

2011 Air Quality Progress Report for *Slough Borough Council*

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

April 2011



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Report Reference number	
Date	July 2011

Customer:

Slough Borough Council

Customer reference:

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AEA reference:

ED56673 - Issue Number 1

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Executive Summary

Slough Borough Council has undertaken an Air Quality Progress Report as required by the Air Quality Review and Assessment process. Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the Local Air Quality Management process.

Analysis of NO₂ data for 2010, presented in this report, shows that within the existing AQMA there continue to be exceedances of the AQS objectives. There are exceedances outside the borough's AQMAs measured at three diffusion tube locations.

These diffusion tube sites were Windsor Road 1N (SL4), Colnbrook By-pass (SL7) and Sussex Place (SL27). The Windsor Road 1N (SL4) and Colnbrook By-pass (SL7) monitoring site is not near any relevant receptors for the annual NO₂ air quality standard. The Nitrogen Fall Off with Distance tool estimates that the concentration at the nearest relevant receptor to the Sussex Place monitoring site is 38.6 µg m⁻³.

At two diffusion tubes sites NO₂ concentrations above 60 µg/m³, this indicates that it is likely that there is an exceedance of the 1-hour objective. These sites include; Brands Hill (SL13) and Yew Tree Road (SL40). As these sites are currently within existing AQMAs a detailed assessment is not required, although the AQMA declaration for the relevant areas would need to be updated to take the 1-hour exceedance into account. To establish the extent of the 1-hour objective exceedance further automatic monitoring would be required at the two sites, although this is not a requirement. Therefore, there is no requirement to proceed to a Detailed Assessment at any of the none automatic monitoring locations.

Therefore, Slough Borough Council is not required to proceed to a Detailed Assessment for NO₂.

Assessment of the trend of NO₂ measurements from both automatic and non-automatic monitoring, indicate that annual mean NO₂ concentrations have remained relatively unchanged, with 2010 appearing to represent a spike in concentrations across a large number of monitoring sites.

Analysis of PM₁₀ data for 2010 shows that there continues to be no exceedance of AQS objectives for this pollutant, therefore Slough Borough Council is not required to proceed to a Detailed Assessment for PM₁₀.

Monitored benzene concentrations also remain below the AQS objective; therefore Slough Borough Council is not required to proceed to a Detailed Assessment for this pollutant.

A review of traffic, commercial, industrial and domestic developments has identified that there are no new or existing developments that are likely to lead to a new exceedance of the AQS objectives for any pollutant.

The review of new monitoring data and new developments available for 2010 and contained within this report concludes that Slough Borough Council is not required to proceed to a Detailed Assessment and that the existing AQMAs are still required.

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Glossary

AURN – Automatic Urban and Rural Network

AQMA – Air Quality Management Area

AQS – Air Quality Standard

EA – Environmental Agency

EfW – Energy from Waste

LA – Local Authority

LTP – Local Transport Plan

NO₂ – Nitrogen Dioxide

PM₁₀ – Particulate Matter

TEA - triethanolamine

USA – Updating and Screening Assessment

WASP – Workplace Analysis Scheme for Proficiency

1 Introduction

1.1 Description of Local Authority Area

Slough is situated in Berkshire, in the south-east of England, close to the West of London. The borough is an urban area located in the Thames Valley and is surrounded by countryside, which forms part of the Metropolitan Green Belt. Slough has excellent communication links and is in close proximity to Heathrow airport and the Greater London conurbation. Slough is integrated into the heart of the UK transport and communications network. It is located between the M4, M40 and the M25. There is also a rail link into the centre of London, with onward links from there to the rest of the country. The town is an important commercial centre and includes both industrial and residential areas.

1.2 Purpose of Progress Report

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

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

1.3 Air Quality Objectives

The air quality objectives applicable to Local Air Quality Management (LAQM) **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), and the Air Quality (England) (Amendment) Regulations 2002 (SI 3043). They are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (for carbon monoxide the units used are milligrammes per cubic metre, mg/m^3). Table 1.1. includes the number of permitted exceedences in any given year (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.

Pollutant	Concentration	Measured as	Date to be achieved by
Benzene	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
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
Nitrogen dioxide	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
Particles (PM₁₀) (gravimetric)	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
Sulphur dioxide	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

1.4.1 First Round of Review and Assessment

Slough Borough Council completed their first round of Review and Assessments and concluded that emissions of carbon monoxide, benzene, 1,3-butadiene, lead and sulphur dioxide and there was therefore no requirement to proceed to a Detailed Assessment for these substances. Emissions of PM₁₀ were assessed in more detail but no areas were anticipated to exceed the AQS Objective for annual mean PM₁₀ for 2004. When considering nitrogen dioxide (NO₂), an area alongside the M25 in Poyle was identified as likely to exceed the AQS Objective of annual mean NO₂ (40 µg/m³). However, when considering the exceedence area, there were no areas of relevant public exposure and hence it was recommended that Slough Borough Council did not declare any Air Quality Management Areas (AQMAs). Although the council proposed not to declare an AQMA, as part of their commitment to sustainable development and improving air quality, an air quality strategy was produced.

1.4.2 Second Round of Review and Assessment

Updating and Screening Assessment (USA), 2003

Slough Borough Council carried out an Updating and Screening Assessment (USA) in 2003. It concluded that the AQS Objectives for CO, benzene and 1,3 butadiene would be achieved in all areas of Slough. The AQS Objectives for annual mean concentrations of lead and SO₂, along with the AQS Objective for hourly mean concentrations of NO₂ and the AQS Objective for 24-hour mean concentrations of PM₁₀, were predicted to be achieved in most areas. However, it was recommended that a future study of areas surrounding the new S. Grondon waste facility (when operational in 2008) was undertaken with respect to these pollutants. In terms of the annual mean objectives for NO₂ and PM₁₀, the 2003 USA predicted that these would be exceeded close to motorways, major roads and junctions. The assessment therefore recommended that a Detailed Assessment should be conducted for annual mean NO₂ and annual mean and 24 hour mean PM₁₀ for five areas in Slough, located primarily around busy roads and junctions where is relevant public exposure.

Further Assessment, 2004

The first Further Assessment (2004) provided a focused consideration of road traffic in the Borough and provided source contribution estimates for major roads and motorways, and estimated percentage improvements required to meet air quality objectives. The major causes of air quality exceedences were found to relate mainly to road traffic. In most cases the majority of road contributions came from motorways, however, there were instances when major roads were found to be the main source.

Progress Report, 2005

Exceedences of the annual mean objective for NO₂ were predicted at several locations in Slough. As a result, Slough Borough Council declared two Air Quality AQMAs in June 2005, which relate primarily to stretches of the M4 (M4 AQMA) and the A4 (Brands Hill AQMA). The Slough Local Transport Plan 2006-2011 (March 2006) contains the air quality action plan for the M4, A4 and also general actions for the Town Centre to improve air quality. The

designation of the two AQMAs was supported by the conclusions reached in the first Progress Report (2005).

Further Assessment, 2005

The Further Assessment (2005) identified a number of sites showing exceedences of the NO₂ annual mean objective that were not currently in the designated AQMAs: Tuns Lane, Lansdowne Avenue and Princess Street. These sites are close to the A4 in the Town Centre. However, the 2005 Further Assessment concluded that there was no requirement to declare an AQMA in the Town Centre along the A4 main road as the Tuns Road monitoring site was affected by construction works close by and the other two sites were borderline when adjusted to the nearest public exposure.

1.4.3 Third Round of Review and Assessment

Updating and Screening Assessment (USA), 2006

Based on the findings of the 2005 Further Assessment the Updating and Screening Assessment (2006), recommended that the new, 2007, NO₂ monitoring sites in the Town Centre (placed where there was relevant public exposure) and the existing sites be closely and regularly reviewed to highlight quickly any need to declare an AQMA in the Town Centre.

Progress Report, 2007

The Progress Report (2007) highlighted the fact that NO₂ concentrations at Town Centre sites found to be in exceedence of the NO₂ annual mean objective within the Further Assessment (2005), remained the same in 2006. It was suggested that four new diffusion tube sites: namely, Wexham Road, Wellington Street – Stratfield, Blair Road – Victoria Court and Wellesley Road, would help to verify these town centre concentrations during 2007. The 2007 Progress Report recommended that the situation in the Town Centre should be reconsidered in detail in the next round of Review and Assessment.

Detailed Assessment, 2008

The recent Detailed Assessment (2008) considered NO_x and NO₂ concentrations in the Town Centre of Slough; assessing the 2007 monitoring data from existing and new diffusion tube sites as well as undertaking modelling of NO_x and NO₂ in order to assess the likelihood of the annual mean NO₂ Air Quality Strategy Objective (40 µg m⁻³) being exceeded in the area. It recommended that Slough Borough Council should consider the declaration of an AQMA along Tuns Lane from the junction with the M4 up to the junction with Bath Road. Slough Borough Council were also advised to consider declaring an AQMA in the Town Centre along the A4 stretching from William Street roundabout to the Uxbridge roundabout.

It also recommended that any future developments in the vicinity of those areas that are likely to impact levels of road traffic should be carefully considered, particularly in the context of the 'Heart of Slough' project that would bring about changes to the Town Centre infrastructure. In addition, it was recommended that the impact on annual mean NO₂ concentrations as a result of the Great Western Railway line running through the Town Centre should be assessed further and monitored carefully in the future.

Updating and Screening Assessment, 2009

Monitoring in 2008 identified exceedences of the annual mean NO₂ objective at the Chalvey automatic monitoring site and at seven diffusion tube monitoring locations, two of which were newly identified exceedences. Five exceedences were within the existing AQMAs, the other two will be within the newly declared Town Centre AQMA, therefore justifying the existence of all the borough's AQMAs.

Based on 2008 monitoring results the 2009 USA recommended, as a result of updated guidance, that the council should proceed to a Detailed Assessment of NO₂ at residential properties that are located within 30m of the Great Western Line. The report also concluded that the council should maintain monitoring at existing sites within the borough and to implement the measures outlined in the Air Quality Action Plan.

Progress Report 2010

Analysis of the 2009 monitoring data showed that there continued to be measured exceedences within the existing Slough AQMAs. There were also two measured exceedences at two monitoring locations outside of the AQMA; one automatic site (SHL4 Salt Hill) and at one diffusion tube site (SL4 Windsor Road). Both sites were not near relevant receptors so there was no requirement to proceed to a Detailed Assessment. All other monitored pollutants met AQS objectives. A review of traffic, commercial, industrial and domestic developments has identified that there are no new or existing developments that are likely to lead to a new exceedence of the AQS objectives for any pollutant.

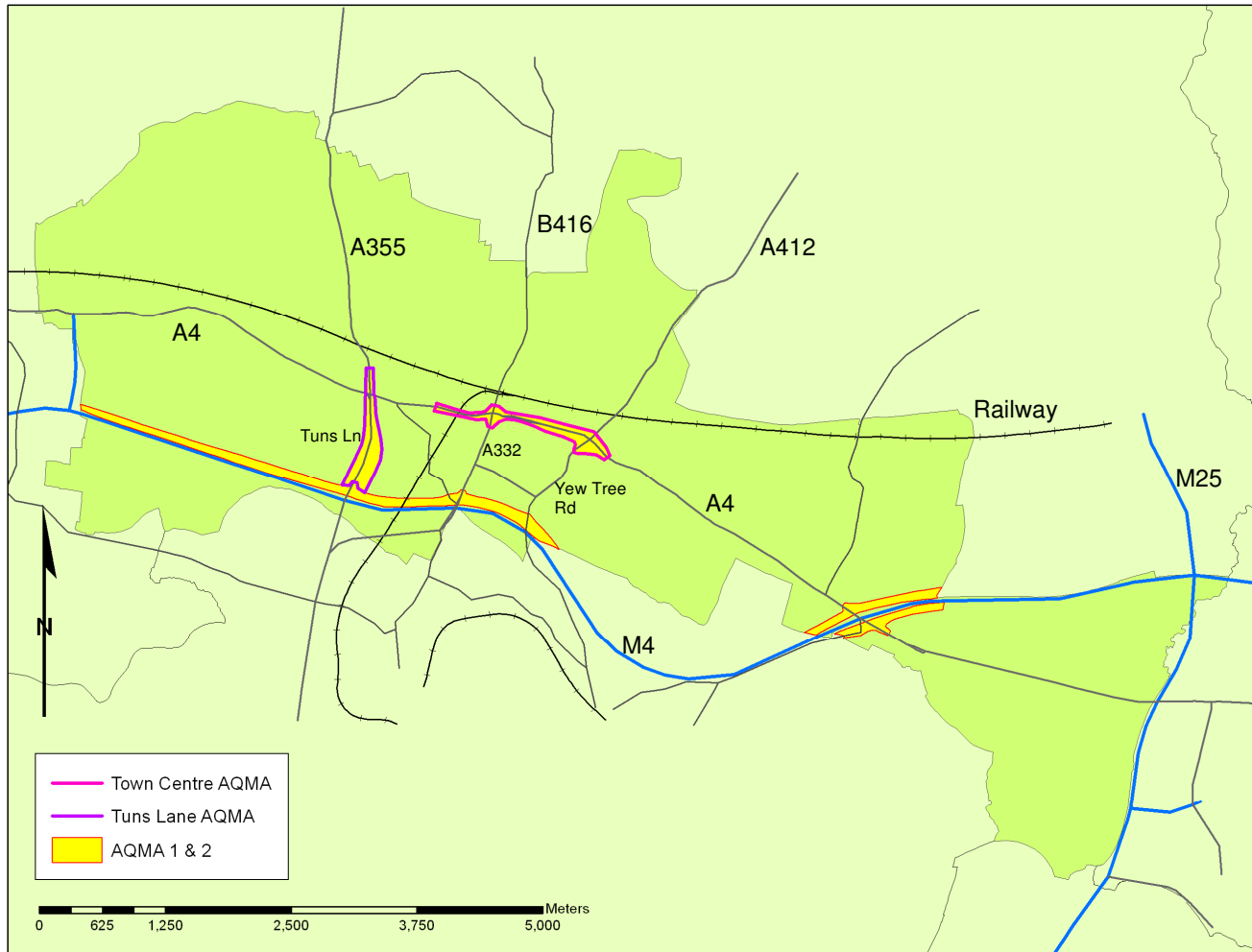
Detailed and Further Assessment 2011

The Detailed Assessment aimed to assess the magnitude and spatial extent of any air quality objective exceedences in the vicinity of the Great Western Mainline. Monitoring data does not support the need for a declaration of an AQMA, however the modelling indicates the potential for air quality objective exceedences at residential receptors. It was therefore recommended that additional monitoring is undertaken at these properties.

The Further Assessment was undertaken to confirm the findings of the 2008 Detailed Assessment which lead to the declaration of the Tuns Lane and Town Centre AQMA. The assessment also apportioned sources of NO_x and the level of reduction required to achieve the NO₂ objective, followed by testing of selected abatement scenarios to inform the AQAP. The report confirmed that the declaration of the AQMAs was appropriate and went on to recommend that the council should consider extending the Tuns Lane AQMA along Bath Road as far as Windmill Road and the Town Centre AQMA northwards along Uxbridge Road.

The source apportionment found that road traffic provides the largest contributions at roadside sites, with heavy duty vehicles contributing more than half of the traffic contribution. The analysis concludes that the air quality objective will be achieved by 2014 at all the diffusion sites except Yew Tree Road, which will not be met until 2017, without Action Plan measures.

Figure 1.1 Map of AQMA Boundaries



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2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

Slough Borough Council currently undertakes ambient monitoring of the following pollutants covered by the AQS:

- Nitrogen dioxide (NO₂)
- Particulate matter (PM₁₀)
- Benzene

Slough Borough Council also monitors PM_{2.5} and PM₁. While these particulate size fractions are not currently included in the Air Quality Regulations for England and Wales, they may become part of future Regulations.

Slough Borough Council continues to monitor radiation as well as continuing with its Carbon Management Plan.

2.1.1 Automatic Monitoring Sites

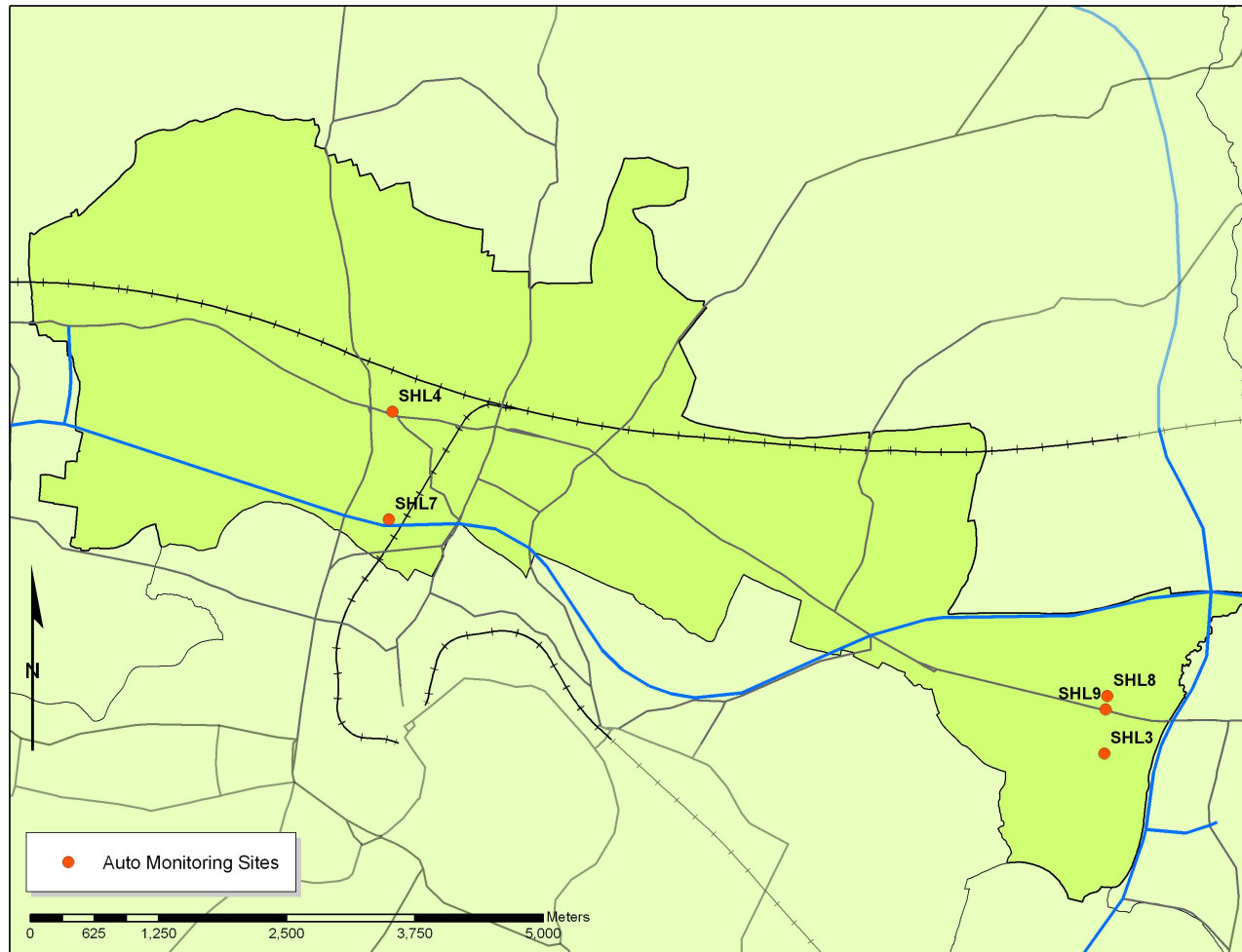
Five automatic monitoring sites are now operational in the borough. These sites comprise four NO_x/NO₂ analysers, two TEOM PM₁₀ analysers, three Osiris PM monitors and one BAM PM monitor.

One site, Slough Lakeside 2, is located at Lakeside Road, Colnbrook. This is north of the new clinical incinerator and the energy from waste plant (EfW). NO₂ is monitored and as well as a BAM there is an Osiris PM monitor located at this site.

These sites are not affiliated to Defra's Automatic Urban and Rural Monitoring Network (AURN), but are part of the National Automatic Monitoring Calibration Club, whereby monitoring data are managed to the same procedures and standards as AURN sites.

Table 2.1 & Figure 2.1 below provide further details about the current automatic monitoring sites within the borough and their location.

Figure 2.1 Map of Automatic Monitoring Sites



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Table 2.1 Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	OS Grid Ref		Pollutants Monitored	In AQMA?	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?
SHL4	Salt Hill (Slough town centre, A4)	Intermediate (Residential)	496599	180156	NO _x , NO ₂ and PM ₁₀ (TEOM)	N	Y	10m	Y
SHL3	Slough Colnbrook (Pippins)	Urban Background (Residential)	503542	176827	NO _x , NO ₂ PM ₁₀ , PM _{2.5} & PM _{1.0} (TEOM and Osiris)	N	Y	>50m	N
SHL7	Slough Chalvey, M4	Intermediate-Motorway (Residential)	496562	179109	NO _x and NO ₂	Y (M4 AQMA)	Y	45m from M4	Y
SHL9	Slough Colnbrook (Lakeside, Tan Hse Farm)	Urban Background	503551	177258	PM ₁₀ , PM _{2.5} & PM _{1.0} (Osiris)	N	Y	>50m	N
SHL8	Slough Lakeside 2 (run by Lakeside Energy from Waste Ltd)	Urban Background	503569	177385	NO _x , NO ₂ and PM ₁₀ (BAM) (Co-located Osiris PM ₁₀ , PM _{2.5} and PM ₁)	N	N	10m	N

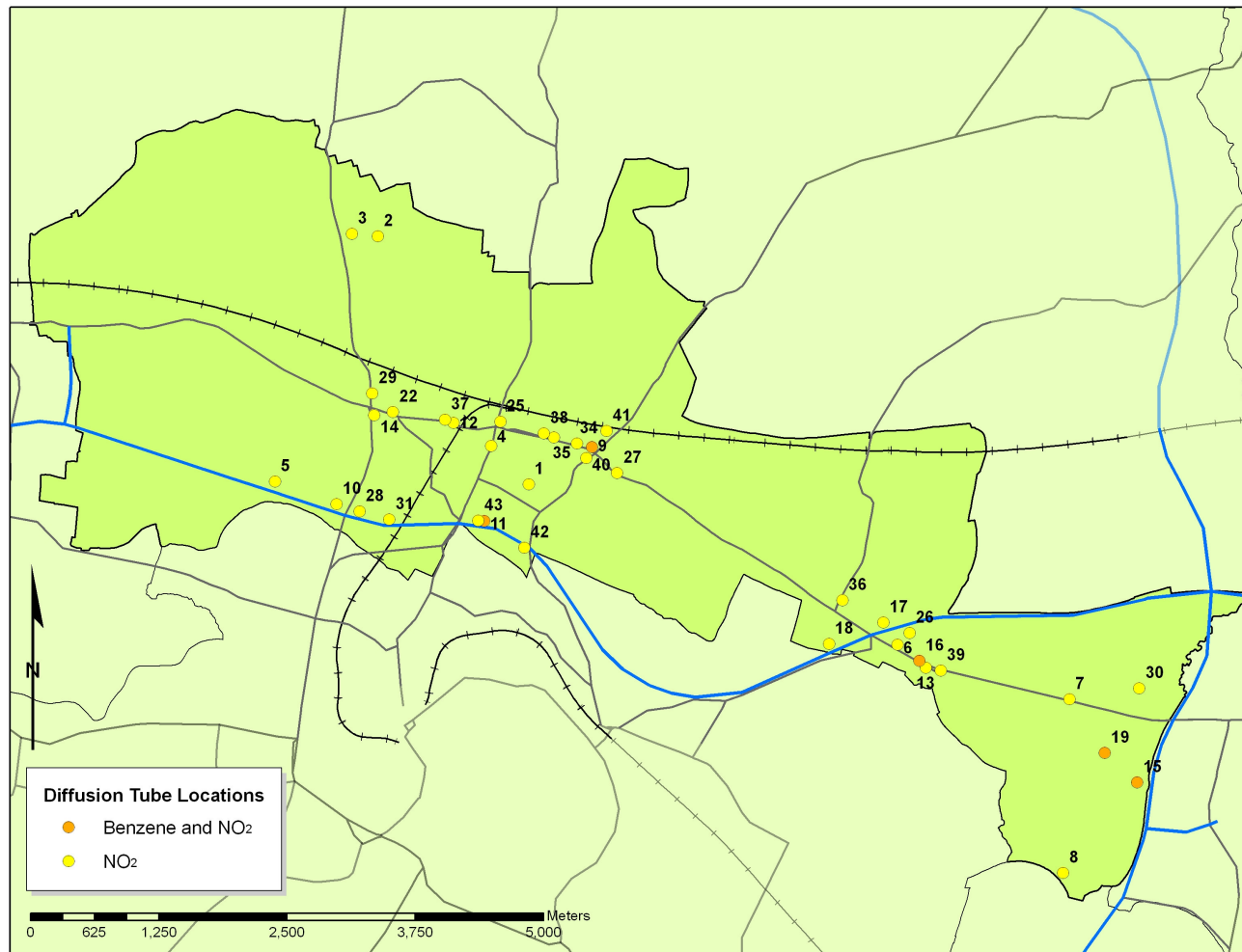
2.1.2 Non-Automatic Monitoring

Diffusion tube monitoring of NO₂ and benzene is carried out at a number of locations in the borough. NO₂ monitoring is currently undertaken at thirty six sites across the borough. Benzene monitoring is currently undertaken at four sites across the borough, with monitoring now also being undertaken at Spackmans Way.

In January 2010 the diffusion tube supplier was changed from Gradko to ESG. The diffusion tubes are still prepared with 50% v/v TEA in acetone.

Details of the diffusion tube monitoring locations are provided in Table 2.2 and Figure 2.2. The locations include kerbside, intermediate and urban background sites.

Figure 2.2 Map of Non-Automatic Monitoring Sites



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Table 2.2 Details of Non- Automatic Monitoring Sites

Site ID	Site Name	Site Type	OS Grid Ref		Pollutants Monitored	In AQMA?	Relevant Exposure?	Distance to kerb of nearest road	Worst-case Location?
1	Hencroft Street 6N	UB	497925	179450	NO ₂	N	Y	N/A	Y
2	Kent Avenue 5N	UB	496450	181875	NO ₂	N	Y	N/A	Y
3	Essex Avenue	I	496200	181900	NO ₂	N	Y	1-5m	Y
4	Windsor Road 1N	K	497557	179825	NO ₂	N	Y	1-5m	Y
5	Mitchell Close	I(M)	495450	179480	NO ₂	Y	Y	90m	Y
6	Tweed Road	I	501518	177882	NO ₂	Y	Y	15m	Y
7	Colnbrook By-pass	K	503196	177349	NO ₂	N	N	5m	N
8	Horton Road (Caravan Park)	I	503136	175654	NO ₂	N	Y	17m	Y
9	Princess Street [#]	I	498541	179815	NO ₂ , Benzene	N	Y	17m	Y
10	Paxton Avenue	I(M)	496050	179258	NO ₂	Y	Y	66m	Y
11	Winvale [#]	K(M)	497488	179090	NO ₂ , Benzene	Y	Y	15m	Y
12	Lansdowne Avenue	I	497188	180050	NO ₂	N	Y	14m	Y
13	Brands Hill	K	501798	177659	NO ₂	Y	Y	3m	Y
14	Tuns Lane	I	496416	180126	NO ₂	N	Y	20m	Y
15	Elbow Meadows [#]	UB(M)	503856	176538	NO ₂ , Benzene	N	Y	119m	Y
16	London Road [#]	K	501733	177725	NO ₂ , Benzene	Y	Y	3m	Y
17	Grampian Way	UB	501382	178101	NO ₂	Y	Y	51m	Y
18	Ditton Road	I(M)	500851	177890	NO ₂	Y	Y	60m	Y
19 - 21	Pippins ^{*#}	UB	503542	176827	NO ₂ , Benzene	N	Y	N/A	Y
22 - 24	Salt Hill *	I	496599	180156	NO ₂	N	Y	10m	Y
25	William Street roundabout	K	497646	180064	NO ₂	N	N	9m	N
26	Torrige Road	I (M)	501637	177999	NO ₂	Y	Y	95m	Y
27	Sussex Place	K	498784	179560	NO ₂	N	Y	6m	Y
28	Spackmans Way	I(M)	496272	179187	NO ₂	Y	Y	40m	Y
29	Farnham Road (2)	I	496397	180341	NO ₂	N	Y	20m	Y
30	Lakeside Road *	UB	503877	177459	NO ₂	N	N	N/A	N

Site ID	Site Name	Site Type	OS Grid Ref		Pollutants Monitored	In AQMA?	Relevant Exposure?	Distance to kerb of nearest road	Worst-case Location?
31-33	Chalvey (CAS) *	I(M)	496562	179109	NO ₂	Y	Y	45m	Y
34	Wexham Road	K	498394	179849	NO ₂	N	Y	4m	Y
35	Wellington Street - Stratfield	I	498168	179907	NO ₂	N	Y	13m	Y
37	Blair Road- Victoria Court	I	497105	180081	NO ₂	N	Y	13m	Y
38	Wellesley Road	I	498071	179949	NO ₂	N	Y	12m	Y
39	Rogans (Colnbrook by pass) [§]	K	501941	177633	NO ₂	Y	Y	5m	Y
40	Yew Tree Road [§]	K	498483	179707	NO ₂	N	Y	3m	Y
41	India Road	R	498681	179972	NO ₂	N	Y	2m	Y

* Diffusion tube co-located with automatic monitor

§ New for 2008

Bold Triplicate diffusion tubes

Key to monitoring site types:

K	Kerbside	1.5m from the kerb of a busy road - residential
I	Intermediate	Between 20-30m from a busy road - residential
UB	Urban Background	More than 50m from a busy road - residential
K(M)	Kerbside Motorway	Between 20-50m from Motorway Centre - residential
I(M)	Intermediate Motorway	Between 50-100m from Motorway centre - residential
UB(M)	Urban Background Motorway	Between 100-200m from Motorway centre - residential

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

Table 2.3a presents the annual mean concentrations of NO₂ for 2008, 2009 and 2010 at each of the automatic monitoring sites within Slough. In 2010 the annual mean NO₂ objective is exceeded at only 1 sites with in the Borough; SHL7 Slough Chalvey M4 (41.8 µg m⁻³). This is a reduction in the number of site measuring an exceedance with SHL4 Salt Hill now below the AQ objective.

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

Site ID	Location	Within AQMA?	Data Capture for full calendar year 2010 %	Annual mean concentrations (µg/m ³)		
				2008	2009	2010
SHL4	Salt Hill (Slough Town Centre A4)	N	98.8	39*	40.1	32.5
SHL3	Slough Colnbrook (Pippins)	N	60.8	31	39.2	29.5*
SHL7	Slough Chalvey M4	Y	84.6	44	44.4	41.8
SHL8	Slough Lakeside 2	N	65.1	36*	35.5	38.8

* Adjusted due to poor data capture
Red Measured concentration exceeds the AQS objective

SHL7 Slough Chalvey site is within the current M4 AQMA. There is no requirement to progress to a Detailed Assessment for this location as it is within the existing AQMA. In the previous Progress Report it was recommended that further diffusion tube monitoring is undertaken at receptors close to the Salt Hill monitoring site. Monitoring results from 2010 indicated that this extra monitoring is no longer required.

Figure 2.3 plots the trend in annual mean NO₂ concentrations at automatic Monitoring Sites in Slough since 2000. This indicates that the overall trend across these monitoring stations has remained steady, although 2010 results represent a significant drop in measured concentrations at two of the sites (SHL4 & SHL3)

Figure 2.3 Annual Mean NO₂ Concentration Trend – Automatic Monitoring Sites

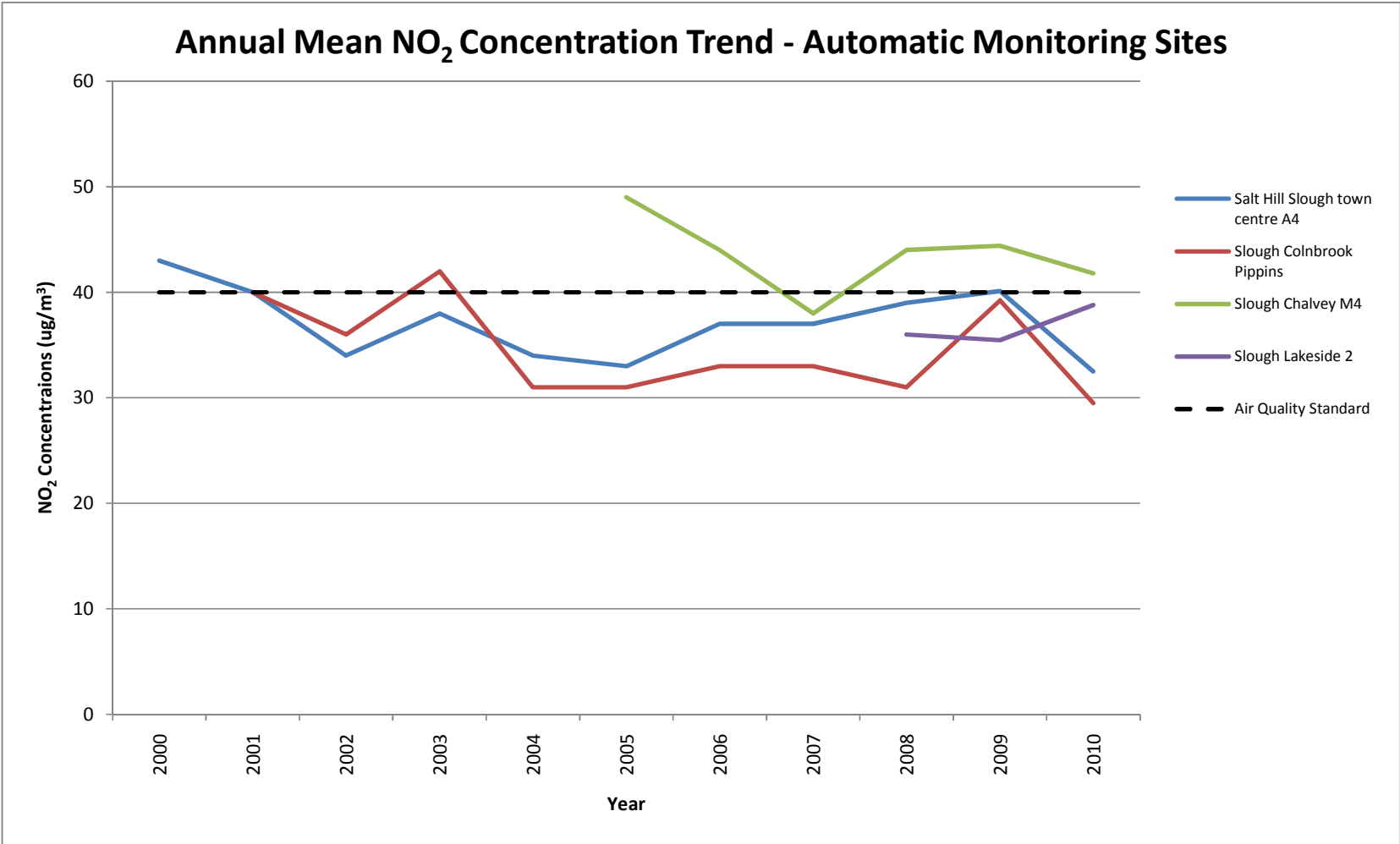


Table 2.3b presents information on all 1-hourly mean NO₂ objective at the continuous automatic monitoring sites over the last 3 years (see also Appendix B). In 2010, the hourly objective was achieved at all sites. At Slough Chalvey (SHL7) there was one exceedance of the hourly mean, this remains well within the air quality objective of 18 exceedances. There were no exceedances of the hourly NO₂ objective at the other automatic monitoring sites in the borough.

Table 2.3b Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective

Site ID	Location	Within AQMA?	Data Capture for 2010 %	Number of Exceedances of hourly mean (200 µg/m ³)		
				2008	2009	2010
SHL4	Salt Hill (Slough Town Centre A4)	N	98.8	0 (111)*	0	0
SHL3	Slough Colnbrook (Pippins)	N	60.8	0	0	0 (103)*
SHL7	Slough Chalvey M4	Y	84.6	13	1 (128)*	1 (130)*
SHL8	Slough Lakeside 2	N	65.1	0*	0	0

* Data capture less than 90%, 99.8th percentile of hourly mean provided in brackets

Red Measured concentration exceeds the AQS objective

Diffusion Tube Monitoring Data

Table 2.4 contains the ambient diffusion tube monitoring data sites within the Borough for the last 2 years. The table shows the estimated annual mean concentrations following adjustment for bias.

Bias Adjustment

The diffusion tubes deployed by Slough Borough Council are supplied and analysed by ESG using a preparation mixture of 50% triethanolamine (TEA) in acetone. ESG comply with the WASP scheme and achieved 'good' performance based on old and new criteria for the April 2009 – April 2010 period. In January 2010 the supplier was changed to ESG from Gradco.

Diffusion tubes may systematically under or over-read NO₂ concentrations when compared to reference chemiluminescence's analyser (automatic monitoring). This is described as "bias" and can be corrected for to improve the accuracy of diffusion tube results, using a suitable bias-adjustment factor. A bias adjustment factor of 0.816 was calculated based on an average of the bias adjustment factors from the average of the bias measured at Salt Hill (bias factor 0.77), Chalvey (0.85) and three sites reported by other local authorities for the national bias adjustment survey (0.75, 0.79, 0.94). Appendix 1 shows details of the calculation of the combined bias adjustment¹.

¹ <http://laqm.defra.gov.uk/documents/NO2-Diffusion-Tube-Collocation-Methodology.pdf>

Table 2.4 Results of Nitrogen Dioxide Diffusion Tubes

Site ID	Location	Within AQMA?	Data Capture for full calendar year 2010 %	Annual mean concentrations ($\mu\text{g}/\text{m}^3$)		
				2008	2009	2010
1	Hencroft Street 6N	N	100%	29	29.7	30.8
2	Kent Avenue 5N	N	92%	25	26.7	28.8
3	Essex Avenue	N	58%	30	33.5	39.6
4	Windsor Road 1N	N	100%	43	44.9	43.2
5	Mitchell Close	Y	92%	33	34.4	36.2
6	Tweed Road	Y	100%	37	36.4	41.2
7	Colnbrook By-pass	N	100%	39	39.5	42.3
8	Horton Road (Caravan Park)	N	100%	31	30.9	37.7
9	Princess Street	Y	92%	38	39.0	42.3
10	Paxton Avenue	Y	92%	38	40.0	38.0
11	Winvale	Y	100%	44	42.1	40.9
12	Lansdowne Avenue	Y	83%	38	40.4	45.1
13	Brands Hill	Y	100%	58	57.9	67.0
14	Tuns Lane	Y	100%	34	35.8	39.0
15	Elbow Meadows	N	100%	34	34.1	39.2
16	London Road	Y	92%	47	48.9	59.1
17	Grampian Way	Y	100%	41	42.1	42.3
18	Ditton Road	Y	100%	39	38.6	40.9
19	Pippins *	N	100%	28	28.6	30.8
20	Pippins *	N	100%	28	28.7	32.8
21	Pippins *	N	100%	28	28.9	31.1
22	Salt Hill *	N	100%	33	34.7	37.0
23	Salt Hill *	N	100%	33	35.2	34.2
24	Salt Hill *	N	100%	31	34.7	32.5
25	William Street roundabout	Y	100%	48	49.6	51.4
26	Torrige Road	Y	100%	38	36.6	47.4
27	Sussex Place	N	92%	36	37.6	40.5
28	Spackmans Way	Y	100%	37	39.6	41.0
29	Farnham Road (2)	Y	92%	36	36.2	36.9
30	Lakeside Road *	N	92%	39	35.3	39.7
31	Chalvey (CAS) *	Y	100%	39	42.1	39.9
32	Chalvey (CAS) *	Y	100%	37	40.4	40.6
33	Chalvey (CAS) *	Y	100%	37	41.8	40.5
34	Wexham Road	Y	100%	42	47.1	45.5
35	Wellington Street - Stratfield	Y	100%	38	37.6	39.4
37	Blair Road- Victoria Court	Y	100%	40	44.2	45.3
38	Wellesley Road	Y	100%	37	40.4	40.4
39	Rogans (Colnbrook by pass) [§]	Y	100%	45	46.2	54.7
40	Yew Tree Road [§]	Y	75%	49	49.2	60.3
41	India Road	N	100%	-	37.0	35.5

Bold Measured concentration exceeds the AQS objective
Bold Triplicate diffusion tubes
 * Diffusion tube co-located with automatic monitor

After the bias adjustment factor has been applied to the 2010 annual mean concentrations the NO₂ objective is exceeded at 20 locations. This is an increase from 14 exceedances in 2009.

The diffusion tube sites where measured concentrations were over the annual mean objective include:

- SL4 Windsor Road 1N
- SL6 Tweed Road
- SL7 Colnbrook By-pass
- SL9 Princess Street
- SL11 Winvale
- SL12 Lansdowne avenue
- SL13 Bands Hill
- SL16 London Road
- SL17 Grampian Way
- SL18 Ditton Road
- SL25 Williams Street Roundabout
- SL26 Torridge Road
- SL27 Sussex Place
- SL28 Spackmans Way
- SL31-33 Chalvey (CAS)
- SL34 Wexham Road
- SL37 Blair road-Victoria Court
- SL38 Wellesley Road
- SL39 Rogans
- SL40 Yew Tree Road

Of these sites, 14 fall within the boundary of the existing AQMAs or the new AQMA in the town centre. Therefore, at these sites there is not a requirement to proceed to a Detailed Assessment.

An exceedance was measured at three monitoring sites that are not within an AQMA, these sites were:

- SL4 Windsor Road 1N
- SL7 Colnbrook By-pass
- SL27 Sussex Place

The Windsor Road 1N (SL4) and Colnbrook By-pass (SL7) monitoring site is not near any relevant receptors for the annual NO₂ air quality standard, therefore there is no requirement to proceed to a Detailed Assessment in this location.

Sussex place monitoring site is close to a residential receptor, although using the Nitrogen Fall Off with Distance calculator the estimated concentration at the receptor is 38.6 µg m⁻³. Therefore, there is no requirement to proceed to a Detailed Assessment in this location.

At two diffusion tubes sites NO₂ concentrations above 60 µg/m³, this indicates that it is likely that there is an exceedance of the 1-hour objective. These sites include; Brands Hill (SL13) with a measured concentration of 67µg/m³ and Yew Tree Road (SL40) with a measured concentration of 60.3µg/m³. Although not exceeding 60 µg/m³, the NO₂ concentration measured at London Road (SL16) was also high at 59.1 µg/m³. As these sites are currently

within existing AQMAs a detailed assessment is not required, although the AQMA declaration for the relevant areas would need to be updated to take the 1-hour exceedence into account. To establish the extent of the 1-hour objective exceedence further automatic monitoring would be required at the two sites, although this is not a requirement.

Figures 2.4a to 2.4c demonstrate the trend in Annual Mean NO₂ concentrations measured at diffusion tube sites since 1993. Figure 2.4a shows the sites where measurements have been undertaken for the longest period of time. The overall trend for Slough appears to show that concentrations have remained relatively stable, apart from a general spike in measured concentrations between 2001 and 2003. Although across the majority of sites there is a spike in concentrations in 2010.

Although representing a shorter period of time figures 2.4b and 2.4c also show an overall stable trend for NO₂ concentrations in Slough. Figure 2.4b also mirrors the spike in measured concentrations seen in Figure 2.4a and the increase in concentrations in 2010. SL31 continues to appear to be on an upwards trend, with measured concentrations around or above those recorded during the 2003 spike.

It should be noted that the results in Figure 4c only represent 5 years of data so any trend noted is indicative.

Figure 2.4a Trends in Annual Mean NO₂ Concentration Measured at Diffusion Tube Monitoring Sites SL1 to SL25

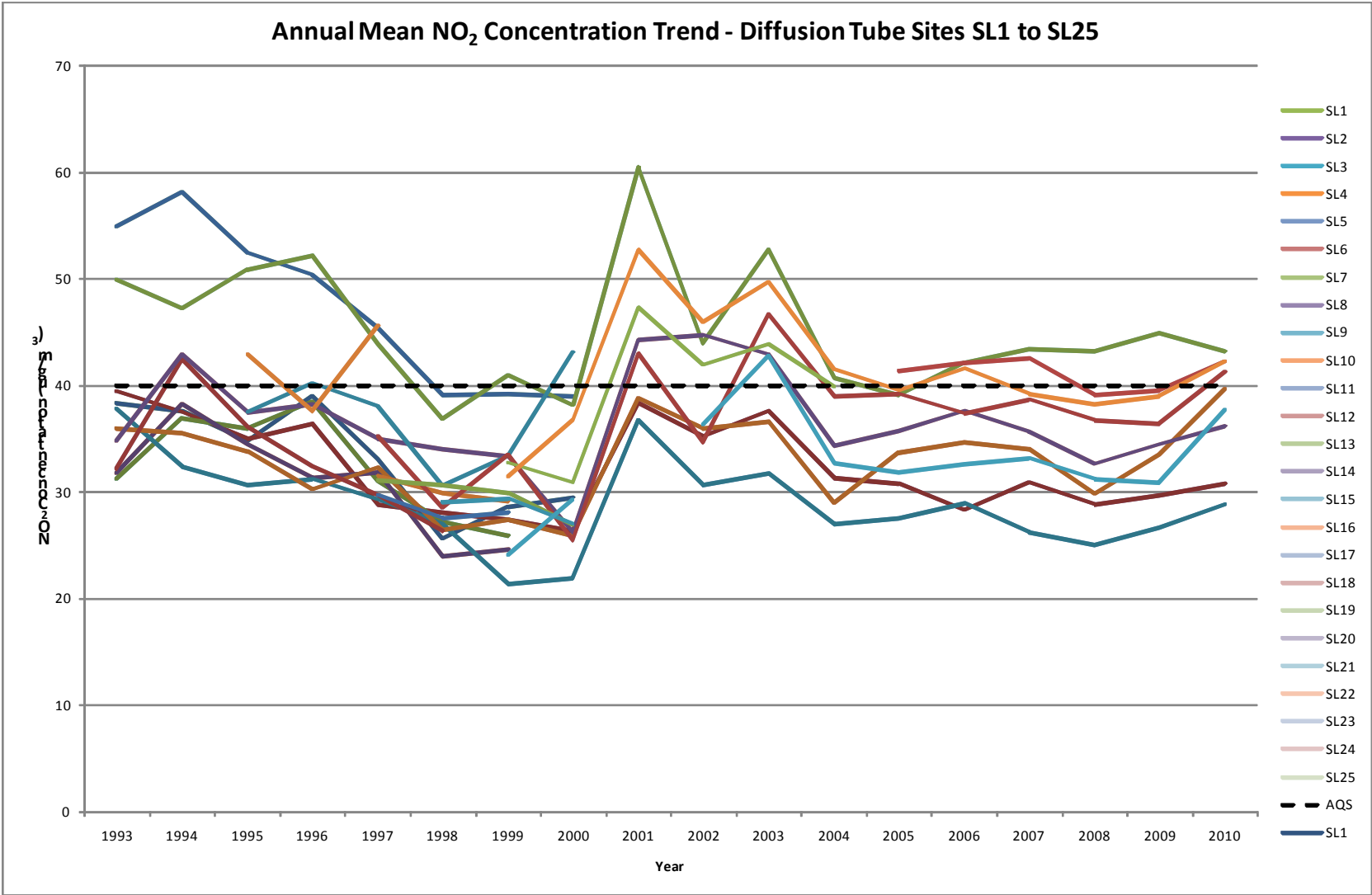


Figure 2.4b Trends in Annual Mean NO₂ Concentration Measured at Diffusion Tube Monitoring Sites

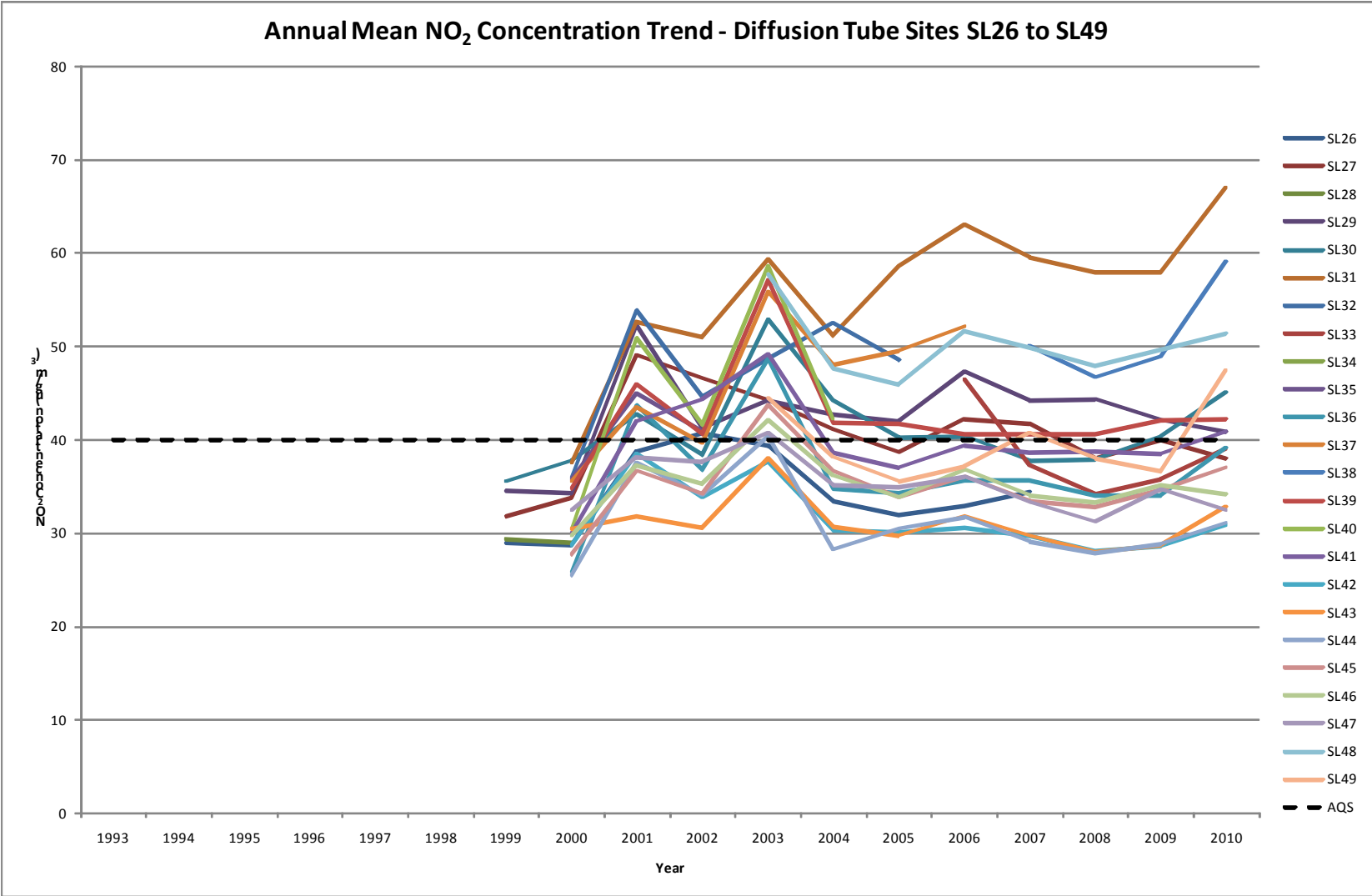
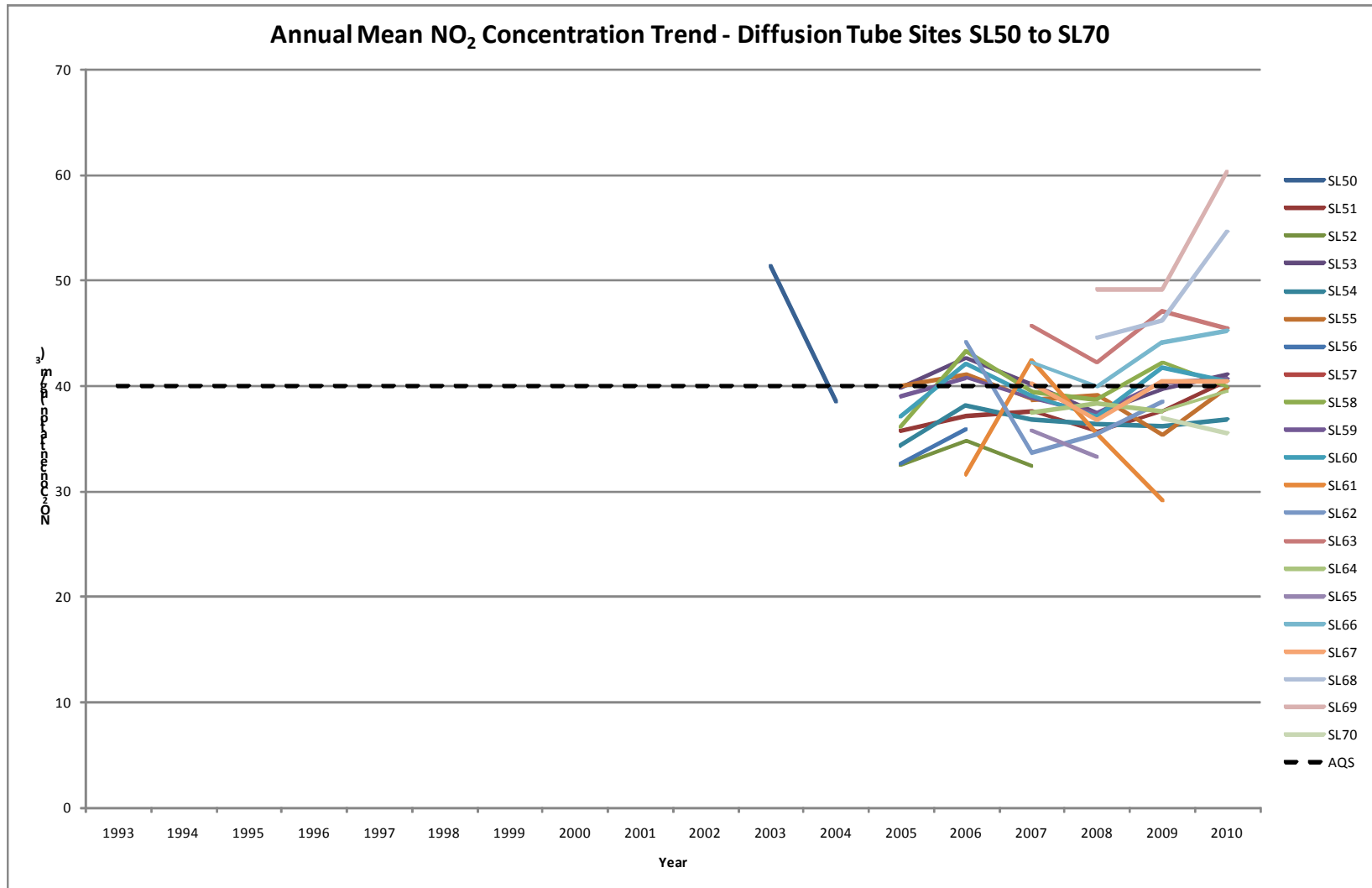


Figure 2.4c Trends in Annual Mean NO₂ Concentration Measured at Diffusion Tube Monitoring Sites



2.2.2 PM₁₀

Table 2.5a displays the annual mean PM₁₀ monitoring results from the automatic monitoring sites in the borough across the time series 2008 - 2010. All statistics have been ratified according to QA/QC procedures outlined in appendix A.

Table 2.5a Results of PM₁₀ Automatic Monitoring: Comparison with Annual Mean Objective

Site ID	Location	Within AQMA?	Data Capture for full calendar year 2010 %	Annual mean concentrations (µg/m ³)		
				2008	2009	2010
SHL4	Salt Hill (Slough town centre, A4) – TEOM	N	97.2	24 [#]	20.7 [#]	20.0 [#]
SHL3	Slough Colnbrook (Pippins) – TEOM	N	85.4	20 [#]	19.6 [#]	14.3 [#]
SLH6	Slough Colnbrook (Pippins) – Osiris	N	92.0	19	21.74	16.8
SHL9	Slough Lakeside 2 – Osiris	N	84.4	23	24.31	18.6
SHL8	Slough Lakeside 2 - BAM	N	86.7	26 [†]	22.76 [†]	26.4 [†]

[#] PM₁₀ measured by TEOM has been converted to indicative gravimetric equivalent, using the Volatile Correction Model

[†] PM₁₀ measured by BAM has been corrected for slope by dividing concentrations by a correction factor of 1.21

When assessing the 2008, 2009 and 2010 annual mean PM₁₀ concentrations against the AQS Objective of 40 µg/m³; no exceedances were measured at any of the automatic monitoring sites.

Table 2.5b details the number of exceedances of the 24hr mean for PM₁₀ AQS objectives, measured at the automatic monitoring sites over the same period.

Table 2.5b Results of PM₁₀ Automatic Monitoring: Comparison with 24-hour Mean Objective

Site ID	Location	Within AQMA?	Data Capture 2010 %	Number of Exceedances of daily mean objective (50 µg/m ³)		
				2008	2009	2010
SHL4	Salt Hill (Slough town centre, A4) – TEOM	N	97.2	(42)*	4 [#] (36.3)*	0
SHL3	Slough Colnbrook (Pippins) – TEOM	N	85.4	21 [#]	5 [#]	0 (58)*
SLH6	Slough Colnbrook (Pippins) – Osiris	N	92.0	(31)*	14	1

Site ID	Location	Within AQMA?	Data Capture 2010 %	Number of Exceedences of daily mean objective (50 µg/m ³)		
				2008	2009	2010
SHL9	Slough Lakeside – Osiris	N	84.4	(39)*	18 (38.3)*	4 (79)*
SHL8	Slough Lakeside - BAM	N	86.7	21 [†]	17	0

§ PM₁₀ measured by TEOM has been converted to indicative gravimetric equivalent, using correction factor of 1.3

* Data capture less than 90%, 99.8th percentile of hourly mean provided in brackets

PM₁₀ measured by TEOM has been converted to indicative gravimetric equivalent, using the Volatile Correction Model

† PM₁₀ measured by BAM has been corrected for slope by dividing concentrations by a correction factor of 1.21

As with the annual mean, there was no exceedance of the 24hr mean objective for PM₁₀. The AQS objective requires that a 24 hour mean of 50 µg/m³ is not exceeded more than 35 times per year.

2.2.3 Benzene

Benzene was monitored by diffusion tube at 4 sites in 2010 within the borough. Table 2.6 displays the diffusion tube monitoring results for benzene at these sites across the time series 2008 – 2010.

Table 2.6: Results of Benzene diffusion tubes

Site ID	Location	Within AQMA?	Annual mean concentrations (µg/m ³)		
			2008	2009	2010
B2	Princess	N	1.4	1.2	0.9
B3	Pippins School	N	1.0	1.0	0.8
B5	London Road	Y	1.4	1.1	0.8
B7	Spackmans Way	Y	n/a	1.1	0.7

When assessing the 2008, 2009 and 2010 annual mean Benzene concentrations against the AQS Objective of 16.25 µg/m³; no exceedances are evident at any of the diffusion tube sites.

2.2.4 Other pollutants monitored

No monitoring is currently undertaken in the Slough Borough Council area for 1,3-butadiene, carbon monoxide, lead and SO₂. Based upon the findings of the previous assessments, the concentrations of these other pollutants are unlikely to be in excess of the air quality objectives at any location.

2.2.5 Summary of Compliance with AQS Objectives

Slough Borough Council has examined the results from monitoring in the borough. Concentrations outside of the AQMA are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

3 New Local Developments

3.1 Road Traffic Sources

Heart of Slough

Since the declaration of the two new AQMAs in the Town Centre there is plans for a major redevelopment know as the Heart of Slough. This re-development will alter the traffic flows in the area and possibly add new receptors. Work is currently underway on the Heart of Slough project. The project report (Heart of Slough Environmental Statement²) gives the following detail;

Synopsis

The proposed scheme comprises the redevelopment of four sites and the reconfiguration of the highway layout with the overall site area of 11.7 hectares of land in Slough town centre between the mainline railway station and Slough's principle shopping area.

The site, centred upon Wellington Street/William Street roundabout, encompasses Brunel bus station, Thames Valley University, the public library site and the area around the St Ethelbert's church and the Day Centre at William Street.

The transport proposals associated with the proposed scheme to radically alter the road layout within the town centre by replacing the current roundabout that connects Wellington Street (A4) to William Street with a comprehensive signalised junction. This will result in significant areas of development land, currently occupied by the roundabout structure, being made available.

The scheme aims to deliver a multi-faceted development that comprises a mix of housing, commercial and civic development, as well as improvements to the highway network, public transport facilities and general townscape.

Road Traffic Emissions

Overall, the predicted change in road traffic emissions associated with the operation of the proposed development would not have a significant effect on any receptors that are sensitive to local air quality.

Emissions from road traffic associated with the development are predicted to increase annual mean concentrations of NO₂ and PM₁₀ and is considered to be an effect of negligible significance.

The objective for PM₁₀ has been assessed qualitatively and it is unlikely that the predicted concentrations will exceed the PM_{2.5} objective of 25 µg/m³.

² REFERENCE NEEDED – CHECK WITH MONICA – Heart of Slough ES

3.2 Other Transport Sources

No new transport sources have been identified since the last Updating and Screening Assessment.

3.3 Industrial Sources

There are no new or newly identified industrial sources within the Borough of Slough since the previous round of the Review and Assessment process. The Energy from Waste facility in Colnbrook has been fully operational since August 2009.

There was one new EA permit issued for 2010 to the Thames Water Utilities at Thames House, Wood Lane (SL1 9EB). Although, this was an existing source and came under new permitting regulations for odour, with no significant impact on air quality.

Changes in 2010 part B process are detailed in the table below.

SLOUGH BOROUGH COUNCIL

LAPPC PROCESSES (B & A2)

Updated December 2010

APPLICANT	TYPE OF PROCESS. Reference	GRID REFERENCE	PROCESS	DATE AUTHORISED
4.	Solvents Sector			
DWS Bodyworks (Heathrow) Ltd Whittle Park Way Slough Berkshire SL1 6FE	Respraying of Road Vehicles		PG 6/34	7 th December 2010
DWS Bodyworks (Slough) Ltd Whittle Park Way Slough Berkshire SL1 6FE	Respraying of Road Vehicles		PG 6/34	7 th December 2010
5.	Bitumen Coatings			
W R GRACE LTD 636/9 and 647/8 Ajax Avenue Slough Berks SL1 4BH	Bituminous Process Plant 2 Closed Sept 2010	495840 E 180730 N	PG 6/42	8 th November 1996
W R GRACE LTD 636/9 and 647/8 Ajax Avenue Slough Berks SL1 4BH	As above Plant 7 Closed Sept 2010	495750 E 180820 N	PG6/43	8 th November 1996

3.4 Commercial and Domestic Sources

There are no new or newly identified commercial or domestic sources within the Borough of Slough since the previous round of the Review and Assessment process.

3.5 New Developments with Fugitive or Uncontrolled Sources

There are no new or newly identified commercial or domestic sources within the Borough of Slough since the previous round of the Review and Assessment process.

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

4 Local / Regional Air Quality Strategy

Slough Borough Council has made the following progress in implementing its Air Quality Action Plans;

LATEST TRAFFIC INFORMATION BEAMED ONTO THE A4

Drivers along the A4 are now able to receive the latest traffic information on delays, road closures and events thanks to two new variable message signs installed by Slough Borough Council. The two new electronic signs have been placed alongside the A4 outside B&Q, Bath Road Retail Park and the Marriot Hotel, Langley.

The signs are remotely controlled by the council's traffic team. They are part of a series of works being undertaken to warn commuters of potential problems affecting the traffic; whether it be a procession, event or accident. They improve traffic flow, reduce congestion and improve air quality through a reduction in pollution along the main route through Slough.

A4 JUNCTIONS IMPROVED FOR DRIVERS

Drivers travelling along the A4 in Slough, from the Brunel roundabout to the Huntercombe roundabout, should also find their journeys easier following the introduction of new traffic light phasing. The changes to the traffic lights at these junctions is the first step in a series of improvements designed to make commuters journeys easier, cut down on congestion and make travelling around the borough better – whether it is by car, public transport, bicycle or on foot.

One of the major changes has been at the Tuns Lane junction where traffic going in opposite directions no longer goes at the same time. This improves safety for those travellers turning right and also means right-turners have longer to pass through the lights. It will also help cut down on congestion, cut down pollution and improve air quality across the borough.

A new computerised traffic light system called SCOOT will also shortly be introduced linking all the junctions to reduce bunching of traffic together and ensure the road ahead is clear when the lights change to green. Slough is also trialling a state-of-the-art wireless traffic detection system – called magnetometres – which will 'see' traffic approaching red lights and will automatically change the lights to green if possible. If successful, they will be rolled out across the borough.

5 Planning Applications

There were 26 major planning applications made within Slough during 2010. Information on these applications has been included in this Progress report to provide a log of applications for new developments to give a picture of areas where changes may take place and where combined impacts from several developments may be important.

Table 2.7: Summary of Major Planning Applications in Slough

Dwellings		
P/00790/019	Change of use of part first floor and second floor from b1 office to c3 residential use together with construction of a third floor to provide a total of 14 no flats comprising, 2 no. X 2 bed and 2 no. X 1 bed flats at first floor level, 2 no. X 2 bed flats 3 no. X 1 bed flat at second floor level and 2 no. X 1 bed 1 no. X 2 bed flats at third floor level plus 2 no. X 2 bed duplex flats at second and third floor levels. Changes to external appearance including existing fenestration in all elevations and the installation of oreil bay windows within the western flank wall at first and second floor levels. Removal of existing external fire escape stair and replacement with new external escape stair. Installation of pedestrian access from high. Construction of an external refuse store.	S F I Group Plc, 281, High Street, Slough, SL1 1BD
P/01412/009	Application for an extension of time for: erection of an additional fifth floor to the existing building and a five storey rear extension and change of use of extended existing offices to residential to provide, 9 no. One bed flats and 3 no. Two bed flats, including alterations to the elevations of the existing building and rear facing balconies at all residential floors and front facing balconies at the proposed fourth floor. Extension of ground floor to increase existing retail area As approved under planning permission p/01412/008 dated 17th December 2007	274-276, High Street, Slough, SL1 1NB
P/01913/006	Erection of four storey building plus basement to provide a mixed use development comprising; A) gymnasium, hair salon / beauticians and sauna / aerobics room at basement level B) 131 sq metres of class of class a2 offices at ground floor level C) 8 no. X one bedroom flats and 8 no. X bed-sit flats on three levels at first second and third floors together with on site cycle and refuse storage (outline application with appearance and landscaping reserved for subsequent approval)	9-10, Chapel Street, Slough, Berkshire
P/01949/015	Outline application (all matters reserved) for the construction of fifty six no. Flats in two no. Four storey blocks (block a: eighteen no. Two bedroom flats and block b: twelve no. One bedroom and twenty six no. Two bedroom flats), with fifty two no. Parking spaces.	Units 2 & 3, The Pavilions, Stoke Gardens, SL1 3QD
P/03167/018	Change of use of floors 2 and 3 from office use (class b1) to residential (class c3) to provide 14 no. Self contained residential apartments.	Wellington House Annexe, Wellington House, Queensmere, Slough, Berkshire, SL1 1FB
P/08770/067	Residential development with ancillary open space, access roads, parking and landscaping	Land North & South of extension of

		Eltham Avenue, Slough, Berkshire
P/10406/007	Redevelopment of site to provide 134 dwellings (in a building rising from 4 storeys to 10 storeys) with associated parking, amenity space and public space (access from grays place) Variation of condition 2 of planning permission reference p/10406/006 dated 13/10/2006. To revise drawings. (increase height of building by 1.16m; increase projection of 4th floor on north elevation 1m; increase ramp gradient).	Intercity House, Railway Terrace, Slough, Berkshire, SL2 5BY
P/11425/008	Residential development for 300 dwellings with primary school; public open space	Land Rear of 2-78 , Castlevie Road & Part Of Upton Court Park &, 36, Blenheim Road, Slough, Berkshire
P/13110/004	Erection of 200 dwellings (application for an extension of time for implementation)	Middlegreen Trading Estate, Middlegreen Road, Slough, Berkshire, SL3 6DF
P/13110/005	Erection of 200 dwellings (application for an extension of time for implementation of existing outline planning permission)	Middlegreen Trading Estate, Middlegreen Road, Slough, Berkshire, SL3 6DF
P/13110/006	Details of 167 dwellings (reserved matters application re. Outline planning permission p/13110/000 dated 28/11/2006.	Middlegreen Trading Estate, Middlegreen Road, Slough, Berkshire, SL3 6DF
P/14218/001	Demolition of 2 no. Existing family dwellings and site clearance of former garage court. Erection of 4 no. Three bedroom houses arranged as two pairs of semi detached houses. Erection of 17 no. Flats comprising 15 no. One bedroom and 2 no. Two bedroom flats contained within a single block 2.5 storeys high (including accommodation within the roof space) access provided from sutton lane and seven crescent and provision of 27 no. On site car parking spaces together with communal amenity space and on site vehicle turning	33-35 Sutton Lane & Land behind, 24-36, Severn Crescent, Slough, Berkshire
P/14218/002	Demolition of two no. Existing residential dwellings and site clearance of former garage court and erection of three no. Pairs of three bedroom semi detached houses and a terrace of four no. Three bedroom houses. All houses are gable end with pitched roofs incorporating modest crown tops with front facing dormer windows and accommodation within the roof space. Access from Sutton Avenue and seven crescent. Provision of rear amenity space and assigned and communal parking.	33-35, Sutton Lane & Land Behind and Rear of, 24-36, Severn Crescent, Slough, Berkshire
Industrial & storage		
P/10650/005	Submission of reserved matters covering details of access appearance landscaping layout and scale following the grant of outline planning permission reference p/10650/004 on 8th July 2009 for the erection of an industrial building (5657 sq.m) for class b1 (c) or class b8 use together with details of car HGV and cycle parking.	International Catering Ltd, Walford Meadow, Horton Road, Colnbrook, Slough, SL3 0BG
Other		
P/02407/081	Variation of condition 2 of planning permission p/02407/076 for the configuration of mini roundabout, alterations to access road, reconfiguration of car park, increased glazing to front retail units,	734a, Bath Road Retail Park, Bath Road, Slough,

	signage boxes, totem pole, ATM's, landscaping, bicycle parking and 2 no. Retail units (class a1/a3) to incorporate additional glazing in the front elevation of unit 734a, bath road retail park (former allied carpets)	Berkshire, SL1 4DX
P/03977/024	Erection of two storey extension to provide new sports hall, changing rooms, classrooms and administration office. The works include a temporary construction compound	Westgate School, Cippenham Lane, Slough, SL1 5AH
P/04296/013	Refurbishment of existing industrial building, including replacement of glazed curtain walling at first floor with new fenestration and new loading bay	480, Bath Road, Slough, Berkshire, SL1 6BE
P/05008/011	Erection of single storey extension with pitched and hipped roof to create 3 form entry school, additional staff/visitor parking, modified play areas and new multi use games area	Wexham Court Primary School, Church Lane, Wexham, Slough, SL3 6LU
P/12244/007	Application to vary condition 01 of planning permission reference p/12244/000 dated 21st October 2003 (as amended) for the retention of a temporary logistics centre for the delivery, storage and assembly of materials and components related to the construction of Heathrow related construction projects, incorporating inter alia rail sidings, bulk powder storage facility , steel reinforcement fabrication facility,	Colnbrook Logistics Centre, Colnbrook By Pass, Slough, Berkshire, SL3 0EA
P/14515/000	Outline application for means of access (in part for changes to Leigh road/bath road junction and access and realignment of Leigh road), demolition of existing buildings and redevelopment of the Leigh road central core, consisting of offices (b1a), hotel (c1), retail (a1), financial and professional services (a2), restaurants (a3), drinking establishments (a4), hot food takeaways (a5), conference facility, skills and learning centre, crèche (all d1), health club/gym (d2), transport hub, new Leigh road bridge, parking hard and soft landscaping, CCTV, lighting, street furniture, boundary treatment and all enabling and ancillary works.	Slough Trading Estate, Central Core Area, Leigh Road, Slough
S/00071/047	Application for the variation of conditions 18, 19, 20 and 23 of planning permission s/00071/45 (demolition of the existing building compair house and provision of a new Slough bus station facility, including a new access road from William Street, ancillary operational facilities, feature canopy, public realm works and associated infrastructure) relating to the timing of the submission of details	Compair House, Brunel Way, Slough, Berkshire, SL1 1QD
S/00614/002	Extension of single storey west wing of existing school building and construction of a new single storey teaching block next to Cobham Close.	Western House Primary School, Richards Way, Cippenham, Slough, Berkshire, SL1 5TJ
S/00533/001	Redevelopment of the site for a new library and cultural centre including life long learning facilities, multi performance space/council chamber, teaching rooms, gallery space, cafe, external reading garden, new vehicular accesses, phased provision of enhanced pedestrian links, public realm and landscape improvements. The proposal will involve the demolition of part of the rear of 3-4 William street, the ramp and toilet block attached to Queensmere shopping centre and scope for the future demolition of 7-11 McKenzie Square for enhanced public realm and pedestrian links.	Day Centre and Prudential Yard, William Street, Slough, Berkshire
P/11033/000	Erection of part four, part five storey offices (outline) (amended plans dated 07/06/2000)	1-7, High Street, Slough, Berks
Retail		

P/00362/066	An application for the approval of reserved matters following the grant of outline planning permission reference p/00362/063 for demolition of existing structure and construction of a new superstore with alterations to existing access, car parking and landscaping	(Former Co-Op Superstore), 78, Uxbridge Road, Slough, Berkshire, SL1 1SU
P/01303/013	Erection of a three / four storey block comprising mosque office and storage at loft level, 12 no two bedroomed flats, 1 no. One bedroom and student accommodation (7 no. Rooms plus communal facilities) at first and second floor level, 2 retail units security office and 17 no. Parking spaces and cycle parking at ground floor level, 25 no. Parking spaces (including 1 disabled), retail service bay, refuse storage and cycle parking at basement level and ramped access between parking levels with storage space under, and limited vehicular egress on to Uxbridge Road.	79-83, Uxbridge Road, Slough, Berkshire

6 Air Quality Planning Policies

The progress report provides an ideal location to list air quality planning policy within Slough and how they change over time. Slough Local Development Framework 'Core Strategy 2006 – 2026' sets out the policies and guidance to govern the spatial planning of Slough over the next 20 years. This document therefore determines the relationship between planning and air quality within Slough. The Core Strategy highlights air quality in the following policies/statements;

3.18 *The council has produced its second, five year Local Transport Plan 2006 – 2011 (Doc.14) The vision for Slough's transport system aims to tackle problems such as congestion, air quality and make the transport structure more sustainable in the future. The three key themes for the vision are:*

- *a more balanced local transport system;*
- *an effective public transport hub serving both local and regional journeys and interchange;*
- *and*
- *better public transport connectivity to and from Heathrow Airport and west London.*

7.16 *The Spatial Strategy also means that there is no need to build on any land outside of the urban area which has been ruled out for a number of reasons. ...Thirdly much of the land is subject to a number of physical or technical constraints. These include the land being subject to flooding, being land filled, having unsuitable access, being in the Public Safety Zone and being subject to excessive noise or poor air quality.*

7.49 *The Sustainability Appraisal Report (Doc.22) identifies the potential adverse environmental effects of the scale of the proposed residential development in the town centre. These include the problems of congestion and air quality....*

7.84 *Office development in the town centre will also be subject to parking restraint which, together with improvements to public transport, should reduce the amount of commuting by the private car. This will help to tackle the problems of congestion and poor air quality in the town centre.*

7.124 *The Slough Local Transport Plan (Doc.14), in accordance with Planning Policy Statement13 – Transport (PPG13), seeks to reduce congestion, improve accessibility, create safer roads, improve air quality and mitigate the impact of the transport system on the environment and ensure that it contributes towards broader social and economic objectives. To effectively tackle congestion the plan seeks to widen travel choices by making public transport, cycling and walking more attractive than the private car....*

7.130 *The Local Transport Plan (Doc.14) has identified a link between the amount of traffic on Slough's roads and an increasing level of pollutants in the town centre, such as carbon dioxide, a contributor to climate change. The plan identifies two Air Quality Management Areas (AQMAs) in Slough and a third may be declared in the town centre that could limit the scope for development there.*

Target: *Annual mean NO2 air quality levels to be 35 ug/m3 by 2021.*

7.141 *The Local Transport Plan (Doc.14) contains a draft Air Quality Action Plan which sets out measures to tackle air quality problems. Further detailed work will have to be carried out to show how air quality problems in the town centre can be mitigated in order to allow the planned additional development to take place.*

7.153 *There are currently two areas close to the motorways which have been designated as Air Quality Management Areas. They are unsuitable for residential development and other sensitive uses, unless it is practical to incorporate mitigation measures to reduce the effects to acceptable levels. Other areas of the Borough are affected by pollution from noise, dust, and chemicals, which may limit new development.*

7.160 *Relevant planning applications will have to be accompanied by noise, light pollution or odour studies, which demonstrate that the proposed development will not have an unacceptable impact upon adjoining uses. Developers will also have to carry out air quality modelling to show that the site is not affected by poor air quality and that the proposed activity will not make the air quality any worse.*

9.2 *There is a risk that the Spatial Strategy of concentrating development in the town centre with taller, denser buildings, together with increased transport movements, will combine to increase emissions and limit the potential for the concentration of pollutants to be dispersed. This has the potential to create significant localised long term adverse effects.*

9.2 *There is a risk that the Spatial Strategy of concentrating development in the town centre with taller, denser buildings, together with increased transport movements, will combine to increase emissions and limit the potential for the concentration of pollutants to be dispersed. This has the potential to create significant localised long term adverse effects.*

9.3 *The air quality review carried out by the council showed that an area along the A4 in the town centre was close to exceeding the nitrogen dioxide objective primarily as a result of road traffic congestion. An Air Quality Management Area (AQMA) was not declared but this will have to be kept under review in the light of the proposals to build large numbers of residential units in the town centre. Any significant deterioration in air quality could therefore undermine the Spatial Strategy and limit the amount of residential development that can take place there.*

9.4 *As a result, air quality in the town centre will have to be monitored and the effects of any changes to the road system, such as those proposed in the Heart of Slough, will have to be fully assessed. Mitigation measures may also have to be introduced such as reducing congestion and controlling the amount of stationary traffic in critical areas. At the same time, buildings may have to be designed so that non residential uses are located on the most sensitive areas. The council will also continue to implement and develop the air quality action plan in the Local Transport Plan.*

The 'General Development Guidance – Developer's Guide Part 4' is intended to assist developers who are proposing to submit planning applications for residential and commercial schemes in Slough. Air Quality is addressed in Chapter 5. Within this chapter there is a description of the background of Air Quality management in Slough, the existing AQMAs and Action Plan.

7 Local Transport Plans and Strategies

Slough Borough Council has started work on Local Transport Plan 3 (LTP3) after LTP2 expired in March 2011. In March the council adopted the Interim Local Transport Implementation plan for 2011/12 (Interim LTIP 2011-12). This plan was designed to show how LTP3 will be delivered on the ground in the first year, 2011/12.

Interim Local Transport Implementation plan for 2011/12

The following statements refer to Air Quality in the interim LTIP 2011-12;

Local Sustainable Transport Fund

2.1.17 The DfT has set aside funding to support successful bids to the new Local Sustainable Transport Fund. This will be aimed at packages of measures that support economic growth and reduce carbon emissions as well as improving air quality, enhancing safety and reducing congestion.

Air Quality Management Area Action Plans

3.2.1 These packages will all contribute towards delivery of the action plans for improving air quality in the Brand's Hill and M4 Air Quality Management Areas (AQMA). Action plans are due to be prepared for the recently declared AQMAs in the town centre and Tun's Lane area. We intend to link these with the forthcoming 3-year LTIP to emphasise the close relationship between air quality and traffic.

LTP3 – 2011 – 2026

The following statements refer to Air Quality in LTP3;

Multi-agency joint working

1.5.6 - Air quality – we have been liaising closely with the Highways Agency over the development of our AQMA action plan

Health Impact Assessment

1.7.7 The current LTP3 guidance indicates that consideration of 'Human health' is a legal requirement in a Strategic Environmental Assessment (SEA) and that a Health Impact Assessment (HIA) is an integral part of an SEA to identify and inform health issues in plans.

1.7.8 This has informed the development of this LTP and helped to mitigate the negative effects on health and well-being (whether physical and/or mental health). In addition, it has helped to:

- secure consistency between the LTP3 and work associated with Sustainable Community Strategy and Local Area Agreement;
- coordinate the public health concerns in respect of air quality, noise and climate change; and
- contribute to the wider agenda relating to quality of life and reducing health inequalities.

Thames Valley DaSTS study

2.3.7 The study recognised the importance of the Thames Valley to the national and regional economy and the need to support future growth. Through working with stakeholders, it identified that there are a number of clear challenges in relation to the capability of the transport network to accommodate future demand for travel arising from new jobs and housing and the continued growth of Heathrow.

2.3.8 Prominent amongst these challenges are:

- growing congestion and delays on major roads such as the M4;
- increasing crowding on rail services, reaching critical levels by 2021;
- limited public transport access to Heathrow from the west; and
- poor air quality in certain areas arising from strategic transport (such as Heathrow and the M4).

West London Sub-Regional Transport Plan

2.3.21 The West London Sub-Regional Transport Plan is important to Slough – there is a very high degree of interaction between Slough and London in terms of commuting to and from the Borough, and access to national and international transport networks.

2.3.22 The West London SRTP identifies a number of strategic challenges, of which the following are of particular relevance to Slough:

- improving access to, from and within key locations and trip generators, such as Heathrow Airport;
- overcoming the congestion and crowding on radial connections between central London and west London (and beyond);
- addressing the major air quality challenges in west London at Heathrow, and along the M4 corridor; and
- enhancing the efficiency of freight movements and reducing the environmental impacts of freight on residents and visitors.

2.3.23 The SRTP proposes or supports a number of potential solutions including

- Crossrail and Great Western Mainline electrification;
- a High Speed Line 2 interchange at Heathrow and with Crossrail;
- road junction capacity enhancements on key roads such as the M3, M4, A4, A40, A30 and A404 will also help improve radial road capacity;
- a motorists cordon charge at Heathrow;
- additional bus priority and high occupancy vehicle lanes on the approaches to Heathrow;
- growth in coach travel to and from Heathrow; and
- opposition to Heathrow expansion.

Environment

3.2.25 There are a number of locations in Slough which suffer from the effects of excessive traffic, be it poor air quality, noise or severance. Our vision is for a Slough where there are fewer cars, and where their negative impacts on our communities no longer exist. We have less say over reducing emissions and noise from aircraft but will continue to support those who do.

3.2.26 The Council is committed to ensuring that Slough makes a full contribution to tackling global climate change. At the time of writing, Slough is one of only two places in Great Britain to have joined the United Nations' Climate Neutral Network and has pledged to reduce CO2 emissions by 20% by 2028. To achieve this, we envisage a town where there is a reduced need to travel by locating new housing, jobs and services close to each other and, where we do need to travel, we can do so easily by sustainable modes such as walking, cycling and public transport.

LTP Objective: to protect and improve personal health**Improving local air quality**

5.6.2 There is clearly a direct link between the amount of traffic on Slough's roads and the levels of pollutants in the air. Of particular concern are levels of nitrogen dioxide (NO2). In two areas in Slough

the levels of NO₂ exceed the UK national standards and objectives and also the EU air quality directive limit values. The main source of the exceedence is from road traffic.

5.6.3 As a result, these areas were declared as Air Quality Management Areas (AQMAs) in 2005. One area extends along the length of the M4 and the other along the A4 at Brands Hill approaching Junction 5 of the M4. Our ongoing monitoring and forecasting work shows that NO₂ levels at a number of other locations along Tuns Lane and the A4 in the town centre are also poor, meaning that two further AQMAs will be declared in 2011.

5.6.4 Air Quality Action Plans (AQAP) were agreed in 2006 for the Brand's Hill and M4 AQMAs and integrated within the LTP2. Our action plans have been revised and the specific measures incorporated into the LTP3 as appropriate. Our work shows that, to reduce levels of NO₂ we need to:

- reduce the number of vehicles on the roads;
- reduce the levels of emissions from vehicles per mile; and
- reduce stop/start traffic conditions.

5.6.5 We intend to prepare AQAPs for the newly declared town centre AQMAs at the same time that we produce our comprehensive 3-year LTP3 Implementation Plan in Autumn 2011. By linking the plans in this way we aim to show the integration between the LTP3 and air quality management.

5.6.6 Components of LTP3 that will help to minimise the effect of transport on local air quality are described below.

Sustainable land use planning

5.6.7 Sustainable land use policies will be key to reducing traffic volumes and focusing development in the most accessible locations such as the town, district and neighbourhood centres, making the best use of existing and proposed infrastructure and helping build local communities for example by protecting the suburban areas and public green spaces. (see Chapter 3). LDF policies that will support our drive to improve air quality:

- limiting the amount of parking allowed;
- requiring developers to prepare 'transport assessments' of the impacts of the development;
- securing financial contributions from development proposals for improving transport links (e.g. to Heathrow); developing transport hubs (in Slough Town Centre and the Trading Estate) and improving the borough's railway stations.; and
- tackling congestion by seeking to widen travel choices and make travel by sustainable means more attractive than the private car.

5.6.8 Improving the management of traffic in Slough, particularly along the A4, is necessary to reduce congestion and improve air quality along this corridor and in the town centre. We believe we can reduce queuing, improve the reliability of journey times and promote quicker, more reliable bus journey times along the A4 corridor if we can reduce overall demand for travel. In doing so, we will improve local air quality by reducing emissions from road vehicles.

5.6.9 We will invest in Urban Traffic Management and Control (UTMC) systems and other Intelligent Transport Systems (ITS) developments, particularly focusing on the A4 corridor. Other traffic and parking management measures such as 20mph zones and controlled parking zones will help us remove unnecessary traffic from residential areas and improve the flow of traffic on key local routes. Better co-ordination of street works and event planning will also assist.

5.6.10 Traffic on the A4 approaching Junction 5 of the M4 is a major contributor to air quality problems. We will seek ways of better managing traffic at this junction but recognise that the way in

which the junction is managed heavily influences traffic flows along the M4 itself. We will therefore work with the Highways Agency to examine ways of improving air quality without unduly affecting the M4. Further, the M4 itself is a major generator of emissions and we will also work with the Highways Agency to reduce the impact of the M4 on Slough's residents, workers and visitors. Cleaner buses, taxis and commercial vehicles

5.6.11 Better management of commercial vehicles, especially Heavy Goods Vehicles (HGVs) on the local road network will be a key action in improving local air quality and we will engage with local businesses and freight operators on how this can be achieved. Upgrading of the lorry and van fleet with greater use of cleaner technology and alternative fuels will help reduce the emission of pollutants as well as emissions of CO₂.

5.6.12 The environmental performance of the bus fleet will increase as new vehicles are put on the road. Within the context of our quality bus partnership with First Berkshire we will promote cleaner buses, including on services passing through the AQMA at Brands Hill. The upgrading of the taxi fleet and the Council's own vehicles will also benefit air quality.

5.6.13 We are committed to significant investment to promote sustainable modes of travel as well as addressing environmental problems including local air quality. For example, through our cycling and walking strategies we will promote use of these low carbon and healthy modes. Many elements of this LTP3 will also support raised standards of air quality by reducing dependence on the private car by making bus and train travel more attractive.

5.6.14 Our parking strategy seeks to restrain and reduce demand for long stay parking in the town centre to promote greater use of public transport, walking and cycling. We will also restrict parking provision associated with new developments as much as possible to prevent significant increases in the size of the overall parking stock and introduce additional Parking Watch Zones. By managing demand for travel by car we can manage emissions. Use of variable message signs and other technology will assist in reducing circulating car park traffic in the town centre.

5.6.15 We continue to deliver travel plans and safer routes to school across Slough to promote walking and cycling and reduce the number of pupils driven to school to minimise the effect school run traffic has on local air quality, and congestion.

5.6.16 Regeneration of the Slough Trading Estate will be linked with significant investment to encourage more sustainable commuter and business travel patterns. We will also continue working with BAA Heathrow on implementation of the Heathrow travel plan as many of Heathrow's workers live in Slough. Staff travel plans will also remain as an integral part of considering planning applications for new developments.

5.6.17 Our Health and Wellbeing Strategy aims to make it easier for people in Slough to be physically active, helping combat obesity, high mortality due to heart disease or stroke. This LTP3 can contribute to this aim by promoting and facilitating active travel i.e. walking and cycling.

5.6.18 Apart from being healthy, walking and cycling offer low carbon, non-polluting alternatives to the private car. Our walking and cycling strategies, combined with our Rights of Way Improvement Plan (RoWIP) are directed at improving facilities and encouraging more people to walk and cycle.

(5.6.19) Investment in maintaining and enhancing walking and cycle routes to make them safer and more attractive is the foundation for boosting levels of active travel in Slough. We will work with health partners, the proposed Cycle Forum (see §5.8.34) and others to promote the health benefits.

5.6.20 Our smarter choices strategy places a strong emphasis on promoting walking and cycling to school by working in partnership with schools and developing initiatives to make travel by these modes more attractive. Initiatives to do this include:

- walking buses;
- walk to school awards;
- cycle training and
- provision of secure and sheltered cycle parking.

5.6.21 Partnership working with employers on preparation and delivery of workplace travel plans also offers an opportunity for the health aspects of travel to be reinforced and this is something we will pursue.

Smarter choices campaign

5.8.17 We will manage a campaign to raise awareness about the impact of car emissions on local air quality and climate change. The campaign will be targeted at young people, ethnic minority communities and commuters. The campaign will also promote the benefits of alternative modes including public transport, walking, cycling, scooter, bike rental, car sharing, car clubs, and incentives to employees for sustainable travel.

5.8.18 We recognise that the poor perception of public transport is a key factor in deterring usage, especially by car drivers. We will therefore also use the campaign to enhance the image of public transport, remove negative associations and make people aware of the availability of bus and rail services. Opening of the new bus station and improvements to Slough station will be a catalyst.

LTP3 Supplementary Strategy Document – Freight Strategy

2.5 Traffic Management Act 2004

The Traffic Management Act now places a network management duty (NMD) on all local authorities to keep traffic flowing and to manage traffic more efficiently...

Proposals or initiatives within the borough must recognise the needs of freight and manage its impact on the highway network, including reducing delays and reduce vehicle delays, particularly in areas with existing poor air quality.

Table 3.3 – Challenges and Opportunities for Freight in Slough

Slough SCS Theme	LTP3 Objectives	Problems/ Issues facing freight	Interventions to address freight problems/ issues
Environment	to reduce transport's CO2 emissions and make the transport network resilient to the effects of climate change	Between 10 – 20% of vehicles on Sloughs road network are commercial vehicles. A third of these are HGVs and their contribution to emissions is disproportionately high. SBC's Air Quality Further Assessment (2004) noted that HGVs contribute to 33% of the total emissions in Slough. Within the M4 Air Quality Management Area (AQMA) this figure rises to 69%.	<p>Set up Freight Quality Partnership to work with operators, including bus operators and the freight industry to:</p> <ul style="list-style-type: none"> ☑ upgrade to cleaner vehicles ☑ investigate alternative fuels i.e. change to biodiesel, compressed natural gas, electricity to reduce emissions CNG (Compressed natural gas)

		<p>Carbon Dioxide (CO₂) emissions from road hauliers increased by more than a third between 1990 and 2002. Road freight now accounts for 8% of UK CO₂ emissions Idling engines in traffic congested streets result in CO₂ and NO₂ emissions.</p>	<p>☒ fitting of particulate traps etc</p> <p>UCCs – Urban Freight Consolidation Centres Management of Council’s own vehicle fleet</p>
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3.3 Key Issues and Challenges

- Freight traffic contribute to air quality issues in the borough

8 Climate Change Strategies

Slough Borough Council's Climate Change Strategy is currently available for consultation. The Strategy and accompanying Summary Document set out a range of measures and proposed recommendations designed to reduce the borough's carbon footprint and enable the borough to cope with the consequences of already occurring or predicted climate change.

The Strategy outlines plans to reduce the Council's own carbon emissions by 40% by April 2014 and proposals to encourage residents and businesses to reduce their greenhouse gas emissions. It also looks at actions which may be taken in terms of new and existing developments, waste disposal, biodiversity, energy supply and transport and how changes to behaviour, technology and policy could contribute to lowering the borough's emissions.

The summary consultation document sets out the following plan for transport and air quality;

Transport and Air Quality

Vehicles play a vital role in the free movement of residents, employees, goods and services around the borough. Most vehicles run on petrol or diesel. Petrol and diesel are fossil fuels which release CO₂ into the atmosphere when burnt. These fuels also produce other pollutants which can affect air quality and cause illnesses such as asthma. Hotter, drier summers can also intensify air quality issues because pollutants react to strong sunlight and are not dispersed in still, warm weather.

14.6% (101 kt CO₂) of Slough's carbon footprint comes from local road transport (based on DECC data from 2007) - this is below the South East regional average but could be reduced further.

Climate change may also affect transport due to damaged road surfaces, railway lines (prone to buckling in the heat) and localised flooding, causing road and rail closures.

Transport Climate Change Actions

Slough Borough Council is implementing a travel plan for the authority.

- Work is also underway to develop the new Local Transport Plan 3 (LTP3) for the borough. This will replace the council's LTP2, which is due to expire in 2011. Local authorities have a statutory obligation, under the Transport Act 2008, to develop a transport strategy. The new LTP3 will be developed to address the challenges faced by the transport infrastructure in and around Slough. It will cover all modes of transport, including walking, cycling, public transport, car travel and freight. It will contain policies that meet the borough's social, economic and environmental objectives, alongside an implementation plan that will outline how these strategies will be delivered. The Plan will broadly seek to promote healthier forms of transport, support robust economic growth, reduce road congestion, and make public transport more attractive.
- Much of the specific action that needs to be carried out to meet the boroughs transport targets and goals requires high level, cross-boundary collaborative working between Slough Borough Council, other Berkshire and Buckinghamshire authorities and organisations such as the Highways Agency and Network Rail. Local transport officers from across Berkshire are working through the Berkshire Strategic Transport Forum to look at sustainable transport measures across the region - be it looking at strategic bus movements to reduce car mileage

or to support the electrification of the Great Western Main line - and provide a unified voice on key transport issues.

- Two variable message signs have been installed alongside the A4 outside B&Q, Bath Road Retail Park and the Marriot Hotel, Langley in 2010. The signs are remotely controlled from Slough Borough Council's traffic team and are part of a series of improvement works being undertaken to improve traffic flow, reduce congestion and improve air quality through a reduction in pollution along this main route through Slough. Changes have also been made to the traffic lights at these junctions to reduce commuters' journey times, reduce congestion, reduce CO2 emissions and improve air quality at these sites. A new computerised traffic light system called SCOOT has also been introduced, linking all the junctions along the A4, between the Brunel roundabout to the Huntercombe roundabout to reduce traffic congestion and ensure the road ahead is clear when the lights change to green. Protect the natural environment, improve air quality (through the continued development of an Air Quality Management Action Plan) and reduce greenhouse gas emissions; which when taken together, will help improve the quality of life for all residents, businesses and visitors to the borough.
- A state-of-the-art wireless traffic detection system known as 'Magnetometres' which 'sees' traffic approaching a red light and automatically changes the lights to green (where possible) is also being piloted across the borough. If successful, Slough Borough Council intends rolling it out across the borough from 2011 onwards.
- The charity Groundwork Thames Valley is also working with residents to reduce food miles across the borough. They aim to reconnect residents with local food producers and reduce food miles by encouraging the establishment of food fairs and stalls across the borough that only sell locally grown produce.

9 Conclusions and Proposed Actions

9.1 Conclusions from New Monitoring Data

The automatic monitoring sites in the borough measured concentrations that exceeded the NO₂ annual mean objective at one sites in 2010. This site is currently within the existing AQMAs, therefore there is no requirement to progress to a Detailed Assessment.

The overall trend across the automatic monitoring stations indicates that annual mean concentrations have remained steady, although 2010 results represent a significant drop in measured concentrations at two of the sites (SHL4 & SHL3)

Based on the automatic monitoring results there is no requirement to proceed to a Detailed Assessment. They also indicate that the current AQMAs are appropriate.

Diffusion tube monitoring in the borough measured exceedances of the annual mean NO₂ objective at 20 sites. Of these sites 17 are within existing AQMAs. The three sites outside AQMAs are; Windsor Road 1N (SL4), Colnbrook By-pass (SL7) and Sussex Place (SL27).

The Windsor Road 1N (SL4) and Colnbrook By-pass (SL7) monitoring site is not near any relevant receptors for the annual mean NO₂ air quality standard. The Nitrogen Fall Off with Distance tool estimates that the concentration at the nearest relevant receptor to the Sussex Place monitoring site is 38.6 µg m⁻³. Therefore, there is no requirement to proceed to a Detailed Assessment at any of the none automatic monitoring locations.

The diffusion tube sites where measured concentrations where over the annual mean objective include:

- SL4 Windsor Road 1N
- SL6 Tweed Road
- SL7 Colnbrook By-pass
- SL9 Princess Street
- SL11 Winvale
- SL12 Lansdowne avenue
- SL13 Bands Hill
- SL16 London Road
- SL17 Grampian Way
- SL18 Ditton Road
- SL25 Williams Street Roundabout
- SL26 Torridge Road
- SL27 Sussex Place
- SL28 Spackmans Way
- SL31-33 Chalvey (CAS)
- SL34 Wexham Road
- SL37 Blair road-Victoria Court
- SL38 Wellesley Road
- SL39 Rogans

- SL40 Yew Tree Road

At two diffusion tubes sites NO₂ concentrations above 60 µg/m³, this indicates that it is likely that there is an exceedence of the 1-hour objective. These sites include; Brands Hill (SL13) with a measured concentration of 67µg/m³ and Yew Tree Road (SL40) with a measured concentration of 60.3µg/m³. As these sites are currently within existing AQMAs a detailed assessment is not required, although the AQMA declaration for the relevant areas would need to be updated to take the 1-hour exceedence into account.

The trend in measured results at diffusion tube sites since 1993 does not indicate that there has been a significant improvement in NO₂ concentrations, with 2010 appearing to represent a spike in concentrations across a large number of monitoring site.

PM₁₀ concentrations are monitored at 5 automatic monitoring sites across the borough. At each of these sites both the annual mean and daily mean objective were achieved. The PM₁₀ concentrations remained relatively stable compared to the concentrations measured in the previous two years.

Benzene is now monitored at 4 diffusion tube sites within the borough. At each of these sites the measured concentration is well below the annual mean objective of 5 µg m⁻³. At all sites there was a reduction in concentrations from 2008. The trend since 2007 appears to be stable with measured concentrations in each year well below the annual mean objective.

Air quality objectives were achieved at all monitoring locations outside of the existing AQMAs at relevant locations; therefore there is no need to proceed to a Detailed Assessment. As NO₂ Air Quality objectives are currently being exceeded at locations within the current AQMAs and proposed new AQMA it demonstrates that they are still required.

9.2 Conclusions relating to New Local Developments

The Heart of Slough re-development of the city centre is currently under construction. This work will alter the traffic flows and result in changes in the relevant receptors in the area. Although, the impact of the re-development on air quality is considered to be of negligible significance.

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

9.3 Proposed Actions

The council is required to submit an Updating and Screen Assessment in 2012.

10 Acknowledgements

This report was prepared in conjunction with Monica Wilsch, Head of Environmental Quality at Slough Borough Council.

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Volatile Correction Model www.volatile-correction-model.info/Default.aspx

Appendices

Diffusion Tube Bias Adjustment Factors and QA/QC

Diffusion tubes may systematically under or over-read NO₂ concentrations when compared to the reference chemiluminescence analyser. This is described as bias and can be corrected for to improve the accuracy of the diffusion tube results, using a suitable bias adjustment factor.

The diffusion tubes deployed by the Slough Borough Council's are supplied and analysed by Gradko using a preparation mixture of 50% triethanolamine (TEA) in acetone. Gradko comply with the WASP scheme and achieved 'good' performance based on old and new criteria for the October 2008 – October 2009 period.

Factor from Local Co-location Studies

There were three local co-location studies between nitrogen dioxide diffusion tubes and continuous monitoring carried out within the borough. Therefore, the bias adjustment factor has been undertaken using these data. The bias adjustment factor of 0.816 was based on the average of the bias measured at Salt Hill (bias factor 0.77), Chalvey (0.85) and three sites reported by other local authorities for the national bias adjustment survey (0.75, 0.79, 0.94). Table 5 shows details of the calculation of the combined bias adjustment³.

Calculation of the bias adjustment factor for 2010 diffusion tube results

Co-location site	Number of tubes	Concentration $\mu\text{g m}^{-3}$		Diffusion tube bias	Bias adjustment factor
		Diffusion tube	Reference analyser		
Salt Hill	36	42	32	31.3%	0.77
Chalvey	36	49	42	16.7%	0.85
Uttlesford DC	9	33	32	5.9%	0.94
Marylebone Road	11	119	94	25.8%	0.79
Rochford	12	62	47	33.2%	0.75
Average bias				22.6%	
Bias adjustment factor calculated from average bias					0.816

³ <http://laqm.defra.gov.uk/documents/NO2-Diffusion-Tube-Collocation-Methodology.pdf>