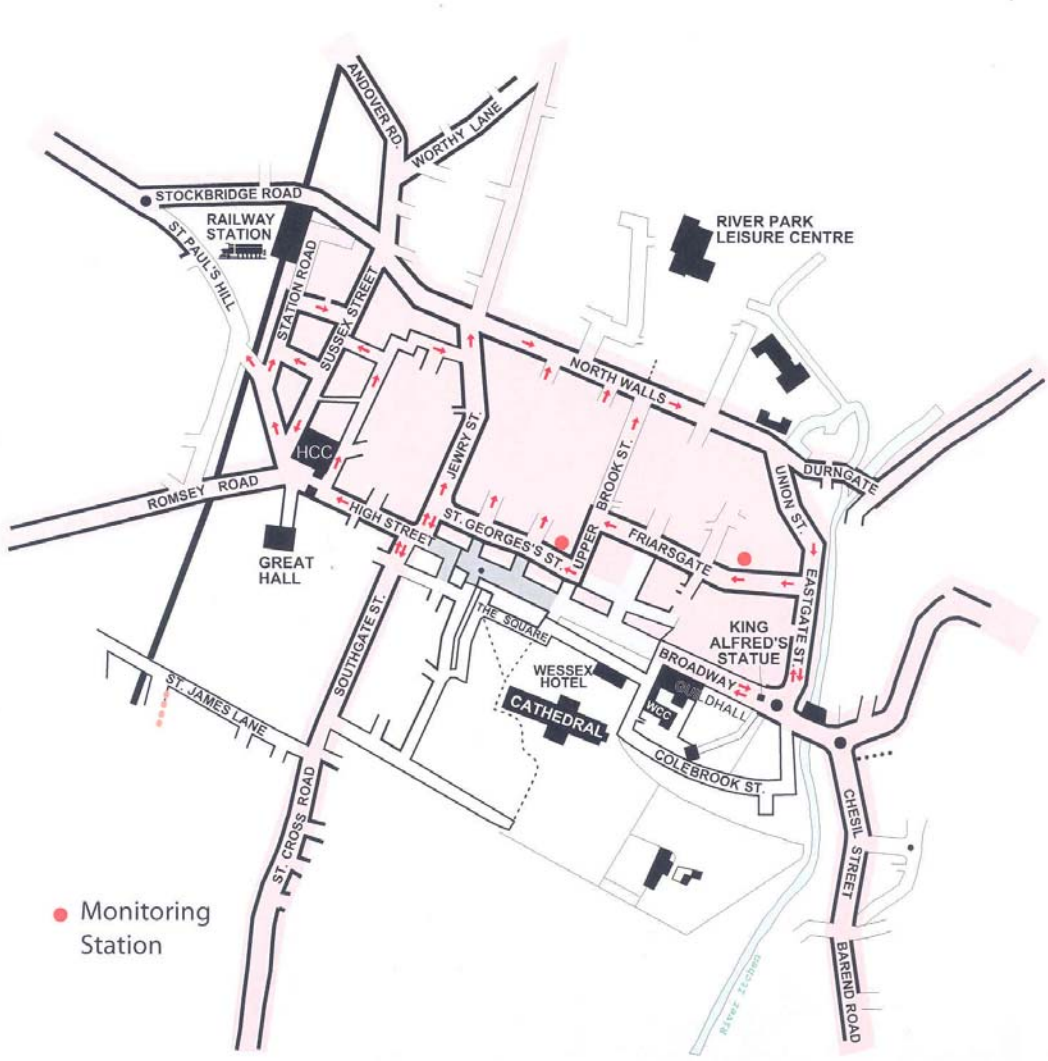
Winchester City Council

AIR QUALITY REVIEW OF WINCHESTER CITY COUNCIL'S DISTRICT

AIR QUALITY PROGRESS REPORT 2005



Report for the Department of Environment Food and Rural Affairs (DEFRA)

Compiled in Accordance with Progress Report Guidance Note LAQM.PRG(03)

SUMMARY

This document provides an update on air quality issues in Winchester's District since publication of the Updating and Screening Assessment of August 2003.

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CONTENTS

1.0 Introduction

Since the implementation of Part IV of the Environment Act 1995 all local authorities have been under a duty to review air quality within their district. It is a requirement that each local authority conducts a formal staged review of air quality within its district in accordance with a comprehensive set of guidance documents. These reports are then sent to the Department of Environment, Food and Rural Affairs (DEFRA) for approval.

There is a comprehensive rolling programme of reports required under DEFRA guidance that includes:

- Updating Screening Assessments
- Detailed Assessments
- Further Assessments
- Action Plans
- Progress Reports

This report is the Progress report for 2005. In producing this report we have followed DEFRA Progress Report Guidance LAQM.PRG(03).

2.0 Monitoring Data

2.1 Real Time Monitoring Equipment

During March 2005 the town centre sites were totally refurbished and new equipment installed at both locations using the existing cabinets. The locations of these sites remain the same and are shown in Figure 1. The roadside site is located 2.75 metres from the kerb whilst the urban background site is located 18 metres from the kerb. The background site samples at a height of 2.80 metres and the roadside site at 2.65 metres. The roadside cabinet was replaced in April 2003 and before this date it sampled at a height of 2.0 metres.

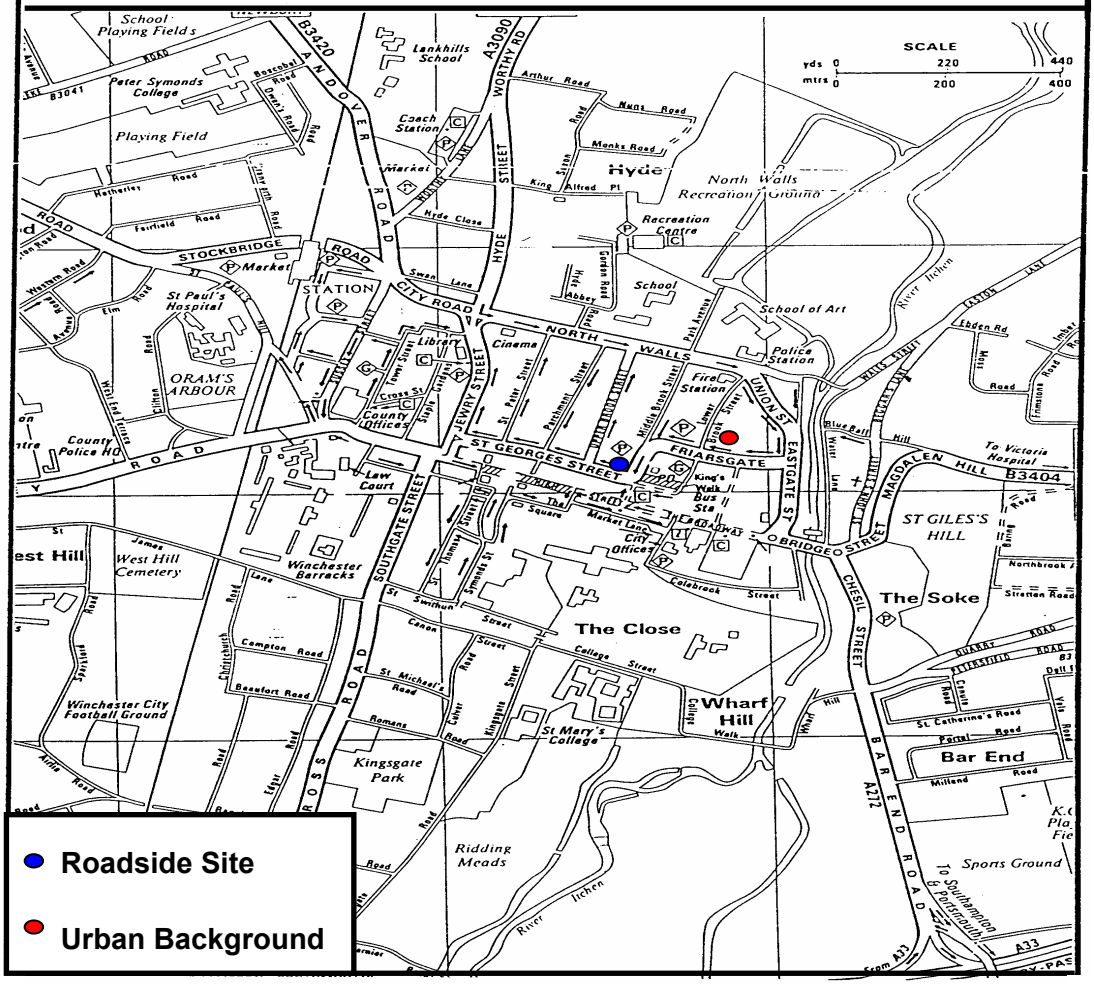
The existing equipment was getting old and a combination of increased breakdowns and the time awaiting spare parts was causing a decrease in data collection efficiency. The new equipment is very similar to that previously installed and is provided by the same equipment supplier. The old equipment has been retained to act as a standby should the new analysers malfunction. The analysers are now:

- API M200E Chemiluminescent NO/NO_2/NO_x analyser with IZS,
- New Met One BAM 1020 PM10 analyser with RH triggered heater units (heater units are not currently being used),
- API M300E CO analyser Gas Filter Correlation analyser - roadside site only,
- 2 Code operated switches for direct communication.

In addition the following changes were made:

- A new Wind speed/direction and temp sensors plus data logger (OPSIS DL256) within a IP65 enclosure and 6 metre pneumatic mast and tripod. This was installed on Winchester City Council City Offices roof on Colebrook St and is polled via a GSM modem.
- Air conditioning plant now serviced annually.

FIGURE 1 – LOCATION OF WINCHESTER'S REAL TIME MONITORS



- A new polling PC was installed operating OPSIS EnviMan ComVisioner and Reporter.
- Use of same calibration gases but now supplied via Envirotechnology Services.
- Independent data ratification/verification with six monthly and yearly reports.

The data collected from these sites is subject to a verification and ratification process that follows that recommended in the AEA Handbook and DEFRA technical guidance document TG(03):

- Nightly automatic internal zero and span checks (IZS) to the gas analysers.
- Fortnightly calibration of gas analysers to traceable primary gas standards. NOx analysers being checked to both NO and NO_2 gas standards. Six monthly servicing by original equipment provider.
- Data correction for zero and span drifts using Enview/Enviman software.
- Up to June 2005 manual and automatic ratification of data using a series of Excel spreadsheets to spot any data errors. After June 2005 ratification and verification has been provided by an independent third party.

2.2 New PM_{10} Monitoring Sites

Currently we are installing three indicative PM_{10} monitoring sites (Turnkey environmental dust monitors) within Winchester City Council to assist with the future assessment of compliance with the 2010 PM_{10} objectives. These are being installed on lampposts on City Road and North Walls. The third analyser will initially be co-located at the background site. These will be commissioned in order to collect data from 1 Jan 2006 onwards.

2.3 Real Time Results

New guidance from the DEFRA supported monitoring helpline now recommends that when comparing results from unheated BAMs with the gravimetric based air quality objectives then the results are divided by 1.2 before calculating the number of exceedances of the 24 hour mean and annual mean objectives.

We have therefore applied this correction factor to all our historic one hour BAM data and recalculated all 24 hour and annual mean results.

Table 2 and 3 below presents a summary of this revised air quality data. All results have a greater than 80 percent collection efficiency except for the results noted below:

2000 PM_{10} Background – 70 percent
2000 No_2 Roadside – 66.4 percent
1999 No_2 Background 74 percent
2004 PM_{10} Background – 44 percent

Historically it has proven difficult to maintain a 90 percent data collection efficiency, as breakdowns have resulted in equipment being removed for repair for significant periods of time. It is hoped that having our old equipment available for hot swapping following any breakdowns will see an improvement in this position. Although it is appreciated LAQM PRG(03) recommends expressing results with a data capture of less than 90 percent as percentiles it is felt expressing some results as percentiles and some as results above objective value would be unhelpful.

Year	Exceedances of Air Quality Objective					
	PM_{10} 50ug/m^3 (24 Hr Mean)		NO_2 200ug/m^3 (1 Hr Mean)		CO 10mg/m^3 (8hr running mean)	
	Background	Roadside	Background	Roadside	Background	Roadside
1997	8	22	0	299	0	0
1998	5	14	0	6	0	0
1999	1	3	0	8	0	0
2000	2	18	0	15	0	0
2001	3	16	0	12	0	0
2002	2	21	0	161	0	0
2003	21	20*	0	70	0	0
2004	Not enough data	17	0	0	0	0
2005	8	13	1	6	NA	0
	Pass = less than 35 failures/year		Pass = less than 18 failures/year		Pass = No failures of objective	
	Numbers in red FAILED the short term mean air quality objectives					

Notes
PM10 data uses unheated BAM analysers, raw data corrected to gravimetric equivalent by dividing by a correction factor of 1.2
*Data missing from roadside site during March/April 03 when background site recorded significant pollution episodes.

Table 1 – Number of failures of short term air quality objectives

Year	Compliance with Annual Mean Air Quality Objectives					
	Mean PM_{10} in ug/m^3 40ug/m^3 (Annual Mean)		Mean NO_2 in ug/m^3 40ug/m^3 (Annual Mean)		Mean CO in mg/m^3 No annual objective	
	Background	Roadside	Background	Roadside	Background	Roadside
1997	18.4	26.5	35.30	82.7	0.7	1.3
1998	17.2	21.9	39.7	58.1	0.5	1.3
1999	17.6	21.1	31.1	60.2	0.5	1.2
2000	16.4	21.2	33.0	68.6	0.5	1.2
2001	14.8	27.3	33.4	50.8	0.3	1.2
2002	19.8	28.9	27.3	65.5	0.3	1.0
2003	25.7	31.6	41.1	55.8	0.3	1.0
2004	Not enough data	29.8	29.4	52.1	0.3	0.8
2005	21.3	28.1	26.2	53.5	NA	0.5
	Numbers in red FAILED the annual mean objective					

Notes

PM10 data uses unheated BAM analysers, raw data corrected to gravimetric equivalent by dividing by a correction factor of 1.2

Table 2 – Number of failures of long term air quality objectives

2.4 Diffusion Tube Results

Site	Mean Concentration in ug/m3	Tubes Missing
Site 1, 10 Eastgate St	42.2	1
Site 2, Greyfriars 1	40.8	1
Site 3, Greyfriars 2	39.0	0
Site 4, Greyfriars 3	39.2	0
Site 5, Friarsgate	34.4	0
Site 6, Middle Brook St	43.6	2
Site 7, Roadside Monitor	51.1	1
Site 8, Roadside Monitor	50.6	1
Site 9, Roadside Monitor	54.1	1
Site 10, St Georges St	59.1	3
Site 11, St Georges St	63.3	1
Site 12, Jewry St CH	47.7	0
Site 13, Jewry St FK	52.1	0
Site 14, Southgate St DV	43.0	0
Site 15, Southgate St CH	55.2	0
Site 16, Sussex St	42.6	3
Site 17, City Road	47.0	0
Site 18, 74 Northwalls	47.5	4
Site 19, 15 Northwalls	38.8	0
Site 20, Wales St	36.9	2
Site 21, Alresford Rd	28.3	0
Site 22, Chesil St	40.0	3
Site 23, Romsey Rd HL	25.6	0
Site 24, Stockbridge Rd	25.2	1
Site 25, Andover Rd	34.7	0
Site 26, Worthy Rd 1	35.7	3
Site 27, Worthy Rd 2	34.3	3
Site 28, Worthy Rd 3	35.4	2
Site29, St Cross Rd	37.3	2
Site 30, Romsey Road	55.9	1
Site 31, Andover Rd	40.2	2
Site 32, Bus Station	50.4	6

Table 3 – City Centre Diffusion Tube Results 2004

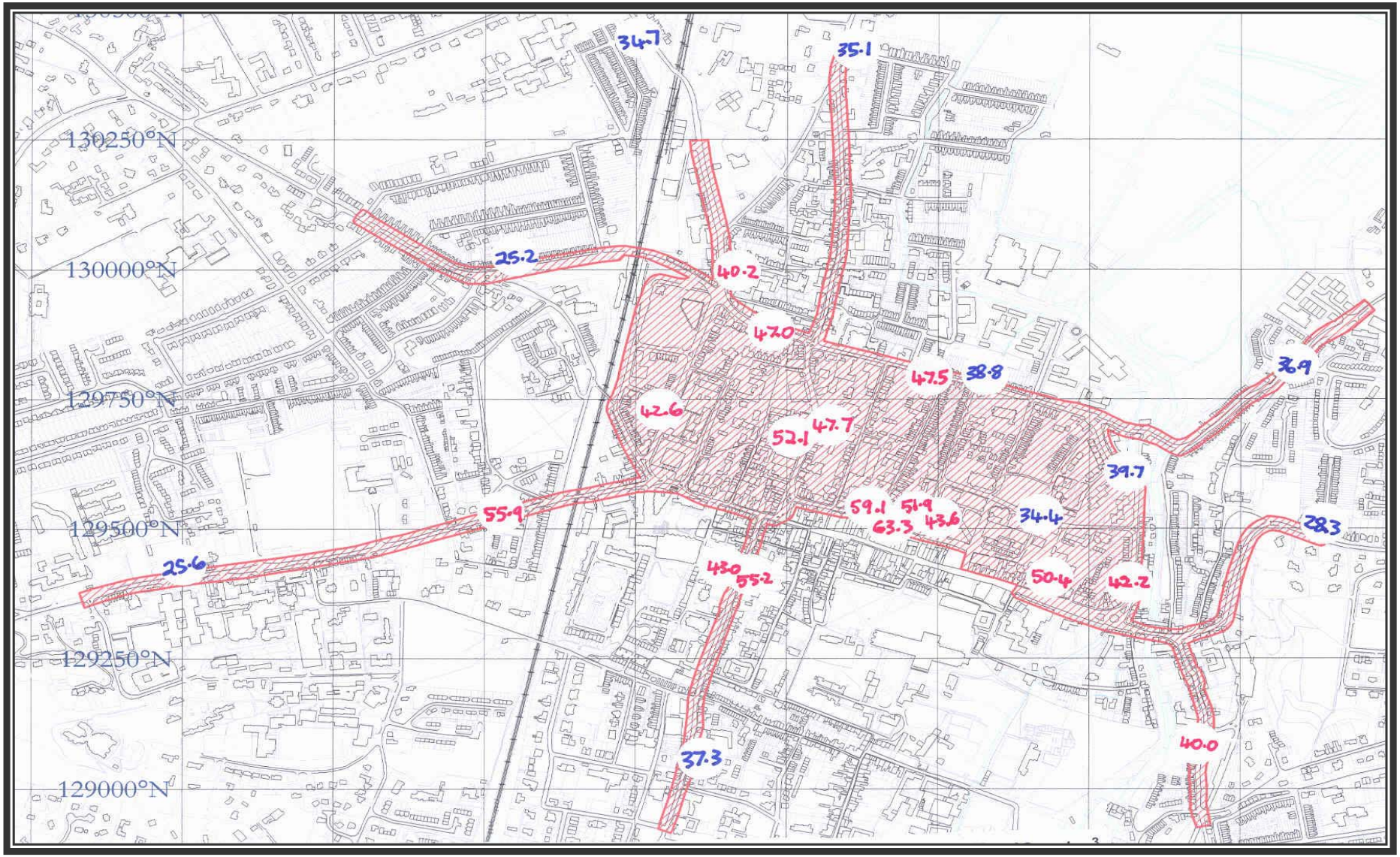


Figure 2 – City Centre Diffusion Tube Results 2004 (By Location)

Site	2003		2004	
	Mean Concentration in ug/m3	Tubes Missing	Mean Concentration in ug/m3	Tubes Missing
Gordon Road, Winchester	37.4	0	29.3	3
City Road, Winchester	57.6	0	56.7	5
Kingsworthy (A34)	34.0	2	29.1	1
New Alresford	36.2	0	35.9	1
Denmead	26.6	2	28.2	0
Wickham	41.1	2	37.1	1
Whiteley	40.0	0	35.5	2
Bishops Waltham	40.1	0	41.9	2
Otterbourne	45.5	1	46.7	0

Table 4 – District Wide Diffusion Tube Results 2003 and 2004

Tables 3 and 4 and Figure 2 show all the new diffusion tube data since issue of our updating and screening assessment in 2003. The town centre diffusion study is conducted using locations representative of public exposure, whilst the District wide study uses busy roadside locations. Exposure heights are a nominal 2.5 metres for the District study and 2 metres for the City study, although the actual heights vary between 1.75 and 2.5 metres.

All tubes were supplied by Gradko International of Winchester and were all 50 percent TEA in water. All results have a local correction factor applied based upon a triplicate co-location study at the roadside site. The correction factor was calculated at 1.23 in 2004 and 1.27 in 2002/03.

2.5 Comment

In conclusion the recalculated PM_{10} results are now in compliance with the 2004 objective but monitoring will continue to assess compliance with the 2010 objectives.

Real time and nitrogen dioxide diffusion tube monitoring shows that the annual mean objective will not be met at locations close to the roads within the town centre. This confirms the necessity for the continued existence of the Air Quality Management Area (AQMA) and the draft Air Quality Action Plan (AQAP). We have therefore adjusted the thrust of the plan towards nitrogen dioxide.

Although some of the district tubes exceed the standard these are worst case roadside exposures. The site at Bishops Waltham is on a lamppost at the edge of the kerb and is not representative of local public exposure. Results to date for 2005 are below 40 ug/m^3. The only result of concern is the increasing trend in the Otterbourne site, which is close to the M3 with associated increases in traffic flows. However, the 2005 average to date is just below 40 ug/m^3. The Otterbourne situation will be re-evaluated early next year when the annual average has been calculated using a 2005 based correction factor. If necessary a more detailed diffusion tube survey will be conducted in the area in 2006.

3.0 Detailed Assessments

We have completed a detailed assessment of sulphur dioxide exposures near to Alresford railway station. This site is used as a heritage steam railway line and is usually referred to as the "Watercress Line". The conclusion of this study, which has been accepted by DEFRA, is that exposures are unlikely to exceed the relevant air quality objectives for sulphur dioxide.

We have also clarified with DEFRA that the Updating and Screening Assessment report of 2003 also served as a detailed assessment for the PM_{10} and NO_2 levels within Winchester Town centre. This has also been accepted by DEFRA.

4.0 New Local Developments

Since the Updating and Screening assessment report of 2003, there have been no new industrial processes within Winchester's District that would significantly impinge upon relevant air quality objectives. There have also been no new significant road, mineral or landfill developments within the district.

However, there are 2 developments that are currently being proposed that could have significant air quality implications.

4.1 North of Winchester

A major development has been proposed to the North of Winchester, infilling an area of agricultural land currently separating Winchester from the nearby satellite settlement of Kings Worthy.

The planning application was rejected by Winchester City Council and has been the subject of an appeal in October 2005. The results of this appeal are at the time of writing this report still awaited.

As part of the planning process the applicant commissioned WSP group Plc to conduct an air quality impact assessment of the proposed development on the area within the AQMA. The impacts were modelled using ADMS Roads and validated against real time and diffusion tube data supplied by Winchester City Council. Predictions were made to the year 2011, which is the earliest completion data for the development. Figure 4 shows a baseline "do nothing" prediction without the development or any AQAP actions taking place. This modelling confirms the necessity for an AQAP with failures still occurring in 2011 immediately adjacent to the main town centre roads. Figure 5 shows the expected additional nitrogen dioxide contribution from the development within the AQMA. This assumes the existence of a comprehensive travel plan for the development. It has therefore been agreed in principle that should the development take place then it will be necessary to fund additional measures to negate this impact. This is likely to be by a finical contribution enabling the earlier implementation of an additional park and ride facility to the South of Winchester.

Further detailed consideration to this issue will be given only if the planning inspector grants permission for the development.

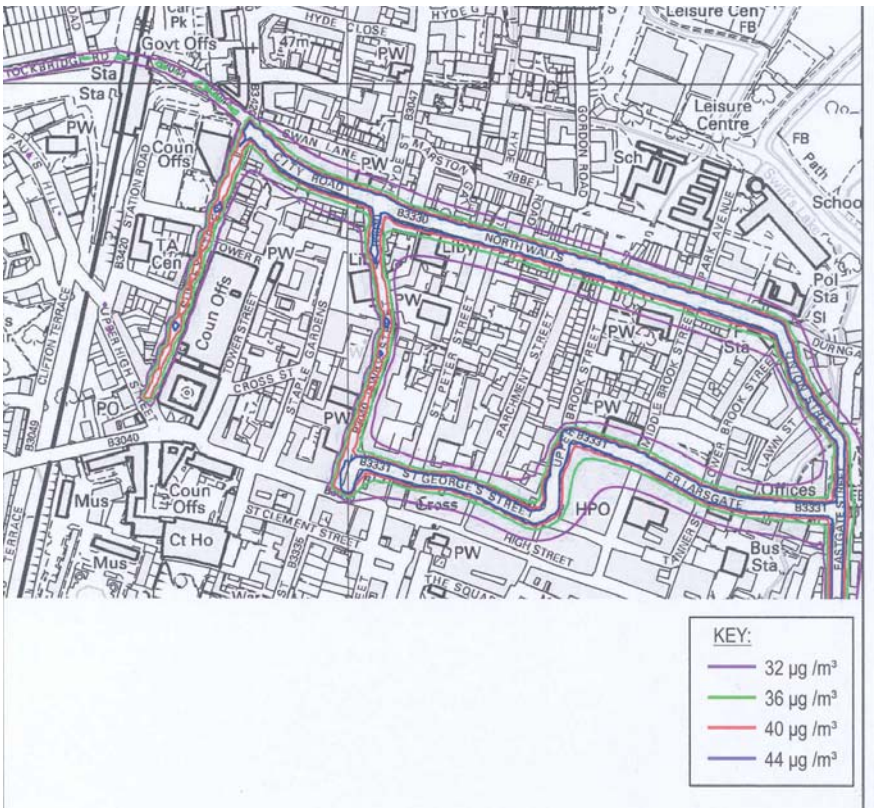


Figure 3 – Predicted Annual Average Nitrogen Dioxide Concentrations in 2011 using a "Do Nothing" Scenario

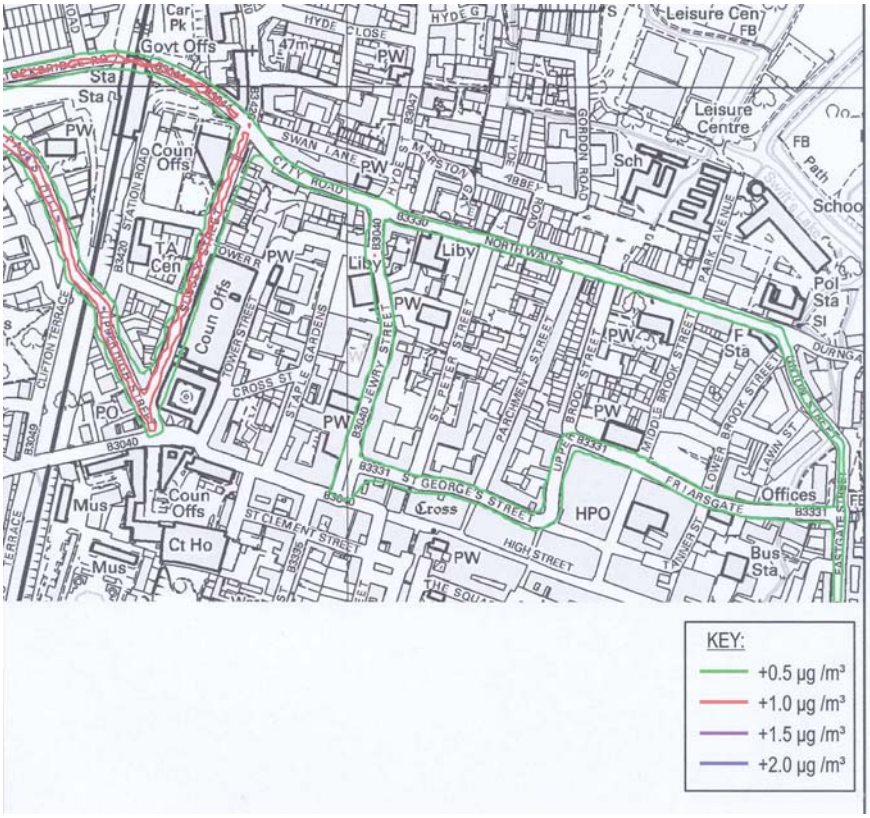


Figure 4 - Predicted Increases in Annual Average Nitrogen Dioxide Concentrations in 2011 from Proposed Winchester City North Development

4.2 Silverhill Redevelopment

Currently there is a proposal to redevelop a significant area of the town centre within the AQMA for mixed commercial and residential use. This is the area between Friarsgate and Broad Street centring around the current bus station and Friarsgate car park. The area is shown in figure 5 below.

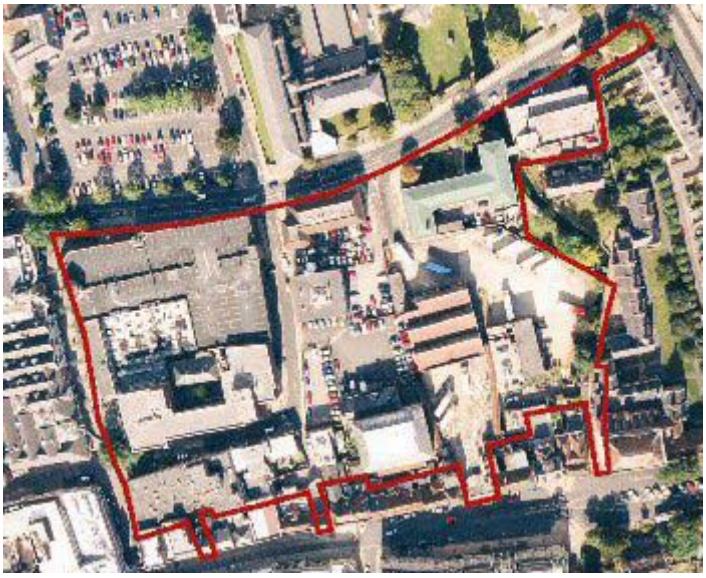


Figure 5 – The proposed Silverhill development

The development has the support of Winchester City Council and a scoping report for an Environmental Impact Assessment (EIA) has been approved. This report identified the need for a detailed assessment of air quality impacts of the proposed development within the EIA.

5.0 Air Quality Action Plan

An Air Quality Management Area (AQMA) was declared in November 2003 for Winchester town centre for the predicted non compliance with the 24 hour mean particle objective and the annual mean nitrogen dioxide objective.

A draft Air Quality Action Plan (AQAP) was produced for initial public consultation in December 2004. This was revised in April 2005 following the consultation process. In light of guidance note LAQM PGA(05) on the integration of AQAP's into local transport plans further liaison with Hampshire County Council took place. This was considered important to ensure the dovetailing of the two plans, as the major delivery of the AQAP will be via the LTP.

This revised version was sent to DEFRA for comment with feedback being received late July 2005. Following comments made it has been necessary to employ consultants in order to make revisions requested by DEFRA. As Hampshire County Council have produced a provisional local transport policy the consultants will also be reviewing the sections of the LTP relevant to AQAP's.

It is now expected that the revised plan will be completed late December 2005.

The final version should therefore be published, assuming Cabinet approval, mid February 2006.