



# 2009 Air Quality Updating and Screening Assessment for *North Somerset District Council*

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

30 April 2009

<b>Local Authority Officer</b>	Mr P Gendle
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<b>Department</b>	Development and Environment
<b>Address</b>	Oxford Street, Weston-super-Mare BS231TG
<b>Telephone</b>	01934 634839
<b>e-mail</b>	peter.gendle@n-somerset.gov.uk

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## **Executive Summary**

This is the fourth round of review and assessment beginning with a further Updating and Screening Assessment (USA). The focus of this USA is to report on changes to emissions, relevant exposures, new monitoring sites and identification of specific locations that may need further investigation.

Road transport is the main source of local pollution in the district, whilst industrial emissions have declined with the closure of some businesses.

Air quality objectives for the main pollutants identified in the 2007 and 2008 Progress Reports, especially Nitrogen Dioxide, PM<sub>10</sub> and Benzene are still not being challenged with no exceedences at any relevant location within North Somerset.

Therefore no Detailed Assessments are currently required.

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# 1 Introduction

## 1.1 Description of Local Authority Area

### The Natural Environment

North Somerset is a mixture of high and low landscapes with distinctive features such as the Mendip Hills and the Tickenham Ridge contrasting with lowlands, levels, wetlands and rhynes around Clevedon and Nailsea. The physical geography of the area and the prevailing westerly wind from the Bristol Channel enables rapid dispersion of pollutants.

The population of the area is now well over 200,000 inhabitants with the majority living in Clevedon, Nailsea, Portishead and Weston-Super-Mare.

### Road and Rail Network

The district is relatively well served with regards to transport links. The M5 bisects the area with most of the population living within 15 minutes of one of the three motorway junctions. The main railway line from the South West to the North and East bisects the area. There are also regular services between Bristol and Weston with intermediate stops on route.

The major 'A' roads in the area are the A38, A369 and A370 all carrying heavy commuter traffic at peak times mainly to Bristol. There is one park and ride scheme operating from Long Ashton.

### Bristol Airport

The location and elevation of the airport is an important factor in the rapid dilution of pollutants arising from use of the airport. There is currently only one major 'A' road, the A38, serving the airport with traffic numbers having a relatively small air quality impact even with a significant increase in passenger numbers since 2001 following the opening of the new terminal and related facilities. Further airport expansion and increases in passenger levels are anticipated over the next years.

## 1.2 Purpose of 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.

## 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. This table shows the objectives in units of microgrammes per cubic metre  $\mu\text{g}/\text{m}^3$  (milligrammes per cubic metre,  $\text{mg}/\text{m}^3$  for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

## North Somerset District Council - England

**Table 1 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.**

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
<b>Benzene</b>	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
<b>1,3-Butadiene</b>	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
<b>Carbon monoxide</b>	10.0 $\text{mg}/\text{m}^3$	Running 8-hour mean	31.12.2003
<b>Lead</b>	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
<b>Nitrogen dioxide</b>	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
<b>Particles (PM<sub>10</sub>) (gravimetric)</b>	50 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
<b>Sulphur dioxide</b>	350 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

## 1.4 Summary of Previous Review and Assessments

Round 1	Date	Procedure
	December 1998	First complete review and assessment as an initial Stage 1 review and assessment
	October 2000	Completion of Stage 2 First review and assessment
	September 2001	Further review and assessment of identified 'hotspots'
	November 2001	Stage 3 draft report Proposed AQMA – Banwell Village
	February 2002	Stage 4 (further monitoring) and confirmation of AQMA – Banwell Village
<b>Round 2</b>	February 2003	Updating and Screening assessment Revocation of AQMA, June 2003 – Banwell Village
	March 2004	Progress Report, no further action
	March 2005	Progress Report, no further action
<b>Round 3</b>	March 2006	Updating and Screening assessment, no further action
	March 2007	Progress Report, no further action
	March 2008	Progress Report, no further action

### Outcome of last Updating and Screening Assessment 2006

The last USA indicated that no exceedences of the objectives for:-

- 1, 3 Butadiene
- Carbon Dioxide
- Lead
- Sulphur Dioxide
- Benzene

Nitrogen Dioxide

- For the majority of relevant locations in North Somerset there were no exceedences of the objective. Only junction 21 (Weston-super-Mare) on the M5 motorway had an annual mean above 40 ug/m<sup>3</sup>

Bristol International Airport

- Air Quality measured on the roads around the airport site did not exceed the objectives for Benzene, Nitrogen Dioxide and PM<sub>10</sub>.

## **2 New Monitoring Data**

### **2.1 Summary of Monitoring Undertaken**

#### **2.1.1 Automatic Monitoring Sites**

North Somerset Council does not carry out automatic monitoring.

#### **2.1.2 Non-Automatic Monitoring**

Currently North Somerset operates 40 diffusion tubes for the sampling of nitrogen dioxide. At 31 of these locations the monitoring also includes BTX diffusion tubes for measuring benzene concentrations.

The full site identifications are listed in Table 2, with sites 2,11,13,15,19,22,24,26,27,34, 36-39 classified as worst case locations.

There are currently no Air Quality Management Areas (AQMA's) within the district.

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**Table 2 Location of Nitrogen Dioxide and Benzene Diffusion Tubes**

<b>Site No</b>	<b>Site Name</b>	<b>OS Grid Ref</b>	<b>Site type</b>	<b>Pollutants monitored</b>	<b>Dist. to kerb of nearest road (m)</b>
1	Long Ashton Park & Ride (A370)	X 356169 Y 171227	B	NO <sub>2</sub> Benzene	11
2	Portbury (Priory Road)	X 349760 Y 175470	R	NO <sub>2</sub>	4
3	Clevedon M5 Roundabout (Junc 20)	X 341623 Y 170589	K	NO <sub>2</sub> Benzene	2
4	Ham Green, St Katherines School	X 353070 Y 175103	B	NO <sub>2</sub> Benzene	NA
5	Pill (Railway Line)	X 352379 Y 176021	B	NO <sub>2</sub> Benzene	NA
6	Portishead , High Street	X 346719 Y 176320	R	NO <sub>2</sub> Benzene	5
7	Portbury M5 (Junc 19)	X 349781 Y 175420	R	NO <sub>2</sub> Benzene	6
8	Bristol Airport (A38)	X 351210 Y 165328	R	NO <sub>2</sub>	8
9	Felton Primary School	X 351327 Y 165523	R	NO <sub>2</sub> Benzene	8
10	Downside Road (Homelea)	X 350928 Y 165723	B	NO <sub>2</sub> Benzene	20
11	Downside Road (Top 8)	X 351092 Y 165875	K	NO <sub>2</sub> Benzene	3
12	Nailsea, Link Road	X 347599 Y 170899	R	NO <sub>2</sub> Benzene	5
13	Yatton, High Street	X 343353 Y 165440	R	NO <sub>2</sub> Benzene	4
14	St Annes School (A370)	X 339748 Y 164207	R	NO <sub>2</sub> Benzene	4
15	Abbots Leigh	X 354326 Y 173541	K	NO <sub>2</sub> Benzene	2
16	Sheepway	X 349609 Y 175648	R	NO <sub>2</sub>	4
17	Backwell (A370)	X 348695 Y 168580	R	NO <sub>2</sub> Benzene	5
18	Churchill (A38)	X 344772 Y 159716	R	NO <sub>2</sub> Benzene	5
19	Congresbury Cross (A370)	X 343 725 Y 163850	R	NO <sub>2</sub> Benzene	3
20	Congresbury , High Street	X 343825 Y 163709	R	NO <sub>2</sub>	3
21	Congresbury, Smallway	X 343733 Y 164122	R	NO <sub>2</sub>	3
	<b>WESTON - SUPER - MARE</b>				
22	High Street	X 331960 Y 161253	R	NO <sub>2</sub> Benzene	4
23	The Boulevard	X 332209 Y 161693	R	NO <sub>2</sub>	4
24	M5 Roundabout (Junc 21)	X 337825 Y 162560	K	NO <sub>2</sub> Benzene	2
25	Locking Road	X 334093 Y 161596	R	NO <sub>2</sub> Benzene	4
26	Herulin Way	X 334495 Y 161263	K	NO <sub>2</sub> Benzene	2
27	Winterstoke Road	X 333297 Y 160497	R	NO <sub>2</sub> Benzene	4
28	Worle Parkway	X 336632 Y 162648	R	NO <sub>2</sub> Benzene	4
29	Willow Close ( M5 Junc 21)	X 337610 Y 162706	R	NO <sub>2</sub> Benzene	4
30	The Drive	X 332919 Y 161713	B	NO <sub>2</sub>	9
31	Bedford Road	X 332429 Y 159898	B	NO <sub>2</sub> Benzene	12
32	Somerset Avenue	X 336852	K	NO <sub>2</sub>	2

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		Y162114		Benzene	
33	Locking Camp	X 337639 Y 159580	R	NO <sub>2</sub> Benzene	4
	<b>BANWELL VILLAGE</b>				
34	Pedestrian Crossing	X 339701 Y 169176	K	NO <sub>2</sub>	1
35	Primary School	X 339705 Y 159169	R	NO <sub>2</sub> Benzene	4
36	A Vicker (shop)	X 339774 Y 159169	K	NO <sub>2</sub> Benzene	2
37	Lp. 13 Junc Wovershill Road	X 339566 Y 159222	K	NO <sub>2</sub> Benzene	2
38	Lp. 3 East Street	X 339975 Y 159059	K	NO <sub>2</sub> Benzene	2
39	The Gables	X 339542 Y 159226	K	NO <sub>2</sub> Benzene	2
40	Bowling Green	X 339877 Y 159155	B	NO <sub>2</sub> Benzene	16

Site type

B – background

K – kerbside

R - roadside

**Table 3 Nitrogen Dioxide, Diffusion Tube Results 2008**

**Annual Mean Concentrations (ug/m<sup>3</sup>)**

<b>Site No</b>	<b>Site Name</b>	<b>Data Capture 2008(%)</b>	<b>Annual Mean Concentration 2008 (ug/m<sup>3</sup>) adjusted for bias</b>
1	Long Ashton Park & Ride (A370)	100	22.6
2	Portbury (Priory Road)	100	27.9
3	Clevedon M5 Roundabout (Junc 20)	100	<b>40.1</b>
4	Ham Green, St Katherines School	100	20.2
5	Pill (Railway Line)	92	21.4
6	Portishead, High Street	92	22.9
7	Portbury M5 (Junc 19)	92	20.3
8	Bristol Airport (A38)	92	27.5
9	Felton Primary School	100	17.7
10	Downside Road (Homelea)	100	28.1
11	Downside Road (Top 8)	100	28.2
12	Nailsea, Link Road	92	28.2
13	Yatton, High Street	92	21.1
14	St Annes School (A370)	100	32.4
15	Abbots Leigh	100	36.0
16	Sheepway	100	25.3
17	Backwell (A370)	92	21.1
18	Churchill (A38)	100	25.9
19	Congresbury Cross (A370)	100	26.8
20	Congresbury, High Street	100	26.9
21	Congresbury, Smallway	67	20.0
	<b>WESTON-S-MARE</b>		
22	High Street	100	31.7
23	The Boulevard	83	31.6
24	M5 Roundabout (Junc 21)	100	<b>56.2</b>
25	Locking Road	100	32.7
26	Herulin Way	100	31.7
27	Winterstoke Road		27.7
28	Worle Parkway	100	26.8
29	Willow Close (M5 Junc 21)	100	26.5
30	The Drive	100	16.3
31	Bedford Road	100	19.2
32	Somerset Avenue	100	20.2
33	Locking Camp	92	26.8
	<b>BANWELL VILLAGE</b>		
34	Pedestrian Crossing	92	28.7
35	Primary School	83	19.4
36	A Vicker (shop)	100	36.7
37	Lp 13 Junc Wolvershill Road	92	26.7
38	Lp 3 East Street	100	24.4
39	The Gables	100	26.9
40	Bowling Green	92	16.1

## **2.2 Comparison of Monitoring Results with AQ Objectives**

### **2.2.1 Nitrogen Dioxide**

<p style="text-align: center;"><b>Relevant NO<sub>2</sub> Objectives</b></p> <p style="text-align: center;"><b>Hourly mean</b></p> <p style="text-align: center;">UK objective to be achieved by 31 December 2005 (&lt;18 times a year): 200ug/m<sup>3</sup> EU objective to be achieved by 31 December 2010 (&lt;18 times a year): 200ug/m<sup>3</sup></p> <p style="text-align: center;"><b>Annual mean</b></p> <p style="text-align: center;">UK Limit Value to be achieved by 31 December 2005:40ug/m<sup>3</sup> EU Limit Value to be achieved by 31 December 2010:40ugm<sup>3</sup></p>
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There are two objectives given for nitrogen dioxide; one is for the annual mean concentration of 40 ug/m<sup>3</sup> and the other is for a one hour mean concentration of 200 ug/m<sup>3</sup> not to be exceeded more than 18 times a year. Both of these objectives should have been achieved by 2005.

The annual mean objective should be applied to any location where members of the public might be regularly exposed such as building facades of residential properties, schools and hospitals etc. The one hour mean objective should be applied to any outdoor locations where members of the public could be exposed to the pollutant for one hour or more e.g. the facades of residential and other long-stay buildings and pavements on busy shopping streets.

Bias corrected values for 2008, Table 3, indicate all locations in North Somerset apart from the two M5 motorway junction roundabouts at 20 and 21 had levels below or well below the 40 ug/m<sup>3</sup> objective. In the case of junction 20 the nearest receptor is 85 metres away likewise at junction 21 the nearest receptor property in Willow Close is at a distance of over 150 metres. Therefore both sites require no further assessment.

Nitrogen Dioxide values in Banwell village again show elevated levels, especially at the A Vicker (shop location) 'pinch point', however they have not exceeded the objective in 2008 with background levels of pollutant being found at the Bowling Green site which is only 16 metres away.

In the 2006 USA we reported that the only road junction in North Somerset with the potential for more than 10,000 vehicles per day and with relevant exposures within 10 metres of the kerb was the junction of Searle Crescent with Winterstoke Road/Herulin Way (A370) leaving Weston-s-Mare. Monitoring was initiated at site no. 27 (Table 4) with results for 2007 and 2008 giving bias adjusted nitrogen dioxide values of 26.5 and 27.7 ug/m<sup>3</sup> respectively, well below the objective.

### **2.2.2 Annual Mean Nitrogen Dioxide 2004 - 2008**

The 5 year comparison data, Table 4, indicates that the majority of monitoring sites appear to have shown only minimal changes in levels of nitrogen dioxide measured over the period, with levels well below the 40 ug/m<sup>3</sup> objective. Most likely, variations in meteorological conditions are the cause of these fluctuations.

Again the highest pollutant values are found on the main commuter routes leading to Bristol, the roads accessing Junctions 20 and 21 of the M5 motorway and where regular congestion occurs such as Congresbury Cross. Monitoring carried out on the roads around the airport at site nos. 8,9,10 and 11 (Table 4) shows no exceedences of the objective.

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**Table 4 Nitrogen Dioxide, Diffusion Tube Results 2006 -2008  
Annual Mean Concentrations (ug/m<sup>3</sup>), all adjusted for bias**

Site No	Site Name	2004	2005	2006	2007	2008
1	Long Ashton Park & Ride (A370)	18.6	22.0	21.1	18.8	22.6
2	Portbury (Priory Road)	nt	nt	25.4	26.6	27.9
3	Clevedon M5 Roundabout (Junc 20)	34.9	35.5	36.4	30.9	<b>40.1</b>
4	Ham Green, St Katherines School	18.4	19.2	18.6	19.3	20.2
5	Pill (Railway Line)	21.4	24.4	26.5	21.4	21.4
6	Portishead, High Street	18.4	22.3	21.6	22.4	22.9
7	Portbury M5 (Junc 19)	31.8	32.8	31.1	32.6	28.8
8	Bristol Airport (A38)	20.3	23.0	22.6	20.6	20.3
9	Felton Primary School	22.3	26.7	25.3	23.5	27.5
10	Downside Road (Homelea)	13.7	16.7	16.7	17.6	17.7
11	Downside Road (Top 8)	25.5	23.3	26.5	24.6	28.1
12	Nailsea, Link Road	22.5	25.5	21.5	24.5	28.2
13	Yatton, High Street	22.0	23.4	22.7	19.0	21.1
14	St Annes School (A370)	23.9	28.1	31.2	28.1	32.4
15	Abbots Leigh	27.8	29.1	33.9	31.5	36.0
16	Sheepway	nt	nt	23.4	23.0	25.3
17	Backwell (A370)	19.7	23.0	22.4	20.6	21.1
18	Churchill (A38)	23.3	26.6	28.9	27.2	25.9
19	Congresbury Cross (A370)	20.0	33.2	30.6	27.4	26.9
20	Congresbury, High Street	nt	nt	nt	27.5	26.9
21	Congresbury, Smallway	nt	nt	nt	25.8	20.0
	<b>WESTON-S-MARE</b>					
22	High Street	25.1	29.5	29.0	29.9	31.7
23	The Boulevard	25.3	26.7	28.3	26.6	31.6
24	M5 Roundabout (Junc 21)	<b>41.8</b>	<b>48.3</b>	<b>50.0</b>	<b>49.3</b>	<b>56.2</b>
25	Locking Road	23.7	25.5	27.7	24.8	32.7
26	Herulin Way	27.4	29.7	33.4	30.7	31.7
27	Winterstoke Road	nt	nt	nt	26.5	27.7
28	Worle Parkway	22.8	22.8	27.8	28.9	26.8
29	Willow Close (M5 Junc 21)	20.5	28.7	21.9	20.6	26.5
30	The Drive	15.2	22.8	16.7	14.9	16.3
31	Bedford Road	14.8	17.2	16.1	15.1	19.2
32	Somerset Avenue	18.7	21.2	19.3	18.4	20.2
33	Locking Camp	25.4	27.6	28.0	26.4	26.8
	<b>BANWELL VILLAGE</b>					
34	Pedestrian Crossing	23.2	33.1	31.1	29.9	28.7
35	Primary School	22.6	18.0	28.3	20.2	19.4
36	A Vicker (shop)	24.6	33.9	30.5	32.1	36.7
37	Lp 13 Junc Wolverhill Road	nt	nt	nt	nt	26.7
38	Lp 3 East Street	nt	nt	nt	nt	24.4
39	The Gables	nt	31.9	29.4	30.1	26.9
40	Bowling Green	15.0	18.4	15.7	14.7	16.1

**Bias adjustment for individual years**

2004 - 0.96, 2005 - 1.10, 2006 - 0.90, 2007 - 0.73, 2008 - 0.87

nt = not tested

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### 2.1.3 PM<sub>10</sub>

<p style="text-align: center;"><b>Relevant PM<sub>10</sub> Objectives</b> <b>24-hour mean</b> Provisional UK objective to be achieved by 31 December 2010 (&lt; 7 times a year); 50 ug/m<sup>3</sup> <b>Annual mean</b> UK objective to be achieved by 31 December 2004: 40 ug/m<sup>3</sup> Provisional UK objective to be achieved by 31 December 2010: 20 ug/m<sup>3</sup></p>
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North Somerset Council does not carry out any automatic monitoring for particulate.

The greatest source of PM<sub>10</sub> emissions in the district is from road traffic. The previous USA and the last two Progress Reports (2007 and 2008) indicated that the PM<sub>10</sub> objectives are unlikely to be exceeded at any location. Primary PM<sub>10</sub> data contained on the UK Air Quality Archive ([www.airquality.co.uk/archive](http://www.airquality.co.uk/archive)) background maps and projections for future years indicate that values of between 15-20 mg/m<sup>3</sup> are currently found. Three quarry sites continue to operate, however there are no relevant human exposures within 400 metres of any quarry site. Any other fugitive sources emanating from agricultural operations in this or adjoining districts will have negligible input on local air quality.

No Biomass combustion plants are currently operating.

As there are no other major PM<sub>10</sub> sources or known 'hot spots' we can assume levels across the remainder of North Somerset are within the objectives.

### 2.1.4 Sulphur Dioxide

Sulphur is monitored at two locations within North Somerset, at Nailsea and Portishead using diffusion tubes. The mean values for 2008 were 1.9 ug/m<sup>3</sup> and 2.2 ug/m<sup>3</sup> respectively well within the objective.

### 2.1.5 Benzene

<p style="text-align: center;"><b>Relevant Benzene Objective</b> UK running annual mean to be achieved by 31 December 2003: 6.25 ug/m<sup>3</sup> UK running annual mean to be achieved by 31 December 2010: 5 ug/m<sup>3</sup></p>
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Again the majority of this pollutant arises from traffic sources. Benzene is monitored locally at 31 sites using BTX diffusion tubes. These sites and their designation, whether background, roadside and kerbside are listed in Table 2. Measurements of pollutant in 2008, Table 5, show there are no annual exceedences of the current objective of 5ug/m<sup>3</sup> and already meet the 2010 objective.

Forward projections to 2010 indicate that concentrations will fall further and continue at that level.

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**Table 5 Benzene, Diffusion Tube Results 2008  
Annual Mean Concentrations (ug/m<sup>3</sup>)**

<b>Site No</b>	<b>Site Name</b>	<b>Data Capture 2008(%)</b>	<b>Annual Mean Concentration 2008 (ug/m<sub>3</sub>)</b>
1	Long Ashton Park & Ride (A370)	100	0.9
2	Portbury (Priory Road)	nt	nt
3	Clevedon M5 Roundabout (Junc 20)	92	0.7
4	Ham Green, St Katherines School	100	0.9
5	Pill (Railway Line)	100	0.7
6	Portishead, High Street	92	1.0
7	Portbury M5 (Junc 19)	100	0.8
8	Bristol Airport (A38)	nt	nt
9	Felton Primary School	100	0.8
10	Downside Road (Homelea)	100	0.8
11	Downside Road (Top 8)	100	0.9
12	Nailsea, Link Road	100	1.0
13	Yatton, High Street	nt	nt
14	St Annes School (A370)	100	0.8
15	Abbots Leigh	100	0.8
16	Sheepway	nt	nt
17	Backwell (A370)	92	0.7
18	Churchill (A38)	100	0.8
19	Congresbury Cross (A370)	92	0.8
20	Congresbury, High Street	nt	nt
21	Congresbury, Smallway	nt	nt
	<b>WESTON-SUPER-MARE</b>		
22	High Street	100	1.1
23	The Boulevard	nt	nt
24	M5 Roundabout (Junc 21)	100	0.8
25	Locking Road	100	1.2
26	Herulin Way	100	1.1
27	Winterstoke Road	100	1.0
28	Worle Parkway	100	1.1
29	Willow Close (M5 Junc 21)	100	0.8
30	The Drive	nt	nt
31	Bedford Road	100	0.8
32	Somerset Avenue	100	0.8
33	Locking Camp	92	0.6
	<b>BANWELL VILLAGE</b>		
34	Pedestrian Crossing	nt	nt
35	Primary School	100	1.1
36	A Vicker (shop)	75	1.0
37	Lp 13 Junc Wolvershill Road	83	0.8
38	Lp 3 East Street	100	0.8
39	The Gables	100	1.0
40	Bowling Green	83	0.7

nt = not tested

## ***North Somerset District Council - England***

### **2.1.6 Ozone**

In 2008, monitoring of ozone using diffusion tubes continued at two locations, on the Bristol Airport boundary, namely Downside Road and at Churchill village on the A38 close to the junction of the A368.

Ozone levels over 2008, although not directly comparable with the running 8-hour mean of  $100\mu\text{g}/\text{m}^3$ , gave annual mean values of  $80.3\mu\text{g}/\text{m}^3$  on Downside Road and  $85.4\mu\text{g}/\text{m}^3$  in Churchill, indicating there were no major pollution incidents.

### 3 Road Traffic Sources

#### 3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

There are no newly identified congested streets meeting this criteria not previously assessed.

North Somerset 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.

**DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.**

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

There are no newly identified streets meeting this criteria not previously assessed.

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

**DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.**

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

As previously reported in 2006 there are no roads in the district with greater than 20% buses and/or heavy duty vehicles.

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

**DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.**

#### 3.4 Junctions

As previously reported in 2006 there are no new/newly identified road junctions with traffic flows in excess of 10,000 vehicles a day.

North Somerset Council confirms that there are no new/newly identified busy junctions/busy roads.

**DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.**

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

Since the previous round of review and assessment no new/proposed roads have been constructed. All new residential/ industrial construction has mostly stopped across the district.

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

***DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.***

### **3.6 Roads with Significantly Changed Traffic Flows**

No existing or newly identified roads with traffic flows of more than 10,000 vehicles a day have shown a 25% increase since the last round of review and assessment.

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

***DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.***

### **3.7 Bus and Coach Stations**

No bus stations located within North Somerset.

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

***DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.***

## 4 Other Transport Sources

### 4.1 Airports

Passenger numbers using the airport were recorded at 6.3 million in 2008. The technical guidance (TG 09) relating to airports has been revised. There is no longer a requirement to carry out a USA for PM10 and the threshold for NO<sub>2</sub> assessment starts at 10 million passengers per annum. Background pollution levels of NO<sub>2</sub> obtained from the NETCEN web site indicate that for the airport and surrounding area a mean background concentration of 15ug/m<sup>3</sup> is measured.

In addition the airport's own air quality assessment for 2004 and 2019, part of their master plan, includes a modelled assessment of NO<sub>x</sub> contributions at 6 receptor sites close to the stand area and access roads. These values when converted to give annual average NO<sub>2</sub> indicate levels well within the objective.

Furthermore, the council has a long term monitoring programme, again using diffusion tubes, at 4 receptors – namely the A38 (a roadside site on the approach to the airport), Felton School (roadside) and Downside Road (kerbside and background sites).

All these locations are measuring NO<sub>2</sub> annual mean concentrations all below the objective (Table 3).

No detailed assessment for this pollutant is required.

### 4.2 Railways (Diesel and Steam Trains)

The only train movements that need to be assessed in North Somerset are those using the line that leads from Portbury dock, trains are normally loaded. This is not a passenger line.

#### 4.2.1 Stationary Trains

There are no locations where individuals would have regular outdoor exposure within 15 m of a line.

North Somerset 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.

**DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.**

#### 4.2.2 Moving Trains

Monitoring for NO<sub>2</sub> (Table 4) adjacent to the line in the village of Pill continues to give measurements below the nitrogen dioxide objective over the last five years, therefore no further assessment is required.

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

**DELETE THIS BOX IF NOT APPLICABLE, OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE**

## **4.3 Ports (Shipping)**

Shipping (ships entering the dock to unload or load cargoes) at Portbury dock in 2008 numbered 805 in, 805 out. This is data provided by the Bristol Port Company and is well below the 5000 movements baseline to initiate a Detailed Assessment.

Currently trade through the port is down around 30% compared to 2008. Consequently lorry traffic numbers in the area around junction 19 of the M5 motorway has also shown a noticeable drop.

## 5 Industrial Sources

### 5.1 Industrial Installations

#### 5.1.1 New or Proposed Installations for which an Air Quality Assessment has been carried out

No new industrial installations have started operation since the last Review and Assessment was carried out.

North Somerset 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.

**DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.**

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

Existing installations, in particular Part B processes have declined slightly in number since the last USA. Currently some sites, in particular those carrying out cement/mineral processes are on short time working or have been become 'dormant' due to the economic downturn. Therefore all emissions across the industrial sector (whether Part A or B's) have diminished.

North Somerset 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.

**DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.**

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

As above there are no new or significantly changed installations that impact on air quality.

North Somerset 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.

**DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.**

## **5.2 Major Fuel (Petrol) Storage Depots**

There are no major overground fuel storage depots of this type in North Somerset.

North Somerset Council confirms that there are no major fuel storage sites.

**DELETE BOX IN NOT APPLICABLE. OTHERWISE ADD LOCAL: AUTHORITY NAME AND LEAVE IN**

## **5.3 Petrol Stations**

There are no new petrol stations with a throughput of more than 2000 m<sup>3</sup> (2 million litres per annum) since the previous USA.

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

**DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.**

## **5.4 Poultry Farms**

There are three poultry farms in North Somerset however none of these site come close to meeting the specified criteria.

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

**DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.**

## 6 Commercial and Domestic Sources

### 6.1 Biomass Combustion – Individual Installations

Currently no biomass plants operate in North Somerset.

North Somerset Council confirms that there are no biomass combustion plants in the Local Authority area.

***DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.***

### 6.2 Biomass Combustion – Combined Impacts

As above no biomass combustion plants are operating in North Somerset.

North Somerset Council confirms that there are no biomass combustion plants in the Local Authority area.

***DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.***

### 6.3 Domestic Solid-Fuel Burning

There are no significant areas of domestic coal burning (areas of 500x500m) with a density of more than 100 houses in North Somerset. The predominant form of heating is either by gas or oil systems.

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

***DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.***

## **7 Fugitive or Uncontrolled Sources**

There are no new locations in North Somerset not covered by previous reviews and assessment with relevant exposures (within 1000m) of a fugitive or uncontrolled dust source.

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

***DELETE BOX IF NOT APPLICABLE. OTHERWISE ADD LOCAL AUTHORITY NAME AND LEAVE IN.***

## **8 Conclusions and Proposed Actions**

### **8.1 Conclusions from New Monitoring Data**

- There were only two locations where the nitrogen dioxide annual means exceeded the objective, these being on the roundabouts of junctions 20 and 21 of the M5 motorway at Clevedon and Weston-super-Mare. The nearest receptors to these locations are also a considerable distance away (85 and 150 meters respectively), therefore no further assessment is required.
- In Banwell no site exceeded the nitrogen dioxide annual objective.
- All locations measuring Benzene were again well within the annual objective.
- No AQMA needs to be introduced in any part of the district.

### **8.2 Conclusions from Assessment of Sources**

- No public, commercial or industrial site is having an adverse effect on North Somerset's air quality.
- As new residential and commercial development is at a standstill in addition to other industrial sites having significantly lower production, overall air quality is very good.
- In some parts of the district there have been noticeable decreases in traffic numbers servicing commercial and industrial locations, therefore there may be enhanced air quality in the short term especially at sites supplying the construction industry.
- All Benzene monitoring sites already meet the 2010 objective of 5ug/m<sup>3</sup>.
- At present the roads surrounding Bristol International Airport meet the air objectives for benzene, nitrogen dioxide and PM<sub>10</sub>.
- All other pollutants included in the Air Quality Strategy 2007 meet their respective compliance dates already. This situation is very unlikely to change.

### **8.3 Proposed Actions**

- No Detailed Assessments are required
- No AQMA's need to be put in place
- The next course of action will be to submit a Progress Report in 2010.

## **9 References**

%	per cent
<	less than
>	more than
AEAT	AEA Technology
AQMA	Air Quality Management Area
Defra	Department for the Environment, Food and Rural Affairs
Gravimetric Quantitative	- analysis in which the desired constituent is determined by weight
LAPPC	Local Authority Pollution Prevention and Control
LAQM.TG(09)	– Technical Guidance, Local Air Quality Management, February 2009
LAQM	Local Air Quality Management
mppa	Million Passengers Per Annum
NAEI	National Atmospheric Emissions Inventory
NAQS	National Air Quality Strategy
NETCEN	National Environmental Technology Centre
NO	Nitrogen monoxide (nitric oxide)
NO <sub>2</sub>	Nitrogen dioxide
NO <sub>x</sub>	Nitrogen oxides (NO + NO <sub>2</sub> )
Part A1	An industrial process regulated by the Environment Agency
Part A2 and Part B	- Industrial processes regulated by Local Authority
PM10	Particulate matter less than 10 microns in diameter
ppb	parts per billion
ppm	part per million
SO <sub>2</sub>	Sulphur dioxide
USA	Updating and Screening Assessment
WASP	Workplace Analysis Scheme for Proficiency



# Appendix A: QA/QC Data

## Diffusion Tube Bias Adjustment Factors

Nitrogen Dioxide tubes were supplied and analysed by Bristol Scientific Services (BSS), Tubes were prepared using 50ul of 20% triethanolamine in water. The tube preparation and subsequent analysis followed the procedures in the harmonised 'Practical Guidance' document.

## Factor from Local Co-location Studies (if available)

No co-location study was undertaken in North Somerset

## Discussion of Choice of Factor to Use

It had been recommended by AEA that bias adjustment factors are obtained either from our own data, or from [www.uwe.ac.uk/aqm/review](http://www.uwe.ac.uk/aqm/review) site that includes field comparison data, published by Air Quality Consultants on behalf of Defra as below.

On this basis the national 'field comparison' bias adjustment was chosen.

Laboratory	Method	Year	Overall Factor (field studies)	Bias Adjustment
Bristol SS	20%TEA in water	2005	6 studies	1.05
Bristol SS	20%TEA in water	2006	6 studies	0.90
Bristol SS	20% TEA in water	2007	5 studies	0.77
Bristol SS	20% TEA in water	2008	4 studies	0.87

## PM Monitoring Adjustment

No particulate monitoring was undertaken.

## QA/QC of diffusion tube monitoring.

### WASP Results Lab 152 Round 97 onwards (Bristol Scientific Services):

Round	97	98	99	100	101	102	103	104
Tube 1(ug NO <sub>2</sub> )	0.890	1.865	2.085	1.385	0.949	1.489	1.178	1.179
Tube 2 (ug NO <sub>2</sub> )	1.573	1.228	2.093	1.474	2.576	1.431	0.916	1.108
Tube 3 (ug NO <sub>2</sub> )	1.582	1.857	0.885	1.354	1.813	2.307	0.934	1.840
Tube 4 (ug NO <sub>2</sub> )	0.914	1.217	0.879	1.467	0.914	1.960	1.071	1.960
Spike tube 1 (ug NO <sub>2</sub> )	0.890	1.830	2.150	1.360	0.920	1.370	1.220	1.220
Spike tube 2 (ug NO <sub>2</sub> )	1.580	1.190	2.150	1.470	1.860	1.370	0.940	1.220
Spike tube 3 (ug NO <sub>2</sub> )	1.580	1.830	0.840	1.360	1.860	2.280	0.940	2.020
Spike tube 4 (ug NO <sub>2</sub> )	0.890	1.190	0.840	1.470	0.920	2.280	1.220	2.020
Standardised result tube 1	1.000	1.090	0.970	0.999	1.032	1.087	0.966	0.966
Standardised result tube 2	0.966	1.032	0.973	1.003	1.385	1.045	0.974	0.980
Standardised result tube 3	1.001	1.015	1.054	0.996	0.975	1.012	0.994	0.911
Standardised result tube 4	1.027	1.023	1.046	0.998	0.993	0.860	0.878	0.970
Performance index	1.87	5.29	16.61	0.08	374.65	73.42	41.98	45.95
Rolling Performance index (NOT best of 4 out of 5)				5.96	99.16	116.19	122.53	134.00
Rolling Performance index (best 4 out of 5)				5.96	5.96	23.85	33.02	40.36
Performance classification (criteria from April 2009)				Good	Good	Good	Good	Good

Good = <56.25    Acceptable = <225    Unacceptable = >225

# Appendix B: DMRB Calculations

DMRB calculations were not necessary in this review and assessment as there were no new/newly identified roads, road junctions or significantly changed traffic flows.

## Input Data

Location/ Receptor	Grid Ref	Background Concentrations			
		Year	NOx	NO <sub>2</sub>	PM <sub>10</sub>
A		2008			
B		2008			
C					

Location/ Receptor	Link number	Distance from link centre to receptor (m)	Traffic flow & speed		Traffic composition		
			AADT (combined, veh/day)	Annual average speed (km/h)	Road type (A,B,C,D)	Total % LDV (<3.5t GVW)	Total % HDV (>3.5t GVW)
A	1						
	2						
	3						
	4						
B	1						
	2						
	3						
	4						

## Verification

Provide full details of model verification, including measured and modelled results, and verification factors applied. Information about model verification is available in LAQM.TG(09) Annex 3, Box A3.6. Currently the verification should focus on the road contribution to nitrogen oxides.

**DELETE THIS INSTRUCTION BOX BEFORE SUBMITTING THE REPORT.**

## Results

The methodology for using the DMRB is described in a Note available on the website [www.airquality.co.uk/archive/laqm/tools.php](http://www.airquality.co.uk/archive/laqm/tools.php)

A suggested table layout for presenting your DMRB results is provided below.  
**DELETE THIS INSTRUCTION BOX BEFORE SUBMITTING THE REPORT.**

Location/ Receptor	Name	Year	Total NO <sub>x</sub> <sup>1</sup>	Rd NO <sub>x</sub> <sup>2</sup>	Adj Rd NO <sub>x</sub> <sup>3</sup>	Adj Total NO <sub>x</sub> <sup>4</sup>	Adj Rd NO <sub>2</sub> <sup>5</sup>	Adj Total NO <sub>2</sub> <sup>6</sup>	PM <sub>10</sub>	
			Annual mean µg/m <sup>3</sup>	Annual mean µg/m <sup>3</sup>	Annual mean µg/m <sup>3</sup>	Annual mean µg/m <sup>3</sup>	Annual mean µg/m <sup>3</sup>	Annual mean µg/m <sup>3</sup>	Annual mean µg/m <sup>3</sup>	Annual mean µg/m <sup>3</sup>

<sup>1</sup> Total NO<sub>x</sub> = direct from DMRB local output sheet

<sup>2</sup> Rd NO<sub>x</sub> = Total NO<sub>x</sub> – Background NO<sub>x</sub>

<sup>3</sup> Adj Rd NO<sub>x</sub> = Rd NO<sub>x</sub> x verification factor (state verification factor used)

<sup>4</sup> Adj Total NO<sub>x</sub> = Adj Rd NO<sub>x</sub> + Background NO<sub>x</sub>

<sup>5</sup> Adj Rd NO<sub>2</sub> = from NO<sub>x</sub> to NO<sub>2</sub> calculator (available LAQM Tools)

<sup>6</sup> Adj Total NO<sub>2</sub> = Adj Rd NO<sub>2</sub> + Background NO<sub>2</sub>

## Maps of Locations

For locations where results are close to any objective, please provide maps of the area indicating modelled road links and receptor location.

**DELETE THIS INSTRUCTION BOX BEFORE SUBMITTING THE REPORT.**

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