County Council
- Hastings Borough Council
- Horsham District Council
- Mid Sussex District Council
- Lewes District Council
- Rother District Council
- Wealden District Council
- West Sussex County Council
- Worthing Borough Council

The Partnership has developed a comprehensive regional monitoring network, which currently (end 2022) has twelve continuous air quality monitoring stations (AQMS) in operation. The network also provides data from five national Automatic Urban and Rural Network (AURN) air quality monitoring stations (AQMSs) based in Sussex. This enhances the network to a total of seventeen stations across Sussex.

The full list of site information and all “live” and historical data is provided on the Sussex-air website: <http://www.sussex-air.net>.



The Sussex-air website also provides health information and the Sussex-wide air pollution forecasting and alert service to support vulnerable persons and the general public and provide pollution alerts direct to the subscriber for “FREE”. To see pollution forecasts go to our homepage and to register for the airAlert service at: <https://sussex-air.net/sussex-air-quality-service-for-sussex/registration/>. Bureau Veritas hosts and supports the Sussex-air website.

2. Sussex Air Quality Network Performance

During 2022, the majority of the Sussex sites returned high data capture rates, with all Sussex owned and operated site averaging above 90% data capture rates.

Table 2-1 shows data capture rates for each network analyser during 2022. Low capture rates may be caused by repeated or prolonged analyser or logging system breakdown, on-site communications problems or interruptions in power supply to the monitoring stations.

Most of the analysers that were in operation for the whole year met the minimum requirement of 75% data capture, except **CI1** Chichester - A27 Chichester Bypass PM₁₀ due to on-going analyser faults.

However, the following site instrumentation failed to meet the stricter network target of 90% valid data capture:

AD1	Adur - Shoreham-by-sea	PM _{2.5}	(87%)
CI1	Chichester - A27 Chichester Bypass	PM ₁₀	(71%)
EB1	Eastbourne - Devonshire Park	NO _x , NO, NO ₂	(88%)

The (Lewes) Newhaven AQMS was not operational during 2022 and is not included in statistical analysis of the network.

AURN data are ratified and managed under a separate national network contract. Data capture rates are therefore provided from the data sets available on UK-AIR. The 2022 data was ratified by UK-AIR at the time of this report being published.

Table 2-1 shows data capture rates for each network analyser during 2022.

Table 2-1 – Data capture rates per pollutant

Site ID	Site Name	Local Authority/AURN	NO _x	NO	NO ₂	PM ₁₀	PM _{2.5}	O ₃	SO ₂	Avg
AD1	Adur - Shoreham-by-sea	Adur	93%	93%	93%	-	87%	-	-	92%
EB3	AURN – Eastbourne, Holly Place	AURN	81%	81%	81%	97%	97%	-	-	87%
LL1	AURN - Lullington Heath	AURN	99%	96%	96%	58%	58%	99%	71%	81%
BH0	AURN – Brighton, Preston Park	AURN	99%	99%	99%	-	94%	77%	-	98%
HO4	AURN - Storrington	AURN	70%	70%	70%	-	-	-	-	70%
WT2	AURN - Worthing A27 Grove Lodge	AURN	95%	95%	95%	-	93%	-	-	87%
BH10	Brighton - North Street	Brighton and Hove	96%	96%	96%	-	91%	-	-	95%
CI1	Chichester - A27 Chichester Bypass	Chichester	96%	96%	96%	71%	-	-	-	90%
CI5	Chichester - Westhampnett Road	Chichester	99%	99%	99%	-	-	-	-	99%
CA2	Crawley - Gatwick Airport	Crawley	91%	91%	91%	94%	94%	-	-	92%
EB1	Eastbourne - Devonshire Park	Eastbourne	88%	88%	88%	96%	-	99%	-	92%
HT1	Hastings - Bexhill Rd, Bulverhythe	Hastings	99%	99%	99%	97%	-	-	-	99%
HO5	Horsham - Cowfold	Horsham	100%	100%	100%	-	-	-	-	100%
HO2	Horsham - Park Way, Horsham	Horsham	95%	95%	95%	95%	-	-	-	95%
LS8	Lewes – Little East Street, Lewes	Lewes	89%	89%	89%	98%	98%	-	-	93%
MS1	Mid Sussex - London Road, East Grinstead	Mid-Sussex	100%	100%	100%	100%	-	-	-	100%
RY2	Rother - De La Warr Road, Bexhill	Rother	99%	99%	99%	98%	-	-	-	99%

Table 2-2 provides commentary on the sites where data loss occurred in 2022.

Table 2-2 – Data capture commentary

Site ID	Site Name	Comments
AD1	Adur - Shoreham-by-sea	PM _{2.5} data invalid: 1/1 to 11/2 plus intermittent issues May – Dec resulting in 1181 hours loss of data
EB3	AURN – Eastbourne, Holly Place	AURN data capture rates available on UK-AIR (as may change)
LL1	AURN - Lullington Heath	AURN data capture rates available on UK-AIR (as may change)
BH0	AURN – Brighton, Preston Park	AURN data capture rates available on UK-AIR (as may change), O ₃ below 75% = N/A
HO4	AURN - Storrington	AURN data capture rates available on UK-AIR (as may change)
WT2	AURN - Worthing A27 Grove Lodge	AURN data capture rates available on UK-AIR (as may change)
BH10	Brighton - North Street	PM _{2.5} data invalid: intermittently 8/1 – 25/2, 9/3 to 23/3, intermittently in April to Oct, 21/11 to 25/11 and intermittently through Dec. Resulting in 782 hours of invalid data.
CI1	Chichester - A27 Chichester Bypass	Invalid PM ₁₀ data: Intermittent invalid data March, 11/4 to 19/5, intermittently in June to Oct, then all data invalid 3/11 to year end. Resulting in 2572 hours of invalid data.
CI5	Chichester -Westhampnett Road	No issues
CA2	Crawley - Gatwick Airport	NO _x data invalid: 21/4 to 12/5, 26/5 to 27/5, 20/7 to 21/7, 10/11 to 16/11, 29/11, 30/11, 21/12 to 22/12. Resulting in 775 hours of invalid data.
EB1	Eastbourne - Devonshire Park	NO _x data invalid: 1/1 to 4/1, 27/1, 30/1 to 6/2, 21/2, 6/4 to 8/4, 20/4 to 11/5, 11/11 to 15/11, 28/11, 29/11. Resulting in 1022 hours of invalid data.
HT1	Hastings - Bexhill Rd, Bulverhythe	No issues
HO5	Horsham - Cowfold	No issues
HO2	Horsham - Park Way, Horsham	Horsham power issues, December 2022.
LS8	Lewes – Little East Street, Lewes	11/2 start date (% data capture relates to the 7764 hours of operational activity)
MS1	Mid Sussex - London Road, East Grinstead	Site commenced operation on 2/8 20:00 hrs, and for the period of operation to year end; the analysers achieved 100% data capture. Spikes in NO _x data under investigation (June 2023)
RY2	Rother - De La Warr Road, Bexhill	No issues

Table 2-3 provides annual mean pollutant concentration results for 2022.

Table 2-3 – Annual mean concentrations 2022

Site ID	Site Name	Local Authority	NO ₂	PM ₁₀	PM _{2.5}	O ₃	SO ₂
AD1	Adur - Shoreham-by-sea	Adur	20.3	-	11.6	-	-
EB3	AURN – Eastbourne, Holly Place	Eastbourne	9.3	14.6	8.9	-	-
LL1	AURN - Lullington Heath	Wealden	7.1	(11.0)	(6.2)	62.8	(0.8)
BH0	AURN – Brighton, Preston Park	Brighton and Hove	12.6	-	11.4	(48.2)	-
HO4	AURN - Storrington	Horsham	(18.7)	-	-	-	-
WT2	AURN - Worthing A27 Grove Lodge	Worthing	25.4	-	8.8	-	-
BH10	Brighton - North Street	Brighton and Hove	34.6	-	10.2	-	-
CI1	Chichester - A27 Chichester Bypass	Chichester	22.0	(24.1)	-	-	-
CI5	Chichester -Westhampnett Road	Chichester	24.7	-	-	-	-
CA2	Crawley - Gatwick Airport	Crawley	21.8	16.6	8.4	-	-
EB1	Eastbourne - Devonshire Park	Eastbourne	12.8	19.3	-	56.8	-
HT1	Hastings - Bexhill Rd, Bulverhythe	Hastings	12.8	23.5	-	-	-
HO5	Horsham - Cowfold	Horsham	22.8	-	-	-	-
HO2	Horsham - Park Way, Horsham	Horsham	19.1	19.5	-	-	-
LS8	Lewes – Little East Street, Lewes	Lewes	12.1	15.6	9.8	-	-
MS1	Mid Sussex - London Road, East Grinstead	Mid-Sussex	39.0	18.1	-	-	-
RY2	Rother - De La Warr Road, Bexhill	Rother	14.2	22.3	-	-	-

Values shown in brackets have less than 75% data capture rate.
All units are µg/m³.

3. 2022 in Comparison with the Air Quality Strategy (AQS) Objectives and Targets

The following data presented in Tables 3-1 to 3-3 compare Sussex monitoring results with the Government's Air Quality Strategy (AQS) objectives. There is often more than one objective per pollutant reflecting the differing health effects of short and long-term exposure. The AQSs are set out in Appendix 1. Where a site did not achieve a minimum of 75% data capture for the year, the measurements cannot be accurately compared to the AQS objectives and are entered as 'not applicable'.

Table 3-1 – NO₂ Comparison with Air Quality Strategy Objectives – Achieved ('yes') or Exceeded ('no')

Site ID	Site Name	NO ₂			
		Annual mean (µg/m ³)	Achieved ?	1-hour mean	Achieved ?
	Objective	40		200 µg/m ³ not to be exceeded more than 18 times per year	
AD1	Adur - Shoreham-by-sea	20.3	Yes	0	Yes
EB3	AURN – Eastbourne, Holly Place	9.3	Yes	0	Yes
LL1	AURN - Lullington Heath	7.1	Yes	0	Yes
BH0	AURN – Brighton, Preston Park	12.6	Yes	0	Yes
HO4	AURN - Storrington	(18.7)	N/A	0	N/A
WT2	AURN - Worthing A27 Grove Lodge	25.4	Yes	0	Yes
BH10	Brighton - North Street	34.6	Yes	10	Yes
CI1	Chichester - A27 Chichester Bypass	22.0	Yes	0	Yes
CI5	Chichester - Westhampnett Road	24.7	Yes	0	Yes
CA2	Crawley - Gatwick Airport	21.8	Yes	1	Yes
EB1	Eastbourne - Devonshire Park	12.8	Yes	0	Yes
HT1	Hastings - Bexhill Rd, Bulverhythe	12.8	Yes	0	Yes
HO5	Horsham - Cowfold	22.8	Yes	0	Yes
HO2	Horsham - Park Way, Horsham	19.1	Yes	0	Yes
LS8	Lewes – Little East Street, Lewes	12.1	Yes	9	Yes
MS1	Mid Sussex - London Road, East Grinstead	39.0	Yes	data under review (47)	TBC
RY2	Rother - De La Warr Road, Bexhill	14.2	Yes	0	Yes

Values shown in brackets have less than 75% data capture rate.

Table 3-2 – PM₁₀ Comparison with Air Quality Strategy Objectives – Achieved ('yes') or Exceeded ('no')

Site ID		PM ₁₀			
		Annual mean ($\mu\text{g}/\text{m}^3$)	Achieved?	24-hour mean	Achieved?
	Objective	40		50 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 35 times per year	
EB3	AURN – Eastbourne, Holly Place	14.6	Yes	1	Yes
LL1	AURN - Lullington Heath	(11.0)	N/A	(0)	N/A
CI1	Chichester -A27 Chichester Bypass	(24.1)	N/A	(2)	N/A
CA2	Crawley - Gatwick Airport	16.6	Yes	0	Yes
EB1	Eastbourne - Devonshire Park	19.3	Yes	5	Yes
HT1	Hastings - Bexhill Rd, Bulverhythe	23.5	Yes	5	Yes
HO2	Horsham - Park Way, Horsham	19.5	Yes	0	Yes
LS8	Lewes – Little East Street, Lewes	15.6	Yes	1	Yes
MS1	Mid Sussex - London Road, East Grinstead	18.1	Yes	0	Yes
RY2	Rother - De La Warr Road, Bexhill	22.3	Yes	0	Yes

Values shown in brackets have less than 75% data capture rate.

Table 3-3 PM_{2.5} Comparison with Air Quality Strategy Target (Year 2040), provides a comparison to the future target value. Regulation 4 of the Environmental Targets (Fine Particulate Matter) (England) Regulations 2022 sets the target to ensure that the annual mean concentration of PM_{2.5} in ambient air is equal to or less than 10 micrograms per cubic metre by 31st December 2040¹.

This is a non-binding target for local authorities.

Table 3-3 – PM_{2.5} Comparison with Air Quality Strategy Target (Year 2040) – Achieved ('yes') or Exceeded ('no')

Site ID	PM _{2.5}		
		Annual mean (µg/m ³)	Achieved?
	Target 2040	10	
AD1	Adur - Shoreham-by-sea	11.6	No
EB3	AURN – Eastbourne, Holly Place	8.9	Yes
LL1	AURN - Lullington Heath	(6.2)	N/A
BH0	AURN – Brighton, Preston Park	11.4	No
WT2	AURN - Worthing A27 Grove Lodge	8.8	Yes
BH10	Brighton - North Street	10.2	No
CA2	Crawley - Gatwick Airport	8.4	Yes
LS8	Lewes – Little East Street, Lewes	9.8	Yes

Values shown in brackets have less than 75% data capture rate.

¹ The Environmental Targets (Fine Particulate Matter) (England) Regulations 2022
<https://www.legislation.gov.uk/ukdsi/2022/9780348242959#:~:text=Regulation%204%20sets%20the%20target,the%20population%20exposure%20reduction%20target.>

4. Daily Air Quality Indices (DAQI)

The Daily Air Quality Indices (DAQI) are provided to identify where exceedances of health-based thresholds occur across the network. The following tables show the number of days where exceedances of “Moderate” (Air Quality Index 4- 6), “High” (Air Quality Index 7-9) and “Very High” (Air Quality Index 10) occurred in 2022.

Table 4-1 – Number of days ‘moderate’ air pollution during 2022 (Air Quality Index 4- 6) 2022

Site ID	Site Name	Local Authority	NO ₂	PM ₁₀	PM _{2.5}	O ₃	SO ₂
AD1	Adur - Shoreham-by-sea	Adur	0	-	24	-	-
EB3	AURN – Eastbourne, Holly Place	Eastbourne	0	12	11	-	-
LL1	AURN - Lullington Heath	Wealden	0	1	1	37	(0)
BH0	AURN – Brighton, Preston Park	Brighton and Hove	0	-	30	(18)	-
HO4	AURN - Storrington	Horsham	0	(6)	(3)	-	-
WT2	AURN - Worthing A27 Grove Lodge	Worthing	0	-	15	-	-
BH10	Brighton - North Street	Brighton and Hove	0	-	8	-	-
CI1	Chichester - A27 Chichester Bypass	Chichester	0	(52)	-	-	-
CI5	Chichester -Westhampnett Road	Chichester	0	-	-	-	-
CA2	Crawley - Gatwick Airport	Crawley	0	15	23	-	-
EB1	Eastbourne - Devonshire Park	Eastbourne	0	24	-	33	-
HT1	Hastings - Bexhill Rd, Bulverhythe	Hastings	0	81	-	-	-
HO5	Horsham - Cowfold	Horsham	0	-	-	-	-
HO2	Horsham - Park Way, Horsham	Horsham	0	38	-	-	-
LS8	Lewes – Little East Street, Lewes	Lewes	0	14	-	-	-
MS1	Mid Sussex - London Road, East Grinstead	Mid-Sussex	0	8	-	-	-
RY2	Rother - De La Warr Road, Bexhill	Rother	0	16	-	-	-

Values shown in brackets have less than 75% data capture rate.

Table 4-2 – Number of days ‘high’ air pollution during 2022 (Air Quality Index 7-9) 2022

Site ID	Site Name	Local Authority	NO ₂	PM ₁₀	PM _{2.5}	O ₃	SO ₂
AD1	Adur - Shoreham-by-sea	Adur	0	-	6	-	-
EB3	AURN – Eastbourne, Holly Place	Eastbourne	0	4	5	-	-
LL1	AURN - Lullington Heath	Wealden	0	0	0	4	(0)
BH0	AURN – Brighton, Preston Park	Brighton and Hove	0	-	2	2	-
HO4	AURN - Storrington	Horsham	0	-	(3)	-	-
WT2	AURN - Worthing A27 Grove Lodge	Worthing	0	-	0	-	-
BH10	Brighton - North Street	Brighton and Hove	0	-	1	-	-
CI1	Chichester - A27 Chichester Bypass	Chichester	0	(8)	-	-	-
CI5	Chichester - Westhampnett Road	Chichester	0	-	-	-	-
CA2	Crawley - Gatwick Airport	Crawley	0	2	1	-	-
EB1	Eastbourne - Devonshire Park	Eastbourne	0	2	-	1	-
HT1	Hastings - Bexhill Rd, Bulverhythe	Hastings	0	11	-	-	-
HO5	Horsham - Cowfold	Horsham	0	-	-	-	-
HO2	Horsham - Park Way, Horsham	Horsham	0	5	-	-	-
LS8	Lewes – Little East Street, Lewes	Lewes	0	1	-	-	-
MS1	Mid Sussex - London Road, East Grinstead	Mid-Sussex	0	2	-	-	-
RY2	Rother - De La Warr Road, Bexhill	Rother	0	5	-	-	-

Values shown in brackets have less than 75% data capture rate

Table 4-3 – Number of days ‘high’ air pollution during 2022 (Air Quality Index 10) 2022

Site ID	Site Name	Local Authority	NO ₂	PM ₁₀	PM _{2.5}	O ₃	SO ₂
AD1	Adur - Shoreham-by-sea	Adur	0	-	2	-	-
EB3	AURN – Eastbourne, Holly Place	Eastbourne	0	0	0	-	-
LL1	AURN - Lullington Heath	Wealden	0	0	0	0	(0)
BH0	AURN – Brighton, Preston Park	Brighton and Hove	0	-	4	0	-
HO4	AURN - Storrington	Horsham	0	(3)	(7)	-	-
WT2	AURN - Worthing A27 Grove Lodge	Worthing	0	-	2	-	-
BH10	Brighton - North Street	Brighton and Hove	0	-	1	-	-
CI1	Chichester - A27 Chichester Bypass	Chichester	0	(8)	-	-	-
CI5	Chichester -Westhampnett Road	Chichester	0	-	-	-	-
CA2	Crawley - Gatwick Airport	Crawley	0	3	5	-	-
EB1	Eastbourne - Devonshire Park	Eastbourne	0	1	-	0	-
HT1	Hastings - Bexhill Rd, Bulverhythe	Hastings	0	8	-	-	-
HO5	Horsham - Cowfold	Horsham	0	-	-	-	-
HO2	Horsham - Park Way, Horsham	Horsham	0	3	-	-	-
LS8	Lewes – Little East Street, Lewes	Lewes	0	3	-	-	-
MS1	Mid Sussex - London Road, East Grinstead	Mid-Sussex	0	2	-	-	-
RY2	Rother - De La Warr Road, Bexhill	Rother	0	5	-	-	-

Values shown in brackets have less than 75% data capture rate

5. Significant events and episodes

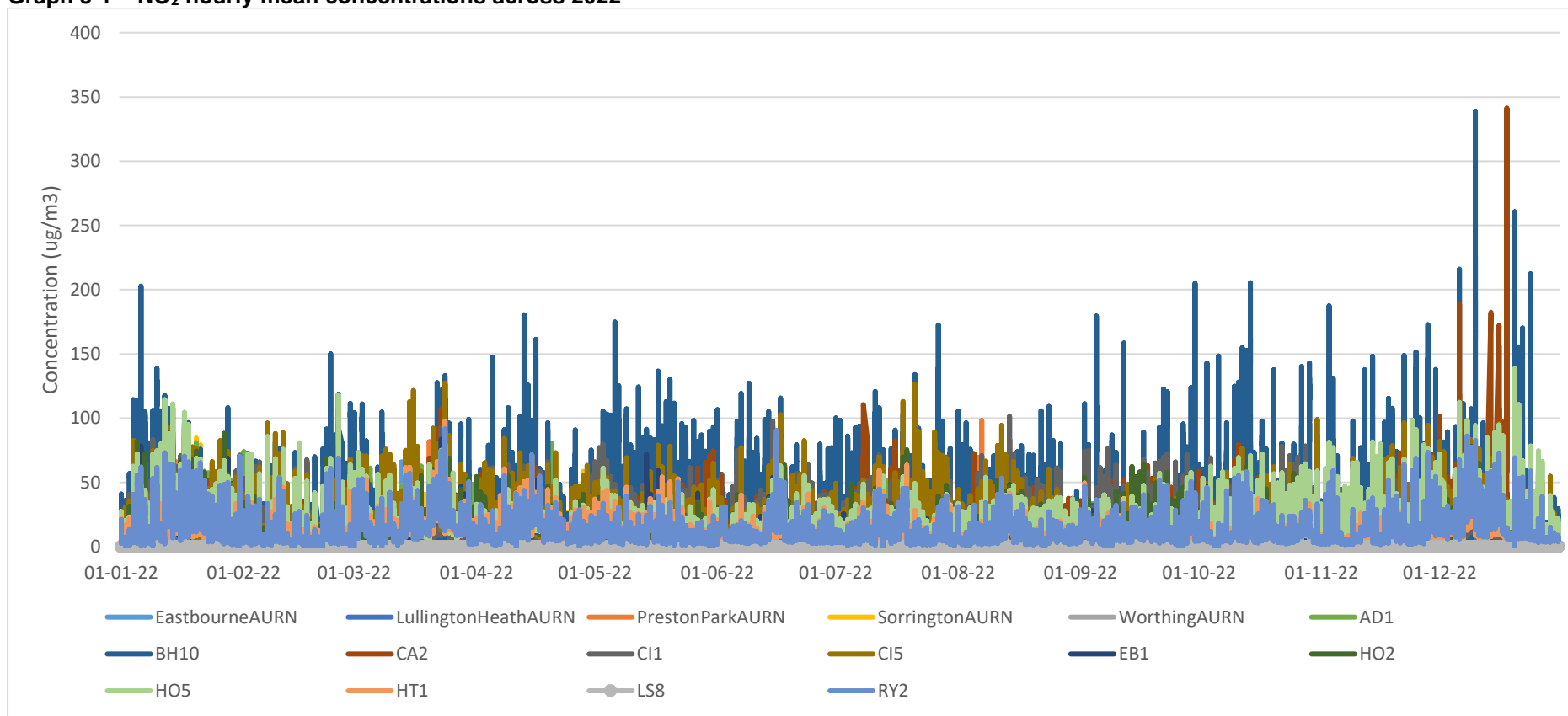
Air quality is measured for a variety of pollutants and can have a variety of effects on different people in society. The UK Air Quality Banding system is used to inform the public about the levels of pollution that they may be exposed to and are based on health advice approved by the Committee on Medical Effects of Air Pollution Episodes (COMEAP).

The system uses an index divided into four bands to provide more detail about air pollution levels in a simple way; these bandings range from Low, Moderate, High to Very High. The overall air pollution index is calculated from the highest index value of five pollutants: Nitrogen Dioxide, Sulphur Dioxide, Ozone, Carbon Monoxide and Particles < 10µm (PM₁₀). The bandings, pollutant concentrations and periods of exposure are provided in Appendix 2.

Nitrogen Dioxide (NO₂)

There were occurrences of 'Moderate' levels (1-hour means >200µg/m³) at four stations for the pollutant NO₂ during 2022. No sites exceeded the 'High' levels (1-hour means >400µg/m³) or 'Very High' levels (1-hour means >600µg/m³).

Graph 5-1 – NO₂ hourly mean concentrations across 2022



Particulates (PM₁₀)

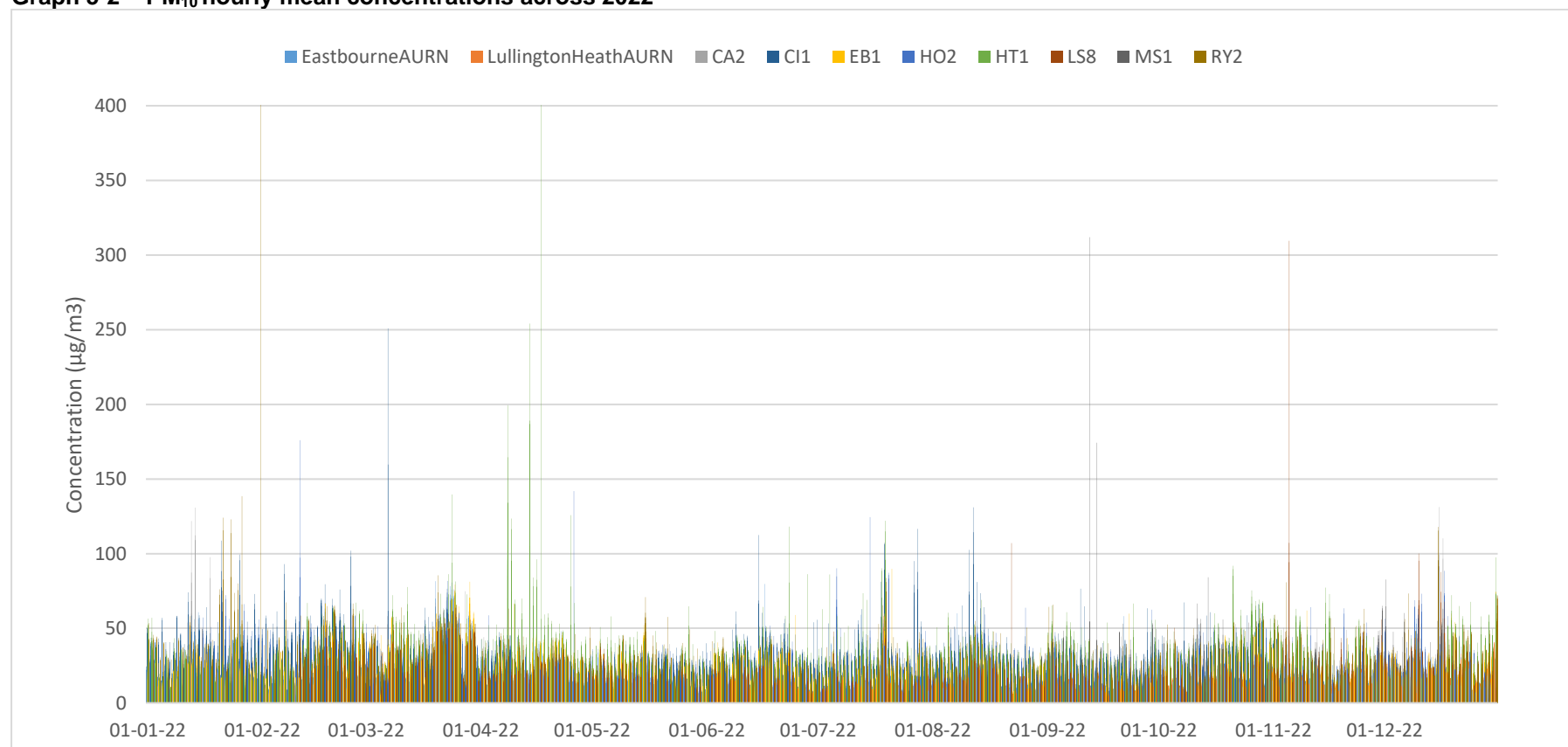
Peak concentrations of PM₁₀ tended to occur in the winter. There were no significant events during 2022. Hastings (HT1) experienced higher concentrations of PM₁₀ during April 14th to 18th.

'Moderate' PM₁₀ levels (24-hour means >51µg/m³ - 75µg/m³) were measured at nine Sussex network sites during 2022 (excludes non-applicable sites due to low data capture rates (<75%).

'High' PM₁₀ levels (24-hour means 76µg/m³ - 100µg/m³) were measured at eight Sussex network sites during 2022.

'Very High' PM₁₀ levels (24-hour means >100µg/m³) were measured at seven Sussex network sites during 2022.

Graph 5-2 – PM₁₀ hourly mean concentrations across 2022



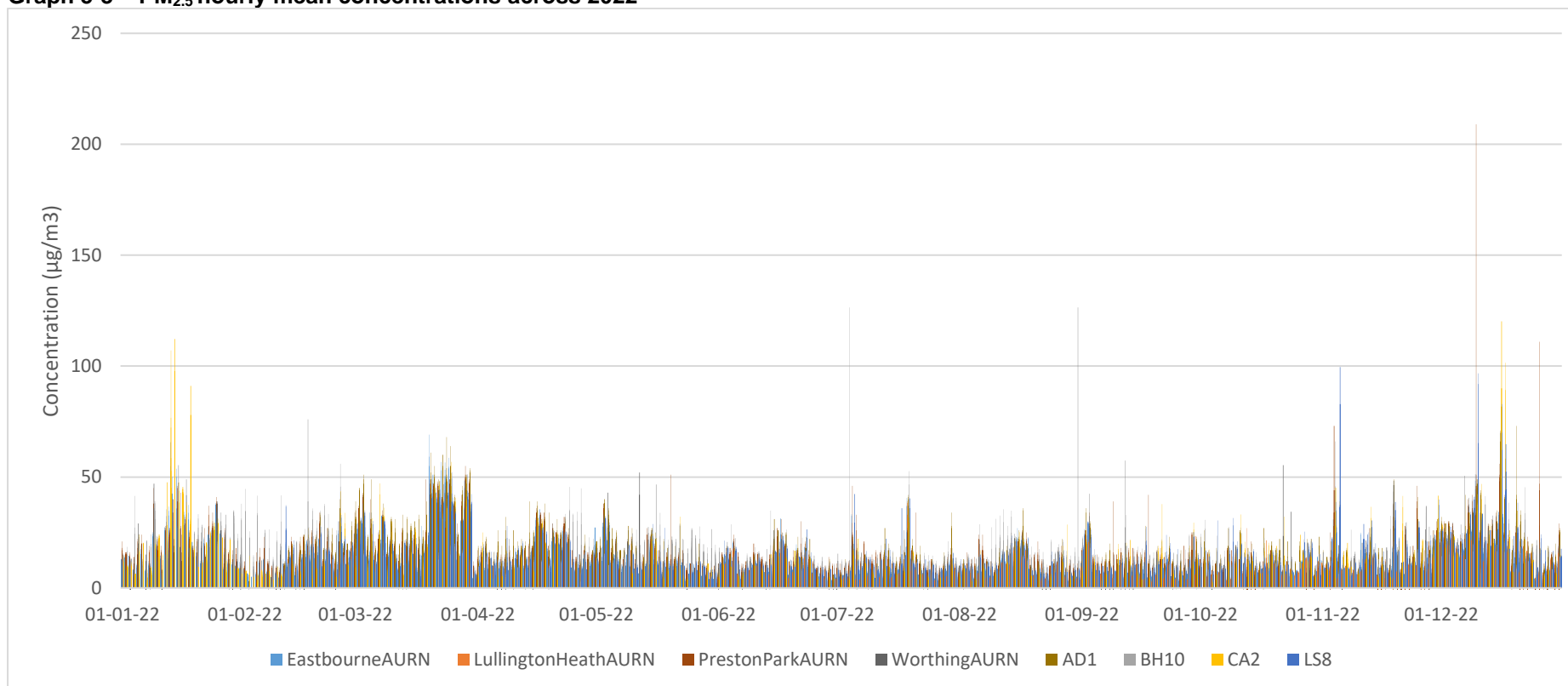
Particulates (PM_{2.5})

'Moderate' PM_{2.5} levels (24-hour means >36µg/m³ - 53 µg/m³) were measured at seven Sussex network sites during 2022 (excludes non-applicable sites due to low data capture rates (<75%).

'High' PM_{2.5} levels (24 hour means 54µg/m³ - 70 µg/m³) were measured at five Sussex network sites during 2022.

'Very High' PM_{2.5} levels (24 hour means >71 µg/m³) were measured at five Sussex network sites during 2022.

Graph 5-3 – PM_{2.5} hourly mean concentrations across 2022



Ozone (O₃)

Widespread 'Moderate' O₃ was recorded on a number of days at all the network sites monitoring for this pollutant. These episodes occur during the warmer sunnier months due to the photochemical reaction of nitrogen oxides with hydrocarbons. It is also known that a proportion of the O₃ experienced in Sussex is transported from continental Europe under certain meteorological conditions.

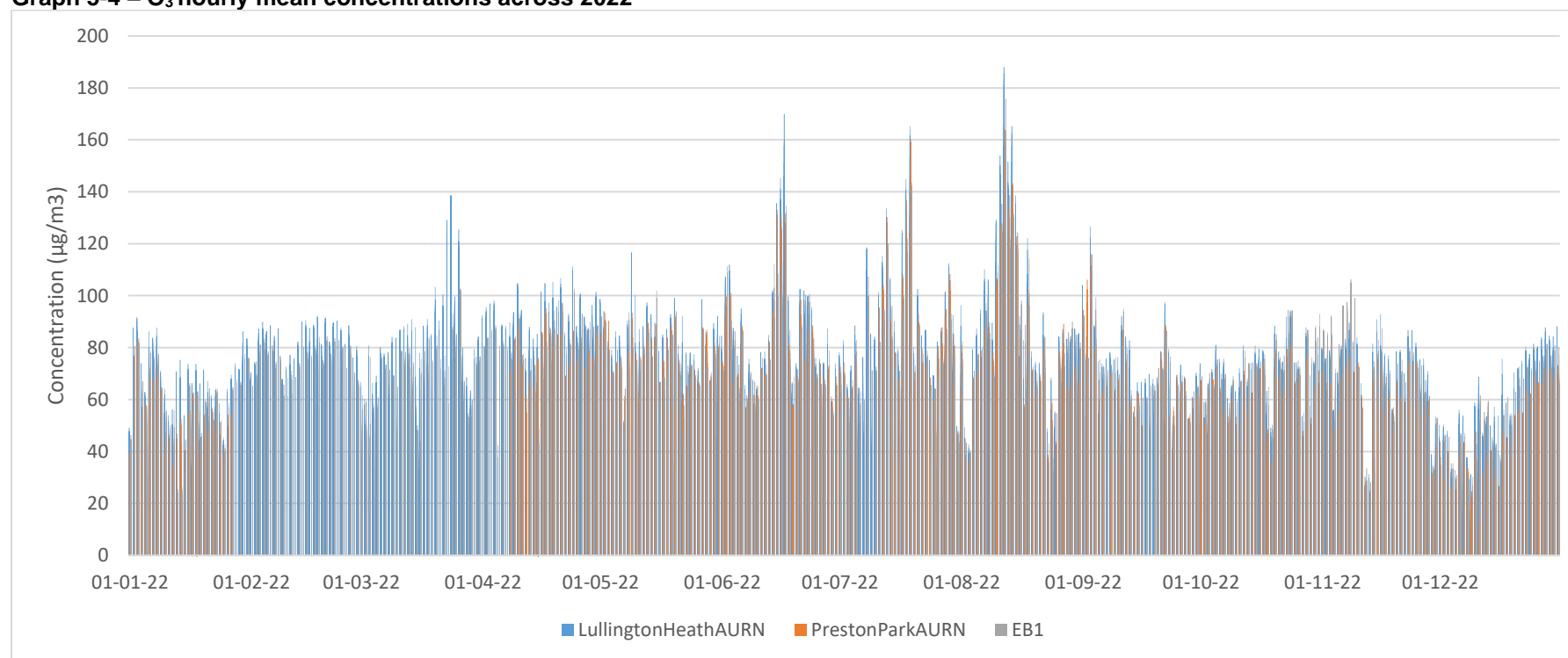
The O₃ network was reduced significantly in 2022, with only three sites operating (Eastbourne - Devonshire Park, AURN Lullington Heath and AURN Brighton Preston Park), down from seven operating in 2021.

'Moderate' O₃ levels (running 8-hour mean >100µg/m³ - 160 µg/m³) were measured at all three Sussex network sites during 2022 (excludes non-applicable sites due to low data capture rates (<75%).

'High' O₃ levels (running 8-hour mean >160µg/m³ - 240 µg/m³) were measured at three Sussex network sites during 2022.

No 'Very High' O₃ levels (running 8-hour mean >240 µg/m³) were measured across Sussex network sites during 2022.

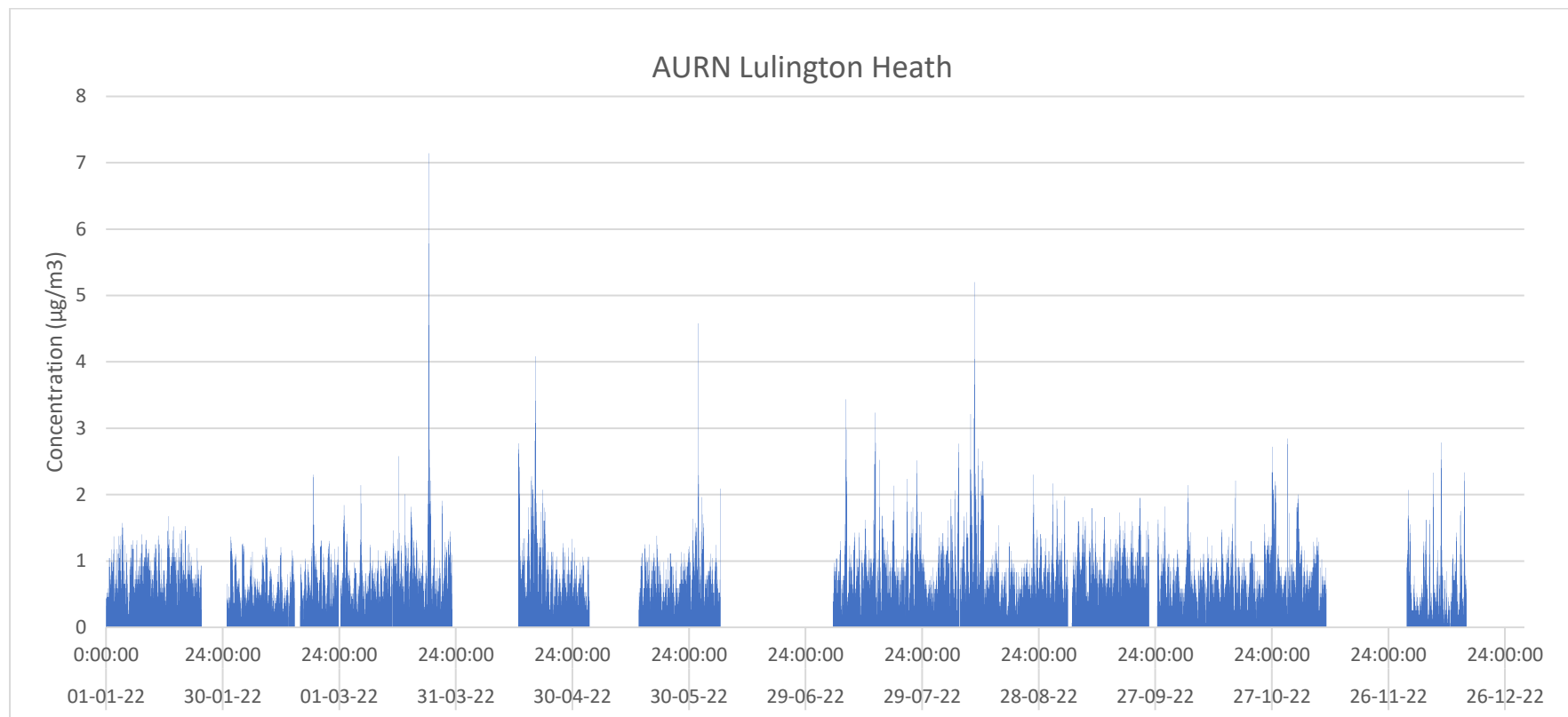
Graph 5-4 – O₃ hourly mean concentrations across 2022



Sulphur Dioxide (SO₂)

There were no occurrences of 'Moderate' levels (15min mean >266µg/m³) or above for SO₂ pollution during 2022 at any network sites.

Graph 5-5 – SO₂ hourly mean concentrations across 2022



6. Air Quality Trends (5 years)

Data trends are provided in the following tables and graphs. Note no data analysis or annual report was provided in 2021, hence the data gaps.

Table 6-1 – Annual mean NO₂ 2018 - 2022

Site ID	Site Name	2018	2019	2020	2021	2022
AD1	Adur - Shoreham-by-sea	26	26	20		20.3
EB3	AURN – Eastbourne, Holly Place	11	11	10		9.3
LL1	AURN - Lullington Heath	8	7	6		7.1
BH0	AURN – Brighton, Preston Park	16	15	11		12.6
HO4	AURN - Storrington	23	22	17		18.7
WT2	AURN - Worthing A27 Grove Lodge	37	33	26		25.4
BH10	Brighton - North Street	-	-	-		34.6
CI1	Chichester - A27 Chichester Bypass	29	28	23		22
CI5	Chichester - Westhampnett Road		27	19		24.7
CA2	Crawley - Gatwick Airport	-	25	17		21.8
EB1	Eastbourne - Devonshire Park	14	16	11		12.8
HT1	Hastings - Bexhill Rd, Bulverhythe	16	15	11		12.8
HO5	Horsham - Cowfold	28	24	23		22.8
HO2	Horsham - Park Way, Horsham	25	24	19		19.1
LS7	Lewes - Newhaven	-	-	20		
LS8	Lewes – Little East Street, Lewes	-	-	-		12.1
MS1	Mid Sussex - London Road, East Grinstead	-	-	-		39
RY2	Rother - De La Warr Road, Bexhill	20	20	15		14.2

Values shown in brackets have less than 75% data capture rate.
Dashes (-) signify no data or pollutant not measured in that year.
All units are µg/m³.

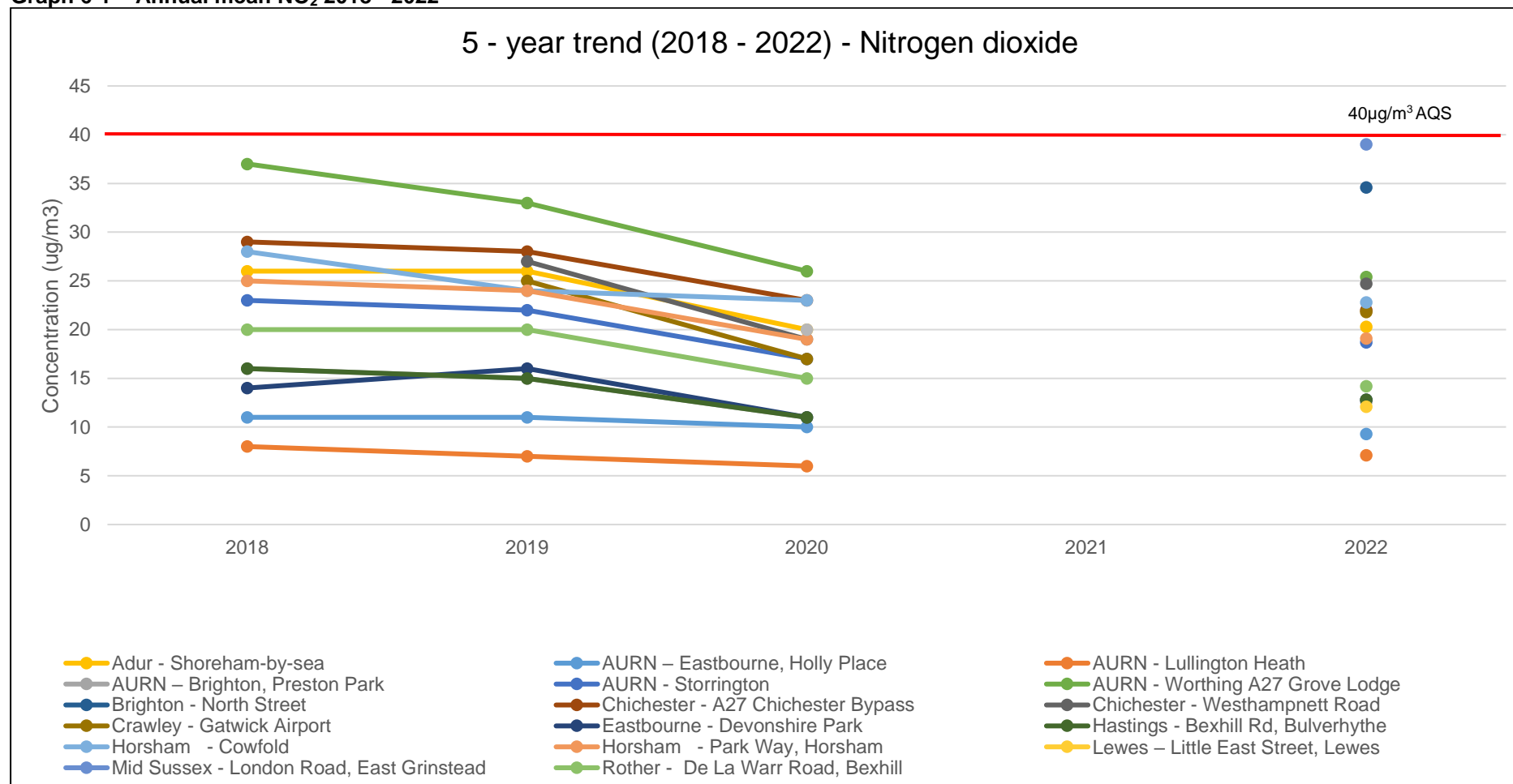
Graph 6-1 – Annual mean NO₂ 2018 - 2022

Table 6-2 – Annual mean PM₁₀ 2018 - 2022

Site ID	Site Name	2018	2019	2020	2021	2022
AD1	Adur - Shoreham-by-sea	23	24	22		-
EB3	AURN – Eastbourne, Holly Place	-	16	14		14.6
LL1	AURN - Lullington Heath	-	-	-		11
WT2	AURN - Worthing A27 Grove Lodge	-	10	-		
CI1	Chichester - A27 Chichester Bypass	18	19	18		24.1
CA2	Crawley - Gatwick Airport	-	17	15		16.6
EB1	Eastbourne - Devonshire Park	19	17	17		19.3
HT1	Hastings - Bexhill Rd, Bulverhythe	23	22	21		23.5
HO2	Horsham - Park Way, Horsham	20	19	16		19.5
LS7	Lewes - Newhaven	-	-	23		-
LS8	Lewes – Little East Street, Lewes	-	-	-		15.6
MS1	Mid Sussex - London Road, East Grinstead	-	-	-		18.1
RY2	Rother - De La Warr Road, Bexhill	22	20	20		22.3

Values shown in brackets have less than 75% data capture rate.
 Dashes (-) signify no data or pollutant not measured in that year.
 All units are µg/m³.

Graph 6-2 – Annual mean PM₁₀ 2018 - 2022

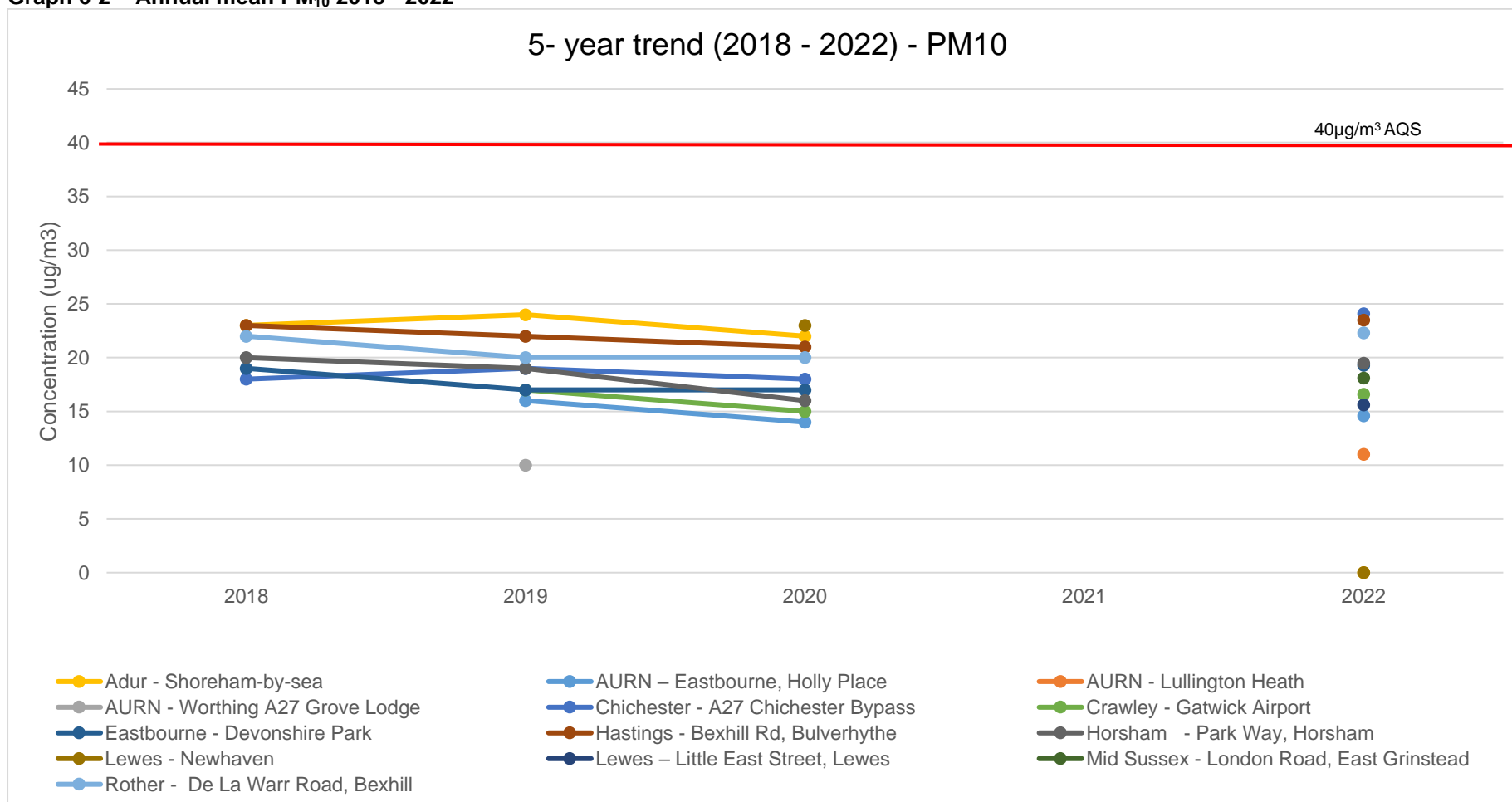
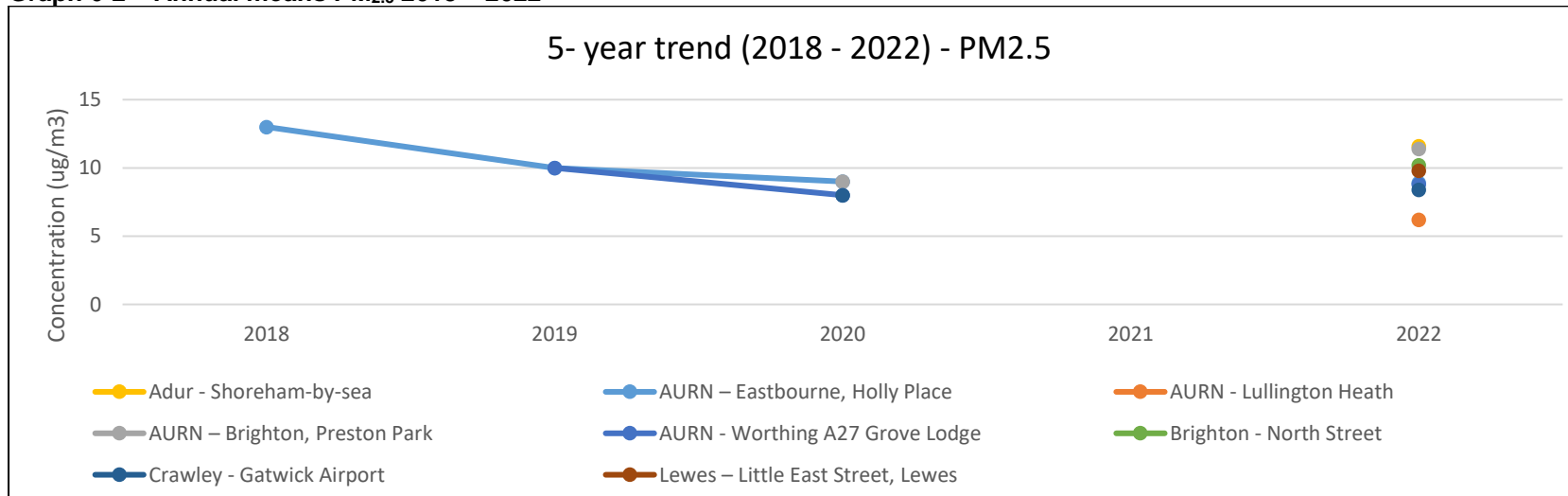


Table 6-3 – Annual mean PM_{2.5} 2018 - 2022

Site ID	Site Name	2018	2019	2020	2021	2022
AD1	Adur - Shoreham-by-sea	-	-	-		11.6
EB3	AURN – Eastbourne, Holly Place	13	10	9		8.9
LL1	AURN - Lullington Heath	-	-	-		6.2
BH0	AURN – Brighton, Preston Park	-	-	9		11.4
WT2	AURN - Worthing A27 Grove Lodge	-	10	8		8.8
BH10	Brighton - North Street					10.2
CA2	Crawley - Gatwick Airport	-	-	8		8.4
LS8	Lewes – Little East Street, Lewes	-	-	-		9.8

Values shown in brackets have less than 75% data capture rate.
 Dashes (-) signify no data or pollutant not measured in that year.
 All units are µg/m³.

Graph 6-2 – Annual means PM_{2.5} 2018 – 2022

Annual mean O₃ 2018 - 2022

Site ID	Site Name	2018	2019	2020	2021	2022
LL1	AURN - Lullington Heath	61	61	66		N/A
BH0	AURN – Brighton, Preston Park	49	47	56		N/A
EB1	Eastbourne - Devonshire Park	63	57	61		56.8

Values shown in brackets have less than 75% data capture rate.
 Dashes (-) signify no data or pollutant not measured in that year.
 All units are µg/m³.

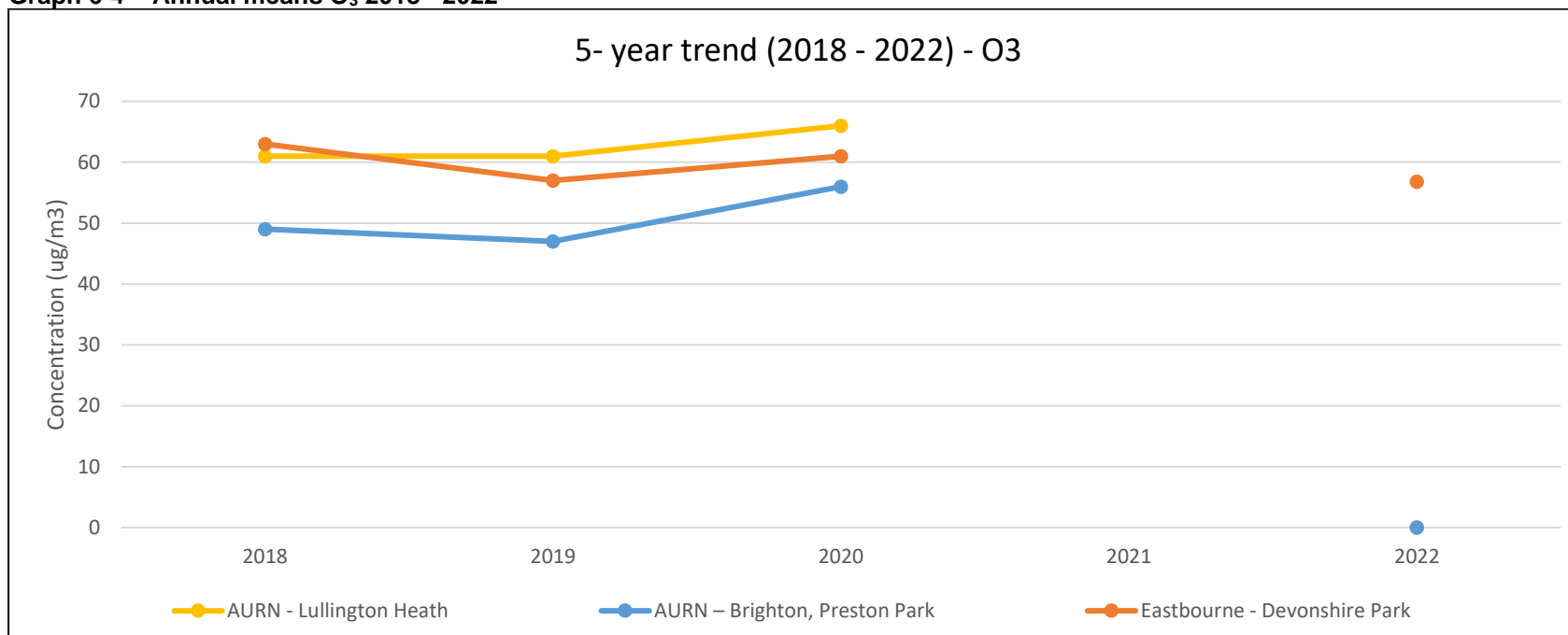
Graph 6-4 – Annual means O₃ 2018 - 2022

Table 6-5 – Annual means SO₂ 2018 - 2022

Site ID	Site Name	2018	2019	2020	2021	2022
LL1	AURN - Lullington Heath	1	1.1	1		0.8

Values shown in brackets have less than 75% data capture rate.

Dashes (-) signify no data or pollutant not measured in that year.

All units are µg/m³.

7. Air Quality Legislation and Evolving Standards

Air Quality Strategies and 25 Year Environment Plan

The importance of existing and future pollutant concentrations can be assessed in relation to the national air quality standards and objectives established by Government. The Air Quality Strategy (AQS)² provides the over-arching strategic framework for air quality management in the UK and contains national air quality standards and objectives established by the UK Government and Devolved Administrations to protect human health. The air quality objectives incorporated in the AQS and UK Legislation.

The Clean Air Strategy 2019³ provided a more focused strategy on PM_{2.5} and was followed up by the 25 Year Environment Plan (2023) "A Green Future: Our 25 Year Plan to Improve the Environment"⁴. The 25 Year Environment Plan included a 25-year goal of "Clean air" amongst other objectives and supporting policies.

The Environment Act 2021

The Environment Act 2021 established a legally binding duty on Government to set an annual mean target on the level of fine particulate matter (PM_{2.5}), in addition to a longer-term target, by 31st October 2022 for England. The Act stated

"Whilst the responsibility for meeting the PM_{2.5} targets sits with national government; local authorities have a role to play in delivering reductions in PM_{2.5}." and;

"Local authorities in England will need to work towards reducing PM_{2.5} in their area. Action to tackle PM₁₀/NO_x can be expected to contribute towards this."

LAQM Policy and Technical Guidance (LAQM PG(22) and LAQM TG(22))

The updated 2022 LAQM Policy and Technical Guidance provided further detail on the focus of actions for local authorities to measure and report PM_{2.5}.

² The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007), Published by Defra in partnership with the Scottish Executive, Welsh Assembly Government and Department of the Environment Northern Ireland.

³ The Clean Air Strategy 2019
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf

⁴ A Green Future: Our 25 Year Plan to Improve the Environment
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/693158/25-year-environment-plan.pdf

Appendices

Appendix 1: Air Quality Objectives

The AQS objectives apply at locations outside buildings or other natural or man-made structures above or below ground, where members of the public are regularly present and might reasonably be expected to be exposed to pollutant concentrations over the relevant averaging period. Typically, these include residential properties and schools/care homes for long-term (i.e. annual mean) pollutant objectives and high streets for short-term (i.e. 1-hour) pollutant objectives. Table A1 -1, taken from LAQM Technical Guidance (LAQM TG(22)), provides an indication of those locations that may or may not be relevant for each averaging period.

Table A1 -1– Examples of where the AQS Objectives should apply

Averaging Period	Objectives should apply at:	Objectives should generally not apply at:
Annual mean	All locations where members of the public might be regularly exposed. Building facades of residential properties, schools, hospitals, care homes etc.	Building facades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
24-hour mean and 8-hour mean	All locations where the annual mean objectives would apply, together with hotels. Gardens or residential properties ¹ .	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term.
1-hour mean	All locations where the annual mean and 24 and 8-hour mean objectives would apply. Kerbside sites (e.g. pavements of busy shopping streets). Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where the public might reasonably be expected to spend one hour or more. Any outdoor locations at which the public may be expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.
15-minute mean	All locations where members of the public might reasonably be expected to spend a period of 15 minutes or longer.	

Table A1-2 – UK Air Quality Objectives - LAQM

Pollutant	AQS Objective	Concentration Measured as:
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times per year	1-hour mean
	40 µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50 µg/m ³ not to be exceeded more than 35 times per year	24-hour mean
	40 µg/m ³	Annual mean
Particulate Matter (PM _{2.5})	*Work towards reducing fine particulate matter (PM _{2.5})	Annual Mean
Sulphur dioxide (SO ₂)	266 µg/m ³ not to be exceeded more than 35 times a year	15 - minute mean
	350 µg/m ³ not to be exceeded more than 24 times a year	1-hour mean
	125µg/m ³ not to be exceeded more than 3 times a year	24-hour mean

Notes:

*Regulation 4 of the Environmental Targets (Fine Particulate Matter) (England) Regulations 2022 sets the target to ensure that the annual mean concentration of PM_{2.5} in ambient air is equal to or less than 10 micrograms per cubic metre by 31st December 2040.

Under the LAQM regime and for the purpose of LAQM reporting, concentrations should be reported to 1 decimal place

Appendix 2: Air Quality Bandings

Table A2 -1– UK Air Quality Bandings

Band	Index	Ozone	Nitrogen Dioxide	Sulphur Dioxide	PM2.5 Particles	PM10 Particles
		Running 8 hourly mean	Hourly mean	15 minute mean	24 hour mean	24 hour mean
		µg m-3	µg m-3	µg m-3	µg m-3	µg m-3
Low						
	1	0-33	0-67	0-88	0-11	0-16
	2	34-66	68-134	89-177	12-23	17-33
	3	67-100	135-200	178-266	24-35	34-50
Moderate						
	4	101-120	201-267	267-354	36-41	51-58
	5	121-140	268-334	355-443	42-47	59-66
	6	141-160	335-400	444-532	48-53	67-75
High						
	7	161-187	401-467	533-710	54-58	76-83
	8	188-213	468-534	711-887	59-64	84-91
	9	214-240	535-600	888-1064	65-70	92-100
Very High						
	10	241 or more	601 or more	1065 or more	71 or more	101 or more