

2018 Air Quality Annual Status Report (ASR)

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

August 2018

Local Authority Officer	Rachel Higgins
Department	Environmental and Regulation
Address	New Forest District Council Appletree Court Lyndhurst Hampshire SO43 7PA
Telephone	023 8028 5561
E-mail	rachel.higgins@nfdc.gov.uk
Report Reference number	NF/01/18
Date	August 2018

Executive Summary: Air Quality in Our Area

Air Quality in New Forest 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.

The New Forest District covers 75,100 hectares (290 sq. miles) and has a diverse environment, including the New Forest (and associated New Forest National Park) that covers approximately three quarters of the district comprising of mainly protected heathlands and forests, a coastline of 64km, areas of industry, towns and villages. Along Southampton Water much of the shoreline is influenced by urban and industrial development. The local landscape is dominated by a refinery, one of the largest in Europe, whilst other industrial processes include a gas fired power station, a number of energy recovery facilities and chemical installations. Furthermore, there are significant areas of sand and gravel extraction in the district to support local businesses.

The total population of the District is 176,800⁴ although the area also attracts local, national and international visitors throughout the year with over 13 million days visits made annually⁵. With 96%⁵ of visitors arriving into the New Forest in cars or coaches, in addition to the local industry, it is not surprising the New Forest district has some current or potential air quality issues relating to both traffic and industry.

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

⁴ Office of National Statistics, 2013

⁵ New Forest National Park, Facts and Figures, 2007

The pollutants of concern in the New Forest district are nitrogen dioxide (NO₂), particulate matter (PM_{10} and $PM_{2.5}$) and sulphur dioxide (SO_2). Traffic produces both NO₂ and particulate emissions, whilst the local industry may produce NO₂, particulate and SO₂ emissions. As a result of identified local air quality issues, the New Forest currently has one declared Air Quality Management Area (AQMA) for the likely exceedance of the annual mean air quality objective for NO₂:

• Lyndhurst (High Street). Traffic related

Further information with regards to the AQMA can be found at: http://www.newforest.gov.uk/airquality

In addition, in 2017 New Forest District Council was named in the UK Air Quality Plan⁶ as having one road which is predicted to persistently exceed nitrogen dioxide EU limit values after 2020. This road is a short stretch (approximately 1km) of the A35 over the Redbridge Causeway into Southampton and is a location where the public has access.

Southampton was identified in 2015 as an area which also has a number of roads which persistently exceed the EU limit values for nitrogen dioxide and therefore Southampton City Council has already progressed action in understanding the issues and forwarding further measures to improve local air quality. The area identified in the New Forest is seen as an extension of the Southampton issue therefore Southampton City Council and New Forest District Council are working in partnership to develop a Clean Air Zone (CAZ) within Southampton to ensure compliance with the EU limit value is met in the shortest time possible.

Measures being forwarded and considered include targeting specific vehicles entering the area, developing distribution centres, improving local cycling infrastructure and the production of regional planning guidance, which may include

⁶ Defra and DfT. UK plan for tackling roadside nitrogen dioxide concentrations. July 2017

the involvement of other local authorities, to assist developers and local authorities to ensure new developments do not have a significant adverse impact on local air quality.

Monitoring

New Forest District Council undertakes automatic and non-automatic monitoring of NO_2 , PM_{10} and SO_2 at locations throughout the district and compares the results to the UK Air Quality Objectives. Air Quality Objectives are set for different pollutants and may include a number of objectives covering a variety of time periods, for example NO_2 has two objectives: an annual mean and an hourly mean.

2017 was the third consecutive year since monitoring began in 2002 (using the current monitoring methods) that there were <u>no</u> monitored exceedances of any of the Air Quality Objectives.

Since the declaration of three AQMA's in 2005 in Fawley, Totton and Lyndhurst, New Forest District Council has worked hard to improve local air quality. Following monitored improvements in air quality, two of the declared AQMA's have subsequently been revoked (Fawley in 2013 and Totton in 2016), with Lyndhurst remaining. However monitoring has continued throughout the District including those areas with revoked AQMA's.

Lyndhurst has monitored significant decreases in nitrogen dioxide concentrations of between 4-11 μ gm⁻³ over the last 7 years within part of the High Street (the annual mean objective for NO₂ is 40 μ gm⁻³), with no exceedances of the nitrogen dioxide annual mean objective being monitored in Lyndhurst over the past 3 years. However whilst the decreases are noted and welcome, the cause of the decrease is not clear. Improvements have been made to the flow of traffic within Lyndhurst, but these came into effect 7 years ago when the decrease in the monitored concentrations started but the continued decreases are difficult to explain, other than a generalisation that newer vehicles on the road may also be having a positive local impact.

As such it is concluded that there needs to be confidence that current nitrogen dioxide concentrations in Lyndhurst can be maintained over the long term. Therefore further work with our partners and the community will continue with the aim to reduce concentrations further in order to obtain the required confidence in the long term concentrations for Lyndhurst before the Council considers revoking the current Air Quality Management Area. However it is noted, the evidence is supporting revocation in the near future should the current trend in monitored nitrogen dioxide concentrations continue.

Monitoring undertaken at new sites located in response to local concerns in Brockenhurst and Lymington have not determined the likely exceedance of the nitrogen dioxide air quality objectives. Additional sites in Lyndhurst and Totton were also installed towards the end of 2017 in response to monitoring along a Clean Walking Route to St. Michaels and All Angels School in Lyndhurst and the Clean Air Zone work along the A35 but there was insufficient data to report an annual mean result.

Local Air Quality Management

New Forest District Council has a legal duty to continue to manage local air quality. The Council fulfils this duty by:

- following Local Air Quality Management guidance⁷ produced by Defra;
- continuously monitoring pollutants of interest at relevant sites including rural background, roadside and industrial locations;
- identifying new major sources of airborne pollution and assessing the impact on local air quality. It should be noted that no new major sources have been identified during 2017;
- working within other legislative parameters such as the planning regime and / or the permitting of industrial processes to assess the impact of development

⁷Defra. Technical Guidance LAQM.TG16

or industry on local air quality, and if appropriate, take measures to reduce the determined impact;

- providing training and updates concerning local air quality to colleagues within the local authority, Council Members, Town and Parish Councils and members of the public; and
- working with our partners such as Hampshire County Council, the Environment Agency, local industry, district and national park colleagues, local Council Members, neighbouring local authorities and Town and Parish Councils.

Working with our partners is vital if air quality is to be recognised as an important local issue that requires consideration and action. Some partners are legal regulators, for example Hampshire County Council regulate roads and transport in our district and the Environment Agency regulate the large industrial processes and therefore their involvement could ensure works are undertaken and / or funding is available for particular schemes.

Ensuring all partners are aware of the local air quality issues is also important, therefore New Forest District Council makes the effort to train and update partners on local air quality by attending District, Town and Parish Council meetings and committees. Furthermore Environmental Protection officer's work with other departments to ensure local air quality is discussed at the planning stages of a development or implementation of a scheme.

Air quality is not just a local issue because airborne pollution is not contained within district boundaries. Therefore New Forest District Council also works with our five neighbouring local authorities when required to address air quality issues. This has become of great importance during our collaborative working with Southampton City Council to progress the work on the Clean Air Zone to improve local air quality within the area as directed by Government.

Actions to Improve Air Quality

Lyndhurst

In order to reduce congestion and air pollution in the High Street in Lyndhurst, particularly within a street canyon, a new traffic light sequencing system has been installed. The aim of the system is to allow traffic to turn left from the High Street onto the northbound A337 out of Lyndhurst even when the southbound A337 traffic is passing through the junction on a green light. The traffic lights enable a green filter to work continuously (in the absence of approaching long vehicles or when the pedestrian crossings are not in use), therefore reducing congestion and pollution on the approach to the junction.

Whilst this system has been operational since 2010, it would appear that it has taken drivers a while to be aware of the new traffic system and to keep driving along the High Street. Observations made have concluded that congestion in Lyndhurst has reduced although there are still periods of congestion due to the numbers of vehicles driving into Lyndhurst or local incidents. New forest District Council work with Hampshire County Council (the regulator for the road network) when issues arise with the traffic lights and flow of traffic, and typically the County Council reassess the lights and traffic system, making adjustments when required.

Overall monitoring in Lyndhurst has shown significant decreases in the annual mean objective for NO₂, with a 4-11 μ gm⁻³ decrease in NO₂ concentrations noted over a 7 year period to date within part of the High Street. There has been no exceedances of the annual mean objective for NO₂ monitored in Lyndhurst during 2017.

Without the filter lane in use



With the filter lane in use



Working collaboratively with Southampton City Council on delivering the Southampton Clean Air Zone (CAZ)

As previously stated, New Forest District Council was named in 2017 within the UK Air Quality Plan⁶ as having a one road predicted to persistently exceed nitrogen dioxide EU limit values after 2020. This road is a short stretch (approximately 1km) of the A35 over the Redbridge Causeway into Southampton and is seen as an extension of issues identified in Southampton in 2015.

As such New Forest District Council and Southampton City Council have been working in partnership to deliver a Southampton Clean Air Zone to ensure compliance with the EU annual mean limit value for nitrogen dioxide on this road in the shortest possible time, and by 2020 at the latest. This requirement has been placed on the Council's by Government.

During 2017 New Forest District Council completed a feasibility study and detail assessment on the area of concern within the District. This has determined New Forest District Council will be compliant with the EU limit value by 2020 if a business as usual scenario is implemented. New Forest District Council has also written and agreed a memorandum of understanding with Southampton City Council to ensure we work effectively together, met a Ministerial Direction placed on the Authority to submit an Initial Plan to the Secretary of State and is on target to submit a Final Plan (detailing how compliance with the EU limit value will be met) by 31 December 2018 as directed by a further Ministerial Direction.

Whilst New Forest District Council is responsible for achieving compliance within its own Authority, we continue to work with Southampton City Council to determine the available options and implement further measures to ensure compliance with the EU limit value in the shortest time possible.

Working with Hampshire County Council and local schools to promote air quality locally

During 2017 New Forest District Council has been working with Hampshire County Council and local schools to promote and improve local air quality. In summary the work completed includes:

St. Michael's and All Angels Infant School - Lyndhurst

Promoting a Clean Walking Route to school avoiding the current AQMA by:

- Running a mini treasure hunt along the route which spelt the word 'breathe'. At the school officers discussed air quality with the children, parents and guardians.
- Diffusion tube monitoring has been installed along the Clean Walking Route to show the differences in pollution levels when compared to the High Street.

Hounsdown School

New Forest District Council worked with the school to design of an anti-idling banner to be placed in Lyndhurst High Street During 2018) to encourage drivers to turn off their engines;



New Milton Infants School

New Forest District Council has been working with New Milton Infants School to install a mini monitoring scheme at and outside the school to determine nitrogen dioxide levels. It was agreed that the Council would provide the tubes, expertise in the monitoring locations and result determination, and the school would change the tubes. After the study, the Council will work with the school to discuss ways to reduce exposure of pollution to their pupils and ways to reduce local pollution. The monitoring is proposed to start in 2018 and run for the calendar year.

Conclusions and Priorities

Conclusions

Monitoring of pollutants within the New Forest district has not shown an exceedance of the Air Quality Objectives at any monitoring location. Decreases in nitrogen dioxide concentrations are observed within the AQMA in Lyndhurst however the Council needs to be confident that the monitored levels can be maintained over the long term. As such further work is proposed in Lyndhurst, for example an update of the current Action Plan to build confidence in the evidence to support revocation of the Lyndhurst AQMA within the next few years. Further monitoring has been and will be installed within the District to assess pollutant levels when circumstances or issues arise. For example additional monitoring was installed towards the end of 2017 to obtain information on the A35 in Totton as part of the Clean Air Zone work and along a Clean Walking Route to school in Lyndhurst.

It is noted that planning applications are expected to be submitted to the Council for proposed large developments over the forthcoming years. As such the associated work to assess the submitted plans and the impact on local air quality (including the potential impact on the Southampton Clean Air Zone) may be significant for the Department.

Priorities

New Forest District Council has the following priorities with regards to local air quality:

- to forward Southampton CAZ work, including the production of regional planning guidance
- to update Lyndhurst Air Quality Action Plan and progress the implementation of a Clean Air Neighbourhood for Lyndhurst
- to consider the development of an Air Quality Strategy for New Forest

Challenges

New Forest District Council has the following challenges with regards to local air quality:

- to ensure the Council makes the best use of the resource available to move local air quality forward, and be prepared for the submission of significant planning applications; and
- to motivate local communities to change their behaviour to improve local air quality, particularly when air quality (outside of the known problem areas) is considered good

Local Engagement and How to Get Involved

Everyone can take small steps to improve local air quality and improve their health, for example:

Vehicles

- Find out about your local public transport and car share schemes when travelling to work, school, business trips or weekends away.
- Find out about local bus services. For example during the summer, bus companies in the New Forest operate hop on / off services throughout the district and to local beaches, often with offers to some local attractions. Details can be found via the following links:

(3 routes throughout the New Forest) <u>http://www.thenewforesttour.info/</u>

- Find out about cycle routes in your local area and across the New Forest you
 may be surprised how easy it is to cycle to your destination rather than take
 your car.
- Use My Journey Planner website to identify transport options, routes (including fastest and quietest) and public transport details. This is an excellent and informative website giving the user great options to compare different journey options. Details can be found via the following link:

http://myjourneyhampshire.com/journeyplanner/

- Turn off your engine when waiting at traffic lights, closed railway barriers or in traffic jams.
- Turn your vehicles air circulation from pulling in external air to re-circulating internal air to stop drawing the surrounding air pollution into your vehicle for you to breathe.
- Become an eco-driver for example by anticipating traffic flow, maintaining a steady speed at a low revs per minute (RPM) and shifting up through the

gears early. This will not only reduce pollution from your vehicle, but save on fuel consumption.

• Maintain your vehicle regularly, including checking tyre pressures monthly.

Get Active

- Leave your car at home and try walking to the local shops or school, even if it is just once or twice a week. If you can make it part of your normal routine, not only will you be reducing air pollution, you will be more active and healthy.
- The majority of New Forest residents live within walking or cycling distance of open spaces. Explore walking and cycling routes you can take from your doorstep, get active and leave your car at home.

Plan ahead

- Take some time to plan ahead and consider the small steps you can take to reduce pollution, for example planning journeys that you can leave your car at home or car share with work colleagues or on the school run even it is just for one day a week or fortnight.
- When planning a walk, consider the route. It may be possible to take footpaths and streets away from busy high street or areas of local traffic congestion therefore avoiding areas of higher air pollution.
- If you are buying or leasing a new vehicle (private or business) consider the vehicle emissions and fuel type in addition to the other typical considerations such as miles per gallon, insurance group and safety.
- Be aware of air pollution forecasts for your local area, particularly if you suffer from respiratory issues. The local forecasts can be found via the following link:

https://uk-air.defra.gov.uk/

Raising concerns

- New Forest District Council residents and businesses can raise concerns about air pollution directly with the Environmental Protection department or their local Councillor; details and links are listed below. Officers may be able to offer advice or investigate your concerns further.
- The New Forest Environmental Protection Liaison Committee holds an annual public participation meeting (usually in the Autumn) where members of the public can raise concerns directly with the Committee. The Committee includes local Councillors, Environmental Health, the Environment Agency, Hampshire County Council, Friends of the Earth and local industry. A link to the details of the Committee is listed below.

Contacts

Local Councillors

Your local Councillor details can be found via the link: http://www.newforest.gov.uk/article/8129/Councillors-and-democracy

• New Forest District Council

Your contact with regards to local air quality at New Forest District Council is:

Mrs Rachel Higgins Environmental Protection Governance and Regulation Appletree Court Lyndhurst Hampshire SO43 7PA

023 8028 5411

New Forest Environmental Protection Liaison Committee

Details of the committee can be found via the link: http://www.newforest.gov.uk/article/8129/Councillors-and-democracy

Table of Contents

E>	cecutive	Summary: Air Quality in Our Area	1
	Air Qualit	y in New Forest District Council	1
	Actions to	Improve Air Quality	6
	Conclusio	ons and Priorities	9
	Local Eng	pagement and How to Get Involved	11
1	Local	Air Quality Management	16
2	Actio	ns to Improve Air Quality	17
	2.1 Ai	r Quality Management Areas	17
	2.2 Pr	ogress and Impact of Measures to address Air Quality in New Forest	
	District Co		
	2.3 PI	$M_{2.5}$ – Local Authority Approach to Reducing Emissions and/or	
	Concentra	ations	31
3	Air Qı	uality Monitoring Data and Comparison with Air Quality	
O	bjectives	and National Compliance	38
	3.1 Su	ummary of Monitoring Undertaken	
	3.1.1	Automatic Monitoring Sites	38
	3.1.2	Non-Automatic Monitoring Sites	38
	3.2 In	dividual Pollutants	
	3.2.1	Nitrogen Dioxide (NO ₂)	39
	3.2.2	Particulate Matter (PM ₁₀)	44
	3.2.3	Sulphur Dioxide (SO ₂)	45
Aı	opendix /	A: Monitoring Results	46
At	opendix l	B: Full Monthly Diffusion Tube Results for 2017	59
A	opendix	C: Supporting Technical Information / Air Quality Monitoring	
D	ata QA/Q	C	63
A	opendix	D: Map(s) of Monitoring Locations and AQMAs	73
A	opendix	E: Summary of Air Quality Objectives in England	79
Δ	opendix	E: Estimating PM - Concentrations from PM - Monitoring Data	80
	nendiv	G: Health Burden of PMac As Reported by Public Health	
		S. Teach Burden of $1 M_{2.5}$ As reported by Fublic field if	04
	iyiana _{(Pl}	HE, 2016)	01
G	ossary o	t Terms	82
Re	eferences	3	83

List of Tables

- Table 2.1 Declared Air Quality Management Areas
- Table 2.2 Progress on Measures to Improve Air Quality
- Table 2.3 Current Measures to Improve PM_{2.5}
- Table A.1 Details of Automatic Monitoring Sites
- Table A.2 Details of Non-Automatic Monitoring Sites
- Table A.3 Annual Mean NO₂ Monitoring Results
- Table A.4 1hr Mean NO₂ Monitoring Results
- Table A.5 Annual Mean PM₁₀ Monitoring Results
- Table A.6 24hr Mean PM₁₀ Monitoring Results
- Table A.7 SO₂ Monitoring Results
- Table B.1 NO₂ Monthly Diffusion Tube Results 2017
- Table C.1 Details of Bias Corrections Factors(a)
- Table C.2 Details of Bias Corrections Factors(b)
- Table C.3 Hillmead, Shrubbs Hill Road (site 4) Monitoring Adjustment
- Table E.1 Air Quality Objectives in Engalnd
- Table F.1 PM_{2.5} Estimations for New Forest District Council 2017
- Table G.1 Fraction of Mortality Attributable to Particulate Air Pollution 2013

List of Figures

- Figure A.1 Trend in Annual Mean NO₂ Concentrations
- Figure D.1 Totton (CM1)
- Figure D.2 Lyndhurst (CM2)
- Figure D.3 Fawley (CM3)
- Figure D.4 NO₂ diffusion tube sites in New Forest district
- Figure D.5 NO₂ diffusion tube sites in Lyndhurst
- Figure $D.6 NO_2$ diffusion tube sites in Totton

1 Local Air Quality Management

This report provides an overview of air quality in New Forest District Council during 2018. 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 New Forest 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.2 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.

A summary of AQMAs declared by New Forest District Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at http://www.newforest.gov.uk/airquality . Alternatively, see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides for a map of air quality monitoring locations in relation to the AQMA. The full list AQMA's in the UK can be found at http://uk-air.defra.gov.uk/aqma/list .

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of	Pollutants and Air	City /	One Line	Is air quality in the AQMA influenced by roads		Is air Level of Exceedar quality in (maximum the AQMA monitored/model influenced concentration at a loc by roads relevant exposur			Action Plan		
Hunte	Declaration	Objectives	Town	Description	controlled by Highways England?	Dec	At Declaration		Now	Name	Date of Publication	Link
Lyndhurst	6 June 2005	NO ₂ Annual Mean	Lyndhurst	25m either side of the High St, Lyndhurst including Lyndhurst Infant School - 97 High St, and 8-76 High St.	NO	52	µg/m³	35	µg/m³	Lyndhurst	2008	http://www.newforest.gov.uk/ airquality
Totton	6 June 2005	NO2 Annual Mean	Totton	An area including a number of properties along Rumbridge Street, Eling Lane, Junction Road and Maynard Road, Totton.	NO	44	μg/m³	26	μg/m³	Totton	2008	AQMA revoked 22 June 2016
Fawley	13 December 2005	SO ₂ 15 Minute Mean	Fawley	An area including Fawley village.	NO	63	Exceeda nces	1	Exceeda nces	Fawley	2008	AQMA revoked 19 April 2013

New Forest District Council confirm the information on UK-Air regarding their AQMA(s) is up to date

2.2 Progress and Impact of Measures to address Air Quality in New Forest District Council

Defra's appraisal of last year's ASR (2017) concluded that 'the report is well structured, detailed and provides the information specified in the Guidance, using the latest report template.'

The main comments from the previous Annual Status Report (2017) include: 'the Council has acknowledged that the Action Plan (for Lyndhurst) requires updating, and has included it within the priorities for the coming year, in addition to:

- Work with the County Council and Southampton City Council to address emissions from the A35
- Implementing a Clean Air Neighbourhood for Lyndhurst
- Air quality promotion in schools and collaboration with Public Health across the County . . . '

furthermore . . .

'The remaining AQMA in High Street Lyndhurst is within sight of reaching the objectives, and subject to the continued operation and management of traffic controls to reduce congestion, there appears every likelihood that the objective will be met in coming years. To that end, we (Defra) support the continuation of the current monitoring strategy as a means to provide continued evidence for reviewing the status of the AQMA.

It is noted that the monitoring sites showing the highest results, site 6, 7 & 8, are all close together near a busy traffic light controlled junction (High Street) which may prove a persistent hot spot. Clearly this area may require further consideration in relation to any additional measures within a revised action plan.'

New Forest District Council has taken forward a number of direct measures during the current reporting year of 2017 in pursuit of improving local air quality. Details of all measures completed, in progress or planned for the District are summarised below. Table 2.2 sets out the work considered, completed and planned for the AQMA in Lyndhurst (based on the current Action Plan).

Key completed measures are:

• Working collaboratively with Southampton City Council on delivering the Southampton Clean Air Zone (CAZ)

New Forest District Council was named in 2017 within the UK Air Quality Plan_(Defra & DfT, 2017) as having a one road predicted to persistently exceed nitrogen dioxide EU limit values after 2020. This road is a short stretch (approximately 1km) of the A35 over the Redbridge Causeway into Southampton and is a location where the public has access. As such New Forest District Council was mandated by the Government to produce a plan to ensure compliance with the EU annual mean limit value for nitrogen dioxide on this road in the shortest possible time, and by 2020 at the latest.

Southampton was identified in 2015 as an area which also had roads persistently exceeding the EU limit values for nitrogen dioxide and therefore Southampton City Council has already progressed some action in forwarding further measures to improve local air quality. The identified stretch of the A35 in New Forest is considered as an extension of the Southampton issue, therefore the Authorities are working in partnership to deliver a Southampton CAZ.

In 2017 New Forest District Council completed a feasibility study and detailed assessment on the area of concern within the District. This has determined New Forest District Council will be compliant with the EU limit value by 2020 if a business as usual scenario is implemented, which includes measures already being forwarded by Southampton City Council such as improving the local cycling infrastructure. New Forest District Council has also written and agreed a memorandum of understanding with Southampton City Council to ensure we work effectively together, met a Ministerial Direction placed on the Authority to submit an Initial Plan to the Secretary of State and is on target to submit a Final Plan (detailing how compliance with the EU limit value will be met) by 31 December 2018 as directed by a further Ministerial Direction.

Whilst New Forest District Council is responsible for achieving compliance within its own Authority, we continue to work with Southampton City Council to determine available options and implement further measures to ensure compliance with the EU limit value is met within Southampton in the shortest time possible.

Currently the Authorities are out to consultation on a preferred charging option for the city. However it should be noted that further work is being undertaken to determine the impact a charging CAZ could have on local business and whether a non-charging CAZ could deliver the required reductions in nitrogen dioxide in the shortest time possible.

Working with Hampshire County Council and local schools to promote air quality locally

Hampshire County Council has a small team of officers who engage with schools with regards to sustainable travel which includes local air quality. Our aim in 2017 was to work collaboratively with the County Council to engage with 3-5 local schools to provide education on air quality and implement local measures to improve air quality. The schools we engage with during 2017 were;

St. Michael's and All Angels Infant School - Lyndhurst

St. Michael's and All Angels School in Lyndhurst is on the High Street within the current AQMA. Although the school itself is below the annual mean objective for nitrogen dioxide, children are often walked to school along the High Street and through areas of poorer air quality. Hampshire County Council has installed an alternative route in the area, through the church and by-passing part of the High Street, therefore we worked with the school and Hampshire County Council to promote this route with children, parents and guardians by;

- Running a mini treasure hunt along the route which spelt the word 'breathe'. At the school officers discussed air quality with the children, parents and guardians.
- Diffusion tube monitoring was installed along the Clean Walking route to show the differences in pollution levels when compared to the High Street.

Hounsdown School

Hounsdown School is already an eco-school and involved with air quality projects. However we worked with the school in the design of an anti-idling banner to be placed in Lyndhurst High Street to encourage drivers to turn off their engines;



The anti-idling campaign will be launched in 2018.

New Milton Infants School

New Milton Infants School approached the Council with concerns relating to air quality at their school. The school is located on a busy road and many children are driven to the school.

Whilst it was determined, following Guidance (DEFRA, 2016) that the school was not in a location of concern requiring further assessment, the Council proposed a mini monitoring scheme at and outside the school to determine nitrogen dioxide levels. The idea is for the Council to provide the tubes, expertise in the monitoring locations and result determination, and the school would change the tubes. After the study, the Council will educate the school further in pollution and ways to reduce exposure to their pupils and reduce local pollution. The monitoring is proposed to start in 2018 and run for the calendar year.

• To re-engage and work collaboratively with departments and Members within the Council, Public Health and the National Park

Some work has been undertaken to work more closely with officers within the Council (planning and well-being in particular) as well as promoting air quality with Members by presenting to relevant committees on the duties placed on the Council with regards to air quality concerning the Local Air Quality Management regime, CAZ work and planning. This work will continue and is proving to be successful in promoting local air quality awareness.

Furthermore, meetings have been held with colleagues in Public Health at Hampshire County Council and New Forest National Park to discuss local air quality. It is evident the Council needs to progress this engagement to pool resources and forward local measures to improve air quality.

New Forest District Council expects the following measures to be completed over the course of the next reporting year:

• Southampton CAZ work

New Forest District Council will continue to work with Southampton City Council to deliver a Southampton CAZ to ensure compliance is met with the EU limit value for nitrogen dioxide. Work is continuing with the aim to submit a Final Business Plan by 31 December 2018 as directed by a Ministerial Direction.

• Working with Hampshire County Council and local schools to promote air quality locally

Work will continue to engage with Hampshire County Council and schools to promote air quality by forwarding schemes to understand local issues and implement measures to improve local air quality. For example, measuring the impact of children being driven to school and implementing schemes to reduce car use.

• Deliver anti-idling campaign in Lyndhurst

Following the banner design, the Council will deliver an anti-idling campaign in Lyndhurst to encourage motorists to turn off their engines whilst stationary, particularly within the AQMA.

• To progress the Air Quality Action Plan for Lyndhurst and work to implement a 'Clean Air Neighbourhood' for Lyndhurst

The Acton Plan for Lyndhurst requires updating even though it is acknowledged the monitoring results are decreasing. Part of this work may include the implementation of a 'Clean Air Neighbourhood' to encourage the community to implement simple measures to ensure pollutant levels do not increase over time. It should be noted that this work is unlikely to be completed within 2018 due to reduced resource within the Department and the CAZ work.

• Working more collaboratively with neighbouring Local Authorities to share information and experiences

Due to extensive restructuring at many Local Authorities it is noted that officers need to re-engage at a regional level on air quality. This will be undertaken through an air quality working group which reports to a Chief Officers group within Hampshire.

In addition the production of regional planning guidance should be forwarded in 2018. This work was highlighted as part of the Southampton CAZ work and is likely to be led by Southampton City Council with the involvement of other Council's including New Forest District Council. New Forest District Council's priorities for the coming year are;

• Southampton CAZ work

This is a priority piece of work (under a Ministerial Direction) to submit a Full Business Case to the Secretary of state by 31 December 2018. After this date, work will continue to implement the CAZ and measures to deliver compliance with the EU limit value in the shortest time possible.

• Update Lyndhurst Air Quality Action Plan and progress the implementation of a Clean Air Neighbourhood for Lyndhurst

It is acknowledged that this piece of work is unlikely to be completed in 2018, however work is required to progress additional measures to ensure compliance with the air quality objectives in Lyndhurst are met and maintained over the long term. Therefore the update of the Action Plan for Lyndhurst is priority work.

• Consideration and commitment to plan for the development of an Air Quality Strategy for New Forest

Local air quality measures have historically focused on the AQMA's, however with the reduction of these from 3 to 1 within the New Forest there is a requirement to formally expand the air quality focus throughout the New Forest. The development of an Air Quality Strategy for the New Forest could bring together air quality, public health, transport and development (business and planning) for the District as a whole, whilst acknowledging localised work within the identified hot-spot areas of AQMA's and CAZ's. As such, the development of an Air Quality Strategy will be considered.

The principal challenges and barriers to implementation that New Forest District Council anticipates facing are the availability of resources, officer time and funding. A recent departmental restructure and the CAZ work has had a huge impact on the service being able to deliver Local Air Quality Management work, resulting in a delay in the progression of implementing certain measures such as the update of the Lyndhurst Action Plan.

As such officers within the service, but with limited air quality knowledge, have been brought in to progress the work to update Lyndhurst Air Quality Action Plan. In the long term, expanding air quality knowledge within the team is a positive step forward enabling more officers to progress work and being able to develop their ideas however increasing officer knowledge and experience takes time and this obviously results in delays with the current air quality work areas.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance with air quality objectives New Forest District Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of Lyndhurst AQMA. This is to ensure long term compliance within Lyndhurst can be achieved and maintained.

Table 2.2 – Progress on Measures to Improve Air Quality (within Lyndhurst AQMA)

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementati on Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Bypass	Transport Planning and Infrastruct ure	Other	Hampshire County Council (HCC) (lead + funded) + New Forest District Council (NFDC) Environmental Health (EH)	n/a	n/a	n/a	Unknown	Scrutiny review at County Council in 2008	Option discounted (cost and environmental impacts)	Option not feasible after scrutiny review
2	Improvements to A337 and High St. junction	Traffic Managem ent	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	HCC (lead + funded) + NFDC (EH)	Completed (2008)	Completed (2010)	Traffic surveys to assess traffic movements and monitoring NO2	~11 µgm-3	No physical junction alterations Installation of long vehicle detection technology in High Street on approach to junction with Romsey Road. 'MOVA' system installed to work in conjunction with long vehicle detection.	Option to alter junction layout discounted (cost) Option to install long vehicle detection completed Option to install 'MOVA' completed	Monitoring at the automatic site has noted a decrease of 11µgm-3 since 2010. Real time analyser monitored compliance with AQO's in 2016. Observations have determined reduced congestion in terms of queue lengths and frequency of occurrence
3	Additional road traffic management scheme	Traffic Managem ent	Other	HCC (lead + funded) + NFDC (EH)	Completed (2008)	AQ & traffic modelling (2009). 2025 for CCTV recognition	Traffic surveys to assess traffic movements and monitoring NO2	1-5 μgm-3	Air quality and traffic modelling work completed. Additional traffic gating systems discounted due to impacts on vehicle flows. New Forest Transport Statement advises of schemes to install CCTV and number plate recognition	Traffic gating option discounted (impact on traffic flows) >10years for traffic management scheme	Traffic management scheme will depend on funding from developers contributions. The scheme is not proposed as a 'vehicle charging' scheme.

									around Lyndhurst to assist in overall traffic management		
4	Enforcement of heavy goods vehicle restriction	Traffic Managem ent	Other	Police - own budget	Continuous	Continuous	Traffic surveys to assess no's. of illegal HGV's and monitoring NO2	1–2 µgm-3	County Council traffic survey	Continuous	HCC traffic survey showed a low percentage of illegal HGV's (~7% of all HGV's) travelling down High St.
5	Installation of variable messaging system	Traffic Managem ent	UTC, Congestion management, traffic reduction	HCC - unknown funding	Completed (2009)	Completed (2010)	Traffic surveys to assess traffic flows and monitoring NO2	1–2 µgm-3	System installed	Completed	System is only used when traffic is congested on A337 and the traffic signs are available for use.
6	Enforcing current parking restrictions	Traffic Managem ent	Other	NFDC (parking) - own budget	Continuous	Continuous	Enforcement figures and monitoring NO2	< 1µgm-3	None	Continuous	Requirement to regularly meet (~ every 6 months) with traffic wardens to discuss issues / progress
7	Review signage around Lyndhurst	Traffic Managem ent	Other	HCC - own budget	Completed (2011)	Completed (2012)	Visitor surveys	< 1µgm-3	7.5t restriction signage reviewed	2018	Meeting held with County Council - agreement for a further review of signage
8	Review and support New Forest District Council's travel plan	Promoting Travel Alternativ es	Workplace Travel Planning	NFDC - own budget	Continuous	Continuous	Travel surveys of Council staff and monitoring NO2	< 1µgm-3	Incentives to car share, use alternative transport.	Continuous	'eCO2 champions' group set up to manage climate change and sustainability responsibilities for the Council but not maintained - requires reviving in some new format
9	Development of school travel plan	Promoting Travel Alternativ es	School Travel Plans	HCC - unknown funding	Continuous	Continuous	Travel surveys of school travel and monitoring NO2	< 1µgm-3	School travel plan approved 2006. Improved pathway to school via church avoiding High Street completed. Monitoring undertaken to identify a clean walking route to school via the church and avoiding the High Street	Continuous	New links with HCC school travel team. Engagement made with 3 local schools to discuss AQ / sustainable travel options
10	Areas of planned developments	Alternativ es to private	Other	NFDC (EH and Planning) + New Forest	Continuous	Continuous	None	< 1 µgm-3	Planning assessed for air quality impacts, including provision of	Continuous	

		vehicle use		National Park planning authority - own budgets					air quality GIS maps to planning		
11	Review bus routes (incl. green transport)	Transport Planning and Infrastruct ure	Bus route improvements	HCC + NFDC (transport) - own budgets	Continuous	Continuous	Travel surveys to assess use of public transport and monitoring NO2	< 1 µgm-3	Bus priority lane installed in Shrubbs Hill Road.	Bus priority lane (Shrubbs Hill Road) completed	Option unlikely to reduce NO2 emissions greatly, but encourages use of public and green transport into and through Lyndhurst. Funding obtained in 2018 (due to Southampton CAZ work) to retrofit buses accessing Southampton. This may include buses accessing Lyndhurst en route to Southampton.
12	Review cycle routes	Transport Planning and Infrastruct ure	Cycle network	HCC + NFDC - own budgets	Completed (2008)	Completed (2010)	Travel surveys to assess use of cycle routes and monitoring NO2	< 1 µgm-3	Installation of additional cycle parking in Lyndhurst. Additional cycle schemes identified in New Forest Transport Statement including cycle routes to rear of primary school	Cycle parking completed. >10yrs for additional schemes	Additional schemes currently at prefeasibility stage
13	Review car parking	Transport Planning and Infrastruct ure	Other	NFDC (EH) - own budget	2016	2016	Travel surveys and monitoring NO2	< 1 µgm-3	Car parking reviewed by County Council	2018 to review car park usage	County Council review determined no agreeable alterations to current car parking arrangement. Car park usage should be reviewed for air quality purposes.
14	New Forest District Council vehicle fleet management	Vehicle Fleet Efficiency	Driver training and ECO driving aids	NFDC - own budget to date	Completed (2008)	Continuous	n/a	< 1 µgm-3	Assessment of council fleet. Staff using Council vehicles trained in eco-driving. Tracker equipment installed into vehicles. Review methods of working of council workers. Assessment of	Continuous	Procurement of fleet vehicles being investigated

									remaining Council fleet.		
15	Vehicle emission testing	Vehicle Fleet Efficiency	Testing Vehicle Emissions	NFDC	2012	2013	n/a	< 1 µgm-3	None	Discounted	
16	Investigate use of absorbing paving surface	Transport Planning and Infrastruct ure	Other	NFDC	n/a	n/a	n/a		Option discounted due to lack of positive outcomes from trials with other LA's	Discounted (technology not viable)	
17	Increase public awareness of air quality	Public Information	Via the Internet	NFDC (EH) - own budget	Continuous	Continuous	n/a	< 1 µgm-3	Update website. Completed a 'anti- idling campaign along the High Street to encourage residents and visitors to turn their engines off when stationary at the traffic lights - media coverage plus school poster campaign	Continuous	Limited success with additional engines being turned off - basic count monitoring noted a 2% increase in vehicles turning off their engines.
18	Review air quality monitoring	Public Information	Other	NFDC (EH) - own budget	Continuous	Continuous	n/a	n/a	Additional monitoring completed	Continuous Review every January	

Note: Table 2.2 (above) concerns all schemes considered and implemented within the Lyndhurst AQMA, including those identified within the Action Plan (2008) as such the measures are not listed in a hierarchy of potential impact. Additional district-wide schemes are noted in Section 2.2.

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

As detailed in Policy Guidance_{(Defra, 2016(a))} (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.

New Forest District Council is taking the following measures to address PM_{2.5}:

Collate information with regards to local PM_{2.5} data

Annual mean concentration

New Forest District Council does not currently monitor $PM_{2.5}$ concentrations. However by using current guidance, Technical Guidance_{(Defra, 2016(b))}, the $PM_{2.5}$ annual mean concentration can be estimated using monitoring data from local PM_{10} analysers. The estimation of the $PM_{2.5}$ annual mean concentration for 2017 is provided in Appendix F.

Health burden

Public Health England provide a Public Health Indicator for PM_{2.5 (PHE, 2016)} which references the health burden of PM_{2.5} at a local authority level as a fraction of mortality attributable to particulate air pollution. This enables local authorities to assess their local figure, compare it to other regions and take appropriate action by targeting resources to reduce the fraction. The figures are provided for the New Forest district and other regions of interest in Appendix G.

Local hot-spots

Background pollutant maps provided electronically by Defra $_{(Defra,2017(a))}$ also give a basic local background concentration for PM_{2.5}. This information may show areas of

higher $PM_{2.5}$ concentrations which New Forest District Council could assess to determine if there are local particulate issues where specific measures could be implemented to reduce particulate emissions.

The above noted methods will be used to establish local PM_{2.5} annual mean concentrations, identify the local health burden of particulate matter and identify any local hot spot areas for particulate matter that have not been identified to date. This will enable New Forest District Council to establish baseline figures for PM_{2.5} with the aim to improve on the established baseline, including the possibility of setting targets for a measured reduction in the near future, and to target resources to assess and improve any identified hot spot areas for PM_{2.5}. This data will be updated on an annual basis, and therefore provide some guidance of whether implemented measures are reducing local PM_{2.5} concentrations.

After 3 years of reporting $PM_{2.5}$ concentrations (based on the monitored PM_{10} concentrations) a slight decrease is noted at the roadside monitoring station in Totton, whereas the industrial monitoring locations of Holbury (and now) Fawley has remained consistent.

Current measures

Whilst it is noted that no specific measures are being implemented to reduce $PM_{2.5}$ concentrations, a number of schemes are being actioned through Air Quality Action Plan and potentially through the introduction of a Southampton CAZ to reduce nitrogen dioxide concentrations which may also reduce $PM_{2.5}$. These measures are shown in Table 2.3:

Table 2.3 – Measures to reduce PM_{2.5}

Measure	Applicable	Applicable	Comments
	to Lyndhurst	to District	
	to Lynandist	to District	
Improvements to A337	N		
and High St. junction	N		
Enforcement of heavy	\checkmark		
Installation of variable	1		
messaging system	N		
Review and support New			Including encouraging car sharing and
Forest District Council's			reducing vehicle use
Development of school			To include messages concerning local
travel plan			air quality.
			Links to the Public Health Outcomes
			Framework by increasing physical
	\checkmark	\checkmark	activity and weight loss of children and
			Work has started with Hampshire
			County Council to work with a number
			of local schools on sustainable travel
			and air quality schemes.
Areas of planned developments	\checkmark	\checkmark	I o review and assess the impact of PM _{e s} where applicable
Review bus routes (incl.	1	1	To support use of public transport as
green transport)	N	N	alternatives to car use
Review cycle routes			Both recreational and non-recreational.
	\checkmark	\checkmark	Links to the Public Health Outcomes
			activity and weight loss.
New Forest District			Including supporting eco-driving for all
Council vehicle fleet	\checkmark	\checkmark	Council staff
management			-
awareness of local air			I o include nealth messages
quality	1	1	cvcling and walking as alternatives to
	N	N	vehicle use. Links to the Public Health
			Outcomes Framework by increasing
Couthomaton CA7 (not			physical activity and weight loss.
currently agreed)			reduce emissions from all vehicles in
currently ugreedy			the eastern part of the District.
			Measures being considered include
	1	1	reducing the numbers of higher
	\checkmark	\checkmark	polluting vehicles on the road network,
			paths and reducing number of vehicle
			journeys. Links to the Public Health
			Outcomes Framework by increasing
			physical activity and weight loss.

Further current measures include:

Working with Public Health colleagues

Meetings have been held with Public Health colleagues working within New Forest District Council and Hampshire County Council, and the following actions were discussed:

- Regular meetings (initially bi-annual) with public health colleagues to forward and implement measures linking air quality and public health which would improve both PM_{2.5} and the health and well-being of the local population by linking with other public health indicators such as weight loss and physical activity.
- Public Health colleagues have implemented walking and cycling schemes to get the local population active for 30 minutes every day as part of their daily routine, which links into the Public Health Outcomes Framework. In addition to the health benefits of walking and cycling (including increased physical activity and weight loss) the air quality message will also be used to encourage individuals to reduce their vehicle use in order to undertake their daily 30 minutes of exercise for example by walking to the shops, school and / or place of work.
- Provide air quality training to local Members and the Health and Well-being board to link the air quality and health and well-being messages which will assist in forwarding future joint actions and schemes.

Working with other partners

Local Tourism

The New Forest district attracts millions of visitors each year including 13.5 million day trips. 96% _(NFNP, 2007) of visitors will arrive in cars or coaches, however there are alternative methods of transport to arrive and explore the New Forest area. By working with partners such as New Forest National Park Authority, New Forest Tourism and transport companies on current and future schemes, the air quality link of improving not only PM_{2.5} but air quality in general by using alternative transport methods could be forwarded. This has been explored for action in the past, but not extended beyond transport schemes which may have impacted the identified AQMAs.
Transport schemes include:

- Local public transport schemes such as New Forest Bus Tour (3 tourist bus routes operating a hop on / off concession scheme)
- Promotion of cycle and walking routes throughout the New Forest
- The production of tourist maps linking local attractions with available transport routes.

Environment Agency

The Environment Agency permits 20 industrial installations within the New Forest and immediate vicinity including some large chemical, waste, energy generating and oil refining processes. Whilst these installations currently operate under the conditions laid out in their Permit which will include emissions to air, New Forest District Council will work further with the Environment Agency and local industries to discuss local PM_{2.5} emissions and whether these can be reduced further. In particular New Forest District Council hosts the Environmental Protection Liaison Committee which brings together local Members, industry, Environmental Health, Environment Agency, Hampshire County Council and Friends of the Earth which is an ideal platform for addressing and discussing PM_{2.5} to attempt to reduce local emissions.

Planning authorities

In addition to the current measure to review and assess the impact of PM_{2.5} from planning developments (as applicable), it is the intention to work with the local planning authorities (New Forest District Council, New Forest National Park Authority and Hampshire County Council) to provide training with regards to local air quality and planning, with particular reference to PM_{2.5}. Ideally, this work would be forwarded into formal local planning guidance which would be consistent between the three planning authorities within the New Forest district however this would be dependent on the agreement of each planning authority.

Hampshire County Council

Whilst New Forest District Council has worked with Hampshire County Council on a number of transport related schemes to reduce congestion and vehicle use, additional schemes could be addressed. New Forest District Council has already engaged with the County Council and is working with a number of local schools to provide information on how the children travel to and from school, education sessions on air quality, increasing walking and cycling to school and competitions to highlight local issues concerning air quality.

Localised burning

New Forest District Council has not declared any smoke control areas. The District is primarily rural with a high proportion of domestic open fires and wood burning stoves. Residents with commoner's rights are also able to collect wood from the Forest for their own domestic use, and therefore to some extent wood burning is an accepted form of heating for many residents within the District. In addition land owners (including the Forestry Commission and National Trust) will periodically burn heathland to effectively manage their land, producing localised smoke episodes with the associated generation of pollution.

Whilst it is acknowledged that these fires and domestic heating sources will give rise to the production of particulate matter, there should be a balance and proportionate response to heathland burning and the use of domestic fires and stoves. Therefore heathland burning is always controlled with an emphasis not to allow smoke to drift over residential properties, and the Council deals with issues of domestic burning as they arise (typically through a nuisance complaint or planning regime) with advice given regarding burning including stove type, flue design, fuel source, wood type, storage and seasoning.

New Measures

Development of an Air Quality Strategy for New Forest

An Air Quality Strategy for New Forest could include $PM_{2.5}$ and a strategy to monitor, assess and if required reduce the pollutant through working with different officers, agencies and businesses. Environmental Protection will be forwarding the idea to develop such a Strategy with senior management.

In summary

The following actions will continue and be progressed:

- To continue to determine local concentrations of PM_{2.5} using current monitoring data, and data from Public Health England (health indicators) and Defra (background maps).
- To continue to raise awareness of air quality (including particulate emissions) with partners (Public Health, Health and Well-being Board, planning authorities, local tourism, Hampshire County Council and the Environment Agency), local Members and the public through training session and at public events
- To continue to work with partners to identify and forward feasible schemes to reduce particulate emissions
- To consider the development of an Air Quality Strategy for New Forest

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.

New Forest District Council undertook automatic (continuous) monitoring at 3 sites during 2017. Table A.1 in Appendix A shows the details of the sites. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem. National monitoring results are available at http://www.airqualityengland.co.uk/local-authority/?la_id=236

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

New Forest District Council undertook non- automatic (passive) monitoring of NO_2 at 46 sites during 2017, of which 8 sites were installed towards the end of the year as part of project work relating to:

- Southampton Clean Air Zone
- Clean walking route to school

As such these sites are listed but the monitoring results are not presented as part of this Annual Status Report.

Table A.2 in Appendix A shows the details of all the monitoring 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.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of $40\mu g/m^3$. For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past 5 years with the air quality objective of $200\mu g/m^3$, not to be exceeded more than 18 times per year.

The monitoring undertaken within New Forest district throughout 2017 has shown no exceedances of the annual mean objective for nitrogen dioxide at any of the automatic and non-automatic monitoring sites. This is the third year since this type of monitoring has been undertaken (since 2002) that no exceedances have been monitored.

<u>Lyndhurst</u>

It is noted that there is an overall reduction of nitrogen dioxide concentrations in Lyndhurst (sites CM2 and non-automatic sites 1-17) with some significant decreases monitored of up to 5µgm⁻³ throughout the whole of Lyndhurst. Within the current AQMA in Lyndhurst the monitoring results were as follows:

	Location		NO₂ Annual Mean Concentration (µg/m ³)							
Site ID	Location	2013	2014	2015	2016	2017				
CM2 Lyndhurst	14 High St. (analyser)	41	41	37	38	35				
6	School, High St.	27.08	26.7	25.19	26.1	21.56				
7	15, High St.	46.77	42.7	38.38	39.8	34.03				
8	14, High St. (diffusion tubes)	39.8	40.12	37.43	38.5	34.46				
9	16, High St.	43.21	43.73	39.22	39.5	37.01				
10	2a, Romsey Rd	37.79	40.3	35.76	30.1	26.8				
12	28, High St.	29.24	29.19	27.99	22.7	20				
13	65, High St.	34.63	33.66	33.33	28.9	30.7				

The graph below also shows the noted continued downward trend in the monitoring results within the current AQMA with only 65 High Street showing a slight increase in concentrations, although this site is still significantly below the air quality objective.



The results from 2017 are encouraging particularly because in 2016 the automatic site and 3 diffusion tube sites (school, 15 and 16 High St.) all measured a noted increase in the nitrogen dioxide concentrations. It is noted that this is the first full calendar year monitoring has been undertaken with new contractors for the provision and analysis of diffusion tubes and servicing of the automatic analyser, however guidance_{(Defra, 2016(b))} has been followed for these monitoring methods and as such the data produced is concluded as being robust.

Further work is being undertaken within the AQMA to improve nitrogen dioxide concentrations, primarily through the forwarding of smarter options such as anti-idling campaigns and working with the local community. Therefore monitoring will continue within the AQMA with the view that revocation could be considered if the decrease in monitoring trend continues.

New Forest District Council will not be proceeding to revoke the Lyndhurst AQMA at this time.

The other monitoring locations around Lyndhurst have also shown noted decreases in monitored nitrogen dioxide concentrations in 2017, except at 2 Gosport St which showed an increase of 2µgm⁻³ to 38.55µgm⁻³ which is just below the air quality objective. This location is after 2 right angled bends where traffic will be accerelating and is a site that historically has shown higher nitrogen dixide concentrations. This site is outside the current Lyndhurst AQMA, however monitoring will be continuing at this location to determine if further action is required.

Monitoring will continue throughout Lyndhurst using automatic and non-automatic monitoring.

<u>Totton</u>

In June 2016, New Forest District Council revoked the AQMA in Totton. The AQMA was declared in 2005 for the likely exceedance of the nitrogen dioxide annual mean objective. Since the revocation monitoring in Totton using an automatic analyser and diffusion tubes (CM1 and diffusion tube sites 21-36) has continued to ensure nitrogen dioxide concentrations remain below the air quality objective.

The monitoring during 2017 has shown the nitrogen dioxide annual mean concentrations were significantly below the Air Quality Objective of $40\mu gm^{-3}$. The highest monitored result for 2017 was ~27 μgm^{-3} monitored at a location in Commercial Road whilst the the automatic site (CM1) monitored a concentration of $26\mu gm^{-3}$.

New Forest District Council will continue to monitori nitrogen dioxide thoughout Totton using automatic and non-automatic monitoring.

Other monitoring locations

Monitoring at the remaining locations have all shown a slight decrease in the annual mean concentrations. These sites are either roadside, industrial or rural in location and have provided consistent results over the past 5 years below the air quality objecitve. As such the rural location at Rockbourne has been removed, leaving one rural monitoring site operating at Beaulieu.

New moniting locations

Some new non-automatic monitoring sites have been included in the 2017 results; locations in Brockenhurst and Lymington following concerns from residents. These locations were on main routes through these towns, however the monitoring over 2017 did not exceed the air quality objective with results significantly below at 20.51µgm⁻³ and 17.5µgm⁻³ at relevant locations.

Additional sites have been located towards the end of 2017 in connection with the Southampton Clean Air Zone work. These additional 5 sites have been located along the A35 between Totton and the boundary with Southampton City Council. The annual mean results from these locations are not reported in this years Annual Status Report due to a lack of data.

An additional 3 sites have also been located in Lyndhurst to promote a Clean Walking Route to the infant school located in the High Street. This route leads from the main car park and through the church, avoiding the High St and current AQMA. The annual mean results from these locations are not reported in this year Annual Status Report due to a lack of data.

Hourly mean air quality objective

The hourly mean nitrogen dioxide objective has not been exceeded at either automatic monitoring sites (CM1 and CM2), with Lyndhurst reducing from 5 hourlyexceedances of 200µgm⁻³ to 0. None of the non-automatic monitoring sites monitored an annual mean nitrogen dioxide concentration greater than 60µgm⁻³

which would also indicate a possible exceedance of the hourly mean nitrogen dioxide concentration.

Based on the monitoring results obtained from 2017 and previous years, no new AQMA's will be declared for the likely exceedance of the annual mean objective or hourly mean objective for nitrogen dioxide. Monitoring using automatic and non-automatic techniques will continue throughout the New Forest district.

3.2.2 Particulate Matter (PM₁₀)

Table A.5 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past 5 years with the air quality objective of $40\mu g/m^3$.

Table A.6 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past 5 years with the air quality objective of $50\mu g/m^3$, not to be exceeded more than 35 times per year.

 PM_{10} is monitored at automatic monitoring sites at Totton (CM1) a roadside site and Fawley (CM3) an industrial site. Previously the TEOM operating at Fawley was operating for a number of years at Holbury (another industrial site) which was closed in 2017 due to over 10 years of monitoring data not showing an exceedance of the air quality objectives. The TEOM was then moved to the Fawley site.

Neither site (Totton and Fawley) monitored an exceedance of the annual mean or hourly mean objective for PM_{10} during 2017, although it is noted that the Totton site monitors higher concentrations of PM_{10} both as an annual mean and hourly mean compared to Fawley. All monitoring results were well below the air quality objectives.

As such no AQMA's will be declared with regards to PM_{10} within the New Forest district. Monitoring of PM_{10} will continue at Totton (CM1) and Fawley (CM3).

3.2.3 Sulphur Dioxide (SO₂)

Table A.7 in Appendix A compares the ratified continuous monitored SO₂ concentrations for 2017 with the air quality objectives for SO₂.

SO₂ is monitored at an automatic monitoring site at Fawley (CM3). SO₂ was also monitored in Holbury an industrial site until 2017 however after 10 years of no exceedances of the air quality objectives the site was closed.

Fawley did not monitor an exceedance of the 15 minute mean, hourly mean or 24 hour mean objective for SO_2 during 2017.

It should be noted that the Exxon Mobil oil refinery in the vicinity of the Fawley monitoring site has a direct link with the Fawley analyser which enables the refinery to take action should SO₂ concentrations start to increase. This system, in addition to Operators Permit conditions reducing SO₂ emissions from the refinery, has worked well since the monitored exceedance of the 15minute mean objective in 2005 when 65 exceedance were monitored.

The concentrations monitored over 2017 are well below the objective levels. Therefore no AQMA's will be declared with regards to SO_2 within the New Forest district. Monitoring of SO_2 will continue at Fawley (CM3).

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m)	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
CM1	Totton	Roadside	436188	113237	NO2; PM10	NO	Chemiluminescent; TEOM	5	1.5	1.75
CM2	Lyndhurst	Kerbside	429859	108204	NO2	YES	Chemiluminescent	1	0.6	3
СМЗ	Fawley	Industrial	445885	103248	SO2; PM10	NO	UV Fluorescence; TEOM	5	N/A	5

Notes:

(1) Om if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

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)
Lyndhurst										
1	Lyndhurst Rd, Goose Green	Roadside	429991	107583	NO2	NO	4	0.4	NO	3
2	1, Foxlease Terrace, Shrubbs Hill Rd	Roadside	429928	107687	NO2	NO	0	1.5	NO	3
3a	The Orchards, Shrubbs Hill Rd	Roadside	429895	107770	NO2	NO	0	3	NO	3
3b	The Orchards, Shrubbs Hill Rd	Roadside	429895	107770	NO2	NO	0	5	NO	3
4	Hillmead, Shrubbs Hill Rd	Roadside	429765	107968	NO2	NO	0	1.5	NO	3
5	Queens House	Roadside	429710	108128	NO2	NO	0	5	NO	3
6	School, High St.	Roadside	429767	108205	NO2	YES	0	6	NO	3
7	15, High St.	Kerbside	429864	108213	NO2	YES	0	1	NO	3
8	14, High St. (analyser)	Kerbside	429858	108205	NO2	YES	0	0.9	YES	3
9	16, High St.	Kerbside	429875	108207	NO2	YES	0	1.55	NO	3
10	2a, Romsey Rd	Roadside	429891	108245	NO2	YES	3	2	NO	3
11	22, Romsey Rd	Roadside	429911	108402	NO2	NO	3	2.3	NO	2
12	28, High St.	Roadside	429933	108200	NO2	YES	5	4	NO	3
13	65, High St.	Roadside	430026	108206	NO2	YES	0	1.8	NO	3

Table A.2 – Details of Non-Automatic Monitoring Sites

14	2, Gosport Lane	Roadside	430079	108147	NO2	NO	0	2.2	NO	3
15	South View, Gosport Lane	Roadside	430092	108077	NO2	NO	5	2	NO	3
16	Lyndhurst Park Hotel	Roadside	430162	108173	NO2	NO	5	2	NO	3
17	Baytree Cottage, Bournem'th Rd	Roadside	429169	108129	NO2	NO	0	1.5	NO	3
18	Lyndhurst 1 (church by crossing)	Roadside	429756	108179	NO2	NO	n/a	1.5	NO	3
19	Lyndhurst 2 (on church)	Other	429825	108176	NO2	NO	n/a	n/a	NO	3
20	Lyndhurst 3 (Church Lane)	Roadside	429928	108165	NO2	NO	n/a	1	NO	3
Totton										
21	Junction Rd (analyser)	Roadside	436189	113235	NO2	NO	7	2	YES	3
22	30, Junction Rd	Roadside	436210	113210	NO2	NO	3	1	NO	3
23	25, Junction Rd	Roadside	436232	113156	NO2	NO	0	4	NO	3
24	26, Rumbridge St.	Roadside	436205	113019	NO2	NO	2	1.5	NO	3
25	BATs corner	Roadside	436278	113081	NO2	NO	3	1.5	NO	3
26	Elingfield Court, High St.	Roadside	436383	113135	NO2	NO	0	1.5	NO	3
27	55, High St.	Roadside	436476	113214	NO2	NO	0	4	NO	3
28	114, Commercial Rd	Roadside	436364	113322	NO2	NO	0	1	NO	3
29	1, Rose Rd	Roadside	436374	112929	NO2	NO	5	2	NO	3
30	26 Winsor Rd	Roadside	436210	112948	NO2	NO	0	2	NO	3

31	A35	Roadside	436234	112898	NO2	NO	3	1	NO	3
32	A35 (1)	Roadside	436210	112902	NO2	NO	n/a	2.6	NO	3
33	A35 (2)	Roadside	436470	113088	NO2	NO	n/a	2.6	NO	3
34	A35 (3)	Roadside	436608	113254	NO2	NO	n/a	2.4	NO	3
35	A35 (4)	Roadside	436675	113400	NO2	NO	n/a	3.2	NO	3
36	A35 (5)	Roadside	436973	113521	NO2	NO	n/a	3.2	NO	3
Other locations										
37	A31, Stoney Cross	Roadside	425877	111778	NO2	NO	0	20	NO	3
38	Rockbourne School	Rural	411569	118098	NO2	NO	0	n/a	NO	3
39	Shorefield Rd, Marchwood	Industrial	438765	111006	NO2	NO	0	1	NO	3
40	Marchwood School, Twiggs Lane	Suburban	438363	109694	NO2	NO	0	25	NO	3
41	Bury Rd, Marchwood	Roadside	437730	111374	NO2	NO	4	1	NO	3
42	Teachers Way, Holbury	Industrial	442947	103931	NO2	NO	4	n/a	NO	3
43	Jubilee Hall, The Square, Fawley	Industrial	445881	103247	NO2	NO	0	n/a	NO	3
44	School field, Beaulieu	Rural	438836	102115	NO2	NO	10	n/a	NO	3
45	Lymington	Roadside	432643	95705	NO2	NO	3	1	NO	3
46	Brockenhurst	Roadside	430250	102569	NO2	NO	n/a	3	NO	3

Notes:

(1) Om 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.3 – Annual Mean NO2 Monitoring Results

	Cite Turne	Monitoring	Valid Data Capture for	Valid Data	l	NO₂ Annual M	ean Concentra	ation (µg/m³) ⁽³)
Site ID	Site Type	Туре	Monitoring Period (%) ⁽¹⁾	2017 (%) ⁽²⁾	2013	2014	2015	2016	2017
CM1 (Totton)	Roadside	Automatic	88	88	28	26	24	31	26
CM2 (Lyndhurst)	Kerbside	Automatic	93	93	41	41	37	38	35
1	Roadside	Diffusion Tube	92	92	28.62	28.96	24.41	23.4	20.41
2	Roadside	Diffusion Tube	100	100	34.24	32.73	30.42	28.8	25.26
3a	Roadside	Diffusion Tube	100	100	44.73	39.83	37.05	36.2	32.6
3b	Roadside	Diffusion Tube	100	100	32.98	32.92	29.54	27.8	25.34
4	Roadside	Diffusion Tube	42	42	_	_	_	_	29.72
5	Roadside	Diffusion Tube	92	92	20.74	20.78	19.97	20.9	17.9
6	Roadside	Diffusion Tube	100	100	27.08	26.7	25.19	26.1	21.56
7	Kerbside	Diffusion Tube	100	100	46.77	42.7	38.38	39.8	34.03
8	Kerbside	Diffusion Tube	83	83	39.8	40.12	37.43	38.5	34.46
9	Kerbside	Diffusion Tube	100	100	43.21	43.73	39.22	39.5	37.01
10	Roadside	Diffusion Tube	100	100	37.79	40.3	35.76	30.1	26.8
11	Roadside	Diffusion Tube	100	100	29.55	29.17	23.39	23.3	23.22

12	Roadside	Diffusion Tube	100	100	29.24	29.19	27.99	22.7	20
13	Roadside	Diffusion Tube	100	100	34.63	33.66	33.33	28.9	30.7
14	Roadside	Diffusion Tube	100	100	37.48	37.65	35.83	36.4	38.55
15	Roadside	Diffusion Tube	92	92	36.5	26.2	30.38	24.9	20.2
16	Roadside	Diffusion Tube	92	92	25.89	25.77	24.72	19.7	17.3
17	Roadside	Diffusion Tube	83	83	28.78	29.17	28.85	27.2	26.76
18	Roadside	Diffusion Tube	n/a	n/a	_	_	-	_	Project
19	Other	Diffusion Tube	n/a	n/a	_	_	-	_	Project
20	Roadside	Diffusion Tube	n/a	n/a	_	_	_	_	Project
21	Roadside	Diffusion Tube	100	100	27.98	25.61	23.89	23.9	23.2
22	Roadside	Diffusion Tube	100	100	30.76	27.41	24.48	25.9	23.8
23	Roadside	Diffusion Tube	83	83	25.87	23.31	24.96	25.2	24.18
24	Roadside	Diffusion Tube	92	92	30.92	28.18	26.13	27.6	24.7
25	Roadside	Diffusion Tube	100	100	32.42	27.58	25.67	27.6	25.2
26	Roadside	Diffusion Tube	100	100	28.12	25.06	22.97	28.5	25.81
27	Roadside	Diffusion Tube	83	83	26.43	23.05	22.07	27.1	23.7
28	Roadside	Diffusion Tube	100	100	31.52	26.47	25.31	28.5	26.74
29	Roadside	Diffusion Tube	83	83	27.28	20.44	19.23	21.8	19.9

30	Roadside	Diffusion Tube	100	100	_	_	_	25.9	24.57
31	Roadside	Diffusion Tube	75	75	_	_	_	23.7	20.1
32	Roadside	Diffusion Tube	n/a	n/a	_	_	_	_	Project
33	Roadside	Diffusion Tube	n/a	n/a	_	_	_	_	Project
34	Roadside	Diffusion Tube	n/a	n/a	_	_	_	_	Project
35	Roadside	Diffusion Tube	n/a	n/a	_	_	_	_	Project
36	Roadside	Diffusion Tube	n/a	n/a	_	_	_	_	Project
37	Roadside	Diffusion Tube	100	100	33.78	31.42	35.6	34	33.1
38	Rural	Diffusion Tube	100	100	10.67	8.02	8.37	8.4	7.18
39	Industrial	Diffusion Tube	100	100	22.83	20.24	18.18	18	13.81
40	Suburban	Diffusion Tube	100	100	20.64	19.14	18.51	18.3	16.88
41	Roadside	Diffusion Tube	100	100				19.7	15.4
42	Industrial	Diffusion Tube	83	83	14.18	11.32	10.2	11	9.46
43	Industrial	Diffusion Tube	100	100	16.45	14.4	15.1	13.3	12.36
44	Rural	Diffusion Tube	83	83	11.85	10.22	9.63	10.7	8.97
45	Roadside	Diffusion Tube	83	83	_	_	_	_	17.5
46	Roadside	Diffusion Tube	100	100	_	_	_	_	20.51

\boxtimes 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 $40\mu g/m^3$ 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 A.1 – Trends in Annual Mean NO₂ Concentrations

Site ID	Site Type	Monitoring	Valid Data Capture	Valid Data	NO ₂ 1-Hour Means > 200µg/m ^{3 (3)}						
	Site Type	Туре	Period (%) ⁽¹⁾	2017 (%) ⁽²⁾	2013	2014	2015	2016	2017		
CM1 (Totton)	Roadside	Automatic	88	88	0	0	0	0 (129)	0		
CM2 (Lyndhurst)	Kerbside	Automatic	93	93	1	1	0	5	0		

Table A.4 – 1-Hour Mean NO2 Monitoring Results

Notes:

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold**.

(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) If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

Table A.5 – Annual Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2017 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (μg/m ³) ⁽³⁾				
				2013	2014	2015	2016	2017
CM1 (Totton)	Roadside	93	93	24	23	22	22	20
CM3 (Fawley)	Industrial	75	75	_	_	_	_	15

\boxtimes Annualisation has been conducted where data capture is <75%

Notes:

Exceedances of the PM_{10} annual mean objective of $40\mu g/m^3$ are shown in **bold**.

(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) All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Site ID	Site Type	Valid Data Capture for Monitoring	Valid Data Capture	РМ	₁₀ 24-Hoເ	ır Means	> 50µg/m	1 ^{3 (3)}
	Sile Type	Period (%) ⁽¹⁾	2017 (%) ⁽²⁾	2013	2014	2015	2016	2017
CM1 (Totton)	Roadside	93	93	8 (38)	9	12	10 (39)	4
CM3 (Fawley)	Industrial	75	75	_	_	_	_	0

Table A.6 – 24-Hour Mean PM₁₀ Monitoring Results

Notes:

Exceedances of the PM_{10} 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold**.

(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) If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

Table A.7 – SO₂ Monitoring Results

		Valid Data Capture	Valid Data Capture	Numbe (per	r of Exceedance centile in bracke	es 2017 et) ⁽³⁾
Site ID	Site Type	for monitoring Period (%) ⁽¹⁾	2017 (%) ⁽²⁾	15-minute Objective (266 μg/m³)	1-hour Objective (350 μg/m ³)	24-hour Objective (125 μg/m ³)
CM3 (Fawley)	Industrial	99	99	1	0	0

Notes:

Exceedances of the SO₂ objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year) (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) If the period of valid data is less than 85%, the relevant percentiles are provided in brackets.

Appendix B: Full Monthly Diffusion Tube Results for 2017

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

							NO ₂ Mean	Concenti	rations (µo	g/m³)					
														Annual Mea	an
Site ID	Jan	Feb	Mar	Apr	Мау	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted and Annualised ⑴	Distance Correcte d to Nearest Exposure (²)
1	40.90	29.90	31.40	29.40	25.20	25.20	22.70	_	24.00	24.00	23.20	<mark>9.70</mark>	27.59	20.41	20.41
2	49.20	33.90	38.00	40.30	35.90	29.10	25.60	31.60	33.30	29.60	38.80	24.40	34.14	25.26	25.26
3a (duplicate)	<mark>73.70</mark>	40.20	47.50	44.70	51.40	43.30	44.20	44.70	43.20	42.40	50.10	29.00	_	_	_
3a (duplicate)	49.40	47.20	46.50	48.40	46.80	42.50	42.30	42.80	42.90	44.50	44.60	29.30	_	_	_
3a (average)	49.40	43.70	47.00	46.55	49.10	42.90	43.25	43.75	43.05	43.45	47.35	29.15	44.05	32.60	32.60
3b	55.30	35.60	17.70	34.80	35.90	34.30	32.80	32.90	32.80	35.20	36.70	26.90	34.24	25.34	25.34
4							36.60	43.20	41.10	42.60		31.10	38.93	28.51	28.51
5	32.30	23.40	23.80	24.80	23.40	18.70	18.80	22.90	21.30		48.60	19.30	25.21	18.65	17.90
6	47.50	33.30	30.20	26.40	26.30	26.40	25.20	29.30	30.20	30.40	32.70	26.50	30.37	21.56	21.56
7	63.60	53.30	57.50	63.20	52.00	49.90	46.60	57.50	49.70	43.20	52.90	38.80	52.35	34.03	34.03

8 (triplicate)	48.40	39.60	48.40	54.20	50.80	56.00	51.60	54.10	59.70	59.90	-	-	_	_	_
8 (triplicate)	67.40		51.70	59.50	52.30	50.00	50.90	54.20	54.50	57.70			_	_	—
8 (triplicate)	64.20		51.00	54.70	52.30	49.90	56.90	51.50	50.40	59.30	_	_	_	-	_
8 (average)	60.00	39.60	50.37	56.13	51.80	51.97	53.13	53.27	54.87	58.97			53.01	34.46	34.46
9	65.90	57.60	58.00	58.90	52.60	53.60	51.10	57.70	55.60	61.00	62.80	48.60	56.95	37.01	37.01
10	56.30	50.80	50.70	53.20	51.10	50.40	46.30	46.10	43.10	49.80	49.00	41.20	49.00	31.85	26.80
11	47.30	33.60	34.70	32.80	38.00	31.10	28.00	29.10	33.80	30.50	31.00	22.60	32.71	23.22	23.22
12 (duplicate)	44.00	36.70	34.90	33.60	28.30	28.50	26.00	29.10	31.30	33.70	35.40	30.70	_	_	_
12 (duplicate)	51.10	<mark>53.30</mark>	31.80	33.80	29.40	29.50	22.80	29.90	32.80	34.40	35.10	31.50	_	_	_
12 (average)	47.55	36.70	33.35	33.70	28.85	29.00	24.40	29.50	32.05	34.05	35.25	31.10	32.96	23.39	20.00
13	60.30	39.40	47.30	41.10	40.80	36.80	32.70	39.60	37.70	37.90	48.30	35.90	41.48	30.70	30.70
14	40.50	47.10	47.60	47.60	44.80	55.90	48.30	56.30	58.80	61.60	66.00	50.70	52.10	38.55	38.55
15	<mark>79.30</mark>	35.50	39.90	39.70	31.90	30.70	27.70	33.40	41.10	35.20	44.70	29.50	35.39	25.13	20.20
16	40.40	31.80	32.20	30.10	25.50		20.60	28.40	26.00	31.10	33.20	26.50	29.62	21.03	17.30
17	43.60			41.10	35.70	38.20	36.30	34.40	38.70	35.30	42.30	31.30	37.69	27.89	26.76
18	_	_	_	_	_	_	_	_	_	19.00	19.80	14.00	_	_	Project
19	_	_	_	_	_	_	_	_	_	14.90	19.10	15.80	_	_	Project
20	_	_	_	_	_	_	_	_	_	16.70	14.20		_	_	Project

21 (triplicate)	55.20	41.90	35.20	35.20	35.40	30.60	28.10	29.40	30.00	36.60	41.60	35.20	_	_	_
21 (triplicate)	54.10	41.00	40.40	37.50	36.60	29.20	27.60	29.70	29.20	36.80	41.70	32.00	_	_	—
21 (triplicate)	55.80	40.30	36.90	36.90	34.80	27.60	28.10	30.70	31.20	37.50	41.40	34.00	_	_	—
21 (average)	55.03	41.07	37.50	36.53	35.60	29.13	27.93	29.93	30.13	36.97	41.57	33.73	36.26	26.11	23.20
22	58.90	39.90	35.80	38.60	34.60	29.10	24.60	30.00	31.10	35.40	44.00	34.40	36.37	26.19	23.80
23	46.40	38.40	35.70	35.40	32.80	30.30	25.40	29.70	29.20	32.60			33.59	24.18	24.18
24	<mark>3.60</mark>	44.50	38.70	41.00	33.00	30.30	28.30	30.80	33.00	37.00	45.00	41.00	36.60	26.35	24.70
25	59.10	43.10	43.10	40.00	32.40	32.30	26.50	30.50	31.90	36.90	46.70	37.40	38.33	27.59	25.20
26	53.30	39.10	38.80	33.80	34.20	31.50	28.30	29.90	31.00	39.70	38.20	32.40	35.85	25.81	25.81
27	51.40		35.80	36.00	36.00	26.50	25.10	24.20	26.00	31.40	36.80		32.92	23.70	23.70
28	45.60	45.90	40.10	38.60	37.00	35.20	27.60	29.00	29.10	37.30	40.70	39.60	37.14	26.74	26.74
29	46.30	33.60	32.30	32.60		23.70	21.00	24.00	24.80	26.10		25.40	28.98	20.86	19.90
30	48.80	35.30	34.40	36.90	33.80	29.10	29.50	29.50	27.80	35.00	35.80	33.50	34.12	24.57	24.57
31	46.20		32.30	33.80	<mark>135.80</mark>	20.60	17.20	22.90	24.70	25.90	38.80		29.15	20.99	20.10
32	_	_	_	_	_	_	-	_	_	40.10	54.50	27.00	_	_	Project
33	-	-	-	-	-	-	-	-	-	66.30	69.10	58.10	_	_	Project
34	_	_	_	_	_	_	_	_	_	55.30	70.60	42.10	_	_	Project
35	_	_	_	_	_	_	_	_	_	_	63.40	30.30	-	_	Project

36	_	_	_	_	_	_	-	_	_	57.60	_	57.20	_	_	Project
37 (duplicate)	44.70	_	41.90	49.20	39.00	43.70	38.00	50.00	41.10	49.10	49.70	45.80	_	_	_
37 (duplicate)	40.10	54.80	42.20	49.40	38.60	42.40	40.40	44.10	41.80	37.30	_	_	_	_	_
37 (average)	42.40	54.80	42.05	49.30	38.80	43.05	39.20	47.05	41.45	43.20	49.70	45.80	44.73	33.10	33.10
38	19.20	10.40	12.40	9.00	8.80	7.70	6.20	5.10	8.40	7.60	13.30	8.40	9.71	7.18	7.18
39	30.60	22.60	11.10	23.50	10.00	14.70	15.20	19.90	14.80	15.80	27.00	18.80	18.67	13.81	13.81
40	38.40	24.30	25.00	21.90	22.30	17.10	16.70	19.80	18.50	23.10	25.00	21.70	22.82	16.88	16.88
41	38.30	20.60	25.00	28.60	24.70	18.20	19.40	20.90	19.50	21.60	27.70	23.30	23.98	17.02	15.40
42	25.70	14.40	13.10	12.50	-	-	7.70	10.00	8.50	11.00	15.30	9.70	12.79	9.46	9.46
43	40.30	17.20	15.80	18.10	13.90	13.40	10.10	13.00	12.90	13.00	20.50	12.20	16.70	12.36	12.36
44	22.40	15.50	10.90	11.80	11.30	8.10	-	7.90	8.50	11.80	13.00	-	12.12	8.97	8.97
45	67.20	32.80	33.00	34.80	28.30	25.20	23.90	24.10	_	28.90	40.00	-	33.82	24.35	17.50
46	52.00	27.90	29.90	27.60	28.90	27.60	23.50	25.50	24.00	26.70	29.00	19.30	28.49	20.51	20.51

☑ 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 $40\mu g/m^3$ 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

Further Assessment

During 2017 there have been no significant changes to pollutant sources, therefore no additional air quality screening assessments have been undertaken. It is noted that air quality assessments have been undertaken during 2016/17 with regards to specific sites or areas as a result of proposed planning applications and / or part of the Environmental Permitting (LAPPC) Regime. These sites were included in the ASR 2017 and include:

- North Road, Marchwood Industrial Site proposal for Flexible Generating Facility for 96 x 0.9MW diesel generators. Air quality assessment completed and planning permission obtained with conditions for community real time monitoring and emission limits. Project subsequently abandoned.
- Hamer Warren Quarry, Somerly proposal for a Short Term Operating Reserve (STOR) 3 x 2MW diesel generators. Planning permission required developer amended application to replace the diesel generators with battery operated generators.
- Site of former Fawley Power Station proposal for development of STOR, housing and commercial. Planning permission required, initial air quality assessment undertaken, further localised monitoring of SO₂ and NO₂ proposed by applicant, application due to be submitted in 2018.

It is noted that planning applications are expected to be submitted to the Council for proposed large developments over the forthcoming years. As such the associated work to assess the submitted plans and the impact on local air quality (including the potential impact on the Southampton Clean Air Zone) may be significant for the Department.

Additional AQMA / Action Plan Assessments

During 2017 there has been no additional dispersion modelling or monitoring campaigns to provide evidence to declare, amend or revoke an AQMA within the New Forest district.

Changes to Monitoring Regime

Current network

Nitrogen dioxide tubes are used extensively throughout the New Forest district as a means to identify potential locations with increased nitrogen dioxide concentrations. Due to local concerns raised due to increases in HGV's and buses on particular routes (although not at a level that meets the criteria laid out in Technical Guidance LAQM.TG16 (Defra, 2016(b)) which would require further action), some additional monitoring was undertaken in 2017 at the following sites at locations of relevant exposure:

- Marsh Lane (Lymington)
- A337 (Brockenhurst)

The monitoring has to date, not determined a likely exceedance of the annual mean objective for nitrogen dioxide. As such, these locations have been removed.

In connection with the New Forest District Council Local Plan, district wide NO₂ health receptor modelling work was commissioned for pre and post developments as detailed in the Local Plan and completed by air quality consultants. Through this work 3 locations were identified as potentially exceeding annual mean NO₂ air quality objectives. As such the diffusion tube monitoring network has been extended to include these locations with monitoring starting in 2018:

- A31 and Christchurch Road (Ringwood)
- A35 (Lyndhurst)
- Romsey Road (Cadnam)

Clean Air Zone - Southampton

New Forest District Council was named in 2017 as have a road (A35, Totton) that was determined as exceeding the EU limit value for nitrogen dioxide. This short stretch of road (<1km) is seen as an extension of the current Clean Air Zone issue in Southampton, therefore New Forest District Council has been working in partnership with Southampton City Council to progress the Clean Air Zone work. As such, towards the end of 2017 New Forest has been monitoring nitrogen dioxide using diffusion tubes along the A35 at 5 monitoring locations, with the potential to install a real time analyser along this stretch of the A35 in the future.

Working with schools

New Forest District Council has started to work with some local schools to look at pollutant levels where concerns have been raised or to forward projects with the aim to raise awareness of air pollution and educate the local community. This is a new area of work, and we anticipate working with a couple of schools every year. The current projects are:

- Lyndhurst Infant School monitoring undertaken on a 'clean walking route' to encourage parents and guardians to walk their children to school avoiding the High Street (and current AQMA)
- New Milton Infant School monitoring on and around the school (located on a busy road) to determine concentrations and potentials impacts on students.

In addition, this monitoring will provide useful nitrogen dioxide data on routes of local concern within the District which will be actioned as required through the Local Air Quality Management regime.

QA/QC of Automatic Monitoring

All of the automatic monitoring sites undertake a daily internal calibration using permeation tubes and scrubbers. The sites are also manually calibrated using a reference span gas once a fortnight. The gas is obtained from Air Liquide and BOC, and each cylinder is certified.

In addition, the sites are serviced and calibrated every 6 months by engineers from ESU1 Ltd. who hold current the service contract until 2020. Engineers are also available for call outs if the site appears to be malfunctioning.

Ricardo AEA validated and ratified the data from the sites during 2017 which was downloaded twice a day. During the validation process any potential problems are identified and if necessary reported back to the Council and ESU1 Ltd. The data is ratified every 1-3 months during which the manual calibrations and servicing are taken into account. Full ratification of the data occurs annually when all servicing and auditing reports, calibrations and breakdown information can be applied to the data.

The Council contracted National Physical Laboratory (NPL) to externally audit the automatic monitoring sites biannually. This process ensures quality assurance and control of the sites.

The data given in the Annual Status Report 2018 has been fully ratified.

QA/QC of Diffusion Tube Monitoring

The determination of nitrogen dioxide diffusion tube precision is obtained from duplicate and triplicate co-located sites. The results from triplicate diffusion tube sites operated by New Forest District Council at Totton and Lyndhurst can be seen in the spreadsheet calculation used to determine local bias correction and shown in Appendix B. Overall the triplicate diffusion tube sites showed good precision during 2017 for both sites.

The diffusion tube supplier (ESG/Socotec) is a UKAS accredited laboratory which has been rated 'satisfactory' in the AIR PT intercomparison scheme. The supplier also follows procedures set out in the Technical Guidance LAQM.TG16 (Defra, 2016(b)).

Diffusion Tube Bias Adjustment Factors

The nitrogen dioxide diffusion tubes were supplied and analysed by ESG (now Socotec). The preparation method used for the diffusion tubes was 20% TEA (triethanolamine) in water.

The national bias adjustment factor for ESG (2017) was 0.74. This was obtained from the Local Air Quality Management website (Defra, 2018(b)) from database version 03/16 in August 2018. This database collates results from Local Authorities who co-locate diffusion tubes with automatic monitoring sites and is subject to change as additional results are reported.

Factor from Local Co-location Studies

A local bias correction factor was determined for the data for 2017:

Table C.1 – Details of Bias Correction Factors – 2017(a)

Location	Bias Correction Factor
Lyndhurst (street canyon)	0.65
Totton	0.72

The local bias correction factors have been determined using calculations supplied by the Local Air Quality Management website (Defra, 2018(b)) and are shown below for Totton and Lyndhurst.

Totton – Local Bias Correction Factor Spreadsheet



Lyndhurst – Local Bias Correction Factor Spreadsheet

C	Checking Precision and Accuracy of Triplicate Tubes AEA Energy & Environment															
			Diffi	usion Tu	bes Mea	surements	1				Automa	tic Method	Data Qual	ity Check		
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm ⁻¹	Tube 2 µgm ⁻¹	Tube 3 µgm ⁻³	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean		Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data		
1	05.01.2017	01.02.2017	48.8	67.4	64.2	60	3.9	17	24.7		50.33	35.63	Good	Good		
2	01.02.2017	06.03.2017	33.6								33.61	94.58		Good		
- 3	05.03.2017	28.03.2017	48.4	51.7	51.0	50	17	3	4.3		33,91	35.46	Good	Good		
4	28.03.2017	28.04.2017	54.2	58.5	54.7	56	2.9	5	7.3		37.62	35.57	Good	Good		
5	28.04.2017	30.05.2017	50.8	52.3	52.3	52	0.9	2	2.2		32.87	35.45	Good	Good		
<u> </u>	30.05.2017	29.06.2017	56.0	50.0	43.3	52	3.5	7	8.7		32.01	35.01	Good	Good		
1	29.06.2017	04.08.2017	51.6	50.9	58.9	53	3.3	6	8.1		30.37	36.33	Good	Good		
8	04.08.2017	01.05.2017	54,1	54.Z	515	53	15	3	3.8		23,40	33.40	Good	Good		
0	01.09.2017	27.08.2017	53.7	54.5	50.4	55	4.7	8	11.6		03.07 00.00	39.20	Good	Good		
10	27,08,2017	03.11.2017	53.3	\$1.1	53.3	53	11	2	2.8		33.04	55.00	Liood	Good		
1	00.112011	00.12.2017									28.27	39,85		e Data Captor		
1	06.12.2011	05.01.2016									2.00 10 1	0.000		Gead		
Di is	necessary to	have results	for at lea	st two tu	bes in ou	ler to calcul	ate the preci	sion of the m	asuremen	AS	Overal	II survey -→	Good	Good Overall		
Si	e Name/ ID:		Lyndhu	irst			Precision 3 out of 3 periods have a CV smaller						than 20% (Check average CV 6.DC			
Accuracy (with 95% confidence interval) without periods with CV larger than 20% model Bias calculated using 9 periods of data Bias factor A 0.65 (0.61 · 0.71) Bias B 53% (41% - 65%) Diffusion Tubes Mean: 55 µgm ³ Mean CV (Precision): 6 Automatic Mean: 36 µgm ³ Data Capture for periods used: 97% Adjusted Tubes Mean: 35 (33 - 39) µgm ³																
ffye	u have any e	inquirles abo	out this s	preadsh	eetplea	se contact t	he LAQM H	elpdesk at	LAONHe	Ipdesk	<u>@uk.bure</u>	auveritas.co	am.			

Discussion of Choice of Factor to Use

The diffusion tube results have been bias corrected to allow for laboratory bias. Bias correction factors can either be determined from local or national data sets, and factors influencing the decision on which bias correction factors to use include local conditions and the location of automatic nitrogen oxides analysers. 3 different bias correction factors have been applied to the 2017 diffusion tube data for New Forest.

In Lyndhurst 5 diffusion tube sites have been locally biased corrected. These 5 diffusion tube sites (sites 7, 8, 9, 10 and 13) and the automatic monitoring site are located within the street canyon of the High Street. The remaining 12 diffusion tube sites in Lyndhurst have been bias corrected using the national bias correction factor, as these sites are located outside the effects of the street canyon in the High Street, Lyndhurst.

Whilst the Totton local correction factor spreadsheet has reported a poor overall precision for the automatic monitoring data due to the data capture (with a data capture of 88%), advise from the national air quality helpdesk and national physical laboratory who collate and use the data for obtaining national correction factors, advised the Totton local bias correction factor could be used. Guidance advises data capture from automatic monitoring sites for nitrogen dioxide should be above 90%. It is noted that the Totton local bias correction factor is 0.72 whereas the national correction factor is 0.74.

The bias correction factors used on the 2017 diffusion tube data are shown below:

Location	Bias Correction Factor	Local / National
Lyndhurst (street canyon)	0.65	Local
Totton	0.72	Local
Remaining sites	0.74	National

Table C.2 – Details of Bias Correction Factors – 2017(b)
It is noted that bias correction factors less than 1 will reduce the raw annual mean result for each diffusion tube, whilst factors greater than 1 will increase the raw annual mean result. The degree of adjustment will depend on the bias correction factor with larger adjustments noted the further the correction factor is from 1. Therefore the choice of bias correction factor is important.

In conclusion, New Forest District Council is confident in the determination and selection of the bias correction factors used to adjust raw diffusion tube data. The correct methods have been followed using the data available, although it is clear how influential the correction factors can be to the overall conclusion made.

PM Monitoring Adjustment

New Forest District Council uses TEOM analysers to monitor PM_{10} . It is noted that this monitoring equipment does not meet the equivalence criteria, however guidance states that it is not necessary to immediately replace the monitoring equipment particularly considering the monitored PM_{10} concentrations are below the objectives. When the equipment is due for replacement the Council will consider other equipment which meets the equivalence criteria.

 PM_{10} data has been adjusted using the Volatile Correction Model (VCM) to correct for the use of a TEOM particulate monitor

Short-term to Long-term Data adjustment (annualised data)

During 2017 1 diffusion tube sites (Hillmead, Shrubbs Hill Road (site ID 4)) reported data over the calendar year of less than 75%. Therefore in accordance with Technical Guidance LAQM.TG16 (Defra, 2016(b)) Box 7.10, the data collated from this site was annualised, as detailed below.

Table C.3 – Hillmead, Shrubbs Hill Road (site 4) - Monitoring Adjustment

The long term sites utilised in the calculations were Portsmouth AURN and Southampton AURN (background sites). For the monitoring period, the annual mean (Am) results for these sites were reported as:

B Southampton (Am) 2017 = 29.7

Long term site	Annual mean (Am)	Period mean (Pm) (26.06.17 – 03.11.17)	Ratio (Am/Pm)	Period mean (Pm) (06.12.17- 04.01.18)	Ratio (Am/Pm)	Average site ratio
Α	18.8	14.7	1.28	20.9	0.90	1.090
В	29.7	25.7	1.16	37.7	0.79	0.975
Average ratio				1.032		

Hillmead, Shrubbs Hill Road

	= 29.72µgm ⁻³	
Bias corrected result	= 40.16µgm ⁻³ x 0.74	
	= 40.16µgm ⁻³	
Annualised result	= 38.92µgm ⁻³ x 1.032	
Data from site over monitoring period = 38.92µgm ⁻³		

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

Automatic Monitoring Sites

Figure D.1 - Totton (CM1)



The Totton site is located in a roadside location to monitor for emissions from a road. This site is located between the road and residential properties, some 5m from the building façade. Therefore the site is not representative of relevant public exposure.

Figure D.2 - Lyndhurst (CM2)



© Crown copyright. All rights reserved New Forest District Council licence no. 100026220 2017

The Lyndhurst site is located on the first floor of an office. The office is situated within a street canyon and is representative of relevant public exposure because the adjacent properties are residential flats.

Figure D.3 - Fawley (CM3)



© Crown copyright. All rights reserved New Forest District Council licence no. 100026220 2017

The Fawley site is located within a village hall, which includes a children's nursery and pre-school, at the centre of the village of Fawley. This site is representative of relevant public exposure.

Non-automatic Monitoring Sites

Figure D.4 – NO₂ diffusion tube sites in New Forest district







Figure D.6 – NO₂ diffusion tube sites in Totton



Appendix E: Summary of Air Quality Objectives in England

Table E.2 – Air Quality Objectives in England

Pollutant	Air Quality Objective ⁴				
Fonutant	Concentration	Measured as			
Nitrogen Dioxide	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean			
(NO_2)	40 μg/m ³	Annual mean			
Particulate Matter	50 μg/m ³ , not to be exceeded more than 35 times a year	24-hour mean			
(F IVI ₁₀)	40 μg/m ³	Annual mean			
	350 μg/m ³ , not to be exceeded more than 24 times a year	1-hour mean			
Sulphur Dioxide (SO ₂)	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 (μ g/m³).

Appendix F: Estimating PM_{2.5} Concentrations from PM₁₀ Monitoring Data

Technical Guidance(Defra, 2016(b)) Box 7.7 provides methods to estimate $PM_{2.5}$ concentrations from monitored PM_{10} concentrations.

New Forest District Council monitors PM_{10} at 2 locations: Totton (roadside) and Fawley (industrial). Whilst it is possible to use data from other local automatic monitoring sites that monitor $PM_{2.5}$ such as Southampton AURN, Bournemouth AURN and Portsmouth AURN, these sites are classified as urban background sites and therefore are not comparable with the automatic monitoring sites in the New Forest district monitoring PM_{10} .

Therefore, in accordance with the Technical Guidance(Defra, 2016(b)) a nationally derived correction ratio of 0.7 can be used to correct locally obtained PM_{10} data to estimate local $PM_{2.5}$ concentrations:

Monitoring Site	2015 Measured Annual Mean PM ₁₀ Concentrat ion / μgm ⁻³	2015 Estimated Annual Mean PM _{2.5} Concentrat ion / μgm ⁻³	2016 Measured Annual Mean PM ₁₀ Concentrat ion / μgm ⁻³	2016 Estimated Annual Mean PM _{2.5} Concentrat ion / μgm ⁻³	2017 Measured Annual Mean PM ₁₀ Concentrat ion / μgm ⁻³	2017 Estimated Annual Mean PM _{2.5} Concentrat ion / μgm ⁻³
Totton (CM1)	22	15.4	22*	15.4	20	14
Holbury (CM4) Site closed 2017	17	11.9	15*	10.5	-	-
Fawley	-	-	-	-	15	10.5

***Note;** As advised in Section 3.2.2 the PM_{10} data for 2016 should be treated with caution due to a data capture from the automatic monitoring sites being less than 75% and the inability to annualise the result. However the data does enable a degree of comparison.

Appendix G: Health Burden of PM_{2.5} As Reported by Public Health England (PHE, 2016)

Table G.1 – Fraction of Mortality Attributable to Particulate Air Pollution - 2013

Region	Fraction of Mortality Attributable to Particulate Air Pollution (2013)
England	5.3
South East	5.2
Hampshire	5.0
New Forest DC	4.6

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
CAZ	Clean Air Zone
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 (2016(a)). Part IV of the Environment Act 1995. Local Air Quality Management. Policy Guidance LAQM.PG(16). June 2017. Defra.

Defra (2016(b)). Part IV of the Environment Act 1995. Local Air Quality Management. Technical Guidance LAQM.TG(16). June 2017. Defra.

Defra (2018(a)). *Background Maps.* [Online]. Available from: <u>http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html</u> [Accessed 10 July 2018].

Defra (2018(b)). *Diffusion Tubes*. [Online]. Available from: <u>http://laqm.defra.gov.uk/diffusion-tubes/diffusion-tubes.html</u> [Accessed 10 July 2018].

Defra & DfT (2017). *UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations*. [Online]. Available from: <u>https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017</u> [Accessed 30 July 2017].

New Forest National Park (2007). *Tourism and Recreation, Facts and Figures.* 2007. New Forest National Park Authority.

Public Health England (2016). *Public Health Profiles*. [Online]. Available from: <u>http://fingertips.phe.org.uk/search/air%20quality#page/0/gid/1/pat/102/par/E1000001</u> <u>4/ati/101/are/E07000084</u> [Accessed 08 August 2018].