



2018 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the
Environment Act 1995
Local Air Quality Management

October 2018

East Dorset District Council

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Executive Summary: Air Quality in Our Area

The 2018 Annual Status Report is designed to provide the public with information relating to local air quality in East Dorset, to fulfil East Dorset District Council's statutory duty to review and assess air quality within its area as required by Part IV of the Environment Act 1985, and to determine whether or not the air quality objectives are likely to be achieved.

Air Quality in East Dorset District Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas^{1,2}.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion³.

East Dorset is considered to be largely rural in nature and has the principal town of Wimborne as its administrative centre. East Dorset is dissected by the A31 trunk road which is considered a main west-east artery.

Traffic emissions are the most significant source of air pollution within the district with large traffic flows at peak times experienced at Canford Bottom Wimborne (A31), Ferndown, cross roads (A348), and Parley Cross Roads.

Monitoring results in East Dorset District Council area demonstrate that between 2012 and 2017 there has been no discernible upward or downward trend in concentrations for this 5 year period.

¹ Environmental equity, air quality, socioeconomic status and respiratory health, 2010

² Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

³ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

Actions to Improve Air Quality

East Dorset District Council has continued to facilitate non-car travel by requiring the incorporation of infrastructure into new residential development through the planning regime. Contributions from developers have been secured towards junction improvements and non-car travel infrastructure beyond the boundary of their development through use of section 106 agreements.

The Council has embarked upon a program of 'smarter' working for its staff, all staff have been equipped with 'hybrid' laptops and software has been put in place to enable staff to work remotely. Many staff now work from home and this has reduced considerably the normal home to work mileage.

The Council has worked closely with the Dorset County Council Highways Section on several schemes, notably the construction of a shared use footway / cycleway from Hampreston Cross to Canford Bottom roundabout.

(1) Scheme objectives

- improve safety
- reduce dependency on a car
- complete the link from Longham to the Castleman Trailway



Works to improve the junction of the B3074 with the Wareham Road at Corfe Mullen have been completed which aid pedestrian usage.



A Major highway improvement scheme is underway to Increase the width of the A31 from two lanes to three lanes on the westbound carriageway between the Ringwood and Verwood junctions (approximately 1km) this should improve traffic flow and reduce congestion.



Christchurch & EDDC Environmental Health departments have embarked on a project in partnership with Public Health Dorset (PHD) and neighbouring authorities to look at population exposure to fine particulate air pollution. PHD have created a model to generate potential monitoring locations based on background levels of particulate matter, prevalence of heart/lung disease, presence of vulnerable populations (young/elderly) and indices of multiple deprivation.

Monitoring stations as pictured below have been put up in seven sites across Dorset. The data from these monitoring stations can be accessed over the internet. The purpose of the project, which will run for 2 years, is to compare particle data with satellite imagery, and compare this data with hospital admissions for respiratory disorders. Currently there is little evidence to link airborne particles and hospital admissions.

The monitoring stations were purchased through a combined Dorset wide project proposal bid.



Conclusions and Priorities

Within the East Dorset District Council area there have been no exceedances of the government's air quality objectives and it has not been necessary to establish any Air Quality Management Areas (AQMA).

The main challenge remains the reduction of congestion at Canford Bottom Wimborne (A31), Ferndown, cross roads (A348), and Parley Cross Roads. The scope for highway improvements is limited, but the council continues to work with

Dorset County Council to assess whether junction/signalling improvements can bring about reductions in congestion in these areas, details of proposals can be found in 'The Bournemouth, Poole & Dorset Transport Plan'

<https://www.dorsetcouncil.gov.uk/roads-highways-maintenance/transport-planning/local-transport-plan/local-transport-plan-supporting-strategies.aspx>

Local Engagement and How to get involved

There are a number of ways members of the public can help to improve local air quality:

Walk or cycle around the area instead of driving

Dorset County Council together with local authorities have launched a car sharing website, <https://liftshare.com/uk/community/dorset> (opens in a new window) is a free service that links up drivers and passengers to enable them to share car journeys. You can give a lift or get a lift for journeys to work, school, the shops, for leisure or work-related trips anywhere in Dorset, Bournemouth and Poole, and beyond - the system is linked to a national database of journeys.

General travel planning advice is available at <https://www.dorsetcouncil.gov.uk/travel/travel.aspx> (including walking, cycling and bus maps and timetables).

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1 Local Air Quality Management

This report provides an overview of air quality in East Dorset District Council during 2017. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by East Dorset District Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

East Dorset District Council currently does not have any AQMAs. For reference, a map of East Dorset District Council's monitoring locations is available in Appendix D.

2.2 Progress and Impact of Measures to address Air Quality in East Dorset District Council

Defra's appraisal of last year's ASR concluded On the basis of the evidence provided by the local authority the conclusions reached are acceptable for all sources and pollutants.

East Dorset District Council has taken forward a number of direct measures during the current reporting year of 2018 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Carshared orset	Alternatives to private vehicle use	Car & Lift sharing schemes	Dorset County Council	N/A	2012	Number of users	Unknown	Ongoing	N/A	
2	Rapid Charging Point Installation	Promoting Low emission transport	EV recharging	East Dorset District Council	2013	2014	Number of users	Unknown	Complete One further point to be installed	complete	
3	Smarter working	Promoting Travel Alternatives	Encourage/ Facilitate Homeworking	East Dorset District Council	2014	2015/6	Reduction in mileage	Unknown	Complete	complete	
4	Civil Enforcement vehicle procurement	Promoting Low Emission Transport	Public Vehicle Procurement- Prioritising uptake of low emission vehicles	East Dorset District Council	2014	2015	Vehicle Fleet efficiency- reduced CO	Unknown	Complete evaluation phase	complete	
5	project to visualise the link between air quality and health	Control	Regional Groups Co-Ordinating programmes to develop area wide strategies to reduce emissions and improve air quality	Dorset Pollution Group	2015	2017	<ul style="list-style-type: none"> •Provide comparison with the Air Quality Objective for PM2.5 at the completion of the project •Evaluate air quality against appropriate air quality 	Unknown	Funding bid being prepared	N/A	Monitoring have been installed

							indicators				
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2.3 PM_{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of PM_{2.5} (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM_{2.5} has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

East Dorset District Council is taking the following measures to address PM_{2.5}:

We are part of the Dorset Pollution Group along with the 8 other Dorset authorities and following a successful bid for funding from Dorset Public Health have embarked on a monitoring project to visualise the link between air quality and health.

We are using imagery's to produce mapping of PM_{2.5} by Southampton University. The project has put analysers on the ground to measure gas & particles to verify that satellite data (& Defra's background). This would be within areas affected by air quality related illnesses as identified by Dorset Public Health.

1. Project Objectives:

2. Build a Dorset-Wide Air Quality Monitoring Network
3. Create an air quality evidence base for Dorset
4. Link health outcome data to air quality indicators / evidence base
5. Enhance existing understandings of air quality and health, and communicate outcomes
6. Enhance current partnerships and consider where opportunities arise for additional partnerships.

The Public Health Outcomes Framework for England includes an indicator of mortality associated with air pollution. The data used for this indicator is based upon modelled concentrations of PM_{2.5}. The project will produce data on concentrations of PM_{2.5} throughout Dorset, and both urban and rural locations.

Our data will then be compared to the most up to date health data regarding hospital admissions / GP attendances. Pollution episodes, and admissions / attendances are thought to be comparable.

All the monitoring stations have already been installed within Dorset, and the network of monitoring stations has now been completed, it is expected that data from these will be incorporated into next year's ASR.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

East Dorset District Council did not operate any automatic (continuous) monitoring sites during 2017.

3.1.2 Non-Automatic Monitoring Sites

East Dorset District Council undertook non- automatic (passive) monitoring of NO₂ at 15 sites during 2017. Table A.1 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D.

Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. “annualisation” and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, “annualisation” and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.2 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Appendix B.

Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
1	Tawa, Horton Road, Ringwood	Roadside	413298	104528	NO2	NO	0	40m (1.1m)*	NO	3
2	22, Avon Park Ringwood	Roadside	413488	104543	NO2	NO	0	50m (0.8m)*	NO	3
3	3, Hurn Road, Ringwood	Other	413686	104709	NO2	NO	0	60m (0.5m)*	NO	3
4	45, Davids Lane, Ringwood	Urban Background	413425	104429	NO2	NO	7	0.5m	NO	3
5	9, Castlewood, Ringwood	Urban Background	413521	104368	NO2	NO	2	0.9m	NO	3
6	392, Ringwood Road, Ferndown	Roadside	407785	100135	NO2	NO	4	1.3m	NO	3
7	(opp) 83, Dudsbury Avenue, Ferndown	Other	407668	99889	NO2	NO	10	1.4m	NO	3
8	11, Fernlea Close, Ferndown	Urban Background	407804	100016	NO2	NO	9	0.9m	NO	3
9	2, Melbury Close,	Urban Background	407650	99763	NO2	NO	12	0.4m	NO	3

	Ferndown									
10	24, Ringwood Road, St Ives	Roadside	412782	104118	NO2	NO	26	1.3m	NO	3
11	6 Sandy Lane, St Ives	Other	412747	104117	NO2	NO	13	30m (1.2m)*	NO	3
12	3, Russell Gardens, St Ives	Urban Background	412749	104262	NO2	NO	20	0.8m	NO	3
13	14 St Ives Wood, St Ives	Urban Background	412978	104339	NO2	NO	14	1.4m	NO	3
14	Public conveniences, Christchurch Road, West Parley	Roadside	408384	97986	NO2	NO	8	1.0m	NO	3
15	235 Christchurch Road, West Parley	Roadside	408468	98002	NO2	NO	4	1.0m	NO	3

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(2) N/A if not applicable.

Table A.2 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2013	2014	2015	2016	2017
1	Roadside	Diffusion Tube		100	26	28	23	22	22
2	Roadside	Diffusion Tube		100	23	22	21	22	21
3	Other	Diffusion Tube		100	24	23	22	22	25
4	Urban Background	Diffusion Tube		100	19	20	16	17	17
5	Urban Background	Diffusion Tube		100	16	18	17	15	16
6	Roadside	Diffusion Tube		100	36	34	31	32	29
7	Other	Diffusion Tube		100	19	19	18	19	18
8	Urban Background	Diffusion Tube		100	13	13	12	14	12
9	Urban Background	Diffusion Tube		100	13	11	12	13	12
10	Roadside	Diffusion Tube		100	34	33	32	31	32
11	Other	Diffusion Tube		100	17	15	16	17	17
12	Urban Background	Diffusion Tube		100	12	11	11	11	11
13	Urban Background	Diffusion Tube		100	15	13	12	13	12
14	Roadside	Diffusion Tube		100	28	25	25	26	25

15	Roadside	Diffusion Tube		100	32	32	28	30	31
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- Diffusion tube data has been bias corrected
- Annualisation has been conducted where data capture is <75%

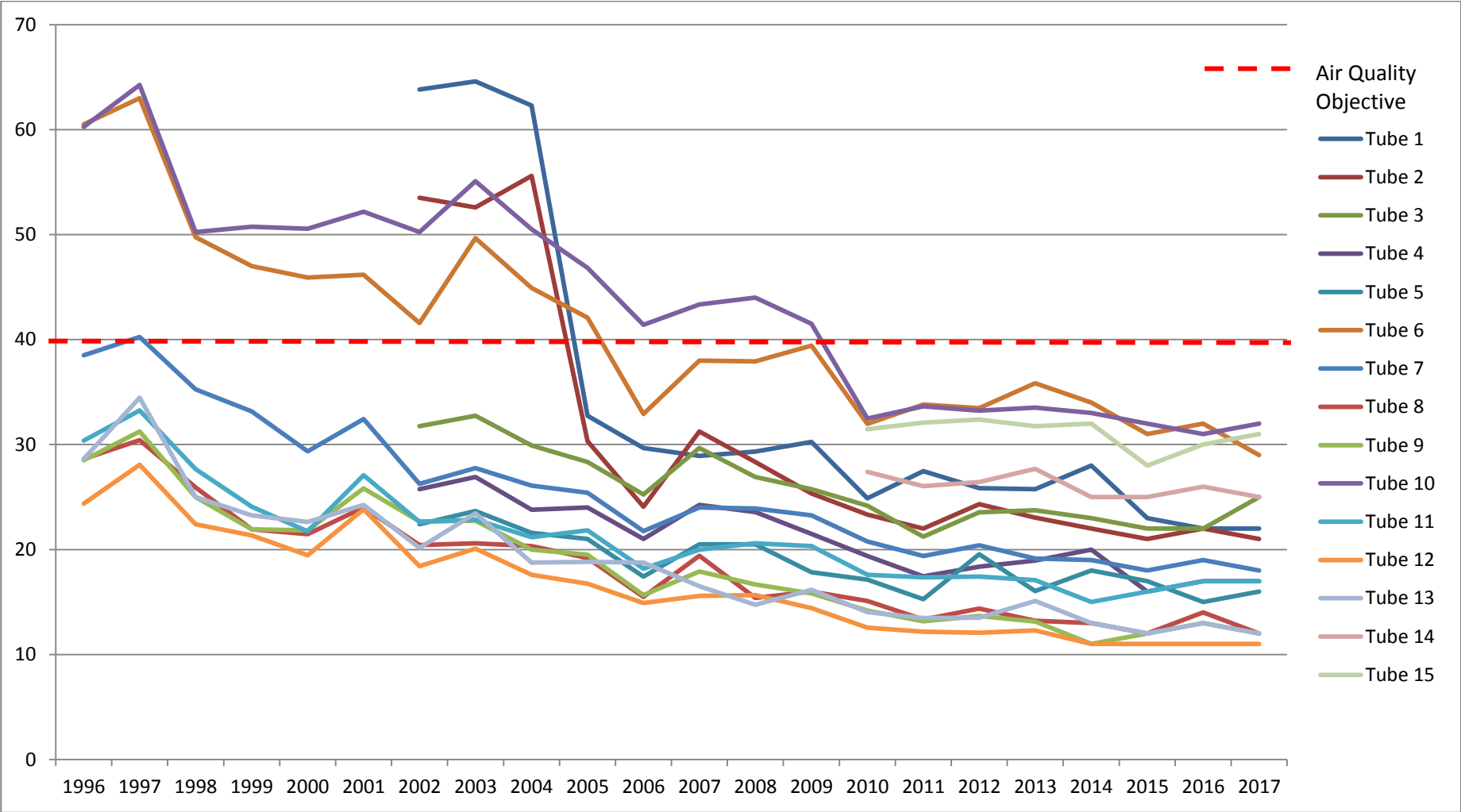
Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

- (1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.
- (2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).
- (3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A1 – Trends in Annual Mean NO₂ Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2017

Site ID	NO ₂ Mean Concentrations (µg/m ³)												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.96) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
1	32	28	23	21	25	25	22	21	21	20	17	22	23	22	
2	32	23	22	21	17	17	17	21	21	20	29	23	22	21	
3	34	23	23	25	18	17	19	22	23	22	30	27	24	25	
4	27	19	17	17	14	13	14	16	16	18	24	20	18	17	
5	46	15	15	11	12	10	11	13	14	15	20	18	17	16	
6	46	34	30	24	34	26	26	24	26	28	34	28	30	29	
7	30	24	19	16	15	14	14	13	17	18	24	23	19	18	
8	24	16	12	10	9	8	8	9	12	10	16	16	13	12	
9	24	16	13	9	9	8	8	9	9	12	15	16	12	12	
10	48	34	36	29	32	32	31	31	29	32	32	34	33	32	
11	32	23	18	13	18	14	14	14	15	16	18	18	18	17	
12	22	14	11	8	10	8	9	9	9	11	13	12	11	11	
13	26	16	14	9	12	10	10	10	11	13	14	14	13	12	
14	41	28	24	24	28	22	21	21	23	22	33	25	26	25	
15	41	32	30	32	30	32	29	29	29	32	35	31	32	31	

- Local bias adjustment factor used
- National bias adjustment factor used
- Annualisation has been conducted where data capture is <75%
- Where applicable, data has been distance corrected for relevant exposure

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

Bias adjustment is effectively a calculated factor which shows whether diffusion tubes are over or under reading ambient concentrations and therefore allows for a correction to be made.

As there is no local automatic monitoring, East Dorset District Council uses a national factor as given in a spreadsheet on the review and assessment web site for Gradko Laboratories using a preparation method of 50%TEA/acetone. Version 06/18 of the spreadsheet was used and can be accessed on-line at:

<https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

Appendix D: Map(s) of Monitoring Locations and AQMAs

The council operates 15 NO₂ diffusion tubes sites within its district. These locations are shown in Figures 2 to 5, with site details given in Table A.2.

Figure 2 NO₂ Tube Locations- A31



Figure 3 NO₂ Tube Locations- Ashley Heath



Figure 4 NO2 Tube Locations- Ferndown



Figure 5 NO2 Tube Locations- West Parley



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective ⁴	
	Concentration	Measured as
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a 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 a year	24-hour mean
	40 µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

⁴ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide
...	...

References

DEFRA Diffusion Tube Bias Factor Spreadsheet

<https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>