2014 Air Quality Progress Report for Sunderland City Council

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

Date April 2014

Local Authority Officer	Joanne Dodson
Department	Public Protection & Regulatory Services
Address	Civic Centre, PO Box 107, Sunderland, SR2 7DN
Telephone	0191 5611696
e-mail	Public.health@sunderland.gov.uk
Report Reference number	PR 2014
Date	April 2014

Executive Summary

The Air Quality Strategy establishes the framework for air quality improvements. Measures agreed at the national and international level are the foundations on which the strategy is based. It is recognised, however, that despite these measures, areas of poor air quality will remain, and these will best be dealt with using local measures implemented by the LAQM regime. The role of the local authority review and assessment process is to identify those areas where the air quality objectives are being or are likely to be exceeded. Experience has shown that such areas may range from single residential properties to whole town centres.

Sunderland City Council have been assessing the air quality in their area for over 15 years through the Review and Assessment framework and this Progress report follows on from last year's report which concluded that there was a need to proceed to a Detailed Assessment for Nitrogen Dioxide. The new format of the USA which carries out an assessment on a source-by-source basis, rather than considering each pollutant in turn has been followed for this Progress Report.
Progress Reports are intended to maintain continuity in the LAQM process, and fill in the gap between the three-yearly cycle of Review and Assessment. Progress Reports are required in all years when the authority is not completing an Updating and Screening Assessment.

Sunderland City Council takes a pro-active stance on LAQM and although we have not had to declare an Air Quality Management Area within our boundaries, considerable effort and funding has been put into monitoring the air quality in Sunderland. We were also very pleased to have one of our automatic monitoring stations adopted into the National Automatic Urban Network in 2004. The station which is situated at the Tennis centre on the Silksworth Sports Complex now monitors NO_x, Ozone, and $PM_{2.5}$ for the AUN along with PM_{10} for the purposes of LAQM.

The Progress Report 2013 has identified the need to proceed to a Detailed Assessment. This decision has been supported by the data collected and presented

in this Progress Report 2014. The objective that is likely to be breached is the Annual Nitrogen Dioxide Objective of 40µg/m^3. The location of the exceedence is at Dunn House which is located at the Northern end of North Bridge Street the A1018 near to the Wheatsheaf Gyratory.

Sunderland's next course of action will be to proceed to a Detailed Assessment for Nitrogen Dioxide for the Annual Objective. Monitoring is now underway at the Wheatsheaf Gyratory Junction for the purpose of completing the Detailed Assessment and will be reported when the monitoring period has been completed.

Table of Contents

Appendices

1 Introduction

1.1 Description of Local Authority Area

Sunderland is one of five Local Authorities making up the conurbation of Tyne & Wear that covers an area of 54,006 hectares, with a population of 1.104 million. The conurbation centres around two major rivers with a mixture of large urban and rural areas.

A substantial rail and road network covers the region, which includes a number of motorways and trunk roads, primary roads, principal roads and other classified and non-classified routes. A comprehensive network of bus services operates in Tyne & Wear, as well as a Metro light rail network. Both regional and national rail systems and freight also operate. Passenger ferries and freight shipping services operate from the Port of Tyne and cargo traffic enters and leaves the Port of Sunderland.

Cars form the bulk of traffic on the roads - car ownership in Tyne & Wear increased by about 44% between 1980 and 1996, broadly in line with national trends. If existing trends continue, further substantial increases in car ownership can be anticipated. This, together with the expected increase in commercial traffic will lead to greater pressure on the road system. As car ownership grows congestion becomes worse. Businesses are especially concerned about rising expenses caused by traffic jams. Regions remote from London, like the North-East, are particularly affected. As a result, large urban areas – including Tyne and Wear – have been instructed by the Department of Transport to set congestion targets. The target for Tyne and Wear is to limit congestion so that, by 2011, travellers experience a maximum 7% increase in average journey time per person mile on 16 key corridors throughout Tyne and Wear. This compares with an expected 12% growth in traffic on these roads during this period.[1]

Air quality in Tyne & Wear may also be influenced by sources external to the region, notably power generation and metal refining activities. The region is bounded to the

east by the North Sea, which is considered to be a source of natural particulates - sea salt- that contribute to the overall particulate level in the region.

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 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 exceedences are considered likely, the local authority must then 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.

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the LAQM process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre µg/m^3 (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m^3	Running annual mean	31.12.2003
	5.00 µg/m^3	Annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m^3	Annual mean	31.12.2004
	0.25 µg/m^3	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10}) (gravimetric)	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m^3	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

Name of Report	Date Produced	Brief Outcome
First Stage Air Quality Review & Assessment for Tyne & Wear *(jointly with the Tyne & Wear authorities)*	1998	Identified that 6 of the 7pollutants with Air Quality Objectives needed further investigation. 1, 3 Butadiene was eliminated.
Final Stage Review and Assessment (*stages 2 & 3 jointly with South Tyneside Council*)	2000	Undertook an Urban Emissions Inventory and a computer model using ADMS- Urban. Concluded all objectives will be met by the specified dates.
Updating & Screening Assessment 2003 (*Sunderland only*)	2003	Proceeded to a detailed assessment for NO2 based on NO2 diffusion tubes and DMRB screening model.
Detailed Assessment of Air Quality (All Tyne & Wear Authorities)	Jan 2005	Concluded that AQMA's should be declared at two sites in Sunderland.
Supplementary Detailed Assessment of Air Quality (Sunderland only)	June 2005	Reversed findings of DA and concluded the AQMA's were not required due to new continuous analyser data and removal of a receptor due to redevelopment.
Updating & Screening Assessment 2006 (*Sunderland only*)	2006	Concluded not necessary to proceed to a DA for any pollutants but monitoring will continue.
Progress Report (*Sunderland only*)	2007	Concluded not necessary to proceed to a DA for any pollutants but monitoring will

		continue.
Progress Report (*Sunderland only*)	2008	Concluded not necessary to proceed to a DA for any pollutants but monitoring will continue.
Updating & Screening Assessment 2009 *(Sunderland only)*	2009	Concluded not necessary to proceed to a DA for any pollutants but monitoring will continue.
Progress Report *(All future reports will be Sunderland only unless stated otherwise)*	2010	Concluded not necessary to proceed to a DA for any pollutants but monitoring will continue.
Progress Report	2011	Concluded not necessary to proceed to a DA for any pollutants but monitoring will continue.
Updating & Screening Assessment	2012	Concluded that it was necessary to proceed to a DA for NO2 at relevant locations
Progress Report	2013	Concluded that it was necessary to proceed to a DA for NO2 at relevant locations

The Updating and Screening Assessments (USA) carried out as part of the second round of Review and Assessment of air quality in the Sunderland region identified a number of locations where the UK Air Quality Objectives were at risk of being exceeded. In 2005, a Detailed Assessment (DA) was carried out to determine whether it was likely that the objectives will be exceeded at these locations, in order to determine the need for any Air Quality Management Areas (AQMA's).

The DA concluded that there was a risk of the annual mean objective for nitrogen dioxide to be exceeded at two locations, Trimdon Street Roundabout and Chester Road/Ormonde Street, and that Air Quality Management Areas (AQMA's) should be declared. Since publication of the Detailed Assessment report, additional information

on measured nitrogen dioxide concentrations at the Chester Road/Ormonde Street junction was made available. The results from three months continuous monitoring at this location, along with the full 12 months data from a diffusion tube monitoring site indicated that the annual mean nitrogen dioxide objective would be achieved by a reasonable margin in 2005.

In addition, further information was obtained relating to the second potential area of exceedence of the annual mean nitrogen dioxide objective at Trimdon Street Roundabout. The area of potential exceedence covered one receptor known as Embassy House. The property was purchased by the City of Sunderland as part of a large development plan and was demolished soon after. Since there were no receptors in the area of potential exceedence there was no requirement for the declaration of an Air Quality Management Area.

The 2012 USA identified that there was a risk of the UK Air Quality Objectives being exceeded in one location. Sunderland City Council have therefore proceeded to a Detailed Assessment for the relevant locations and are currently working towards completing this assessment.

This Progress Report will provide an interim report and present data collected since the last Progress Report in 2013.

Currently Sunderland City Council has no AQMA's within its boundary.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

During this reporting period, pollutants have been automatically monitored at 4 sites within Sunderland. Trimdon Street and Puma Centre are long term sites which have been in operation for several years. In addition, there have been two additional sites monitoring for a period of one year as part of the New Wear Bridge Project. These are located at Northern Way and Ferndale Terrace and monitoring was carried out from September 2012 to August 2013.

Details of the four stations are shown below in table 2.1. Maps of the 4 locations have also been provided as Fig 2.1-2.4. QA/QC procedures for these sites are detailed in Appendix 1 of this report. PM_{10} is measured at two locations using Tapered Element Oscillating Microbalances (TEOM's).

Figure 2.1 Map of Trimdon Street

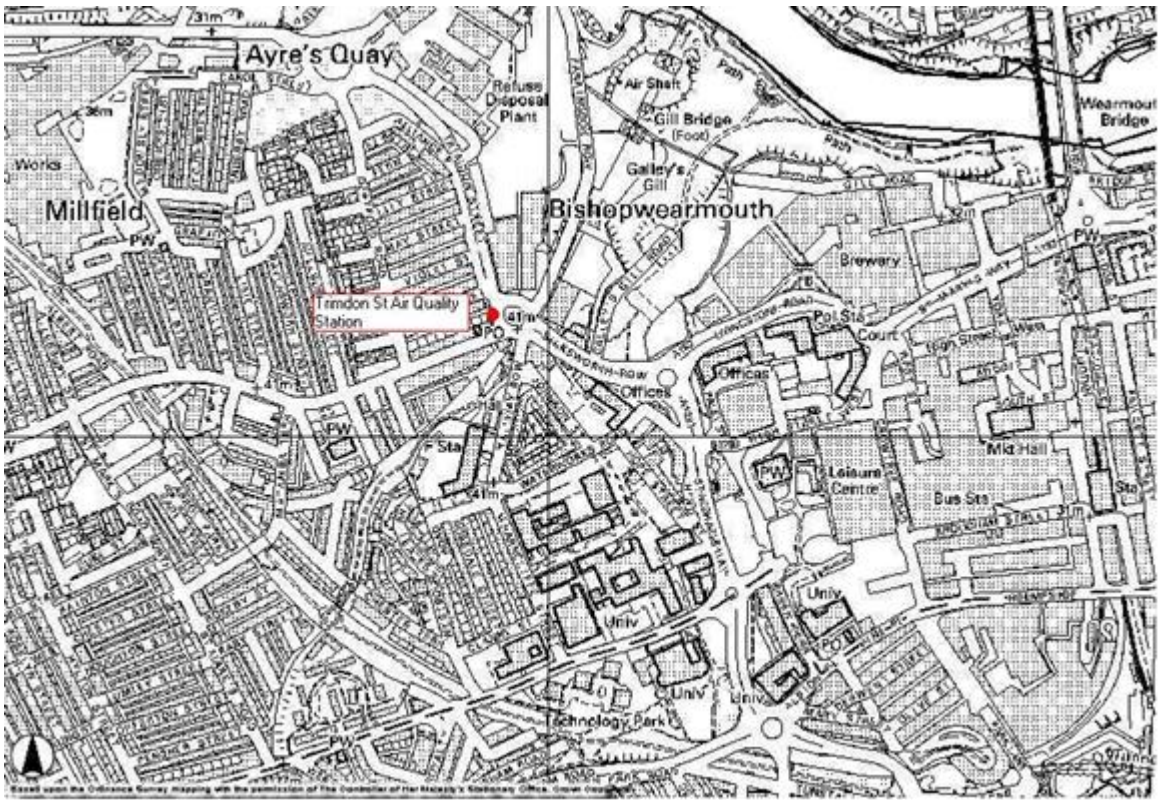


Figure 2.2 Map of Puma Centre (Sunderland Silksworth)

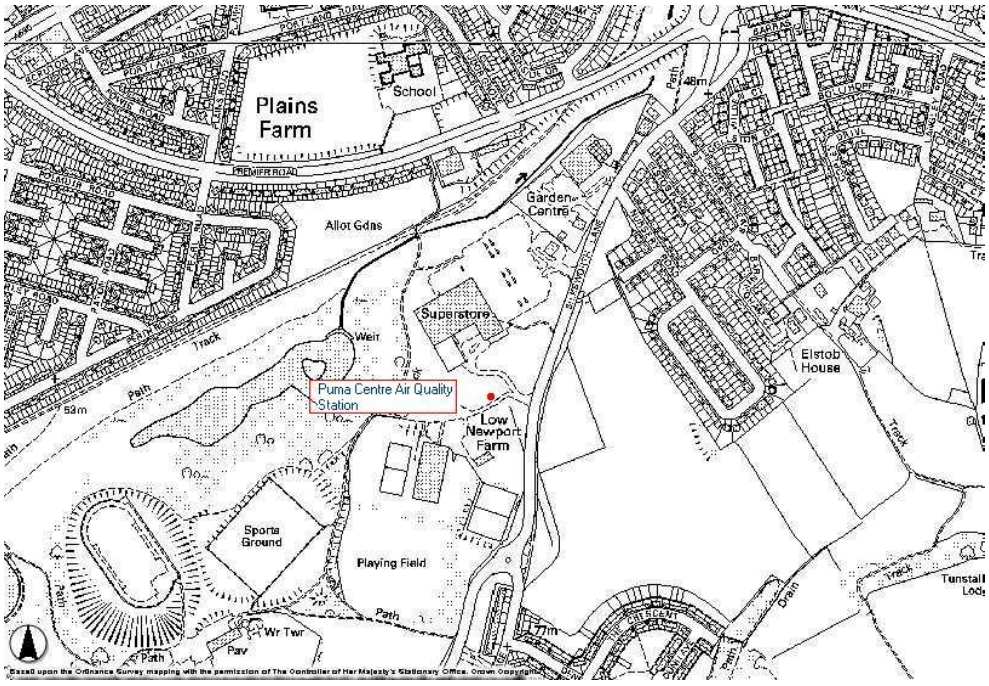


Figure 2.3 Map of Northern Way (Southwick)

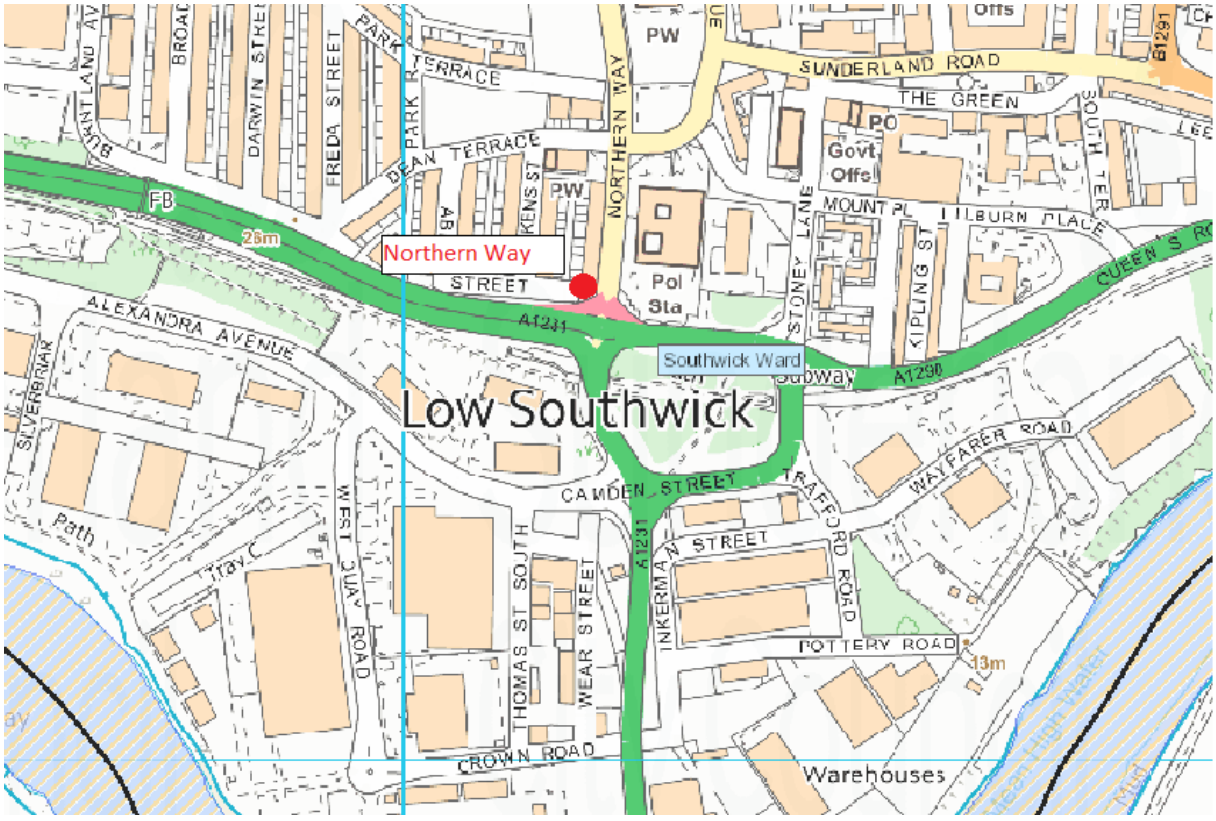


Figure 2.4 Map of Ferndale Terrace (Pallion)

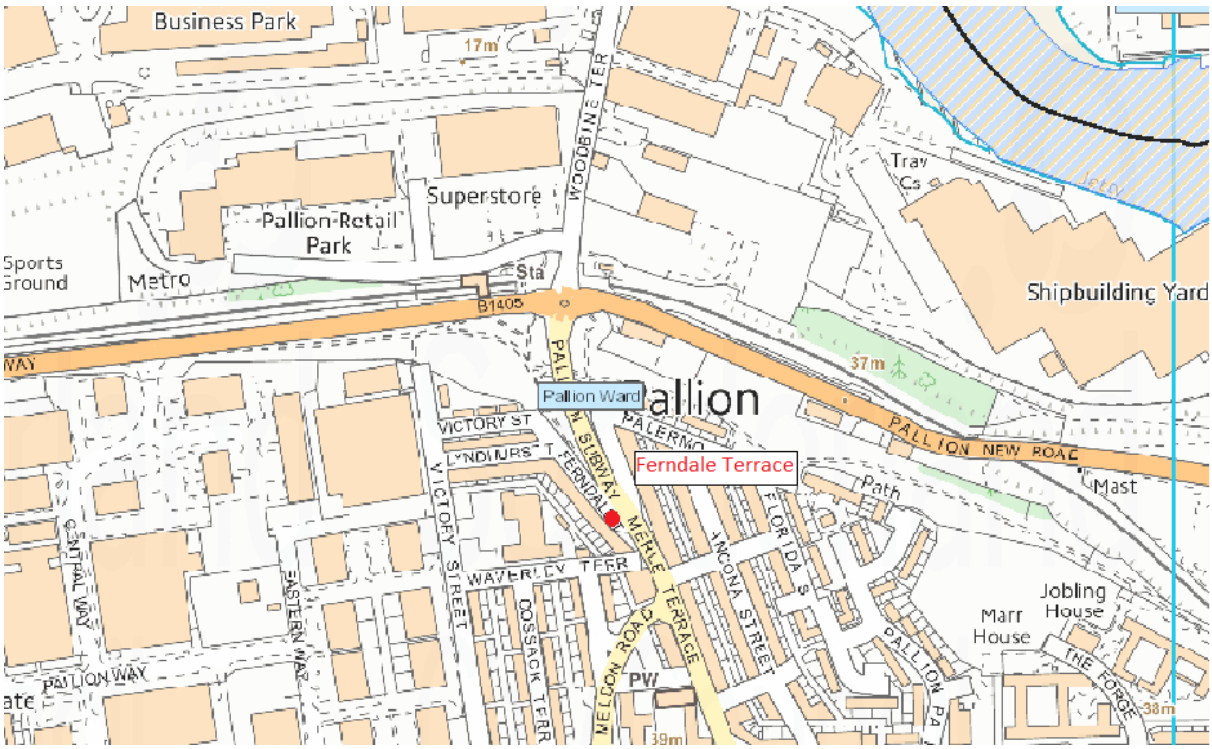


Table 2.1 Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Inlet Height (m)	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
CM1	Trimdon Street	Kerbside	438928	557151	2.0	NO_x,PM_{10}	N	TEOM	Y (3m)	0.5	Y
CM2	Puma Centre	Urban background	438116	554462	2.0	NOx, PM_{10}, $PM_{2.5}$, O_3	N	TEOM, FDMS	No	0.5m but approx. 10m to nearest 'busy road'	N
CM3	Northern Way	Roadside	438142	558349	1.5	NO_x	N	Chemilum-inescence	Yes	3.7	Y
CM4	Ferndale Terrace	Roadside	437538	557534	1.5	NO_x	N	Chemilum-inescence	Yes	3.8	Y

2.1.2 Non-Automatic Monitoring Sites

Nitrogen Dioxide has been measured using passive diffusion tubes for several years throughout Sunderland and the number of sites is currently 37. The vast majority of the tubes are located on busy roads and there are two co-located sites where diffusion tubes in triplicate are sited at automatic stations. These are at Trimdon Street and the Puma Centre, Silksworth. Wherever possible the tubes are located on the façade of buildings that are relevant receptors such as residential properties.

The monitoring of Benzene concentrations has ceased due to continually insignificant results.
Details of the QA/QC procedures and the laboratory used to analyse the tubes are contained in Appendix 1.

Sunderland City Council has calculated the precision and bias of the NO_2 diffusion tubes to evaluate their performance. Diffusion tube precision can be described as the ability of a measurement to be consistently reproduced, i.e., how similar the results of duplicate or triplicate are to each other. Bias represents the overall tendency of the diffusion tubes to depart from the true value, i.e., to under or over-read relative to the reference method (the chemiluminescence analyser).

A database of bias adjustment factors determined from Local Authority co-location studies throughout the UK has been collated by the Local Air Quality Management Helpdesk. Using orthogonal regression, combined bias adjustment factors have been calculated for each laboratory, year and preparation method combination for which data are available.

The National Bias adjustment database was used to calculate a bias adjustment factor. The correct laboratory, preparation method and year of study were selected from the data base to produce an adjustment factor of 0.95.

Site Number	Site Name	Site Type	OS Grid Ref	Pollutants Monitored	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Worst-case Location?
29	Arndale House, St Mary's Way	Roadside	X439508 Y557151	NO_2	No	0.5m	Y
38	17 Parkside Sth, E. Herrington	Roadside	X435714 Y552473	NO_2	Yes 0m	10m	Y
39	15 John Street	Urban Centre	X439835 Y556978	NO_2	No	3m	N
53	166 Chester Road	Roadside	X438568 Y556566	NO_2	Yes 0m	4m	Y
55	25 Eden Vale	Roadside	X438690 Y556135	NO_2	Yes 0m	2m	Y
56	101 Southwick Road	Roadside	X439101 Y553282	NO_2	Yes 0m	2m	Y
57	5/6 Nbridge St, Monkwearmouth	Kerbside	X439664 Y557829	NO_2	Yes 0m	1m	Y
58	6 Beatrice Tce, Shiney Row	Kerbside	X432634 Y552616	NO_2	Yes 0m	1m	Y
86	2 Alice Street	Roadside	X439466 Y556484	NO_2	Yes 0m	2m	Y
88	Hinds Street	Roadside	X439160 Y556995	NO_2	No	1m	Y
94	Chaplin's PH, Mary St.	Kerbside	X439423 Y556738	NO_2	Yes 0m	0.5m	Y
100	Trimdon St AQ Station	Kerbside	X438927 Y557151	NO_2	Yes 3m	0.5m	Y
101	Puma Centre, Silksworth Ln	Urban Background	X438116 Y554462	NO_2	No	0.5m	N
103	Trimdon St AQ Station	Kerbside	X438927 Y557151	NO_2	Yes 3m	0.5m	Y
104	Trimdon St AQ Station	Kerbside	X438927 Y557151	NO_2	Yes 3m	0.5m	Y
105	Puma Centre, Silksworth Ln	Urban Background	X438116 Y554462	NO_2	No	0.5m	N
106	Puma Centre, Silksworth Ln	Urban Background	X438116 Y554462	NO_2	No	0.5m	N
109	23 Newcastle Rd	Roadside	X439648 Y558120	NO_2	Yes 0m	2m	Y
111	237 Queen Alexandra Rd,	Roadside	X438453 Y555507	NO_2	Yes 0m	5m	Y
113	181 Durham Road	Roadside	X437446 Y554989	NO_2	Yes 0m	5m	Y
116	9 Derwent St	Urban Centre	X439451 Y556718	NO_2	Yes 0m	1m	Y
117	3, Holmeside	Roadside	X439495 Y556795	NO_2	No	1m	N

Site No	Site Name	Site Type	OS Grid Ref	Pollutants Monitored	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Worst-case Location
118	27 Bridge St	Roadside	X439696 Y557205	NO_2	Yes 0m	2m	Y
119	4 Athenaeum St	Roadside	X439792 Y556921	NO_2	Yes 0m	2m	Y
120	Gillespie's PH	Roadside	X439806 Y557063	NO_2	No	2m	N
121	16 Windsor Tce, Grngetwn	Roadside	X440702 Y554722	NO_2	Yes 0m	3m	Y
123	263 Chester Rd	Roadside	X437943 Y556341	NO_2	Yes 0m	4m	N
125	45 Station Rd	Roadside	X435417 Y547025	NO_2	Yes 0m	1m	Y
128	Echo Building	Roadside	X439707 Y557312	NO_2	Yes 10m	10m	Y
129	West Sunniside	Roadside	X439938 Y557089	NO_2	Yes 5m	1m	Y
130	St Mary's Car Park	Roadside	X439538 Y557292	NO_2	No	1m	Y
131	Chaplin's PH 2nd Tube	Kerbside	X439397 Y556666	NO_2	Yes 3m	0.5m	Y
132	Dunn House, N Bridge St.	Kerbside	X439661 Y557901	NO_2	Yes 3m	1m	Y
133	26 Northern Way	Roadside	X438153 Y558344	NO_2	Yes 3m	2m	Y
134	Southwick Road /Thompson	Roadside	X438563 Y558517	NO_2	Yes 3m	2m	Y
135	Merle Terrace	Roadside	X437561 Y557538	NO_2	Yes 3m	2m	Y
136	1 Morningside Rickleton	Roadside	X428269 Y553809	NO_2	Yes 5 m	0.5m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

Nitrogen Dioxide (NO_2)

Automatic Monitoring Data

Nitrogen dioxide was monitored at four locations across the city. The annual mean objective was met at all four sites (table 2.3). There were no exceedences of the hourly NO_2 objectives at any of the four sites (table 2.4).

Table 2.3 Results of Automatic Monitoring for NO_2: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2013 % [b]	Annual Mean Concentration (µg/m^3)				
					2009* [c]	2010* [c]	2011* [c]	2012* [c]	2013 [c]
CM1	Kerbside	N	N/A	93.2	33	N/A	36.4	35.3	33.5
CM2	Urban background	N	N/A	84.1	16	16	16	18	16
CM3	Roadside	N	N/A	97.4	N/A	N/A	N/A	N/A	31.8
CM4	Roadside	N	N/A	95.2	N/A	N/A	N/A	N/A	28.1

In bold, exceedence of the NO_2 annual mean AQS objective of 40µg/m^3

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] Means should be "annualised" as in Box 3.2 of TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), if valid data capture is less than 75%

* Annual mean concentrations for previous years are optional

Trends in Annual Mean NO_2 Concentrations Measured at Automatic Monitoring Sites

The figure below shows data from our two long running automatic sites. Although Trimdon Street site data is missing for 2010 it can be observed that levels of NO_2 have remained at reasonably constant levels over the past 5 years. This is particularly noticeable in the data from the Puma centre which is an Urban Background Site.

Figure 2.3

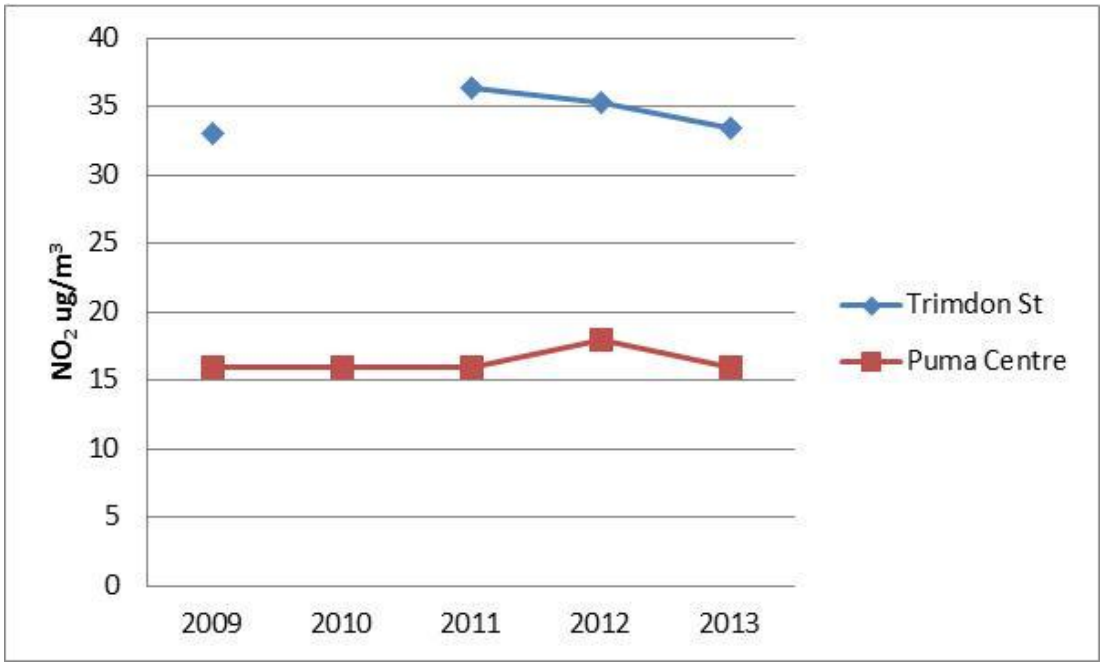


Table 2.4 Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2013 % [b]	Number of Hourly Means > 200µg/m^3				
					2009* [c]	2010* [c]	2011* [c]	2012* [c]	2013 [c]
CM1	Kerbside	N	N/A	93.2	0	N/A	**0**	0	0
CM2	Urban background	N	N/A	84.1	0 (40.5)	0	0	0 (80 µg/m^3)	0 (80 µg/m^3)
CM3	Roadside	N	N/A	97.4	N/A	N/A	N/A	N/A	0
CM4	Roadside	N	N/A	95.2	N/A	N/A	N/A	N/A	0

In bold, exceedence of the NO_2 hourly mean AQS objective (200µg/m^3 – not to be exceeded more than 18 times per year)

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] If the data capture for full calendar year is less than 90%, include the 99.8th percentile of hourly means in brackets

* Number of exceedences for previous years is optional

Diffusion Tube Monitoring Data

The results of the diffusion tube data for NO_2 were that the annual objective of 40µg/m^3 was met at the majority of locations. However, there were two locations where it was exceeded. Tube 103 is located at Trimdon Street Air Quality Station. However, the results from the automatic analyser at this site show that the annual mean was not exceeded and as these results are more accurate there is no need to proceed to a Detailed Assessment. Tube 132 also showed an exceedence of 46.0 µg/m^3. This area is currently subject to a Detailed Assessment and the results of this assessment will be provided once it has been completed.

Figure 2.4 below shows the annual averages for tubes from various locations across the city. These have been plotted for the last 5 years to investigate trends in NO_2 within Sunderland. The 5 sites show a strong visible correlation even though some are road side and some are classed as background sites. The annual averages can also be seen to generally increase from 2009 reaching a peak in 2012 and then have fallen again in 2103 which would indicate that NO_2 levels are being affected by additional factors apart from traffic for which there should have been only a steady increase in the data as the number of vehicles across the region increases.

Table 2.5 Results of NO_2 Diffusion Tubes 2013

Site ID	Location	Within AQMA?	Data Capture 2013 months	Annual mean concentration 2013 (μg/m^3) Adjusted for bias (0.95)
29	Arndale House, St Mary's Way	N	12	28.0
38	17 Parkside Sth, E. Herrington	N	12	31.0
39	15 John Street	N	12	23.8
53	166 Chester Road	N	11	32.3
55	25 Eden Vale	N	12	33.3
56	101 Southwick Road	N	12	28.7
57	5/6 Nbridge St, Monkwearmouth	N	12	34.6
58	6 Beatrice Tce, Shiney Row	N	12	32.8
86	2 Alice Street	N	10	21.3
88	Hinds Street	N	9	36.8
94	Chaplin's PH, Mary St.	N	10	37.0
100	Trimdon St AQ Station	N	12	40.0
103	Trimdon St AQ Station	N	12	**40.2**
104	Trimdon St AQ Station	N	12	39.0
101	Puma Centre, Silksworth Ln	N	12	16.7
105	Puma Centre, Silksworth Ln	N	12	16.3

106	Puma Centre, Silksworth Ln	N	12	16.0
109	23 Newcastle Rd	N	10	29.1
111	237 Queen Alexandra Rd,	N	12	21.8
113	181 Durham Road	N	9	29.5
116	9 Derwent St	N	12	26.6
117	3, Holmeside	N	12	35.8
118	27 Bridge St	N	12	26.4
119	4 Athenaeum St	N	12	30.3
120	Gillespie's PH	N	10	25.9
121	16 Windsor Tce, Grngetwn	N	11	28.3
123	263 Chester Rd	N	11	35.0
125	45 Station Rd	N	10	26.7
128	Echo Building	N	9	31.2
129	West Sunniside	N	12	22.2
130	St Mary's Car Park	N	11	25.3
131	Chaplin's PH 2nd Tube	N	9	35.4
132	Dunn House, N Bridge St.	N	9	**46.0**
133	26 Northern Way	N	12	31.5
134	Southwick Road/Thompson	N	12	31.9

135	Merle Terrace	N	10	25.9
136	1 Morningside Rickleton	N	12	24.8

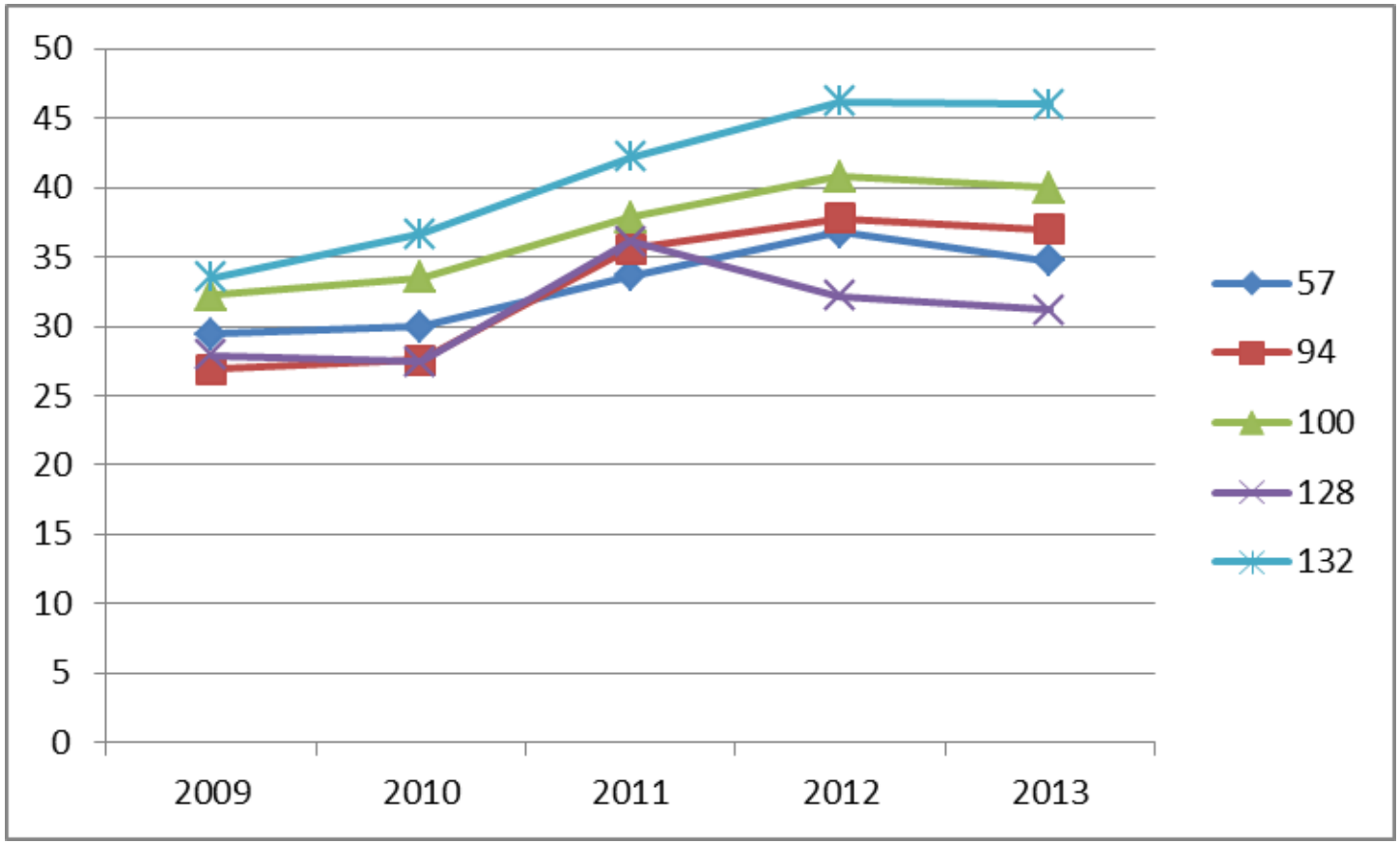
In bold, exceedence of the NO_2 annual mean AQS objective of 40µg/m^3

Underlined, annual mean > 60µg/m^3, indicating a potential exceedence of the NO_2 hourly mean AQS objective

[a] Means should be "annualised" as in Box 3.2 of TG(09)(http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), if full calendar year data capture is less than 75%

[b] If an exceedence is measured at a monitoring site not representative of public exposure, NO_2 concentration at the nearest relevant exposure should be estimated based on the "NO_2 fall-off with distance" calculator (http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html), and results should be discussed in a specific section. The procedure is also explained in Box 2.3 of Technical Guidance LAQM.TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=30).

Figure 2.4 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites



2.2.1 Particulate Matter (PM_{10})

PM_{10} is measured at two locations in Sunderland at present. Both sites use a TEOM to collect these measurements. The data has been corrected for both sites using the Volatile Correction Model. This is carried out on our behalf by SupportingU who collect and ratify our data. Data Capture at both sites was relatively good and was over 80%. Both sites met the annual objective of 40 µg/m^3 and the 24-hour mean of less than 35 exceedences of 50 µg/m^3 per year.

Table 2.7 Results of Automatic Monitoring for PM_{10}: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2013 % [b]	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration (µg/m^3)				
						2009* [c]	2010* [c]	2011* [c]	2012* [c]	2013 [c]
CM1	Kerbside	N	n/a	88.9	Y	18	18	20	22.1	21.6
CM2	Urban Background	N	n/a	99.5	Y	12	15	15	15.6	15.3

In bold, exceedence of the PM_{10} annual mean AQS objective of 40µg/m^3

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] Means should be "annualised" as in Box 3.2 of TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), if valid data capture is less than 75%

* Annual mean concentrations for previous years are optional

Table 2.8 Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2013 % [b]	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m^3				
						2009* [c]	2010* [c]	2011* [c]	2012* [c]	2013 [c]
CM1	Kerbside	Y	N/A	88.9	Y	4	0	16	10	3
CM2	Urban background	Y	N/A	99.5	Y	0	0	0	0	3

In bold, exceedence of the PM_{10} daily mean AQS objective (50µg/m^3 – not to be exceeded more than 35 times per year)

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

[c] if data capture for full calendar year is less than 90%, include the 90.4th percentile of 24-hour means in brackets

* Number of exceedences for previous years is optional

2.2.2 Sulphur Dioxide (SO_2)

Sulphur Dioxide monitoring has taken place at the Puma Centre Monitoring Station in Silksworth (CM2) for several years. This site, operating since 2004, had been part of the National Network operated on behalf of the UK Government. However due to a national decline in the pollutant, Sulphur Dioxide monitoring has now ceased.

The main source of this pollutant is fossil fuel combustion. SO_2 emissions in the UK have decreased substantially since 1990, due to reductions in the use of coal, gas and oil, and also to reductions in the sulphur content of fuel oils and DERV (diesel fuel used for road vehicles). The fall in emissions is reflected by a corresponding fall in ambient concentration, (*Air Pollution in the UK 2012* Published by the Department for Environment, Food and Rural Affairs, September 2013.

2.2.1 Benzene

Due to consistently low levels in previous years, Benzene monitoring is no longer undertaken.

Summary of Compliance with AQS Objectives

Sunderland City Council has measured concentrations of Nitrogen Dioxide above the annual mean objective at relevant locations and **will need to proceed to a Detailed Assessment**, for the North Bridge Street/ Roker Avenue junction also known as the Wheatsheaf Gyratory.

3 New Local Developments

This section of the Progress Report deals with changes that have taken place that may affect air quality. The types of developments that were considered are

- New industrial processes, i.e. Part A, A2 or B
- New developments with an impact on air quality, especially those that will significantly change traffic flows. Only developments that have been granted planning permission are included
- New landfill sites, quarries that have been granted planning permission, and which have nearby relevant exposure.

This Progress Report will log these changes so that they can be considered more thoroughly during the next full round of review and assessment.

3.1 Road Traffic Sources

Sunderland confirms that there are no new/ newly identified road traffic sources which may have an impact on air quality within the Local Authority area.

3.2 Other Transport Sources

Sunderland confirms that there are no new/newly identified road traffic sources which may have an impact on air quality within the Local Authority area.

3.3 Industrial Sources

There were 4 new Part B processes that were permitted between Jan and Dec 2013. The table below summarises these processes and they will be more fully considered at the 2015 USA.

Development	Description	Source of information
New Part B process Karting NE	Waste Oil Burner	Sunderland City Council
New Part B process Tyneside Minimix Concrete	Bulk Cement	Sunderland City Council
New Part B process Sainsbury's Supermarket	Petroleum Process	Sunderland City Council
New Part B Process Spectrum Brands Uk Ltd	Coating Process	Sunderland City Council

3.4 Commercial and Domestic Sources

Sunderland confirms that there are no new or newly identified commercial and domestic sources which may have an impact on air quality within the Local Authority area.

3.5 New Developments with Fugitive or Uncontrolled Sources

Sunderland confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

4 Local / Regional Air Quality Strategy

The **Tyne and Wear Air Quality Delivery Plan** has been completed by the Tyne and Wear Local Transport Plan Core Team as a response to air quality issues and problems. The overall aim is to outline air quality conditions across Tyne and Wear, to show where potential problems lie and finally to outline what can be done to improve air quality and thus the quality of life for the people of Tyne and Wear. In doing so, the plan sets out:

- The background to air quality issues and air quality objectives in Tyne and Wear
- Governance and monitoring arrangements to drive improvement forward
- Current air quality levels and measures in the region
- New air quality indicators and targets for Tyne and Wear
- Challenges to our proposed objectives and solutions, and how these can be overcome
- Examples of national and regional best practice which can be used to improve Tyne and Wear air quality levels
- Proposed actions to improve area specific and overall Tyne and Wear air quality levels which affects us all

The key issues raised by the plan are an emphasis on action and a clear commitment that we must, wherever possible, prevent further areas in Tyne and Wear from becoming AQMAs – areas where air quality had been recognised as being especially poor. Current air quality action plans produced subsequent to an area being declared an AQMA do not propose tangible actions, ownership of problems, budgets or timelines. This indicates that the problem does not lie in insufficient monitoring, but in what this information is subsequently utilised for; signifying a need for the proposed actions and for clear ownership of these, as presented in the plan.

The plan therefore presents realistic, efficient and reliable air quality solutions which need to incorporate the promotion of alternative modes, management of the existing highway network, planning, emissions management, information and education. This will be based around a combination of policy implementation and interventions. However, the task of implementing such actions to improve air quality in a specific area can be challenging due to a lack of standardised processes and the varying

conditions and sources in each area. Two 'sets' of actions are hence needed; one aimed at area-specific interventions, and one dealing with measures which will improve Tyne and Wear air quality levels as a whole.

In order to achieve these ambitions, the plan recognises the need for a clear commitment from stakeholders, along with a better working relationship between planning departments and environmental health officers and more pooling of knowledge. It is also important to note that the Air Quality Delivery Plan is a living document and will hence be regularly updated to reflect changes in AQMA boundaries and to take into account results of on-going detailed assessments.

The LTP is now going into its third round (LTP3) and will be a 10 year strategy with 3 year delivery plans.

The **Tyne and Wear Air Quality Delivery Plan** has recently been completed by the Tyne and Wear Local Transport Plan Core Team as a response to these issues and problems. The overall aim is to outline air quality conditions across Tyne and Wear, to show where potential problems lie and finally to outline what can be done to improve air quality and thus the quality of life for the people of Tyne and Wear. In doing so, the plan sets out:

- The background to air quality issues and air quality objectives in Tyne and Wear
- Governance and monitoring arrangements to drive improvement forward
- Current air quality levels and measures in the region
- New air quality indicators and targets for Tyne and Wear
- Challenges to our proposed objectives and solutions, and how these can be overcome
- Examples of national and regional best practice which can be used to improve Tyne and Wear air quality levels
- Proposed actions to improve area specific and overall Tyne and Wear air quality levels which affects us all

The key issues raised by the plan are an emphasis on action and a clear commitment that we must, wherever possible, prevent further areas in Tyne and Wear from becoming AQMAs – areas where air quality had been recognised as being especially poor. Current air quality action plans produced subsequent to an area being declared an AQMA do not propose tangible actions, ownership of problems, budgets or timelines. This indicates that the problem does not lie in

insufficient monitoring, but in what this information is subsequently utilised for; signifying a need for the proposed actions and for clear ownership of these, as presented in the plan.

The plan therefore presents realistic, efficient and reliable air quality solutions which need to incorporate the promotion of alternative modes, management of the existing highway network, planning, emissions management, information and education. This will be based around a combination of policy implementation and interventions. However, the task of implementing such actions to improve air quality in a specific area can be challenging due to a lack of standardised processes and the varying conditions and sources in each area. Two 'sets' of actions are hence needed; one aimed at area-specific interventions, and one dealing with measures which will improve Tyne and Wear air quality levels as a whole.

In order to achieve these ambitions, the plan recognises the need for a clear commitment from stakeholders, along with a better working relationship between planning departments and environmental health officers and more pooling of knowledge. It is also important to note that the Air Quality Delivery Plan is a living document and will hence be regularly updated to reflect changes in AQMA boundaries and to take into account results of on-going detailed assessments.

A copy of the Air Quality Delivery Plan can be accessed at http://www.tyneandwearltp.gov.uk/documents/air-quality-delivery-plan/ .

5 Planning Applications

It was reported in the 2011 Progress Report that Sunderland City Council has submitted a planning application relating to the construction of a new wear bridge across the River Wear with associated access roads.

An air quality assessment was carried out as part of the application and although it concluded that the Air Quality Objectives would not be exceeded at relevant receptors, the annual NO_2 objective was close to being breached at two locations. Comments regarding this were passed from this department highlighting these concerns and asking for further monitoring and modelling work be carried out.

The two sites of concern have therefore been subject to one years' worth of monitoring and the results presented in this report. The site names are Northern Way and Ferndale Terrace. The results of this monitoring will be used to verify the air quality modelling undertaken. When the new wear bridge has been constructed a further years' worth of monitoring will be carried out to verify the results of the model.

6 Local Transport Plans and Strategies

The current Local Transport Plan (LTP3) is the third for Tyne and Wear. It comprises a ten-year strategy (2011 – 2021) covering all forms of transport in Tyne and Wear, underpinned by the first in a series of three-year delivery plans (2011 – 2014) setting out how the strategy will be put into effect at a local level.

This Plan has been produced by the Tyne and Wear Integrated Transport Authority on behalf of the six LTP Partners – the five local authorities in Tyne and Wear (Gateshead, Newcastle, North Tyneside, South Tyneside and Sunderland) plus Nexus, the local Passenger Transport Executive. It has been produced in accordance with the Local Transport Plan Guidance issued by the Department for Transport in 2009 and takes into account national, regional and local policies and plans. It is complementary to the Transport Strategy for the North Eastern Local Enterprise Partnership (LEP), which covers a wider geographic area including those parts of Durham and Northumberland which have close economic and commuter ties to Tyne and Wear.

The draft LTP was subject to a period of public consultation and comments received have been used to finalise the document.

The Strategy

Vision

Our vision for transport in Tyne and Wear is that:

Tyne and Wear will have a fully integrated and sustainable transport network, allowing everyone the opportunity to achieve their full potential and have a high quality of life. Our strategic networks will support the efficient movement of people and goods within and beyond Tyne and Wear, and a comprehensive network of pedestrian, cycle and passenger transport links will ensure that everyone has access to employment, training, community services and facilities.

The five goals of the transport strategy that we have adopted to meet this vision are:

- To support the economic development, regeneration and competitiveness of Tyne and Wear, improving the efficiency, reliability and integration of transport networks across all modes
- To reduce carbon emissions produced by local transport movements, and to strengthen our networks against the effects of climate change and extreme weather events

- To contribute to healthier and safer communities in Tyne and Wear, with higher levels of physical activity and personal security
- To create a fairer Tyne and Wear, providing everyone with the opportunity to achieve their full potential and access a wide range of employment, training, facilities and services
- To protect, preserve and enhance our natural and built environments, improving quality of life and creating high quality public places

As there is considerable overlap between the latter three goals, and many of our proposed measures would help to address all three of them, these have be summarised under the term “Safe and Sustainable Communities”. Therefore the strategy has been focused on ways to address challenges within the following three key areas :

- Supporting economic development and regeneration
- Addressing climate change
- Supporting safe and sustainable communities

Challenges

Economic Development and Regeneration – By many standard economic indicators, Tyne and Wear is less successful than other urban areas of the UK. Transport needs to help address this by supporting the development of new regeneration and housing sites, managing congestion, ensuring high levels of accessibility to key employment sites and making sure our transport network can continue functioning after disruption from natural or man-made events.

Climate Change – All local authorities in Tyne and Wear have committed themselves to meeting challenging targets for the reduction of CO_2 emissions and will also be required to play their part in meeting the UK’s national Climate Change Act objectives. This will require a significant reduction in transport’s share of emissions.

Safe and Sustainable Communities - The least prosperous areas of Tyne and Wear are amongst the most deprived in England. Source: Index of Multiple Deprivation (2007) This situation is influenced by many factors but transport can assist by improving accessibility so that people can reach employment sites and key services more easily, and by promoting healthy, active travel modes such as walking and cycling. The need to improve safety and reduce crime and fear of crime is also an issue for all modes of transport. We recognise the need to protect and enhance the natural environment.

Strategic Framework

Recognising the importance of our climate change objectives and the fact that, at least in the short-term, there will be considerably less funding available than in recent years, we have adopted a strategic framework based on three broad intervention types (measures), beginning with the lowest-cost measures that make the least impact on the environment;

(i) managing the demand for travel;

(ii) managing and further integrating existing networks; and

(iii) targeting new investment at top priority challenges.

The aim is to firstly reduce cost and demand on the system; then to make maximum use of existing networks; and finally to concentrate our limited resources for new investment on key schemes that promote sustainable regeneration, or where current provision is clearly inadequate.

Managing the Demand for Travel

By close integration between transport and land use planning strategies, we will seek to ensure that development is focused on the most accessible locations that minimise demand for travel and make it easy to use sustainable modes. This will be supplemented by the use of Travel Planning and Smarter Choices resources, whilst Car Clubs provide an additional option that caters for essential car journeys whilst minimising overall car use.

Management and Integration of Existing Networks

We have listened to what the people of Tyne and Wear want, and therefore, we will continue to promote and invest in our existing transport networks, focusing particularly on active travel modes, such as walking and cycling, as well as public transport. It will also be important to make best use of taxi and private hire services and to ensure the safe and sustainable movement of freight around the region. Using Network Management Plans, Partners will continue to ensure delivery of the Network Management Duty to facilitate the efficient movement of vehicles, pedestrians and cyclists throughout the city region. Excellent integration between all modes is essential as many journeys involve more than one form of transport.

Investing in our Networks

Our major scheme programme includes a number of key schemes that are underway, such as the New Tyne Crossing and the region’s Urban Traffic Management and Control (UTMC) project. Our investment in electric vehicle

infrastructure is also a key commitment that addresses our need for sustainable economic growth. There are also a number of important schemes under development, such as the Sunderland Strategic Transport Corridor (currently in the Development Pool) and our Bus Corridor Improvement Programme, as well as other schemes that are longer-term aspirations.

Underpinning the measures are three key priorities: providing high-quality information to assist in informed travel choices; improving safety on all modes; and ensuring existing infrastructure is kept in good condition by keeping up high standards of maintenance.

Information

We will use a variety of media to inform people about routes, services and fares / charges, both before and during their journey, thus helping them make informed travel choices, for all modes of travel.

Safety

We intend to work closely with the public, the police and transport operators to improve safety on all modes of transport. In the case of road safety, we will continue to use a targeted range of education, engineering and enforcement measures to maintain our good record in reducing road accidents.

Maintenance

The Metro Reinvigoration project will help to secure the future of the Metro system and renew structures that are reaching the end of their useful life. Highways Asset Management Plans allow authorities to make best use of the budgets available and provide a robust and efficient service to road users and residents, ensuring efficient, appropriately targeted maintenance and improvements of the existing assets.

Main Policies

The main policies in the strategy are listed in Table 1.

Category	Main Policy
Maintenance	We will keep all our transport networks in good condition.
Management	We will manage our networks to provide for the safe and efficient flow of travel by all modes.
Information	We will help people make informed travel choices by giving them accurate information.
Walking and	We will give priority to and invest in walking and cycling.

Cycling	
Public Transport	We will give priority to and invest in public transport.
Safety and Security	We will enhance personal safety and security for all transport users.
Road Safety	We will work to improve road safety.
Air Quality	We will seek to improve air quality.
Links	We will improve links to our airports, ports, rail and motorway systems.
Low Carbon	We will support low-carbon transport initiatives.
Access	We will help people to reach key services, such as healthcare, employment and education, easily and safely by ensuring that access issues are given due consideration for service and land use planning.
Investment	We will pursue all investment opportunities to improve our transport networks.

Further information on the LTP can be accessed here :http://www.tyneandwearltp.gov.uk/ .

7 Climate Change Strategies

Sunderland's Climate Change Action Plan was adopted in November 2008, and is the framework through which Sunderland will work to reduce the city's carbon emissions.

Sunderland is now aiming to cut carbon emissions by at least 34% by 2020 (compared to 2005), to align itself with the new UK Low Carbon Transition Plan (July 2009). This is an increase from the 26% target agreed previously.

In 2007, Sunderland's carbon emissions were 1,864,300 tonnes CO2. This is 4.5% lower than the previous year (2006), and 5.6% below the baseline year of 2005. Of these emissions, 34% were produced by housing, 40% from employers (public and commercial) and 26% from road transport.

With initiatives known to have been implemented to from April 2008 to January 2010, an estimated 54,500 tonnes CO2 will be saved, taking total emissions in 2009 to 8% below 2005 levels. The following summarises key areas of progress, between April 2008 – January 2010:

Housing initiatives have saved 8,200 tonnes of carbon emissions

Carbon savings are expected from:

• Insulation measures were installed in 4014 homes, by the Council, Gentoo and Warmfront combined.

• 3231 new boilers were installed by Gentoo and Warmfront

Other progress includes:

• The Council has secured £3M of CERT funding, to fund energy efficiency improvements up to March 2012.

Employer actions have saved 27,300 tonnes of carbon emissions

Carbon savings are expected from:

• Nissan installed 2 more 660kW wind turbines, taking the total to 10 turbines.

• Employers continued to install carbon saving measures. For example, City Hospital Sunderland installed new CHP boilers, and the University of Sunderland installed Sunderland's first ground source heating system in their new Chester Rd campus building.

• The Council installed 1.7MW of wood burning boilers, in 6 new schools.
• Emissions saved from closure of Sunderland Glassworks in Sept 2007, will manifest in 2008 emissions data.

• Low Carbon City campaign was launched in March 2009, with 20 major employers committing to cut their carbon emissions by 10% or more. This already will save 28,000 tonnes CO2 by 2020.
• The Council continued to develop plans for 250kW of wind energy to power its own buildings
• Planning approval was granted for a 9MW biomass power station at the Port of Sunderland

Transport initiatives have saved 20,800 tonnes of carbon emissions

Carbon savings are expected from:
• A 1% reduction in traffic levels from 2007 to 2008
• Introduction of 2.5% biofuels into all road fuels
• Continued expected increases in vehicle efficiency.

Other progress includes:
• Sunderland was included in the UK's first Low Carbon Economic Area, to support electric vehicle manufacturing and deployment.
• The Smarter Choices campaign was launched across Tyne and Wear, to help individuals make sustainable travel choices

Awareness and recognition

• Capitalising on its expertise in carbon management, the Council was commissioned to conduct a carbon emissions study for all 5 Tyne and Wear local authorities.
• In Feb 2009, Sunderland City Council won the national Sustainable Communities Award, for "Tackling Climate Change"

Outlook from 2010 to 2020

Future actions and opportunities identified in this progress report could cut Sunderland's carbon emissions by a further 404,000 tonnes CO2. This will reduce total emissions to 29% below 2005 levels, with future revisions to this action plan

needing to identify how the further 5% reduction could be achieved, to meet the 34% target. New initiatives to support these more ambitious targets include the following:

1. Sunderland is developing a new Economic Masterplan, with a vision that Sunderland is to become "**An entrepreneurial University City at the heart of a low carbon regional economy"**

Action plans that demonstrate how Sunderland will develop a Low Carbon Economy –will be developed during 2010. These will both support low-carbon business sectors, such as electric vehicles and offshore wind, and develop Sunderland as a centre of low carbon business infrastructure, buildings and transport.

2. Sunderland City Council and housing partners will continue efforts to work towards insulating every possible home in Sunderland. From 2010, this will now include the first trials of solid wall insulation for private homes, which is where the greatest potential exists for making carbon savings in Sunderland's housing stock.

Sunderland is also relying on the UK Government to successfully deliver renewable energy targets for heat and electricity, along with national sustainable construction policies for homes and all other buildings.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

The results from the automatic NO_2 monitoring data were that both the annual and hourly mean was met at all four sites. The results from the non-automatic monitoring were that the annual mean was met at all sites apart from one.

The site where an exceedence was recorded was tube no. 132 located on a lamp post in North Bridge Street adjacent to Dunn House which is a large block of apartments approximately 5 storeys high. North Bridge Street is a four-laned road that leads from the Wearmouth Bridge, 3 lanes flow northwards away from the city centre and one lane carries buses and taxis towards the city. Tube 132 had an annual average of 46 µg/m^3 after bias adjustment. The tube is positioned on a lamp post on the path adjacent to the building and adjacent to Northbridge Street. The residents do not live on the ground floor of the premises and the first level is at approximately 3 metres above street level.

Sunderland City Council are proceeding to a Detailed Assessment for this location as stated in the Progress Report 2013. Monitoring had been delayed in order to allow the new junction to 'settle' with the agreement with the Air Quality Monitoring Helpdesk operated by DEFRA.

A continuous analyser which samples the air every 15 minutes has now been installed at this location and monitoring has begun.

This method of monitoring is much more accurate and reliable than non-automatic methods such as diffusion tubes. The possible exceedence of the objective at this location has been measured with a diffusion tube and so until this has been confirmed using a continuous analyser it is not confirmed whether the Air Quality Objectives are being breached.

After a year's data has been collected Sunderland City Council believe they will have a much clearer picture of the air quality at this location and be able to come to a decision on whether an AQMA should be declared.

8.2 Conclusions relating to New Local Developments

There were four new industrial processes identified that could have a potential impact on Local air quality. These have been logged for further assessment during the next USA.

8.3 Proposed Actions

The Progress Report 2014 has identified the need to proceed to a Detailed Assessment. The objective that is likely to be breached is the Annual Nitrogen Dioxide Objective of 40µg/m^3. The location of the exceedence is at Dunn House which is located at the Northern end of North Bridge Street the A1018 near to the Wheatsheaf Gyratory.

Sunderland's next course of action is to continue to collect one year's worth of data for the Detailed Assessment for the Annual Nitrogen Dioxide Objective. Following this the Detailed Assessment will be produced and a decision made whether it is necessary to declare an AQMA.

Sunderland City Council will also produce an Updating and Screening Assessment in 2015 which will report data collected in 2014.

9 References

Department for Environment, Food and Rural Affairs, 2009, *Local Air Quality Management Technical Guidance* LAQM.TG (09).

Department for Environment, Food and Rural Affairs, September 2013, *Air Pollution in the UK 2012*.

Appendices

Appendix A: Quality Assurance / Quality Control (QA/QC) Data

Sunderland City Council diffusion tubes are supplied and analysed by Gradko International Ltd, Winchester, Hampshire. The preparation method used is 20% TEA and acetone.

The bias adjustment factor of 0.95 was obtained from the Spreadsheet version 6 – 14.

PM Monitoring Adjustment

PM_{10} is monitored at two locations using TEOM instruments. The data has been adjusted using the volatile correction model (VCM) accessed at http://www.volatile-correction-model.info/ .

QA/QC of automatic monitoring

The QA/QC procedures of Sunderland are based on the AUN Site Operator's manual along with training received from our equipment suppliers, Casella Measurement.

The fundamental aims of a quality assurance/ control programme are:

- The data obtained from measurement systems should be representative of ambient concentrations existing in each area.
- Measurements must be accurate, precise and traceable.
- Data must be comparable and reproducible.
- Results must be consistent over time.

An appropriate level of data capture is required throughout the year.

Equipment Maintenance

- Automatic analysers are serviced every 6 months by a qualified engineer under a contract with SupportingU
- Local Authority staff visits the air quality sites at least once every 4 weeks during which a check of the equipment is made to ensure it is all working within normal parameters. Filters are also changed during this visit.
- If a problem occurs then a call-out is instigated to the service centre and an engineer will normally visit site within 48-hours to correct the fault.

Calibration

- Each day a calibration response check is undertaken by the logger, this check does not re-calibrate the instrument. The calibration system uses certified gas cylinders of a known concentration, to produce an expected response from the analyser.
- Calibration reports stored in the logger will retain expected zero and span gas responses and the actual measured zero and span gas responses.
- Computer software collects and stores these calibration reports and also calculates a zero correction and span response scaling factor which can be applied to the data if required.
- At the 6-month service the instruments are re-calibrated to the site cylinder certificated value.
- Gas cylinder pressures are regularly checked at routine visits to ensure they are replaced before they run out completely.

When a cylinder is replaced the new certified values are entered into the logger.

Data Validation

Data from all of Sunderland City Council's automatic monitoring sites are collected via modem by SupportingU. SupportingU are under contract with Sunderland City Council to validate and ratify the data. Monthly reports of the data are produced by SupportingU and e-mailed to Sunderland City Council. The data is also displayed on a website that members of the public can freely access. The website address is http://www.wecare4air.co.uk/

SupportingU review data daily to ensure that

- Telecommunications to the station are operational
- The air quality station is operational
- Individual analysers are operational
- Air quality exceedences are identified
- Operational information such as TEOM filter loading, does not invalidate data
- Obvious data errors are identified

Data Ratification

In addition to the initial data screening process (validation), data are further scrutinised in monthly blocks in order to provide a final ratified data set.

The software that collects the data is used to rescale the data using the factor calculated from the monthly calibration check. Data is then reviewed for erroneous data such as:

- Daily calibration spikes
- Routine or service visit errors
- Analyser faults
- Site faults, such as power outages

When data is satisfactory, it is compared to other local sites. This provides a check to ensure data is realistic.

QA/QC of diffusion tube monitoring

Gradko has full U.K.A.S. accreditation for compliance with ISO-IEC 17025 for laboratory management system. Its accuracy and consistency of analytical methods is regularly monitored using external proficiency schemes such as

- Workplace analysis scheme for proficiency (W.A.S.P.)

- Laboratory Environmental Analysis Proficiency (L.E.A.P.)

In addition regular cross-checks are carried out with other U.K.A.S. accredited labs using certified standard solutions.

According to the *WASP – Annual Performance Criteria for NO_2 Diffusion Tubes used in Local Air Quality Management (LAQM), January 2012 – December 2013, and Summary of Laboratory Performance in Rounds 116-123*, Gradko International were deemed to have a good performance and 100% of samples were satisfactory over the period. Gradko International also follows the procedures set out in the Harmonisation Practical Guidance.