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2015 Updating and Screening Assessment for **North Tyneside Council**

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

Date (April, 2015)

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Executive Summary

Under the Environment Act 1995, local authorities are required to review and assess air quality on a regular basis and consider the air quality in relation to the objective levels prescribed in the Air Quality (England) Regulations 2000 (SI 928) and The Air Quality (England) (Amendment) Regulations 2002 (SI 3043). North Tyneside Council has undertaken the 2015 Local Air Quality Management Updating and Screening assessment of air quality for the borough. This report presents the findings with regard to recent air quality monitoring carried out.

This Updating and Screening Report reviews if there were any changes within the borough that may influence air quality since the last round of review and assessment in 2014. The report reviewed data on measurements of air pollutants in the borough and compared these to the national air quality objectives for human health. The monitoring in the borough has confirmed that both the hourly average and the annual mean objectives for nitrogen dioxide have been met. Real time continuous monitoring of particulate matter does not indicate any exceedances of the annual mean objective level. Sulphur dioxide real time monitoring shows negligible levels of sulphur dioxide due to the smoke control areas. It is concluded that air quality objectives were not exceeded in 2014 and there is no risk that the objective levels are likely to be exceeded during 2015. North Tyneside Council will therefore not be required to undertake any detailed assessments of air quality in 2015.

Consideration was given to new developments and industrial processes with regard to air quality. Developers were required to provide air quality assessment to show no detrimental impact on air quality. The assessment identified that no new or existing sources of pollution were likely to exceed national air quality objectives for human health.

There is therefore no need for a detailed review and assessment or to declare any air quality management areas within North Tyneside.

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1 Introduction

1.1 Description of Local Authority Area

North Tyneside is situated between the North Sea and the regional capital of Newcastle upon Tyne and is one of the five metropolitan districts which makes up the Tyne and Wear conurbation. The borough has a residential population of 194,000 with approximately 84,000 households, (data from the 1991 census), and covers an area of 84 square kilometres. The borough stretches from the eastern boundary of Newcastle upon Tyne to the North Sea and from the southern boundary of Northumberland to the River Tyne.

The northern fringe of the borough is open countryside with the main urban areas, including the towns of Wallsend, North Shields, Tynemouth and Whitley Bay, along the river and coastline. There are three other large settlements, Longbenton, Forest Hall and Killingworth between the main towns and the rural hinterland. In the north of the borough there are a number of old mining villages; large open areas extending into the urban area separate settlements.

The River Tyne is a commercial river with ship repair, offshore fabrication, fishing and port related industries. The riverside urban area is undergoing major regeneration which has resulted in some diversification from ship building to dismantling and waste transfer stations namely SITA, Wallsend Road, Percy Main and Impetus Waste Transfer site at Hadrian Road Fabrication Yards, Wallsend and O'Briens Waste Transfer site at Willington Quay. There have also been a number of new industrial estates created along the main transport routes of the A19 and the coast road A1058 consisting of office developments including the Cobalt Business Park, Balliol Business Park and retail outlets including the Silverlink and the Royal Quays. New residential areas have been developed on former industrial land adjacent to the former Amec ship yard at Wallsend, Hayhole gas works at Wallsend and a new large development at The Limes, Great Lime Road, Palmersville.

1.2 Purpose of Report

This report fulfils the requirements of the Local Air Quality Management 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.

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an update of any outstanding information requested previously in Review and Assessment reports.

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) as amended by the Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. Table 1.1 shows the pollutant objectives over relevant exposure period in units of microgrammes per cubic metre ($\mu\text{g}/\text{m}^3$) except for carbon monoxide which is in units of milligrammes per cubic metre (mg/m^3 for carbon monoxide) and gives the number of exceedences permitted each year 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	Running annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m ³	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m ³	Running 8-hour mean	31.12.2003
Lead	0.5 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
Particles (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

Annual reporting of air quality within the Borough of North Tyneside has been carried out since 2004. The annual objectives have been met throughout the reporting period and no air quality management areas have been declared. The most recent progress reports in 2013 and 2014 recommended that North Tyneside Council

continue to monitor for nitrogen dioxide, particulate matter (PM₁₀) and sulphur dioxide (SO₂) using real time monitoring and continue with monthly diffusion tubes for nitrogen dioxide (NO₂).

The 2014 report recommended that monitoring for particulate matter level would continue to be carried out at the real time monitoring station at Northumbria Water, East Howdon. The annual monitoring has shown that there has been no significant change in the levels of NO₂ or PM₁₀ within the borough over recent years.

The 2013 progress report reviewed potential exposure to air emissions such as road transport, industrial sources, commercial and residential heating sources. It found that there were no further new or significant changes to these sources that would indicate any potential exceedences of the objective levels.

In 2012 the update and screening report concluded that the hourly average and the annual mean objective are being met for NO₂, PM₁₀ and SO₂.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Figure 2.1 details the location of the three real time monitoring sites within the Borough of North Tyneside. These have been running in their current locations for the full 2014 calendar year. One station is located in Wide Open and provides urban background data for nitrogen dioxide and particulates (PM₁₀), two further real time monitoring sites are used, one is located at a roadside location in the town centre of Wallsend, monitoring nitrogen dioxide, particulates and sulphur dioxide and the third station is located in an industrial location within the Northumbria Water site in East Howden, close to the Tyne Tunnel (A19) link, monitoring nitrogen dioxide and particulates. Table 2.1 provides full details on each of these locations.

North Tyneside Council carries out routine manual calibrations fortnightly and also undertakes the ratification of the data. Invalid data are removed from the data set; such as spurious results that indicate possible equipment malfunction. The supplier Horiba carries out maintenance and independent calibration on the equipment every six months. PM₁₀ data is monitored using Eberline analysers which consist of a Beta monitor. A correction factor of 1.3 is applied.

Figure 2.1 Map of Automatic Monitoring Sites



Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
High Street East, Wallsend	Roadside	430222	566476	Nitrogen Dioxide Sulphur dioxide, Particulates	N	Eberline	Y (4m)	2m	Y
Sandy Lane Wideopen	Urban Background	424432	571984	Nitrogen Dioxide, Particulates	N	Eberline	Y (16m)	1m	Y
Northumbria Water East Howden	Industrial/ Construction	433289	566313	Nitrogen Dioxide, Particulates	N	Eberline	NA	NA	Y

2.1.2 Non-Automatic Monitoring Sites

Figure 2.2 details the locations of the diffusion tube monitoring sites within the Borough of North Tyneside. Table 2.2 provides details on the monitoring locations used for NO₂ diffusion tube monitoring. Passive diffusion tube data on nitrogen dioxide were collected, ratified and assessed. The nitrogen dioxide diffusion tubes for 2014 were supplied and analysed by Gradko International Ltd, whose performance in 2014 was assessed as satisfactory, achieving 100% proficiency in each round during the year under the Workplace Analysis Scheme for Proficiency (WASP), quality assurance/ quality control performance criteria as confirmed from the WASP results located on www.airquality.co.uk website.

The discs are impregnated with triethanolamine/acetone before being placed in the coloured caps. The tubes are analysed using ultra violet/visible spectrophotometer after complexing with N-1-naphthylethylenediamine dihydrochloride (NEDA) and sulphalinamide. The ultra violet / visible spectrophotometer is calibrated with nitrite ions standards. The bias adjustment from the Netcen spreadsheet was considered, this gave a value of 0.91 based on the average from 16 sites. However, it was considered more appropriate to use the locally obtained bias adjustment factor.

The Bias factor used for the nitrogen dioxide tubes was determined from the precision and accuracy of the co-location site at our Sandy Lane real time monitor, which gave a bias adjustment factor of 0.96. Triplicate co-location diffusion tubes are exposed at Sandy Lane to enable the precision and accuracy to be calculated. This bias adjustment factor was used and is considered representative for the exposure sites used throughout the borough.

There have been no significant changes in industrial sources to require the need for non-automatic monitoring for particulates, sulphur dioxide, benzene or any other pollutants. Benzene diffusion monitoring was discontinued in 2011 as the long term non-automatic monitoring for benzene had not shown any significant exposure arising from petrol stations and the LA-IPPC permit for the Velva Liquids petrol terminal at Percy Main was surrendered.

Figure 2.2 Map(s) of Non-Automatic Monitoring Sites (if applicable)



Table 2.2 Details of Non-Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring co-located with a Continuous Analyser? (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
A192	Kerbside	435031	569965	NO ₂	N	N	N (22m)	N/a	Y
BG1	Kerbside	430469	567809	NO ₂	N	N	Y (3m)	1m	
BK2	Roadside	430100	571500	NO ₂	N	N	Y (7m)	1m	Y
BM1	Roadside	431743	570649	NO ₂	N	N	Y(5m)	1m	Y
CH1	Kerbside	433580	567865	NO ₂	N	N	Y (2m)	N/a	Y
CH3	Roadside	433097	569066	NO ₂	N	N	N (3m)	2m	N/a
CL1	Roadside	427366	568495		N	N	Y (5m)	1m	Y
DB1	Roadside	430905	566294	NO ₂	N	N	Y (15m)	1m	Y
FH3	Suburban	427529	570379	NO ₂	N	N	Y (10m)	2m	Y
FR1	Kerbside	435671	571019	NO ₂	N	N	Y (5m)	1m	Y
FS1	Kerbside	434064	571727	NO ₂	N	N	Y (4m)	1m	Y
HR1	Roadside	432664	566413	NO ₂	N	N	Y (5m)	1m	Y
HR2	Roadside	431445	566574	NO ₂	N	N	Y (1m)	1m	Y
HW3	Suburban	433194	566418	NO ₂	N	N	Y (2m)	1m	Y
NW1	Industrial/	433289	566313	NO ₂	N	Y	N/A	15m	Y

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Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring co-located with a Continuous Analyser? (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
	Construction								
NW2	Industrial/Construction	433289	566313	NO ₂	N	Y	N/A	15m	Y
NW3	Industrial/Construction	433289	566313	NO ₂	N	Y	N/A	15m	Y
SB4	Suburban	424302	572014	NO ₂	N	N	Y (2m)	1m	Y
SL1	Urban Background	424432	571984	NO ₂	N	Y	N/a	N/a	N/a
SL2	Urban Background	424432	571984	NO ₂	N	Y	N/a	N/a	N/a
SL3	Urban Background	424432	571984	NO ₂	N	Y	N/a	N/a	N/a
SP1	Roadside	430444	570242	NO ₂	N	N	Y (10m)	2m	Y
SM2	Kerbside	431110	571216	NO ₂	N	N	Y (2m)	N/A	Y
TR1	Kerbside	431854	566961	NO ₂	N	N	Y (3m)	1m	Y
W10	Roadside	429316	567391	NO ₂	N	N	Y (3m)	2m	Y
W12	Roadside	429262	567378	NO ₂	N	N	Y (1m)	2m	Y
W15	Roadside	429750	566600	NO ₂	N	N	Y (3m)	1m	Y
W16	Roadside	429743	566667	NO ₂	N	N	Y (1.6m)	N/a	Y
W17	Roadside	429663	568223	NO ₂	N	N	Y (5m)	1m	Y
WB9	Roadside/Industrial	435205	571823	NO ₂	N	N	N/a	2m	N
WB18	Kerbside	435390	571977	NO ₂	N	N	Y (4m)	N/A	Y

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Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring co-located with a Continuous Analyser? (Y/N)	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
HH1	Urban Background	432382	568031	NO ₂	N	N	Y (1m)	3m	Y
NS9	Urban Centre	435450	568250	NO ₂	N	N	Y (2m)	1m	Y
NS10	Roadside	434099	569098	NO ₂	N	N	Y (2m)	3m	Y
PS1	Kerbside	436836	569498	NO ₂	N	N	Y (5m)	1m	Y
PG1	Kerbside	434932	569522	NO ₂	N	N	Y (1m)	N/A	Y
E1	Kerbside	432302	572504	NO ₂	N	N	Y (1m)	N/A	Y
A19-1	Roadside	432080	568523	NO ₂	N	N	Y(1m)	N/A	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

The annual mean concentrations for nitrogen dioxide (NO₂) at the real time analyser locations are well below the air quality objective of 40 µg/m³ as shown in table 2.3. The industrial real time monitoring site at Northumbria Water, East Howden and the roadside monitor at Wallsend have shown a slight increase over the last three years but the values are half that of the objective levels. The short term one hourly mean concentration for nitrogen dioxide at all three real time stations for 2014 did not exceed the hourly 200 µg/m³ objective for 2014 as shown in table 2.4. The urban background at Wide Open has remained steady and the air quality is considered good in North Tyneside.

Table 2.3 presents the annual mean concentrations for NO₂ for 2010 to 2014 at each of the automatic monitoring sites within North Tyneside. The annual mean concentrations detailed in the table confirm that all sites have met the annual mean NO₂ objective of 40 µg/m³ in 2014. Table 2.4 details the results of monitoring for the 1 hour mean objective and indicates that the three sites did not exceed the hourly 200 µg/m³ objective for 2014.

Overall NO₂ monitoring results indicate that year on year NO₂ levels have been consistent with no indication that the 40 µg/m³ is likely to be breached.

Table 2.3 Results of Automatic Monitoring of Nitrogen Dioxide: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture 2014 % ^b	Annual Mean Concentration $\mu\text{g}/\text{m}^3$				
				2010* ^c	2011* ^c	2012* ^c	2013* ^c	2014 ^c
High Street East Wallsend	Roadside	N	98	NA	19.25	22.6	22.17	22.56
Northumbrian Water, Howden	Industrial/Construction	N	99.5	19.15 (19.0)	18.5	20.57	20.05	20.19
Sandy Lane, Wide Open	Urban Background	N	96.1	20.04	21.7	19.91	18.61	19.24

Table 2.4 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour mean Objective

Site ID	Location	Within AQMA?	Data Capture for full calendar year 2013 % ^b	Number of hourly NO ₂ mean (200 $\mu\text{g}/\text{m}^3$) Exceedences ($< 90\%$ of a full year data capture, 99.8 th percentile of hourly means provided).				
				2010	2011	2012	2013	2014
High Street West Wallsend	Roadside	N	98	NA	0 (81.68)	0	0	0
Northumbrian Water, Howdon	Industrial/Construction	N	99.5	0 (104.48)	0 (82.9)	0	0 (100.1)	0
Sandy Lane Wide Open	Urban Background	N	96.1	0	0	0	0	0

Diffusion Tube Monitoring Data

Annual mean concentrations for NO₂ diffusion tube locations in 2014 corrected for bias are shown in Table 2.5. Table 2.6 provides year by year comparison for specific monitoring locations of nitrogen dioxide. A review of the NO₂ diffusion tube locations was carried out at the end of 2013 so that the monitoring sites in the borough are fully reflective of all potential sources including road traffic sources. As a result of the review, six new locations linked to road traffic pollution were identified for NO₂ monitoring in 2014 and six locations in 2013 discontinued due to good air quality standards. The new monitoring sites are FA1 located on Firtrees Avenue, High Howdon; HR1 located on the junction of Bewicke Road and Hadrian Road, Willington Quay; HR2 located on Point Pleasant Terrace, Wallsend; PS1 located on Percy Park Road, Tynemouth and W17 located on Hotspur Road, Wallsend. The 2014 results at these locations indicate that the NO₂ annual means for the new sites met the annual mean NO₂ objective.

Figure 2.3 shows the chart of long term trend in NO₂ annual mean concentrations from the diffusion tube monitoring sites. The chart shows that the NO₂ results for the long term sites have remained consistent year on year with only minor changes in the levels recorded. This is particularly evident in the most recent years with the levels remaining consistent. The trend chart indicates that the highest levels recorded are within the Wallsend and North Shields town centre area and adjacent to major artillery roads within the Borough. The lowest recorded levels are those in urban background areas such as Dudley and Wide Open. However the trend chart shows that in 2003 and 2006 there were unusual peaks recorded for all sites.

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2014

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2014 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = XX)
								2014 ($\mu\text{g}/\text{m}^3$)
A19-1	Travel Lodge, Silverlink, A19	Roadside	N	N	11	N	N	35.0
A192	Roundabout NE side Preston North Road	Kerbside	N	N	12	N	Y	26.5
BG1	Beckenham Gardens, Battle Hill, Wallsend	Kerbside	N	N	12	N	N	27.8
BK2	Backworth Lane Backworth	Roadside	N	N	10	N	N	26.3
BM1	Park Lane, Shiremoor	Roadside	N	N	10	N	N	24.7
CH1	Norham Rd/ Rothbury Terrace,	Kerbside	N	N	12	N	N	32.3
CH3	West Side Norham Road / Formica, Chirton	Roadside	N	N	11	N	N	25.8
CL1	Front Street/Coach Lane, Benton	Roadside	N	N	12	N	N	35.3
DB1	Davy Bank, Wallsend	Roadside	N	N	12	N	N	23.6
E1	Front Street Earsdon	Kerbside	N	N	12	N	N	23.4
FA1	Firtrees Avenue, High Howdon	Kerbside	N	N	12	N	N	25.6

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Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2014 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = XX)
								2014 ($\mu\text{g}/\text{m}^3$)
FH3	Glebe Road, Forest Hall	Suburban	N	N	11	N	N	24.9
FR1	Farrington Road, Whitley Bay	Kerbside	N	N	12	N	N	21.4
FS1	Front Street, Monkseaton	Kerbside	N	N	12	N	N	26.1
HH1	Melrose Gardens, High Howdon	Urban Background	N	N	12	N	N	23.4
HR1	Bewicke Road, Willington Quay	Roadside	N	N	12	N	N	32.8
HR2	Point Pleasant Terrace, Wallsend	Roadside	N	N	12	N	N	25.2
HW3	Meldon Street East Howdon	Suburban	N	N	11	N	N	25.7
NS9	Rudyerd Street, North Shields	Urban Centre	N	N	11	N	N	25.8
NS10	Queen Alexandra Road North Shields	Roadside	N	N	12	N	N	31.8
NW1	Northumbrian Water, Northumberland Dock Road, East Howdon	Industrial/ Construction	N	Y	12	N	N	22.6

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Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2014 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = XX)
								2014 ($\mu\text{g}/\text{m}^3$)
NW2	Northumbrian Water, Northumberland Dock Road, East Howdon	Industrial/ Construction	N	Y	10	N	N	23.9
NW3	Northumbrian Water, Northumberland Dock Road, East Howdon	Industrial/ Construction	N	Y	12	N	N	21.9
PG1	Walton Avenue North, Preston	Kerbside	N	N	12	N	N	23.7
PS1	Percy Park Road, Tynemouth	Kerbside	N	N	12	N	N	20.8
SB4	Sandy Lane, Seaton Burn	Suburban	N	N	12	N	N	25.3
SL1	Sandy Lane, Monitoring Station	Urban Background	N	Y	12	N	N	19.4
SL2	Sandy Lane, Monitoring Station	Urban Background	N	Y	12	N	N	18.9
SL3	Sandy Lane, Monitoring Station	Urban Background	N	Y	12	N	N	18.6
SP1	Holystone Way Holystone	Roadside	N	N	12	N	N	31.2
SM2	Earsdon Road, Shiremoor	Kerbside	N	N	12	N	N	23.2

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Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2014 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = XX)
								2014 ($\mu\text{g}/\text{m}^3$)
TR1	Tynemouth Road, Rosehill	Kerbside	N	N	12	N	N	34.0
W10	Coast Rd, Wallsend	Roadside	N	N	12	N	N	34.6
W12	Kings Road North/Coast Road.	Roadside	N	N	11	N	N	32.3
W15	Station Road, Wallsend	Roadside	N	N	12	N	N	28.5
W16	North Road, Wallsend	Roadside	N	N	12	N	N	24.6
W17	Hotspur Road, Wallsend	Roadside	N	N	12	N	N	21.5
WB9	Morrisons Petrol Station, Whitley Bay	Roadside/Industrial	N	N	12	N	N	27.9
WB18	Grosvenor Drive, Whitley Bay	Kerbside	N	N	12	N	N	19.8

Table 2.6 Results of Nitrogen Dioxide Diffusion Tubes (2010 to 2014)

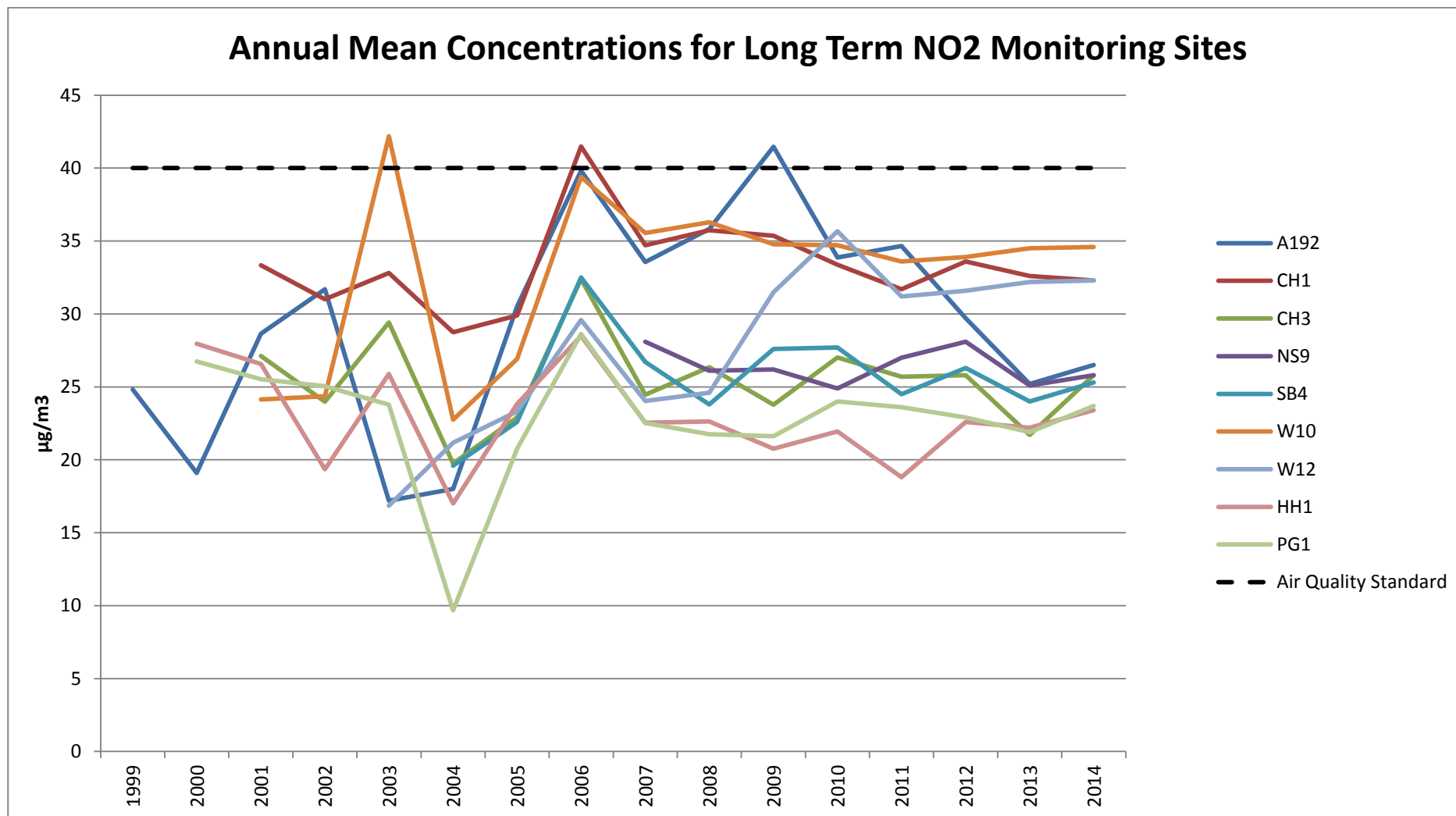
Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$				
			2010* (Bias Adjustment Factor = 0.92)	2011* (Bias Adjustment Factor = 0.89)	2012* (Bias Adjustment Factor = 0.97)	2013* (Bias Adjustment Factor = 0.95)	2014 (Bias Adjustment Factor = 0.96)
A19-1	Roadside	N	32.36	33.9	32.8	30.9	35.0
A192	Kerbside	N	33.88	34.6	29.7	25.2	26.5
BG1	Kerbside	N	20.0	17.2	18.0	18.84	27.8
BK2	Roadside	N	29.85	25.6	26.8	25.9	26.3
BM1	Roadside	N	NA	NA	24.5	22.3	24.7
CH1	Kerbside	N	32.57	31.7	33.6	32.6	32.3
CH3	Roadside	N	27.01	25.7	25.8	21.7	25.8
CL1	Roadside	N	NA	NA	NA	32.1	35.3
DB1	Roadside	N	24.55	24.9	23.7	21.6	23.6
E1	Kerbside	N	25.42	22.6	25.2	21.9	23.4
FA1	Kerbside	N	NA	NA	NA	NA	25.6
FH3	Suburban	N	28.38	23.0	27.8	25.6	24.9
FR1	Roadside	N	NA	NA	NA	NA	21.4
FS1	Kerbside	N	NA	NA	NA	23.9	26.1
HH1	Urban Background	N	21.64	21.1	22.6	22.2	23.4
HR1	Roadside	N	NA	NA	NA	NA	32.8
HR2	Roadside	N	NA	NA	NA	NA	25.2
HW3	Suburban	N	NA	23.4	26.3	24.9	25.7

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$				
			2010* (Bias Adjustment Factor = 0.92)	2011* (Bias Adjustment Factor = 0.89)	2012* (Bias Adjustment Factor = 0.97)	2013* (Bias Adjustment Factor = 0.95)	2014 (Bias Adjustment Factor = 0.96)
NS9	Urban Centre	N	24.89	27.0	28.1	25.1	25.8
NS10	Roadside	N	NA	NA	33.1	27.5	31.8
NW1	Industrial/ Construction	N	23.31	21.0	23.3	19.7	22.6
NW2	Industrial/ Construction	N	22.80	19.9	22.1	20.5	23.9
NW3	Industrial/ Construction	N	23.18	20.8	22.19	21.0	21.9
PG1	Kerbside	N	24.0	23.6	22.9	21.9	23.7
PS1	Kerbside	N	NA	NA	NA	NA	20.8
SB4	Suburban	N	27.70	24.5	26.3	24.0	25.3
SL1	Urban Background	N	20.8	18.8	17.9	18.19	19.4
SL2	Urban Background	N	21.07	18.2	19.0	18.20	18.9
SL3	Urban Background	N	20.42	18.4	19.0	18.28	18.6
SP1	Roadside	N	NA	NA	27.6	27.0	31.2
SM2	Kerbside	N	28.57	23.7	24.3	21.8	23.2
TR1	Kerbside	N	NA	NA	NA	36.3	34.0
W10	Roadside	N	34.71	33.6	33.9	34.5	34.6
W12	Roadside	N	35.68	31.2	31.6	32.2	32.3
W15	Roadside	N	31.05	24.7	28.1	28.4	28.5
W16	Roadside	N	27.56	24.5	25.2	23.9	24.6

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$				
			2010* (Bias Adjustment Factor = 0.92)	2011* (Bias Adjustment Factor = 0.89)	2012* (Bias Adjustment Factor = 0.97)	2013* (Bias Adjustment Factor = 0.95)	2014 (Bias Adjustment Factor = 0.96)
W17	Roadside	N	NA	NA	NA	NA	21.5
WB9	Roadside/Industrial	N	28.19	25.9	28.9	23.8	27.9
WB18	Kerbside	N	22.66	18.5	26.3	17.8	19.8

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

A trend chart may be inserted here. Please discuss any trends shown.



2.2.2 PM₁₀

Tables 2.7 indicate no exceedances of the annual mean particulate objective of 40 $\mu\text{g}/\text{m}^3$ in 2014 at the real time monitoring locations. Table 2.8 indicates that although there was no breach in the objective for the 24 hour mean for particulate, there were three exceedances of the 24 hour PM₁₀ standard of 50 $\mu\text{g}/\text{m}^3$. The air quality objective permits 35 exceedances of the 24 hour mean annually, and therefore the results meet the objective..

The trend in annual and 24 hour mean PM₁₀ results are shown for years 2010 to 2014 in tables 2.7 and 2.8 respectively and the number of exceedances of the 24 hour mean objective given. Table 2.8 highlights that 11 exceedances of the 24 hour mean objective were recorded in 2010 for the urban background monitor located at Sandy Lane, Wide Open. The 2010 results at this location were attributed to utility works being carried out next to the air monitoring station. Since 2012 there have been no exceedances of the 24 hour mean objective for PM₁₀ at the real time monitoring station at Sandy Lane, Wide Open.

The Howden industrial site is located in an industrial site adjacent to a Part A biogas digester plant and a Part B cement batching plant. The site is in close proximity to the A19 Tyne Tunnel entrance and a compound of building materials. The Howden site is influenced by dust from the compound and is considered that the 3 exceedances in the 24 hour mean emission objective in 2014 were localised to the dust arising from cement batching plant. This monitoring location has shown a similar number of exceedances of the 24 hour mean objective year on year. However, the number of exceedances of the 24 hour mean objective annually is still well below the 35 exceedances permitted.

This confirms all sites are below the annual mean objective and the 24 hour mean objective and there is no potential for a breach of the air quality objectives.

Table 2.7 Results of Automatic Monitoring of PM₁₀: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture 2014 % ^b	Confirm Gravimetric Equivalent (Y or N)	Annual Mean Concentration $\mu\text{g}/\text{m}^3$				
					2010	2011	2012	2013	2014
High Street East, Wallsend	Roadside	N	96.5	N	16.43	19.85	16.08	16.8	15.7
Sandy Lane Wideopen	Urban Background	N	87.1	N	18.73	14.96	13.7	14.55	15.9
Northumbria Water East Howden	Industrial/ Construction	N	94.2	N	20.22	22.68	17.1	17.8	13.6

Table 2.8 Results of Automatic Monitoring for PM₁₀: Comparison with 24-hour mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture 2014 % ^b	Confirm Gravimetric Equivalent	Number of Exceedences of 24-Hour Mean ($50 \mu\text{g}/\text{m}^3$)				
					2010*	2011*	2012*	2013*	2014
High Street East, Wallsend	Roadside	N	97	N	1 (26.49)	8 (37.16)	0	1	0
Sandy Lane Wideopen	Urban Background	N	93	N	11 (35.23)	2 (26.8)	0	0 (22.2)	0
Northumbria Water East Howden	Industrial/ Construction	N	97.5	N	6 (32.8)	8 (41.2)	4(29.7)	3	3

*90th percentile of 24-hour means in brackets for data capture <90%

2.2.3 Sulphur Dioxide

Sulphur dioxide (SO₂) monitoring was carried out at Wallsend fixed site close to High Street East in 2014. Table 2.9 details the results of the monitoring and shows that none of the objective levels were exceeded. The annual mean concentrations for 2014 recorded for the 15 minute mean was 2.6 µg/m³, the 1 hour mean was 2.6 µg/m³ and the 24 hour mean concentration was 2.7 µg/m³. The maximum concentrations recorded for the 15 minute mean was 110 µg/m³, the 1 hour maximum mean was 100 µg/m³ and the 24 hour maximum mean concentration was 27.3 µg/m³.

Table 2.9 confirms that there were no exceedences of the 15 minute, 1 hour and 24 hour mean during 2014 and that there is no risk of the sulphur dioxide objective being exceeded.

Table 2.9 Results of Automatic Monitoring of SO₂: Comparison with Annual Mean Objectives

Site ID	Site Type	Within AQMA?	Valid Data Capture 2014 % ^b	Number of Exceedences (percentile in bracket $\mu\text{g}/\text{m}^3$) ^c		
				15-minute Objective (266 $\mu\text{g}/\text{m}^3$)	1-hour Objective (350 $\mu\text{g}/\text{m}^3$)	24-hour Objective (125 $\mu\text{g}/\text{m}^3$)
High Street East Wallsend	Roadside	N	97.9	0	0	0

2.2.4 Summary of Compliance with AQS Objectives

The 2014 monitoring data for both the passive NO₂ diffusion tube monitoring and the real time air quality stations has confirmed that there are no exceedances of the hourly average and annual mean objective for nitrogen dioxide. The overall nitrogen dioxide results in 2014 compared with previous years suggest that the concentrations for nitrogen dioxide remain consistently well below the objective and that there is no likelihood of breaches of the annual mean objective. There is no requirement to proceed to a detailed assessment for nitrogen dioxide.

Real time monitoring for particulates for the 24 hour mean exposure highlighted 3 exceedances of the 50 µg/m³ air quality PM₁₀ standard at the East Howdon monitoring site. However there was no breach in the 24 hour mean objective for PM₁₀ as the objective permits 35 exceedances of the standard. The number of PM₁₀ exceedances was well below the permitted number and therefore there is no likelihood of a breach of the 24 hour mean objective. There were no exceedances in the annual mean objective for particulates at all three automatic sites. There is therefore no requirement to proceed to a detailed assessment for particulate.

Sulphur dioxide real time monitoring at the Wallsend High Street site indicated that the objective levels would be met. There is therefore no requirement to proceed to a detailed assessment.

North Tyneside Council has examined the results from monitoring in the borough. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Annual NO₂ diffusion tube monitoring on Earsdon Road in the vicinity of properties located close to the kerb in Shiremoor has shown that the annual mean is consistently below the air quality annual mean objective level of 40 µg/m³. There are no other narrow or congested streets that have been identified within the borough that have residential properties close to the kerb that have not been considered during previous review and assessments.

North Tyneside Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

No new streets have been identified where the traffic movements are in excess of 10,000 movements and have relevant exposure within 5 m of the kerb and may spend time for 1 hour or more for exposure to the 1 hour mean objectives.

North Tyneside Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.3 Roads with a High Flow of Buses and/or HGVs.

No new streets have been identified where the traffic movements are in excess of 10,000 movements and have relevant exposure within 10 m of the kerb and may spend time for 1 hour or more for exposure to the 1 hour mean objectives.

North Tyneside Council confirms that there are no new/newly identified roads with high flows of buses/HGVs.

3.4 Junctions

One new junction has been identified resulting from a new development built adjacent to Earsdon Road, Wellfield, Whitley Bay. This development has been considered in previous review and assessments as an air quality assessment was provided as part of the planning application. The conclusion of the air quality assessment was that the air quality objectives for both particulates and nitrogen dioxide would be met. The residential development is set back more than 20 metres from the road and therefore there is no requirement to proceed with a DRMB assessment for this junction.

North Tyneside Council has assessed new/newly identified junctions meeting the criteria in Section A.4 of Box 5.3 in TG(09), and concluded that it will not be necessary to proceed to a Detailed Assessment.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

There have been no new roads built or proposed that have been granted planning consent since the last review and assessment. Changes to the A19 Silverlink road network are currently in the development stage and are undergoing examination for

the development order, but consent has not been granted as yet. The proposed new road configuration will be considered during the next review and assessment if consent has been granted.

North Tyneside Council confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

The pollution team are consulted by planning and provide advice at pre-planning stage on requirements for air quality assessments. Such assessments are required for large housing developments to consider the impact of the development on neighbouring roads and sensitive exposure groups. Air quality assessments are also required for developments close to busy roads or junctions with traffic flows greater than 10,000 vehicles per day.

Recent major planning applications requiring air quality assessments included a variation to the housing development at Scaffold Hill. An air quality assessment was carried out for this proposed development due to consideration of impacts on traffic volumes for the A191. The air quality assessment determined that the air quality objectives would not be exceeded as a result of the new housing area. However, the variation included changes to the design of the layout of the residential units to increase the distance between the residential plots and the A19 road and to include for a service road.

Another large housing development at the former Killingworth stores, Killingworth Lane required an air quality assessment due to potential impacts on traffic volumes on the B1317. This air quality assessment determined that the potential increases against the existing air quality pollutant levels would be negligible and that the air quality objectives would not be exceeded.

Planning consent was also provided for the development of 290 residential dwellings with mixed use for commercial units, allotments and public open space at Killingworth Lane, Backworth. An air quality assessment was submitted as part of this proposal

to assess the potential impacts of the development on the local road network and potential air quality impacts from the adjacent A19. The air quality assessment for the operational phase when the development has been completed determined that the percentage change in the background concentrations will be below the air quality objectives for nitrogen dioxide and particulates.

A review of all major roads in the borough of North Tyneside Council was carried out against recorded traffic counts for the average daily traffic movements. The data was obtained from the Department of Transport website for the period 2010 and 2013. The major roads with more than 10,000 movements were considered to determine if there had been a significant increase of more than 25% in traffic movements over the years. This review confirmed that none of the roads in the borough have seen a significant increase in traffic movements to meet the 25% increase criteria.

North Tyneside Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

There has been no significant change in the bus movements from the bus station located on Norham Road since the previous Review and Assessments. Daily bus movements equate to less than 200 movements per day, which is significantly below the 2,500 movement threshold.

North Tyneside Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

The nearest airport to the Borough of North Tyneside is Newcastle International Airport. The nearest residential properties within the boundary of the borough are those located at Brunswick Village, Wide Open, approximately 1700 m east of the boundary of the airport. As there is no relevant exposure there was no requirement to proceed further with the assessment.

North Tyneside Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

North Tyneside Council has two potential sources of diesel and steam trains operating within the borough. A steam locomotive is in use at the Stephenson railway museum that operates on a short rail track from the Silverlink to Percy Main. There is also the East Coast Main Line that operates through the borough, but this line has no stations or goods loops within the borough.

4.2.1 Stationary Trains

The Stephenson railway line has a steam locomotive operating on a Sunday, four times a day. The engine rests for a maximum of five minutes adjacent to residential premises in Percy Main which would reduce potential exceedance of 15 mean exposure standard. It is considered that there is unlikely to be the potential for outdoor exposure of significant levels of sulphur dioxide for residents in this area.

Review of the freight trains operating on the Ashington / Blyth line that connects with the East Coast Main line has been considered. The assessment has determined that although the freight trains may stop for more than 15 minutes. The majority of the trains operate during the night and as the nearest garden on Granville Crescent, Benton is some 20 metres away from the rail line, it is considered that there is no relevant exposure to sulphur dioxide.

North Tyneside Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving Trains

North Tyneside Council has the East Coast Main Line. This line has no stations or goods loops within the North Tyneside area. This line is also not defined as having heavy traffic movement of diesel locomotives or relevant long-term exposure.

North Tyneside Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

Assessment for shipping movements and potential concern over sulphur dioxide exposure for housing located within 250 metres of the berths and main manoeuvring areas has determined that although there is relevant exposure located within 250 m of the berths and main areas of manoeuvring, the number of shipping movements is below the criteria of 5,000 movements to indicate a requirement to proceed to a detailed assessment. This is determined from reviewing the shipping movements for

North Tyneside Council

the Port of Tyne obtained from the Department of Transport statistics for large ships such as North Sea Ferries, Ro-Ro and container ships arriving into the Tyne.

The shipping movements consist of around 1371 arrivals (based on 2013 arrivals data) of the large vessels into the Port of Tyne. This indicated that shipping movements have remained constant over the last few years. As the number of movements is below the 5,000 movements per year it is considered unlikely to give rise to any exceedances in the short-term exposure levels for sulphur dioxide.

North Tyneside Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

There are no new or proposed installations within the borough of North Tyneside for which an air quality assessment has been carried out since the last review and assessment report.

North Tyneside Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

Review of existing installations has confirmed that current emissions from Part A and Part B processes in the borough have not substantially increased by greater than 30%. There has also been no new relevant exposure within the vicinity of existing industrial premises to require further assessment

North Tyneside Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

No new industrial sources have been identified within the Borough of North Tyneside since the last Review and Assessment report to require to proceed with a detailed assessment.

North Tyneside Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major Fuel (Petrol) Storage Depots

Major fuel storage depots have been considered as part of the review and assessment. There was historically one major fuel depot that was regulated as a Part B installation. However petrol was not stored at the depot and the permit was surrendered in 2012. There are no longer any major fuel storage depots located within North Tyneside and there is no requirement to consider potential air quality impacts for benzene.

There are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

There are three petrol stations that have an annual throughput of more than 2000m³ of petrol with busy roads nearby. All petrol stations have upgraded to stage II vapour recovery systems. One new petrol station opened in 2011 that had stage II vapour

recovery installed but is not located next to a busy road. None of the three service stations have a relevant exposure group within 10m of the pumps and it is therefore concluded that none of the petrol stations in the borough meet the criteria to proceed to a detailed assessment for benzene.

North Tyneside Council confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

The Borough of North Tyneside does not have any poultry farms located in the area that house in excess of 400,000 birds (mechanically ventilated), 200,000 birds (naturally ventilated) or 100,000 birds for any turkey unit.

North Tyneside Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

There are two biomass combustion plants given planning consent. Both plants have as yet to be built and operated. One of the processes is for a bio diesel and glycerol production facility at Hayhole road, North Shields, grid reference: 434540, 566241.

The other process was submitted by Holystone Heat and Power Ltd and is to consist of a wood waste biomass combustion plant at Davy Bank, Wallsend, grid reference: 430759, 566153. Air quality assessments were provided for both proposed combustion plants that concluded that the air quality objectives would be met. There are no other biomass combustion plants given planning approval in the borough.

There is no requirement to undertake a further detailed assessment.

North Tyneside Council confirms that there are no biomass combustion plant in the Local Authority area.

6.2 Biomass Combustion – Combined Impacts

The majority of the borough of North Tyneside is a smoke control area. No new areas of domestic coal burning have been identified. The previous assessment in 2012 indicated that the percentage of solid fuel use in the borough was around 0.12% with over 96% of the borough using gas as the main heating source. This was based on approximately 47,000 homes surveyed in 2011. The most recent survey from the Homes Heating Efficiency database confirms that the percentage of solid fuel usage is still around 0.1% and the situation has not changed since the last review and assessment.

North Tyneside Council confirms that there are no biomass combustion plant in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

The majority of North Tyneside has been designated into smoke control areas, however a proportion of properties may use smokeless fuel. The most recent data available from the Homes Heating Efficiency Database confirms that solid fuel use is still around 0.1% based on a review of 73,604 properties. There is no evidence of areas within the Borough where smoke lingers over the houses during winter months. Only 34 complaints were received in 2014 regarding smoke from domestic chimney's and this indicates that there is no significant issue of solid fuel use within the Borough. Therefore the evidence indicates that there is no significant areas within the borough where the density of houses, with more than 50 houses, are using solid fuel as their primary heating source within a 500 x 500 metre square grid . There is therefore no requirement for the need to proceed with a detailed assessment for sulphur dioxide.

North Tyneside Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

Dust emissions from uncontrolled and fugitive sources have been considered. There are no quarrying or mineral extraction sites, landfill sites or major new waste management sites within the borough to consider. There are a number of small new construction sites within the borough for residential developments. One complaint was received regarding one of the construction site about potential dust nuisance from the site access roads. Investigations of the potential dust nuisance determined that best practice was being applied at the site, site haul roads were being regularly cleaned and water suppression was in use.

In conclusion no new sources or relevant exposures have been introduced since the last review and assessment.

North Tyneside Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

New monitoring data for 2014 has shown that there are no areas likely to exceed the air quality objectives in the borough of North Tyneside.

Real time monitoring has shown consistent levels well below the annual mean objective levels at the three monitoring sites for nitrogen dioxide, particulates and sulphur dioxide. There have been no exceedances of the 1 hour mean to indicate any need to proceed to a detailed assessment for nitrogen dioxide. There were three exceedances of the 24 hour mean at the Northumbrian Water, East Howdon real time monitoring site, but these are well below the permitted 35 occasions.

Monitoring with NO₂ diffusion tubes at roadside site, since 2000 initially showed a slight decline but has now levelled off to range between 20 - 35 µg/m³. The location with the highest measured concentration of 35 µg/m³ is the A19-1 which is adjacent to the A19, which is a major arterial through the borough. None of the sites recorded concentrations close to the objective level of 40 µg/m³.

No further Detailed Assessment required.

8.2 Conclusions from Assessment of Sources

No sources have been identified which are likely to cause an exceedance to require further detailed assessment or to proceed to declare an AQMA.

8.3 Proposed Actions

The Updating and Screening Assessment has not identified the need to proceed to a detailed assessment.

North Tyneside Council will continue to monitor at locations which are determined to be relevant locations of exposure to air pollutants.

The air quality assessments for newly introduced processes/installations in TG (09), such as biomass and solid fuel burning, indicated that there are no likely exceedences.

The assessment of new applications will continue to be undertaken at the planning stage with regard to the relevant guidance documentation.

North Tyneside Council will be submitting a Progress Report in 2016.

9 References

1. Department for Environment, Food and Rural Affairs, Local Air Quality Management, Technical Guidance LAQM.TG(09), DEFRA Publications.
2. North Tyneside Council, Updating and Screening Assessment 2012.
3. North Tyneside Council, Progress Reports 2011, 2013 and 2014.
4. Department of Transport, Road traffic statistics
<http://www.dft.gov.uk/traffic-counts/cp.php?la=North+Tyneside>
5. Local Air Quality Management Tools, available from Defra web site:
<http://laqm.defra.gov.uk/review-and-assessment/review-and-assessment.html>

Appendices

Appendix A: QA/QC Data


Diffusion Tube Bias Adjustment Factors

North Tyneside Council reviewed the national bias adjustment figures for the laboratory it contracts to supply and analyse the results. The supplier is Gradko. The bias adjustment factor for this supplier for 2014 is 0.91, based on 20% triethanolamine (TEA) in water and is calculated from 16 studies. The version of the spreadsheet number was 03/15.

Factor from Local Co-location Studies (if available)

North Tyneside Council have two co-location study sites, one at Sandy Lane and the other at the Northumbrian Water, East Howdon Site. The Northumbrian Water site did not achieve a full data set for the diffusion tube monthly monitoring sites, and so has not been used for the precision and accuracy. Sandy Lane, as a background location, is considered representative and gave a bias factor of 0.96 as detailed in the table below.

Checking Precision and Accuracy of Triplicate Tubes



AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	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	07/01/2014	05/02/2014	30.5	27.4	29.5	29	1.6	5	4.0	30.3	99.7	Good	Good
2	05/02/2014	05/03/2014	27.3	27.0	28.1	27	0.6	2	1.4	26.95	99.7	Good	Good
3	05/03/2014	02/04/2014	19.9	19.6	17.8	19	1.1	6	2.8	18.71	99.7	Good	Good
4	02/04/2014	30/04/2014	17.5	16.5	16.8	17	0.5	3	1.2	14.09	92.5	Good	Good
5	30/04/2014	28/05/2014	14.1	14.4	13.8	14	0.3	2	0.7	13	99.4	Good	Good
6	28/05/2014	02/07/2014	13.0	12.2	12.9	13	0.4	3	1.1	12	94.74	Good	Good
7	02/07/2014	30/07/2014	15.2	14.7	13.7	15	0.7	5	1.9	13	96.2	Good	Good
8	30/07/2014	27/08/2014	15.2	14.7	13.7	15	0.7	5	1.9	13	98.35	Good	Good
9	27/08/2014	01/10/2014	18.2	18.5	16.5	18	1.0	6	2.6	17	97.3	Good	Good
10	01/10/2014	29/10/2014	22.7	23.1	20.0	22	1.7	8	4.3	20	99.5	Good	Good
11	29/10/2014	04/12/2014	24.9	25.0	24.8	25	0.1	0	0.3	28.28	99.7	Good	Good
12	04/12/2014	07/01/2015	24.1	23.9	25.4	24	0.8	3	2.0	22.09	98.8	Good	Good
13													

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ID: **Sandy Lane NT Mobile 2**

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%

Bias calculated using 12 periods of data

Bias factor A: **0.96 (0.91 - 1.01)**

Bias B: **4% (-1% - 10%)**

Diffusion Tubes Mean: **20 μgm^{-3}**

Mean CV (Precision): **4**

Automatic Mean: **19 μgm^{-3}**

Data Capture for periods used: **98%**

Adjusted Tubes Mean: **19 (18 - 20) μgm^{-3}**

Precision 12 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval)
WITH ALL DATA

Bias calculated using 12 periods of data

Bias factor A: **0.96 (0.91 - 1.01)**

Bias B: **4% (-1% - 10%)**

Diffusion Tubes Mean: **20 μgm^{-3}**

Mean CV (Precision): **4**

Automatic Mean: **19 μgm^{-3}**

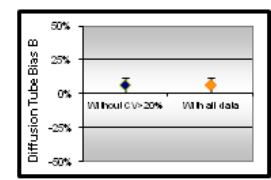
Data Capture for periods used: **98%**

Adjusted Tubes Mean: **19 (18 - 20) μgm^{-3}**

Overall survey -->

Good precision	Good Overall
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(Check average CV & DC from Accuracy calculations)



Jaume Targa, for AEA
Version 04 - February 2011

Discussion of Choice of Factor to Use

It was considered more representative to use the co-location site at Sandy Lane for the bias adjustment, even though the bias factor was marginally higher at the co-location site than that calculated for the national bias adjustment factor. However, both the national bias adjustment factor and the co-location site gave similar bias adjustment factors and it is considered that using either would result in a negligible difference in the final NO₂ mean values presented within the report.

QA/QC of Diffusion Tube Monitoring

Gradko Laboratory participate in the Workplace Analysis Scheme for Proficiency (WASP) and for the period January to March 2014, received a 100% rating.