

**DARTFORD BOROUGH COUNCIL**

**LOCAL AIR QUALITY MANAGEMENT UPDATING AND SCREENING  
ASSESSMENT 2009**

**AGG07102/BV/AQ**

**MAY 2009**



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## TABLE OF CONTENTS

Executive Summary .....	4
1 Introduction.....	5
1.1 Description of Local Authority Area .....	5
1.2 Purpose of Report.....	5
1.3 Air Quality Objectives .....	6
1.4 Local Air Quality Management (LAQM).....	8
1.5 Summary of Review and Assessment undertaken by Dartford Borough Council .....	8
2 Updating and Screening Assessment Methodology .....	11
2.1 Input Data .....	13
2.1.1 Traffic data.....	13
2.1.2 Background concentrations.....	13
3 New Monitoring Data.....	14
3.1 Summary of Monitoring Undertaken.....	14
3.1.1 Automatic Monitoring Sites.....	15
3.1.2 Non-Automatic Monitoring Data .....	16
3.2 Comparison of Monitoring Results with AQ Objectives .....	19
3.2.1 Nitrogen dioxide.....	19
3.2.2 Particles (PM <sub>10</sub> ) .....	21
4 Road Traffic Sources.....	23
4.1 Narrow congested streets with residential properties close to the kerb .....	23
4.2 Busy streets where people may spend 1-hour or more close to traffic .....	23
4.3 Roads with a high flow of buses and/or Heavy Goods Vehicles .....	23
4.4 Junctions.....	23
4.5 New roads constructed or proposed since the last round of Review and Assessment .....	24
4.6 Roads with significantly changed traffic.....	24
4.7 Bus and coach stations.....	24
5 Other Transport Sources.....	25
5.1 Airports.....	25
5.2 Railways (diesel and steam trains).....	25
5.2.1 Stationary Trains .....	25
5.2.2 Moving Trains .....	25
5.3 Ports (shipping).....	25
6 Industrial Sources.....	26
6.1 Industrial Installations .....	26
6.1.1 New or Proposed Installations for which an Air Quality Assessment has been carried out .....	26
6.1.2 Existing Installations where emissions have increased substantially or new relevant exposure has been introduced .....	26
6.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment ..	26

6.2	Major fuel (petrol) storage depots.....	26
6.3	Petrol stations.....	27
6.4	Poultry farms.....	27
7	Commercial and Domestic Sources.....	28
7.1	Biomass combustion.....	28
7.1.1	Biomass combustion - individual installations.....	28
7.1.2	Biomass combustion – combined impacts (PM <sub>10</sub> emissions).....	28
7.2	Domestic solid-fuel burning (sulphur dioxide emissions).....	28
8	Fugitive or Uncontrolled Sources.....	29
9	Conclusions and Proposed Actions.....	30
9.1	Conclusions from new monitoring data.....	30
9.2	Conclusions from assessment of sources.....	30
9.2.1	Road Sources.....	30
9.2.2	Other Sources.....	30
9.3	Proposed Actions.....	30
10	References.....	32
APPENDICES.....		33
Appendix 1	- Traffic data.....	33
Appendix 2	- Bias Adjustment Factor Calculations.....	37
Appendix 3	- Nitrogen dioxide diffusion tube results 2008.....	38
Appendix 4	- DMRB Assessment Inputs.....	41
Appendix 5	- DMRB Assessment Results.....	42
Appendix 6	- Maps of Locations DMRB Results indicate risk of exceedence of Air Quality Objectives.....	43
Appendix 7	- List of Industrial Processes.....	47

## LIST OF TABLES

Table 1– Air Quality Objectives included in the Air Quality Regulations for the purpose of Local Air Quality Management .....	7
Table 2– Summary of emission sources and relevant pollutants to be considered as part of the Updating and Screening Assessment.....	12
Table 3– Details of Automatic Monitoring Sites .....	15
Table 4– Details of Non- Automatic Monitoring Sites .....	16
Table 5– Results of Automatic Monitoring for Nitrogen dioxide: Comparison with Annual Mean Objective .....	19
Table 6– Results of nitrogen dioxide diffusion tubes ( $\mu\text{g}/\text{m}^3$ ) .....	20
Table 7– Results of nitrogen dioxide diffusion tubes ( $\mu\text{g}/\text{m}^3$ ) .....	21
Table 8– Results of $\text{PM}_{10}$ Automatic Monitoring: Comparison with Annual Mean Objective.....	21
Table 9– Results of $\text{PM}_{10}$ Automatic Monitoring: Comparison with 24-hour Mean Objective .....	22

## LIST OF FIGURES

Figure 1 – Dartford AQMA No. 1 – Junction 1A –1B A282 Dartford Tunnel Approach Road (For $\text{NO}_2$ Annual Mean Objective and $\text{PM}_{10}$ 24 Hour mean objective) .....	9
Figure 2 – Dartford AQMA No. 2– A226 London Road AQMA (For $\text{NO}_2$ Annual Mean Objective and $\text{PM}_{10}$ 24 Hour mean objective).....	9
Figure 3 – Dartford AQMA No. 3–Dartford Town Centre and Approach Roads AQMA (For $\text{NO}_2$ Annual Mean Objective) .....	10
Figure 4 – Dartford AQMA No. 4– Bean Interchange AQMA (For $\text{NO}_2$ Annual Mean Objective) .....	10
Figure 5 – Map of monitoring sites in Dartford town centre .....	14
Figure 6 – Map of monitoring sites in Dartford (east of borough) .....	14

## Executive Summary

Part IV of the Environment Act 1995 places a statutory duty on local authorities to review and assess the air quality within their area and take account of Government Guidance when undertaking such work.

The Updating and Screening Assessment (USA) provides an update with respect to air quality issues within the Borough. There have been a number of changes since the last (third) round of review and assessments which have been taken into account in this assessment; including revised Local Air Quality Management (LAQM) Guidance, modelled background concentration maps, updated NO<sub>x</sub>:NO<sub>2</sub> conversion calculator, updated future year calculation tools and updates on specific sources (rail, poultry farms, biomass). The USA has included consideration of new monitoring data and emissions sources, in addition to any significant changes to existing emission sources identified in the previous rounds. The USA considers the seven priority health based air quality objectives as laid down in Regulations and assesses the likelihood that the air quality objectives will be met by their target dates. If the air quality objectives are unlikely to be met, a detailed assessment will be required.

Having considered each emission source and presented evidence to support the assessment of each, it is concluded that the air quality objectives for benzene, 1, 3-butadiene, carbon monoxide, lead, PM<sub>10</sub> and sulphur dioxide will be met. There is no requirement to undertake a detailed assessment for these pollutants. However, there are exceedences of the annual mean nitrogen dioxide objective identified through monitoring data at five locations in Dartford outside of areas declared as Air Quality Management Areas:

- DA41 Church Hill roadside site at junction with Hawley Road
- DA45/DA52 background sites parallel the A282 Dartford Tunnel Approach Road, but outside the contours of the current AQMA declaration
- DA48 Hawley Road, adjacent to the M25 south of Junction 2
- DA50 A2/Bridge, adjacent to the A2 west of Junction 2.

In addition, a risk of exceedence of the hourly NO<sub>2</sub> objective has been identified at two roadside monitoring sites, with relevant exposure in reasonably close proximity:

- DA43 A226 Overt Liberty
- DA14 Bow Arrow Lane

Four areas have been identified through assessment of road sources using the DMRB model as potentially at risk of exceedence of the annual mean NO<sub>2</sub> objective, outside the existing AQMAs.

- B258 Church Hill/A225 Hawley Road
- B258 Church Hill/A2 Bridge
- A225 Hawley Road/M25 Bridge
- B260 Green Street Green Road

Proposed actions arising from the Updating and Screening Assessment are as follows:

- Undertake a Detailed Assessment for the annual mean NO<sub>2</sub> objective by April 2010 at the five locations outside AQMAs, where exceedences of the annual mean NO<sub>2</sub> objective were measured in 2008, and at the additional location identified through DMRB (beyond those identified through monitoring);
- Undertake a Detailed Assessment for the hourly NO<sub>2</sub> objective by April 2010 at the two locations identified through monitoring as significantly exceeding the 60µg/m<sup>3</sup> annual mean NO<sub>2</sub> threshold and with nearby relevant exposure;
- Progress to a 2010 Annual Progress Report by April 2010.

## 1 Introduction

### 1.1 Description of Local Authority Area

The borough of Dartford situated in north Kent in the Southeast of England comprises of the town of Dartford and eight surrounding parishes. Dartford, originally a market town with a rich industrial heritage, now boasts one of the largest shopping centres in Europe, Bluewater, and has direct links to the continent with the development of the International railway station at Ebbsfleet. Dartford is at the heart of one of the Government's key growth zones within the Thames Gateway and will see around 20,000 new homes and up to 50,000 new jobs created in the borough over the next 25 years – a substantial addition to the existing 80,000 residents in the Borough.

The main source of air pollution in the borough is road traffic emissions from major roads, notably the M25, A282, A2, A226, A296 and A206. Dartford suffers from significant congestion, especially on the A282 Dartford Tunnel Approach Road, A2 Bean Interchange for Bluewater and main approach roads into Dartford town centre. Four Air Quality Management Areas (AQMA) have been declared along these roads where exceedences of NO<sub>2</sub> and PM<sub>10</sub> objectives were predicted. Other pollution sources, including commercial, industrial and domestic sources, also make a contribution to background pollution concentrations.

### 1.2 Purpose of Report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The Local Air Quality Management (LAQM) process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

Bureau Veritas has been commissioned by Dartford Borough Council to undertake the Updating and Screening Assessment (USA) 2009, as part of the fourth round of LAQM Review and Assessment.

The following information has been considered within this assessment:

- Relevant legislative background
- Dartford Borough Council Review and Assessment of air quality under the Local Air Quality Management (LAQM) regime
- Traffic data provided by Kent County Council; For the purposes of the updating and screening assessment, the Highways Agency's DMRB<sup>1</sup> model has been used to assess traffic data
- Industrial, domestic and other non-traffic related source data provided by Dartford Borough Council
- Monitoring data for 2008 provided by Dartford Borough Council
- Background pollutant concentrations from modelled maps
- Technical guidance and tools provided by Defra<sup>2</sup>

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<sup>1</sup> Highways Agency's Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3, Part 1 Air Quality, May 2007, and accompanying spreadsheet DMRB Screening Method V1.03.xls. July 2007

<sup>2</sup> Local Air Quality Management Technical Guidance LAQM.TG(09). February 2009. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland

This report sets out the relevant air quality legislation for air quality, provides a review of local air quality management within the administrative area, assesses the air quality for all relevant sources and then summarises the findings of the assessment and potential need for further detailed assessment work.

### 1.3 Air Quality Objectives

The significance of existing and future pollutant levels are assessed in relation to the national air quality standards and objectives, established by Government. The revised Air Quality Strategy (AQS)<sup>3</sup> for the UK (released in July 2007) provides the over-arching strategic framework for air quality in the UK and contains national air quality standards and objectives established by the UK Government and devolved administrations to protect human health. The air quality objectives incorporated in the AQS and the UK Legislation are derived from the Limit Values prescribed in the EU Directives transposed into national legislation by member states.

The CAFE (Clean Air for Europe) programme was initiated in the late 1990s to draw together previous directives into a single EU Directive on air quality. The Directive 2008/50/EC<sup>4</sup> introduces new obligatory standards for PM<sub>2.5</sub> for Government but places no statutory duty on local Government to work towards achievement.

The Air Quality Standards (England) Regulations 2007<sup>5</sup> came into force on 15<sup>th</sup> February 2007 in order to align and bring together in one statutory instrument the Governments obligations to fulfil the requirements of the CAFE Directive.

The objectives for ten pollutants (benzene, 1,3-butadiene, carbon monoxide, lead, nitrogen dioxide, sulphur dioxide particulates - PM<sub>10</sub> and PM<sub>2.5</sub>, ozone and PAHs - Polycyclic Aromatic Hydrocarbons) have been prescribed within the Air Quality Strategy<sup>3</sup> based on The Air Quality Standards (England) Regulations 2007.

This assessment focuses on those pollutants included in Air Quality Regulations for the purpose of Local Air Quality Management, in respect of pollutant sources affecting air quality within the Council's administrative area. The objectives set out in the AQS for these pollutants are presented in the table below.

The UK Government and the Devolved Administrations have also set new national air quality objectives for PM<sub>2.5</sub>. These objectives have not been incorporated into LAQM Regulations, and authorities have no statutory obligation to review and assess air quality against them.

The locations where the AQS objectives apply are defined in the AQS as locations outside buildings or other natural or man-made structures above or below ground where members of the public are regularly present and might reasonably be expected to be exposed [to pollutant concentrations] over the relevant averaging period of the AQS objective. Typically these include residential properties and schools/care homes for longer period (i.e. annual mean) pollutant objectives and high streets for short-term (i.e. 1-hour) pollutant objectives.

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<sup>3</sup> The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007), Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland

<sup>4</sup> Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

<sup>5</sup> The Air Quality Standards Regulations 2007, Statutory Instrument No 64, The Stationary Office Limited

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

Pollutant	Objective	Concentration measured as	Date to be achieved by and maintained thereafter
<b>Benzene</b> All authorities	16.25 µg/m <sup>3</sup>	running annual mean	31.12.2003
Authorities in England and Wales only	5.00 µg/m <sup>3</sup>	annual mean	31.12.2010
Authorities in Scotland and Northern Ireland only	3.25 µg/m <sup>3</sup>	running annual mean	31.12.2010
<b>1,3 Butadiene</b> All authorities	2.25 µg/m <sup>3</sup>	running annual mean	31.12.2003
<b>Carbon monoxide</b> Authorities in England, Wales and Northern Ireland only	10.0 µg/m <sup>3</sup>	maximum daily running mean 8-hour	31.12.2003
Authorities in Scotland only	10.0 µg/m <sup>3</sup>	running mean 8-hour	31.12.2003
<b>Lead</b> All authorities	0.5 µg/m <sup>3</sup>	annual mean	31.12.2004
	0.25 µg/m <sup>3</sup>	annual mean	31.12.2008
<b>Nitrogen dioxide</b> <sup>a</sup> All authorities	200 µg/m <sup>3</sup> , not to be exceeded more than 18 times a year	hourly mean	31.12.2005
	40 µg/m <sup>3</sup>	annual mean	31.12.2005
<b>Particles (PM<sub>10</sub>) (gravimetric)</b> <sup>b</sup> All authorities	50 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	24 hour mean	31.12.2004
	40 µg/m <sup>3</sup>	annual mean	31.12.2004
Authorities in Scotland only <sup>c</sup>	50 µg/m <sup>3</sup> not to be exceeded more than 7 times a year	24 hour mean	31.12.2010
	18 µg/m <sup>3</sup>	annual mean	31.12.2010
<b>Sulphur dioxide</b> All authorities	350 µg/m <sup>3</sup> not to be exceeded more than 24 times a year	1 hour mean	31.12.2004
	125 µg/m <sup>3</sup> not to be exceeded more than 3 times a year	24 hour mean	31.12.2004
	266 µg/m <sup>3</sup> not to be exceeded more than 35 times a year	15 minute mean	31.12.2005

<sup>a</sup> EU Limit values in respect of nitrogen dioxide to be achieved by 1st January 2010. There are, in addition, separate EU limit values for carbon monoxide, sulphur dioxide, lead and PM<sub>10</sub>, to be achieved by 2005, and benzene by 2010.

<sup>b</sup> Measured using the European gravimetric transfer sampler or equivalent.

<sup>c</sup> These 2010 air quality objectives for PM<sub>10</sub> apply in Scotland only, as set out in the Air Quality (Scotland) Amendment Regulations 2002.

## 1.4 Local Air Quality Management (LAQM)

As established by the Environment Act 1995 Part IV, all local authorities in the UK are under a statutory duty to undertake an air quality assessment within their area and determine whether they are likely to meet the air quality objectives set down by Government for a number of pollutants. The process of review and assessment of air quality undertaken by local authorities is set out under the Local Air Quality Management (LAQM) regime and involves a phased three yearly assessment of local air quality. Where the results of the review and assessment process highlight that problems in the attainment of health-based objectives for air quality will arise, the authority is required to declare an Air Quality Management Area (AQMA) – a geographic area defined by high levels of pollution and exceedences of health-based standards.

The LAQM regime was first set down in the 1997 National Air Quality Strategy (NAQS)<sup>6</sup> and introduced the idea of local authority 'Review and Assessment'. The Government subsequently published policy and technical guidance related to the review and assessment processes in 1998. This guidance has since been reviewed and the latest documents include Policy Guidance (LAQM.PG (09))<sup>7</sup> and Technical Guidance (LAQM.TG (09))<sup>8</sup>. The guidance lays down a progressive, but continuous, framework for the local authorities to carry out their statutory duties to monitor, assess and review air quality in their area and produce action plans to meet the air quality objectives.

Defra and the Devolved Administrations released the latest Policy and Technical Guidance in February 2009, in anticipation of the fourth round of review and assessment. The fourth round begins with this Updating and Screening Assessment, required to be completed by local authorities by the end of April 2009, and builds upon the Council's previous work in the first three rounds.

## 1.5 Summary of Review and Assessment undertaken by Dartford Borough Council

The first round of review and assessment resulted in the declaration of an Air Quality Management Area (AQMA) in 2001 along the A282 Dartford Tunnel Approach Road for nitrogen dioxide and particulates (PM<sub>10</sub>) largely due to road traffic emissions from the A282.

The results of the second round review and assessment showed exceedences of air quality objectives outside the AQMA declared in the first round. Exceedences of the NO<sub>2</sub> annual mean objective were predicted at relevant receptors along the:

- Dartford Town Centre and approach roads,
- A226 London Road, and the
- Bean Interchange (A2).

In addition, exceedences of the PM<sub>10</sub> 24-hour mean objective were predicted along the A226 London Road. This resulted in the declaration of three AQMAs in 2006 in relation to the local road network and A2 Trunk Road.

The results of the third round of review and assessment showed no exceedences outside the areas already declared as AQMAs.

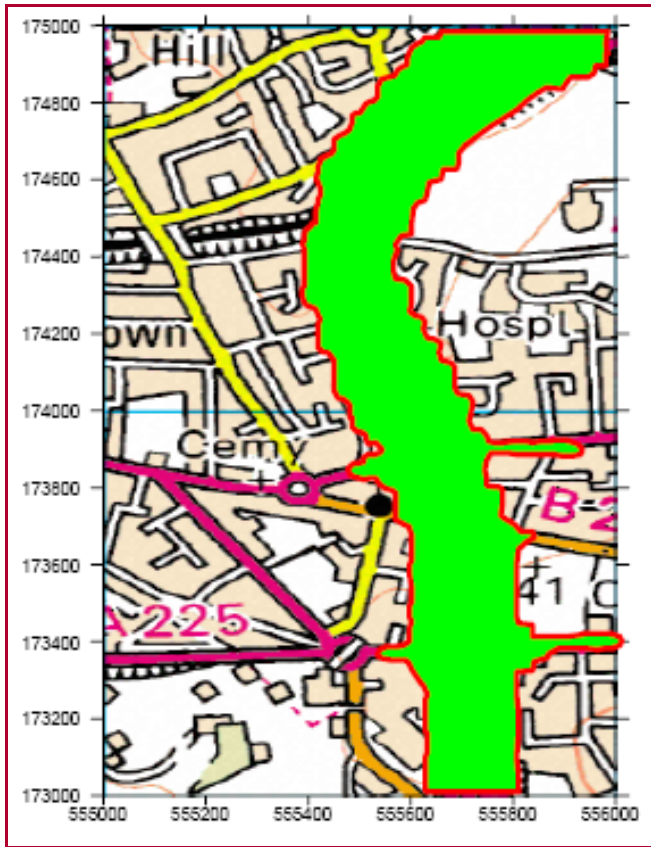
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<sup>6</sup> DoE, 1997, 'The United Kingdom National Air Quality Strategy', The Stationary Office

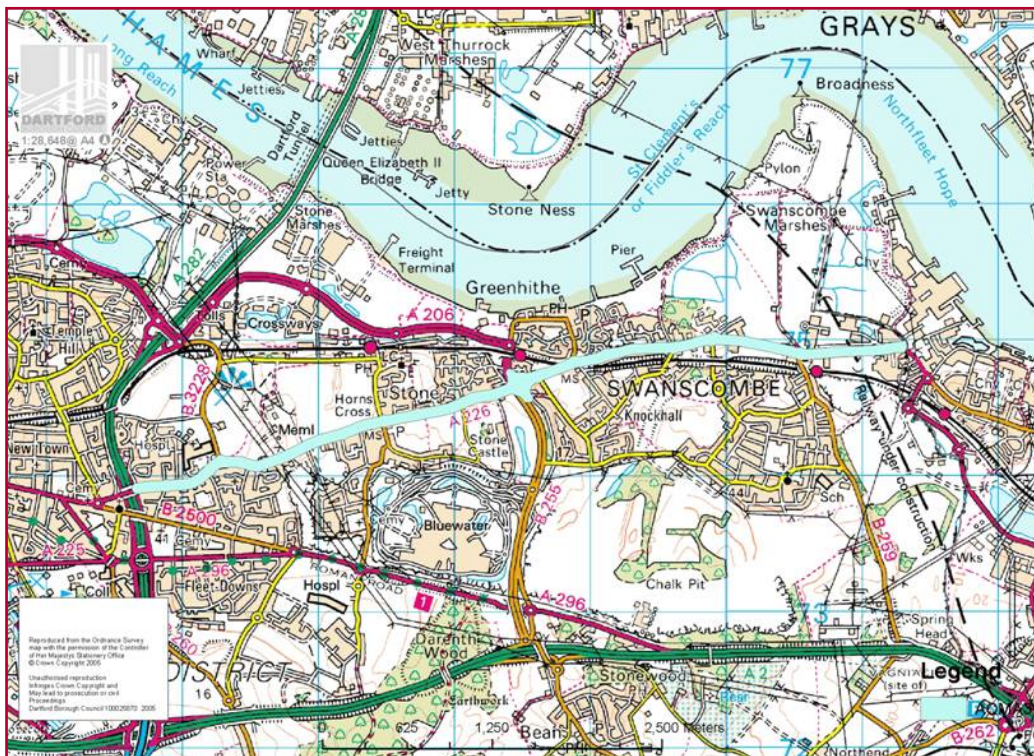
<sup>7</sup> Policy Guidance LAQM.PG(09) (2009), Part IV of the Environment Act 1995, Local Air Quality Management, Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland, The Stationery Office

<sup>8</sup> Technical Guidance LAQM.TG (09) (2009), Part IV of the Environment Act 1995, Local Air Quality Management, Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland, The Stationery Office

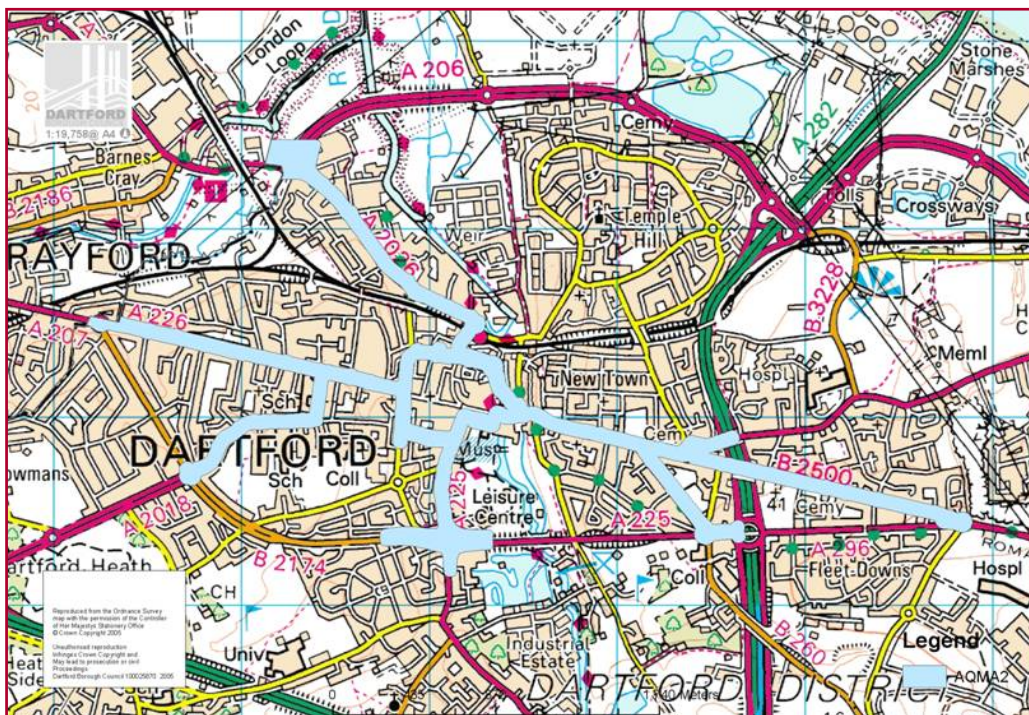
**Figure 1 – Dartford AQMA No. 1 – Junction 1A –1B A282 Dartford Tunnel Approach Road (For NO<sub>2</sub> Annual Mean Objective and PM<sub>10</sub> 24 Hour mean objective)**



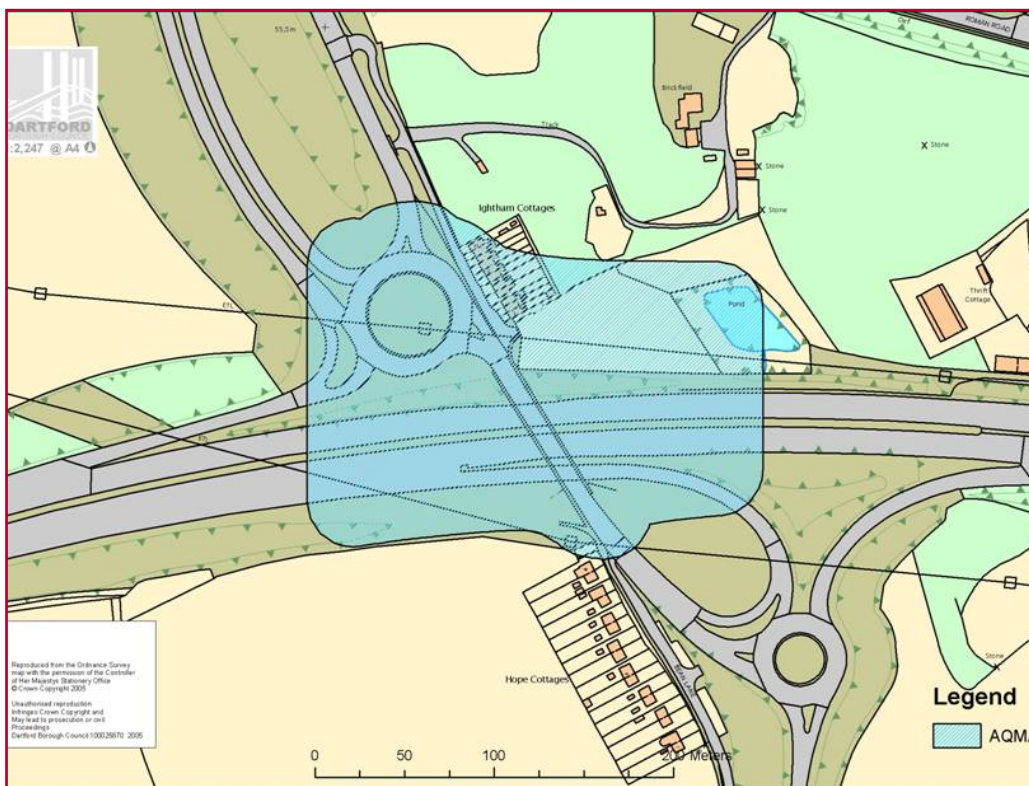
**Figure 2 – Dartford AQMA No. 2– A226 London Road AQMA (For NO<sub>2</sub> Annual Mean Objective and PM<sub>10</sub> 24 Hour mean objective)**



**Figure 3 – Dartford AQMA No. 3–Dartford Town Centre and Approach Roads AQMA (For NO<sub>2</sub> Annual Mean Objective)**



**Figure 4 – Dartford AQMA No. 4– Bean Interchange AQMA (For NO<sub>2</sub> Annual Mean Objective)**



## 2 Updating and Screening Assessment Methodology

The Updating and Screening Assessment is intended to identify any significant changes that may have occurred since the previous rounds of Review and Assessment were completed. This includes new monitoring data, new or changed emissions sources (either locally or in neighbouring authorities), or any other local changes that might affect air quality e.g. new relevant exposure. The assessment builds on the previous Review and Assessment work undertaken by local authorities.

The Updating and Screening Assessment involves a checklist approach that considers all significant emissions sources relevant to the Air Quality Objectives. The checklists are broadly the same as in the previous rounds, but have been re-ordered so that they follow a source-by-source rather than pollutant-by-pollutant approach. This is to reduce repetition within the screening process for those local authorities that do not have all the listed sources within their area. These can more easily be discounted at an early stage.

A summary of the emission source categories for the Updating and Screening checklists is provided below. The detailed checklists for each source type are then set out in the following sections, as per the methodology provided in Chapter 5 of the Technical Guidance LAQM.TG (09).

The air quality assessment for road traffic emissions sources has been undertaken using the Highways Agency's DMRB<sup>1</sup> model. NO<sub>2</sub> concentrations have been calculated based on the updated NO<sub>x</sub>:NO<sub>2</sub> conversion method provided on behalf of Defra as part of the LAQM.TG(09) tools.

For other sources, the checklist approach to screening and relevant LAQM.TG(09) nomograms have been utilised.

**Table 2– Summary of emission sources and relevant pollutants to be considered as part of the Updating and Screening Assessment**

Reference No.	Emission sources to be assessed	Relevant Pollutants
<b>A. Road Transport Sources</b>		
A.1	Narrow congested streets with residential properties close to the kerb	Nitrogen dioxide
A.2	Busy streets where people may spend 1-hour or more close to traffic	Nitrogen dioxide
A.3	Roads with a high flow of buses and/or HGVs.	Nitrogen dioxide, PM <sub>10</sub>
A.4	Junctions (including busy roads and junctions in Scotland and Northern Ireland)	Nitrogen dioxide, PM <sub>10</sub>
A.5	New roads constructed since the last round of review and assessment	Nitrogen dioxide, PM <sub>10</sub>
A.6	Roads/junctions identified as being close to the objective during the previous round of review and assessment	Nitrogen dioxide, PM <sub>10</sub>
A.7	Roads with significantly changed traffic flows	Nitrogen dioxide, PM <sub>10</sub>
A.8	Bus and coach stations	Nitrogen dioxide
<b>B: Other transport sources</b>		
B.1	Airports	Nitrogen dioxide
B.2	Railway (diesel and steam trains)	Sulphur dioxide, nitrogen dioxide
B.3	Ports (shipping)	Sulphur dioxide
<b>C: Industrial sources</b>		
C.1	Industrial processes (new processes and those with significantly increased emissions)	Benzene, 1,3-butadiene, lead, nitrogen dioxide, sulphur dioxide, PM <sub>10</sub>
C.2	Major petrol storage depots	Benzene
C.3	Petrol Stations	Benzene
C.4	Poultry farms	PM <sub>10</sub>
<b>D: Commercial and domestic sources</b>		
D.1	Biomass combustion	Nitrogen dioxide, PM <sub>10</sub>
D.2	Domestic solid-fuel burning	Sulphur dioxide
<b>E: Fugitive or uncontrolled sources</b>		
E.1	Quarries, landfill sites, opencast coal mining, waste transfer sites, materials handling (i.e. ports, major construction sites)	PM <sub>10</sub>

## 2.1 Input Data

### 2.1.1 Traffic data

Kent County Council, via their consultants Jacobs, provided the annual average daily traffic flows (AADT) and speed data used in this assessment, including relevant projection factors to the baseline year 2008.

Where speed data has not been available, speeds have been based on speed limits, modified according to local conditions to take account of congestion and stop/start vehicle movements at junctions. Speeds were reduced at busy junctions to 20kph to reflect the higher emissions of queuing traffic.

Appendix 1 contains the tabular summary of traffic data provided for the Updating and Screening Assessment for use in the DMRB model.

### 2.1.2 Background concentrations

The DMRB model calculates the pollutant concentrations due to road traffic emissions only. The user must then add the background concentrations (arising from sources other than traffic) to derive the total pollutant concentrations at the relevant receptors modelled.

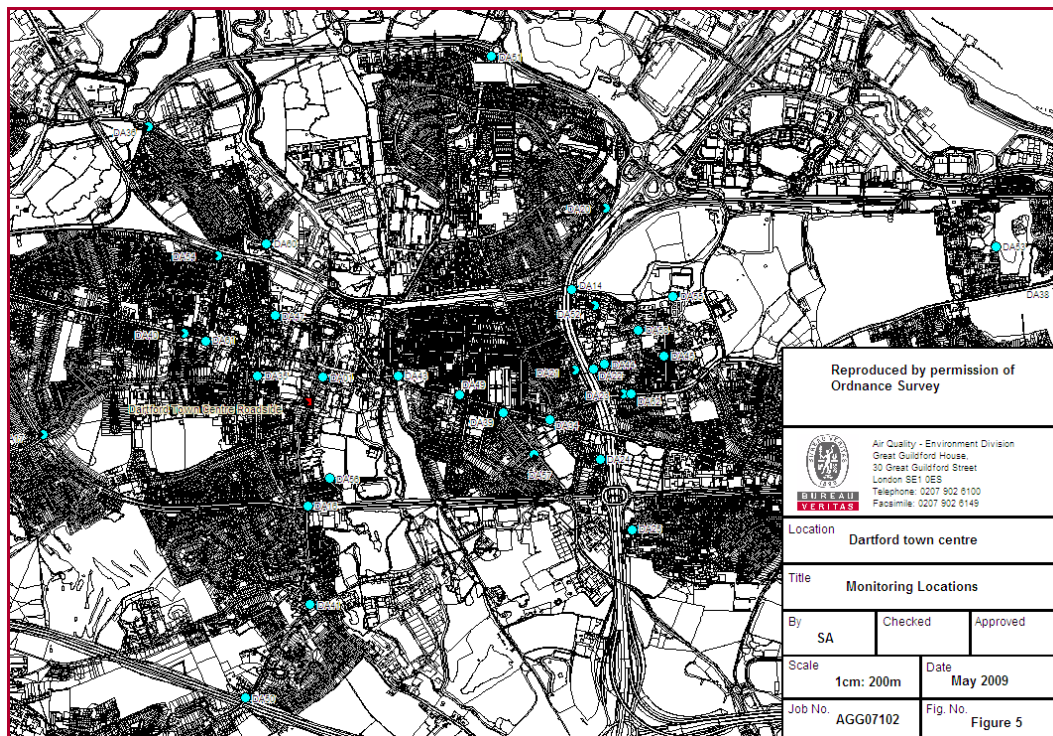
The background concentrations can be obtained either from appropriate monitoring stations or from Defra maps of modelled background pollutant concentrations. These maps are available at a resolution of 1x1 km for the entire UK. Maps are provided for future years' background pollutant concentrations. The maps can be obtained from the UK Air Quality Information Archive<sup>9</sup>. The maps have been updated from the previous round of review and assessment as part of the LAQM.TG (09) tools released in February 2009. Background concentrations used in the DMRB model runs are shown in Appendix 4.

### 3 New Monitoring Data

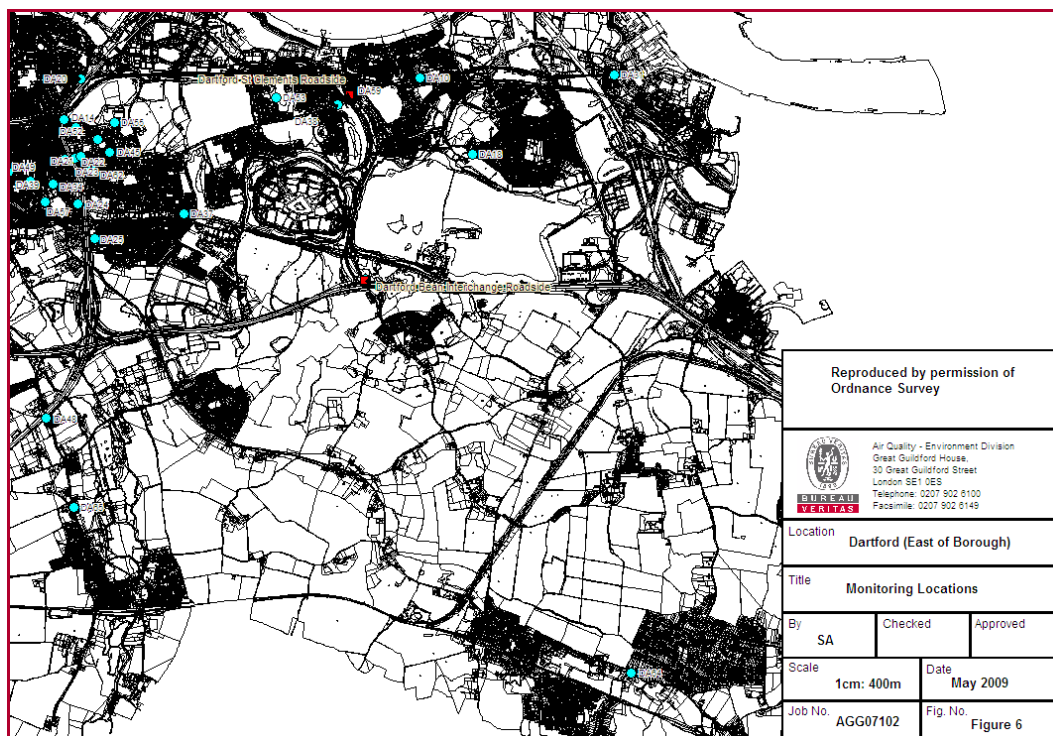
Section 3 reviews and assesses all new monitoring data in order to determine whether the air quality objectives are at risk of exceedance.

#### 3.1 Summary of Monitoring Undertaken

**Figure 5 – Map of monitoring sites in Dartford town centre**



**Figure 6 – Map of monitoring sites in Dartford (east of borough)**



### 3.1.1 Automatic Monitoring Sites

This section provides details of automatic monitoring carried out in 2008, the year covered by this report.

**Table 3– Details of Automatic Monitoring Sites**

Site Name	Site Type	OS Grid Ref (x,y)	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)	Worst-case Location?
Dartford St Clements Roadside	Roadside	X=558525 y=174709	NO <sub>2</sub> , PM <sub>10</sub>	Yes	Y-20m	2.5m	Y
Dartford Town Centre Roadside	Roadside	X=554117 y=173852	NO <sub>2</sub> , PM <sub>10</sub>	Yes	N	3.8m	N
Dartford Bean Interchange Roadside	Roadside	X=558622 y=172752	NO <sub>2</sub> , PM <sub>10</sub>	Yes	Y-7m	4.5m	Y

There is currently automatic monitoring of nitrogen dioxide (NO<sub>2</sub>) and particulates (PM<sub>10</sub>) undertaken by Dartford Borough Council at three locations in the area, Dartford St Clements, Dartford town centre and Bean Interchange roadside sites. There are triplicate NO<sub>2</sub> diffusion tubes co-located at the Bean Interchange site, which provide co-location data for calculation of the bias adjustment factor. PM<sub>10</sub> monitoring is undertaken using Beta Attenuation Monitors (BAM) and NO<sub>2</sub> using chemiluminescent analysers.

The ratified monitoring results for 2006 - 2008 for these sites are shown in Tables 5, 7, and 8. The QA/QC procedures for the KMAQMN are equivalent to the UK Automatic Urban and Rural Network (AURN) procedures, with the exception of the following:

- Calibration of NO<sub>x</sub> analysers with NO gas (AURN also use NO<sub>2</sub>)
- Data checks are done once daily and downloads are done twice daily (AURN are hourly)
- Independent audits of the stations are undertaken annually (AURN are 6 monthly).

### 3.1.2 Non-Automatic Monitoring Data

Details of the non-automatic monitoring undertaken in the borough are shown below.

**Table 4– Details of Non- Automatic Monitoring Sites**

Site No.	Location	Site Type	X	Y	Pollutant monitored	In AQMA?	Relevant Exposure ? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location (Y/N)?
DA01	Lowfield Street	Roadside	554190	173985	NO <sub>2</sub>	Yes	Y-1.1m	1.3m	N
DA05 (A,B,C)	Ightham Cottages (triplicate)	Roadside	558622	172771	NO <sub>2</sub>	Yes	Y-7m	4.5m	N
DA07	Summerhouse Drive	Background	550749	171924	NO <sub>2</sub>	No	Y-6.4m	3.1m	N
DA10	London Road	Roadside	559189	174872	NO <sub>2</sub>	Yes	Y-2.5m	3m	N
DA14	Bow Arrow Lane	Intermediate	555484	174441	NO <sub>2</sub>	Yes	Y-2m	8.2m	N
DA16	Princes Road 2	Roadside	554108	173318	NO <sub>2</sub>	Yes	Y-15.7m	<1m	Y
DA17	Shepherds Lane	Roadside	552732	173689	NO <sub>2</sub>	Yes	Y-11m	1.5m	N
DA18	Alkerden Lane	Background	559734	174077	NO <sub>2</sub>	No	N	1.5m	N
DA20	Elliot Road	Roadside	555660	174863	NO <sub>2</sub>	Yes	Y-9.4m	22.3m	N
DA21	Brentfield Road	Roadside	555497	174025	NO <sub>2</sub>	Yes	Y-10.3m	31m	N
DA22	Brent Way	Roadside	555600	174030	NO <sub>2</sub>	Yes	Y-7.2m	18.4m	N
DA23	The Brent	Roadside	555751	173900	NO <sub>2</sub>	Yes	Y-5.8m	1.4m	N
DA24	Wayville Rd	Roadside	555632	173558	NO <sub>2</sub>	Yes	Y-0m	34m	N
DA25	Queens Gardens	Background	555801	173194	NO <sub>2</sub>	Yes	Y-0m	52m	N
DA28	Ivy Villas	Roadside	558472	174670	NO <sub>2</sub>	Yes	Y-13m	5.2m	N
DA31	Taunton Rd (nr London Rd)	Intermediate	561215	174898	NO <sub>2</sub>	No	Y-0m	12.9m	N
DA34	The Brent II	Roadside	555373	173763	NO <sub>2</sub>	Yes	Y-6m	7.8m	N
DA35	Highfield Road	Roadside	553848	173994	NO <sub>2</sub>	Yes	Y-4.6m	1m	Y
DA36	Burnham Road	Roadside	553281	175290	NO <sub>2</sub>	Yes	Y-12.7m	2.8m	N
DA37	Watling Street	Roadside	556734	173456	NO <sub>2</sub>	Yes	Y-6.2m	3.1m	N
DA38	London Road 3	Roadside	558331	174596	NO <sub>2</sub>	Yes	Y-3.2m	2.7m	N

**Table 4– Details of Non- Automatic Monitoring Sites (Continued)**

Site No.	Location	Site Type	X	Y	Pollutant monitored	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location (Y/N)?
DA39	Park Road	Roadside	555129	173802	NO <sub>2</sub>	Yes	Y-6m	<1m	Y
DA40	West Hill	Roadside	553463	174215	NO <sub>2</sub>	Yes	Y-7m	<1m	Y
DA41	Church Hill	Roadside	554123	172805	NO <sub>2</sub>	No	Y-6.2m	4.2m	N
DA43	Overy Liberty	Roadside	554580	173992	NO <sub>2</sub>	Yes	Y-0.8m	6.1m	N
DA44	Brent Close	Roadside	555656	174053	NO <sub>2</sub>	Yes	Y-0m	80m	N
DA45	Milestone Road	Background	555964	174098	NO <sub>2</sub>	No	Y-3.4m	4m	N
DA47	Westgate Road	Roadside	553938	174308	NO <sub>2</sub>	Yes	Y-2.8m	3.3m	N
DA48	Hawley Road	Roadside	555297	171327	NO <sub>2</sub>	No	Y-0m	16m	N
DA49	St Albans Road	Roadside	554902	173893	NO <sub>2</sub>	Yes	Y-0m	6.5m	N
DA50	A2/Bridge	Roadside	553783	172319	NO <sub>2</sub>	No	Y-0m	13m	N
DA51	Cornwall Road	Roadside	555068	175653	NO <sub>2</sub>	No	Y-0m	11.3m	N
DA52	Grange Crescent	Background	555605	174358	NO <sub>2</sub>	No	Y-0m	130m	N
DA53	Park (Off Swallow Close)	Background	557693	174666	NO <sub>2</sub>	No	Y-0m	N/A	N
DA54	King Edward Avenue	Background	553642	174616	NO <sub>2</sub>	No	Y-0m	25m	N
DA55	Littlebrook Hospital	Background	556012	174405	NO <sub>2</sub>	No	Y-0m	N/A	N
DA56	Cranford Road	Background	554222	173460	NO <sub>2</sub>	No	Y-0m	N/A	N
DA57	Park Road II nr Downs Road	Intermediate	555290	173585	NO <sub>2</sub>	Yes	Y-2.2m	6.2m	N
DA58	High Trees (The Oaks, BAL)	Background	555831	174230	NO <sub>2</sub>	No	Y-5m	N/A	N
DA59	Ivy Villas II	Intermediate	558458	174695	NO <sub>2</sub>	Yes	Y-13m	18m	N
DA60	Burnham Road II	Roadside	553895	174678	NO <sub>2</sub>	Yes	Y-4.6m	<1m	Y
DA61	West Hill II	Roadside	553578	174175	NO <sub>2</sub>	Yes	Y-0m	4.8m	N
DA62	The Brent/London Road	Roadside	555796	173902	NO <sub>2</sub>	Yes	Y-5m	<1m	Y

### 3.1.2.1 Nitrogen dioxide diffusion tube data

Outside the continuous monitoring network, Dartford Borough Council undertook monitoring at 42 NO<sub>2</sub> diffusion tubes sites in 2008. The diffusion tubes are supplied and analysed by Gradko utilising the 20% Triethanolamine (TEA) in water preparation method. Gradko participate in the Workplace Analysis Scheme for Proficiency (WASP) for NO<sub>2</sub> diffusion tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO<sub>2</sub> concentrations reported are of a high calibre. The lab follows the procedures set out in the Harmonisation Practical Guidance.

With regard to the application of a bias adjustment factor for the diffusion tubes, the technical guidance LAQM.TG (09) and Review and Assessment Helpdesk recommends use of a local bias adjustment factor where available and relevant to diffusion tube sites. Dartford Borough Council has a triplicate diffusion tube co-location studies at the Bean Interchange roadside site. For 2006 and 2007 data, the bias adjustment factors have been taken from the Council's previous LAQM reports. These were calculated as 0.97 for 2006 and 0.91 for 2007, based on local co-location studies. For 2008, the bias adjustment factor has been calculated as 0.94 from the local co-location study. The full calculation of the bias adjustment factor is shown in Appendix 2.

## 3.2 Comparison of Monitoring Results with AQ Objectives

### 3.2.1 Nitrogen dioxide

#### 3.2.1.1 Automatic Monitoring Data

The 2008 data shows exceedences of the annual mean nitrogen dioxide objective at all three roadside sites. These are all within existing Air Quality Management Areas for the nitrogen dioxide annual mean objective. However, there are additionally exceedences of the hourly objective at the Dartford St Clements roadside site. There is no relevant exposure at this site; residential properties are set back approximately 20m from this monitoring site.

The Dartford Town Centre roadside site showed a significant reduction in annual mean concentrations in 2008. There was a marked reduction in concentrations during the summer months, which coincided with the period when road works were being carried out in Lowfield Street.

**Table 5– Results of Automatic Monitoring for Nitrogen dioxide: Comparison with Annual Mean Objective**

Site ID	Location	Within AQMA?	Description	Annual mean concentrations ( $\mu\text{g}/\text{m}^3$ )		
				2006	2007	2008
ZD1	Dartford St Clements Roadside	Yes	Hourly Mean > 200 $\mu\text{g}/\text{m}^3$ (18 times per year permitted)	<b>62</b>	<b>75</b>	<b>64</b>
			Annual mean	<b>64</b>	<b>58</b>	<b>69</b>
			%Data capture	97	99	92
ZD2	Dartford Town Centre Roadside	Yes	Hourly Mean > 200 $\mu\text{g}/\text{m}^3$ (18 times per year permitted)	1	7	0
			Annual mean	<b>52</b>	<b>54</b>	<b>43</b>
			%Data capture	94	100	97
ZD3	Dartford Bean Interchange Roadside	Yes	Hourly Mean > 200 $\mu\text{g}/\text{m}^3$ (18 times per year permitted)	1	<b>23</b>	18
			Annual mean	<b>58</b>	<b>56</b>	<b>58</b>
			%Data capture	97	99	99

\*Data for all years has been fully ratified.

Exceedences of the air quality objectives are shown in bold. Data capture less than the recommended 90% is shown in brackets.

#### 3.2.1.2 Diffusion Tube Monitoring Data

The nitrogen dioxide diffusion tube data are summarised in the table below. The full dataset (monthly mean values) are included in Appendix 3.

The 2008 diffusion tube results show twenty-eight sites exceeding the annual mean  $\text{NO}_2$  objective. Of these, twenty-three are within the existing AQMAs. The remaining five sites are:

- DA41 Church Hill roadside site at junction with Hawley Road. Using the LAQM.TG(09)  $\text{NO}_2$  with distance from road calculator, the concentration at the nearest receptor 34 Hawley Road reduces from roadside concentrations of  $48.0\mu\text{g}/\text{m}^3$  to  $44.8\mu\text{g}/\text{m}^3$  at façade i.e. there is a risk of exceedence of the  $\text{NO}_2$  annual mean objective.
- DA45/DA52 background sites parallel the A282 Dartford Tunnel Approach Road, but outside the contours of the current AQMA declaration;
- DA48 Hawley Road, adjacent to the M25 south of Junction 2. The monitoring site is in line with residential properties, so representative of relevant exposure;
- DA50 A2/Bridge, adjacent to the A2 west of Junction 2. The monitoring site is in line with residential properties, so representative of relevant exposure.

Based on the risk of exceedence of the annual mean NO<sub>2</sub> objective at relevant receptor locations, the Council should proceed to a detailed assessment at these five locations.

With respect to the hourly NO<sub>2</sub> objective, sites potentially at risk of exceedence are roadside sites along the A282 and the A226, within AQMAs declared for the annual mean NO<sub>2</sub> objective. Three roadside diffusion tube concentrations in 2008 were >60µg/m<sup>3</sup>. These sites are not locations where members of the public are likely to be present at the roadside for the averaging period of the objective. However, at DA43 A226 Overy Liberty, annual mean concentrations of 65µg/m<sup>3</sup> were measured in 2008, and the site is near to facades of residential properties. Also, DA14 Bow Arrow Lane (8m from the A282) measured 76µg/m<sup>3</sup> and given there are residential properties within approx 12m of the A282 there is a risk that the hourly NO<sub>2</sub> objective is also being exceeded where there is relevant exposure. Based on the risk of exceedence of the hourly NO<sub>2</sub> objective at relevant receptor locations, the Council should proceed to a detailed assessment at these two locations.

**Table 6– Results of nitrogen dioxide diffusion tubes (µg/m<sup>3</sup>)**

Site ID	Location	Within AQMA?	Data Capture 2008 %	Annual mean concentrations (µg/m <sup>3</sup> ) adjusted for bias		
				2006 (Bias factor: )	2007 (Bias factor: )	2008 (Bias factor: 0.94)
DA01	Lowfield Street	Yes	100	49	49	48
DA05	Ightham Cottages (triplicate)	Yes	100	58	55	57
DA07	Summerhouse Drive	No	100	28	29	27
DA10	London Road	Yes	100	45	50	47
DA14	Bow Arrow Lane	Yes	100	68	67	74
DA16	Princes Road 2	Yes	92	47	50	48
DA17	Shepherds Lane	Yes	100	49	49	48
DA18	Alkerden Lane	No	92	33	32	29
DA20	Elliot Road	Yes	100	51	47	48
DA21	Brentfield Road	Yes	100	42	45	39
DA22	Brent Way	Yes	92	60	63	61
DA23	The Brent	Yes	100	49	50	50
DA24	Wayville Road	Yes	100	45	43	41
DA25	Queens Gardens	Yes	75	46	46	44
DA28	Ivy Villas	Yes	100	60	56	54
DA31	Taunton Rd (near London Road)	No	100	37	36	33
DA34	The Brent II	Yes	100	50	52	46
DA35	Highfield Road	Yes	100	53	53	55
DA36	Burnham Road	Yes	100	38	40	37
DA37	Watling Street	Yes	92	43	50	40
DA38	London Road 3	Yes	83	44	45	39
DA39	Park Road	Yes	92	45	42	42
DA40	West Hill*	Yes	33	47	42	34
DA41	Church Hill	No	100	45	46	48
DA43	Overy Liberty	Yes	100	63	64	65
DA44	Brent Close	Yes	100	52	49	52
DA45	Milestone Road	No	100	40	39	41
DA47	Westgate Road	Yes	100	37	39	40
DA48	Hawley Road	No	100	42	46	42
DA49	St Albans Road	Yes	100	-	45	43
DA50	A2/Bridge	No	100	-	45	44
DA51	Cornwall Road	No	92	-	42	38
DA52	Grange Crescent	No	92	-	46	44

\*Less than 9 months data capture. Annualisation undertaken using five background sites in the Kent & Medway air quality monitoring network (Canterbury, Rochester Stoke, Thanet Airport, Tunbridge Wells Town Centre, Swale Sheerness).

**Table 7– Results of nitrogen dioxide diffusion tubes ( $\mu\text{g}/\text{m}^3$ )**

Site ID	Location	Within AQMA?	Data Capture 2008 %	Annual mean concentrations ( $\mu\text{g}/\text{m}^3$ ) adjusted for bias		
				2006 (Bias factor: )	2007 (Bias factor: )	2008 (Bias factor: 0.94 )
DA53	Park (Off Swallow Close)	No	83	-	29	27
DA54	King Edward Avenue	No	100	-	28	29
DA55	Littlebrook Hospital	No	92	-	46	37
DA56	Cranford Road	No	83	-	-	35
DA57	Park Road II nr Downs rd	No	75	-	-	42
DA58	High Trees (The Oaks, BAL)*	Yes	25	-	-	39
DA59	Ivy Villas II	No	75	-	-	50
DA60	Burnham Road II *	Yes	25	-	-	40
DA61	West Hill II *	Yes	25	-	-	53
DA62	The Brent/London Road*	Yes	17	-	-	49

\*Less than 9 months data capture. Annualisation undertaken using five background sites in the Kent & Medway air quality monitoring network (Canterbury, Rochester Stoke, Thanet Airport, Tunbridge Wells Town Centre, Swale Sheerness).

### 3.2.2 Particles ( $\text{PM}_{10}$ )

There is currently continuous monitoring of particles ( $\text{PM}_{10}$ ) undertaken by Dartford Borough Council at three locations in the area, Dartford St Clements, Dartford Town Centre and Bean Interchange roadside sites using a Beta Attenuation Monitors (BAM). The Dartford St Clements site is within an AQMA for the  $\text{PM}_{10}$  24-hour mean objective. Data for the BAM has been corrected to gravimetric equivalent dividing by the 1.221 factor from the "UK Equivalence Programme for Monitoring of Particulate Matter".

The 2008 results show that the  $\text{PM}_{10}$  objectives are continuing to be met at the Dartford Town Centre and Bean Interchange roadside sites. There continues to be exceedences of the 24-hour mean objective at the Dartford St Clements Roadside (AQMA) site. At the Dartford Town Centre site, annual mean concentrations were lower in 2008 than in previous years. This is likely to be due in part to road works, which were being carried out in Lowfield Street over the summer months.

**Table 8– Results of  $\text{PM}_{10}$  Automatic Monitoring: Comparison with Annual Mean Objective**

Site ID	Location	Within AQMA?	Data Capture 2008 %	Annual mean concentrations ( $\mu\text{g}/\text{m}^3$ )		
				2006	2007	2008
ZD1	Dartford St Clements Roadside	Yes	99	32	38	33
ZD2	Dartford Town Centre Roadside	Yes	95	31	31	26
ZD3	Dartford Bean Interchange Roadside	Yes	99	32	29	26

\*Data for all years has been fully ratified.

**Table 9– Results of PM<sub>10</sub> Automatic Monitoring: Comparison with 24-hour Mean Objective**

Site ID	Location	Within AQMA?	Data Capture 2008 %	Number of Exceedences of 24-hour mean (50 µg/m <sup>3</sup> ) <i>If data capture &lt; 90%, include the 90<sup>th</sup> %ile of hourly means in brackets.</i>		
				2006	2007	2008
ZD1	Dartford St Clements Roadside	Yes	99	35	68	46
ZD2	Dartford Town Centre Roadside	Yes	95	22	30	20
ZD3	Dartford Bean Interchange Roadside	Yes	99	23	25	11

\*Data for all years has been fully ratified.

## 4 Road Traffic Sources

The air quality assessment for road traffic emissions sources has been undertaken using the Highways Agency's DMRB<sup>1</sup> model. The DMRB inputs and results are shown in Appendices 4 - 6.

### 4.1 Narrow congested streets with residential properties close to the kerb

There are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb identified by Dartford Borough Council. There are existing narrow congested streets, which fit these criteria within Dartford town centre (AQMA), but these have been previously assessed.

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

### 4.2 Busy streets where people may spend 1-hour or more close to traffic

There are no busy streets where members of the public are likely to spend 1-hour or more close to traffic in the borough of Dartford that have not been assessed previously. The town centre of Dartford is largely pedestrianised.

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

### 4.3 Roads with a high flow of buses and/or Heavy Goods Vehicles

Traffic data assessed for the Updating and Screening Assessment show no roads with high flows of buses and heavy goods vehicles >20%.

Dartford Borough Council confirms that there are no new/newly identified roads with high flows of buses and/or heavy goods vehicles.

### 4.4 Junctions

Dartford Borough Council has identified the B258 Church Hill/A225 Hawley Road as a busy junction outside the existing AQMA declarations, which has not been adequately considered in previous rounds. In addition, the B258 Church Hill as it crosses the A2 and the A225 Hawley Road at the M25 bridge have been identified as areas of potential concern with respect to the annual mean NO<sub>2</sub> objective. These have been assessed using DMRB and the results indicate a potential risk of exceedence of the annual mean objective. Monitoring data in 2008 at these locations also indicate a risk of exceedence. It is therefore recommended that the Council undertake a Detailed Assessment at these locations.

Dartford Borough Council has assessed new/newly identified junctions meeting the criteria in Section A.4 of Box 5.3 in TG(09), and concluded that **it will be necessary to proceed to a Detailed Assessment.**

#### 4.5 New roads constructed or proposed since the last round of Review and Assessment

There are no newly constructed roads since the previous round of review and assessment, other than small roads serving new developments, which have flows significantly below 10,000 vehicles per day.

Dartford Borough Council confirms that there are no new/proposed roads that meet this criteria.

#### 4.6 Roads with significantly changed traffic

Traffic data assessed for the Updating and Screening Assessment show no roads with significantly changed traffic flows of more than 25%.

In addition, there has been new traffic count data made available since the previous round at sites not previously assessed. These include: B260 Green Street Green Road, A225 Main Road Sutton-at-Hone, A2018 Old Bexley Lane and B260 Main Road New Barn. These have been run through DMRB to confirm compliance with the objective. The results as shown in Appendix 5 show the prescribed objectives are predicted to be met at all locations with the exception of the B260 Green Street Green Road on its approach to the A225 junction. Predicted annual mean concentrations are  $40\mu\text{g}/\text{m}^3$  at the nearest residential exposure, indicating a risk of exceedence of the objective. It is recommended that the Council proceed to a Detailed Assessment at this location.

Dartford Borough Council confirms that there are no new/newly identified roads with significantly changed traffic flows. However, the Council has assessed new traffic data for the Updating and Screening Assessment at roads not previously assessed and concluded that **it will be necessary to proceed to a Detailed Assessment.**

#### 4.7 Bus and coach stations

The assessment considers both nitrogen dioxide and  $\text{PM}_{10}$  emissions at bus stations that are not enclosed with >2500 movements per day. There is an open bus station in Dartford as assessed in previous rounds, but this does not meet the specified criteria of bus movements. There are no new bus stations or significant changes since the last round of review and assessment.

Dartford Borough Council confirms that there are no relevant bus stations in the Local Authority area.

## 5 Other Transport Sources

### 5.1 Airports

The assessment for airports considers nitrogen dioxide. If there are no airports in the Local Authority area, there is no need to proceed further with this part.

Dartford Borough Council confirms that there are no airports in the Local Authority area.

### 5.2 Railways (diesel and steam trains)

The assessment for stationary trains considers sulphur dioxide emissions, while the assessment for moving diesel trains considers nitrogen dioxide emissions. If there are no railways carrying diesel or steam trains in the Local Authority area, there is no need to proceed further with this part.

#### 5.2.1 Stationary Trains

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

#### 5.2.2 Moving Trains

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

### 5.3 Ports (shipping)

The assessment for shipping considers sulphur dioxide emissions at busy ports with 5,000 and 15,000 movements per year and relevant exposure within 250 metres. If there are no ports or shipping, there is no need to proceed further with this part.

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

## 6 Industrial Sources

### 6.1 Industrial Installations

The assessment of industrial installations considers all of the regulated pollutants, although those most at risk of requiring further work are sulphur dioxide, NO<sub>2</sub>, PM<sub>10</sub> and benzene. A list of industrial processes in the borough is provided in Appendix 7.

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

Dartford Borough Council confirms there are no new or proposed installations for which an air quality assessment has been carried out.

#### 6.1.2 Existing Installations where emissions have increased substantially or new relevant exposure has been introduced

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

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

There are twelve new Part B processes permitted by Dartford Borough Council since the last round of review and assessment. These include a mobile crusher, a vehicle resprayer and ten dry cleaning processes. There are no significant emission releases from these processes relevant to the AQS objectives.

Dartford Borough Council has assessed new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

### 6.2 Major fuel (petrol) storage depots

The assessment considers benzene, with respect to the 2010 objective.

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

### 6.3 Petrol stations

The assessment considers benzene, with respect to the 2010 objective. Large petrol stations, where annual throughput is more than 2000 m<sup>3</sup> of petrol (2 million litres per annum), and with a busy road nearby of >30000 annual average daily traffic flows, require consideration with respect to relevant exposure.

Dartford Borough Council confirms that there are no petrol stations meeting the specified criteria.

### 6.4 Poultry farms

Farms housing in excess of: 400,000 birds if mechanically ventilated, 200,000 birds if naturally ventilated, and 100,000 birds for any turkey unit, require consideration in this assessment, to establish whether there is relevant exposure within 100m of the poultry units. The assessment needs to consider only PM<sub>10</sub>.

Dartford Borough Council confirms that there are no poultry farms in the local authority area meeting the specified criteria.

## 7 Commercial and Domestic Sources

### 7.1 Biomass combustion

#### 7.1.1 Biomass combustion - individual installations

The assessment considers both PM<sub>10</sub> and nitrogen dioxide objectives.

There are no biomass processes at present with planning permission that meet the criteria for assessment.

Dartford Borough Council confirms that there are no biomass combustion plants in the Local Authority area, which meet this criteria.

#### 7.1.2 Biomass combustion – combined impacts (PM<sub>10</sub> emissions)

Dartford Borough Council confirms that there are no biomass combustion plants in the Local Authority area, which meet this criteria.

### 7.2 Domestic solid-fuel burning (sulphur dioxide emissions)

The assessment considers sulphur dioxide emissions (only) from significant areas of residential properties that use solid fuel to heat their houses. ‘Significant’ areas are those of about 500 x 500 m with more than 50 houses burning coal/smokeless fuel as their primary source of heating. PM<sub>10</sub> from domestic solid fuel burning is covered under the Biomass combustion – combined impacts section above.

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

## 8 Fugitive or Uncontrolled Sources

The assessment of fugitive and uncontrolled sources considers the PM<sub>10</sub> objectives. This included consideration to quarries, landfill sites, opencast coal mining, waste transfer sites, and materials handling (i.e. ports, major construction sites). Only locations not covered by previous rounds of review and assessment, or where there is new relevant exposure, require consideration. In the case of proposed new sources, these are only required to be considered if planning approval has been granted.

There have been no substantial changes, new exposure or any dust complaints.

Dartford Borough Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area that have not been adequately covered in previous rounds of review and assessment.

## 9 Conclusions and Proposed Actions

### 9.1 Conclusions from new monitoring data

The Updating and Screening Assessment review of new monitoring data, has shown that exceedences continue to occur in the existing Dartford AQMAs.

Outside the AQMA, exceedences of the annual mean NO<sub>2</sub> objective were measured in five monitoring locations:

- DA41 Church Hill roadside site at junction with Hawley Road
- DA45/DA52 background sites parallel the A282 Dartford Tunnel Approach Road, but outside the contours of the current AQMA declaration
- DA48 Hawley Road, adjacent to the M25 south of Junction 2
- DA50 A2/Bridge, adjacent to the A2 west of Junction 2.

In addition, a risk of exceedence of the hourly NO<sub>2</sub> objective has been identified at two roadside monitoring sites, with relevant exposure in reasonably close proximity:

- DA43 A226 Overtly Liberty
- DA14 Bow Arrow Lane

It is therefore recommended that the Council proceed to a Detailed Assessment at these locations.

### 9.2 Conclusions from assessment of sources

The Updating and Screening Assessment has reviewed new and significantly changed sources in the borough.

#### 9.2.1 Road Sources

Four areas have been identified through assessment of road sources using the DMRB model as potentially at risk of exceedence of the annual mean NO<sub>2</sub> objective, outside the existing AQMAs.

- B258 Church Hill/A225 Hawley Road
- B258 Church Hill/A2 Bridge
- A225 Hawley Road/M25 Bridge
- B260 Green Street Green Road

It is therefore recommended that the Council proceed to a Detailed Assessment at these locations.

#### 9.2.2 Other Sources

There are no significant new or substantially changed sources that warrant a detailed assessment.

### 9.3 Proposed Actions

Proposed actions arising from the Updating and Screening Assessment are as follows:

- Undertake a Detailed Assessment for the annual mean NO<sub>2</sub> objective by April 2010 at the five locations outside AQMAs, where exceedences of the annual mean NO<sub>2</sub> objective were measured in 2008, and at the additional location identified through DMRB (beyond those identified through monitoring);



- Undertake a Detailed Assessment for the hourly NO<sub>2</sub> objective by April 2010 at the two locations identified through monitoring as significantly exceeding the 60µg/m<sup>3</sup> annual mean NO<sub>2</sub> threshold and with nearby relevant exposure;
- Progress to a 2010 Annual Progress Report by April 2010.

## 10 References

- Highways Agency's Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3, Part 1 Air Quality, May 2007, and accompanying spreadsheet DMRB Screening Method V1,03.xls. July 2007
- Local Air Quality Management Technical Guidance LAQM.TG(09). February 2009. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland
- Local Air Quality Management Policy Guidance LAQM.PG(09). February 2009. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland
- Dartford Borough Council 2008 Local Air Quality Management Annual Progress Report
- Dartford Borough Council 2007 Local Air Quality Management Annual Progress Report
- Dartford Borough Council 2006 Local Air Quality Management Updating and Screening Assessment

## APPENDICES

### Appendix 1 - Traffic data

Site Ref	Data source	Location	X	Y	%HDV *	AADT 2008	Speed (mph)	Previously Assessed?	Substantial change since USA 2006 (25%)?	Assessed in USA 2009 using DMRB?	Reason for assessment
-	DfT	A2026 Burnham Road	553600	175000	5.4	10842	-	Y	N	N	N/A
-	DfT	A282 Canterbury Way	556200	175400	16.4	134643	-	Y	N	N	N/A
-	DfT	A206 Crossways Boulevard	558000	175050	5.6	24717	-	Y	N	N	N/A
-	DfT	A226 Dartford Road	553000	174320	3.4	10745	-	Y	N	N	N/A
-	DfT	A226 East Hill	555000	173860	5.7	19210	-	Y	N	N	N/A
-	DfT	A226 Highfield Road	553839	174000	4.6	13538	-	Y	N	N	N/A
-	DfT	A226 Home Gardens	554353	174186	4.2	19649	-	Y	N	N	N/A
-	DfT	A226 London Road	557000	174240	3.9	14546	-	Y	N	N	N/A
-	DfT	A226 London Road	560000	174970	8.6	13187	-	Y	N	N	N/A
-	DfT	A225 Lowfield Street	554070	173700	4.0	10520	-	Y	N	N	N/A
-	DfT	A225 Lowfield Street	554120	173000	4.9	15252	-	Y	N	N	N/A
-	DfT	A225 Main Road	555730	170000	3.5	14670	-	Y	N	N	N/A
-	DfT	A226 Market Street	554259	173950	4.6	11524	-	Y	N	N	N/A
-	DfT	A2 N/A	551232	173310	5.5	96534	-	Y	N	N	N/A
-	DfT	A2 N/A	555000	172000	5.8	89362	-	Y	N	N	N/A
-	DfT	A2 N/A	556250	172190	9.2	98598	-	Y	N	N	N/A
-	DfT	A2 N/A	560000	172670	8.9	109440	-	Y	N	N	N/A
-	DfT	A2 N/A	562250	172250	9.4	10743	-	Y	N	N	N/A
-	DfT	A282 N/A	555470	174470	15.6	123388	-	Y	N	N	N/A
-	DfT	A282 N/A	555720	172470	14.0	25320	-	Y	N	N	N/A
-	DfT	A282 N/A	555740	172920	14.0	126598	-	Y	N	N	N/A
-	DfT	A296 N/A	557000	173400	5.6	19285	-	Y	N	N	N/A
-	DfT	A296 N/A	558000	173130	5.6	17551	-	Y	N	N	N/A
-	DfT	M25 N/A	554050	170000	12.8	124865	-	Y	N	N	N/A
-	DfT	M25 N/A	555770	172500	14.0	101282	-	Y	N	N	N/A
-	DfT	A2018 Old Bexley Lane	551100	172910	3.2	19483	-	N	N/A	Y	Relevant exposure

\*Heavy duty vehicles (HDV) >20% is considered as an unusually high proportion, which would warrant assessment if not previously considered.

### Appendix 1 (Continued) - Traffic data

Site Ref	Data source	Location	X	Y	%HDV *	AADT 2008	Speed (mph)	Previously Assessed?	Substantial change since USA 2006 (25%)?	Assessed in USA 2009 using DMRB?	Reason for assessment
-	DfT	A296 Park Road	555300	173600	5.3	9035	-	Y	N	N	N/A
-	DfT	A225 Princes Road	555000	173340	3.7	22776	-	Y	N	N	N/A
-	DfT	A296 Princes Road	556000	173400	3.8	14476	-	Y	N	N	N/A
-	DfT	A296 Prince's Road	555500	173360	4.6	28978	-	Y	N	N	N/A
-	DfT	A296 Roman Road	559000	172910	6.4	14607	-	Y	N	N	N/A
-	DfT	A2018 Shepherd's Lane	552050	173360	4.5	19309	-	Y	N	N	N/A
-	DfT	A206 Thames Road	553190	175330	12.0	29427	-	Y	N	N	N/A
-	DfT	A206 University Way	554000	175670	17.2	20913	-	Y	N	N	N/A
-	DfT	A2 Watling Street	562000	172380	8.9	98496	-	Y	N	N	N/A
-	DfT	A226 West Hill	553600	174180	4.9	14187	-	Y	N	N	N/A
-	DfT	A226 Westgate Road	554000	174320	-	16069	-	Y	N	N	N/A
00000026	KCC	A226 Dartford West	552568	174438	-	12974	28.9	Y	N	N	N/A
20020129	KCC	A206 Burnham Road - Dartford CF03	553602	175015	-	12641	25.1	Y	N	N	N/A
20020130	KCC	A226 Dartford Road - Dartford West CF04	552615	174420	-	10389	29.4	Y	N	N	N/A
20020131	KCC	B2174 Princes Road - Dartford CF05	553489	173319	-	13466	36.4	Y	N	N	N/A
20030024	KCC	A225 Hawley Road - Dartford NF02	554808	172216	-	12899	36.2	Y	N	N	N/A
20030111	KCC	A226 London Road - Knockhall NF 28	559819	174992	-	16251	27.5	Y	N	N	N/A
20030201	KCC	A226 London Road - Stone Lodge Farm NF07	556457	174061	-	12076	25.9	Y	N	N	N/A
20030208	KCC	A226 London Road - Horns Cross Stone (Hills) NF17	557721	174431	-	15086	31.7	Y	N	N	N/A
20040280	KCC	A225 Main Road Sutton At Hone NF36	555806	169439	-	12198	27.9	N	N/A	Y	Relevant exposure
20050047	KCC	A2018 Shepherds Lane - Dartford	553060	173974	-	12876	28.4	Y	N	N	N/A

\*Heavy duty vehicles (HDV) >20% is considered as an unusually high proportion, which would warrant assessment if not previously considered.

### Appendix 1 (Continued) - Traffic data

Site Ref	Data source	Location	X	Y	%HDV *	AADT 2008	Speed (mph)	Previously Assessed?	Substantial change since USA 2006 (25%)?	Assessed in USA 2009 using DMRB?	Reason for assessment
20060067	KCC	Bluewater Out Slip To Clements Way Roundabout	558492	173918	-	10472	30.4	Y	N	N	N/A
20060069	KCC	Bluewater Out Slip To B255	558565	173677	-	10186	39.8	Y	N	N	N/A
20060070	KCC	Bluewater In Slip From B255 Single Lane	558404	173720	-	11494	25.1	Y	N	N	N/A
20060101	KCC	St Vincent's Road Dartford	555277	174045	-	13098	22.3	Y	N	N	N/A
20060102	KCC	B260 Main Road New Barn	561391	168689	-	11870	31.9	N	N/A	Y	Relevant exposure
20060103	KCC	A226 London Road The Brent Dartford	555995	173918	-	15967	25.7	Y	N	N	N/A
20060104	KCC	Shepherds Lane Dartford	552187	173422	-	20052	38.1	Y	N	N	N/A
20060119	KCC	A2018 Old Bexley Lane - Dartford	551849	173281	-	29991	45.6	N	N/A	Y	Relevant exposure
20060134	KCC	B255 St Clement's Way - Greenhithe	558667	174287	-	27649	50.5	Y	N	N	N/A
20070065	KCC	A226 East Hill - Dartford	555043	173854	-	18890	26.0	Y	N	N	N/A
20070066	KCC	A226 London Road - Knockhall	559819	174992	-	18925	26.1	Y	N	N	N/A
20070176	KCC	B260 Green Street Green Road	557482	171013	-	14584	38.0	N	N/A	Y	Relevant exposure
20070188	KCC	A225 Main Road - Sutton At Hone	555685	170123	-	14508	27.2	N	N/A	Y	Relevant exposure
20080119	KCC	A2018 SHEPHERDS LANE DARTFORD SITE 1	553411	174116	-	9994	25.1	Y	N	N	N/A
20080120	KCC	SHEPHERDS LANE DARTFORD SITE 2	553333	173960	-	10706	26.6	Y	N	N	N/A
7000001	KCC	A2018 Old Bexley Lane, Dartford	551829	173264	-	26087	40.3	N	N/A	Y	Relevant exposure
7000002	KCC	A225 Hawley Road, Dartford	554118	173066	-	15768	29.2	Y	N	Y	Junction assessment
7000003	KCC	B260 Green Street Green Road, Dartford	556241	172482	-	11476	42.9	N	N/A	Y	Relevant exposure
7000003	KCC	B260 Green Street Green Road, Dartford	556241	172482	-	9386	42.7	N	N/A	Y	Relevant exposure

\*Heavy duty vehicles (HDV) >20% is considered as an unusually high proportion, which would warrant assessment if not previously considered.

## Appendix 1 (Continued) - Traffic data

Site Ref	Data source	Location	X	Y	%HDV *	AADT 2008	Speed (mph)	Previously Assessed?	Substantial change since USA 2006 (25%)?	Assessed in USA 2009 using DMRB?	Reason for assessment
7000004	KCC	A296 Princes Road, Dartford	556469	173386	-	15843	33.6	Y	N	N	N/A
7000005	KCC	B2500 Watling Street, Dartford	556002	173624	-	9439	33.9	Y	N	N	N/A
7000006	KCC	A226 The Brent, Dartford	556093	173938	-	13450	29.8	Y	N	N	N/A
7000007	KCC	A2026 Burnham Road, Dartford	553613	174998	-	12069	25.0	Y	N	N	N/A
7000008	KCC	A226 Dartford Road, Dartford	552574	174415	-	10762	27.1	Y	N	N	N/A
7000051	KCC	A226 West Hill, Dartford	553751	174140	-	14183	20.7	Y	N	N	N/A
7000052	KCC	A226 Highfield Road, Dartford	553842	173845	-	7073	24.5	Y	N	N	N/A
7000053	KCC	A225 Lowfield Street, Dartford	554095	173772	-	12632	22.1	Y	N	N	N/A
7000054	KCC	A226 East Hill, Dartford	554761	173909	-	17971	26.3	Y	N	N	N/A
7000055	KCC	A2026 Hythe Street, Dartford	554152	174345	-	15066	22.5	Y	N	N	N/A
26	KCC	A226 Dartford West	552568	174438	-	12323	-	Y	N	N	N/A
27	KCC	A296 Dartford East	556328	173428	-	17336	-	Y	N	N	N/A
135	KCC	Temple Hill, Dartford	554602	174497	-	13648	-	Y	N	N	N/A
X620711	KCC	Watling St (London)	559999	172670	-	124838	-	Y	N	N	N/A
X612355	KCC	Princes Rd (Crayford)	555469	173354	-	24200	-	Y	N	N	N/A
X612355	KCC	Park Road	555469	173354	-	14750	-	Y	N	N	N/A
X612355	KCC	Princes Road	555469	173354	-	27942	-	Y	N	N	N/A
X612355	KCC	Green Street Green Road	555469	173354	-	11150	-	N	N/A	Y	Relevant exposure
K712629	KCC	The Brent	555400	173800	-	16573	-	Y	N	N	N/A
K814219	KCC	Crossways Boulevard	558300	175100	-	22263	-	Y	N	N	N/A
K814200	KCC	Crossways Boulevard (Jun1A)	556000	174900	-	22251	-	Y	N	N	N/A
20070107	KCC	B258 Church Hill Dartford	553859	172434	-	6958	30.1		N/A	Y	Junction assessment

\*Heavy duty vehicles (HDV) >20% is considered as an unusually high proportion, which would warrant assessment if not previously considered.

## Appendix 2 - Bias Adjustment Factor Calculations

Period	Start Date	End Date	Tube 1 $\mu\text{g}/\text{m}^3$	Tube 2 $\mu\text{g}/\text{m}^3$	Tube 3 $\mu\text{g}/\text{m}^3$	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% Confidence Interval of mean	Automatic Monitor Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data Capture Check
1	02-Jan	30-Jan	60	74	65	66	7	11	18	52	98	Good	Good
2	30-Jan	27-Feb	70	61	53	62	9	14	21	65	100	Good	Good
3	27-Feb	02-Apr	63	66	58	62	4	6	9	59	100	Good	Good
4	02-Apr	30-Apr	71	69	75	72	3	4	8	64	99	Good	Good
5	30-Apr	28-May	51	51	53	51	1	2	3	41	99	Good	Good
6	28-May	02-Jul	64	47	65	58	10	18	25	57	100	Good	Good
7	02-Jul	30-Jul	60	57	67	61	5	8	12	56	100	Good	Good
8	30-Jul	03-Sep	62	50	56	56	6	11	16	49	100	Good	Good
9	03-Sep	01-Oct	39	64	39	47	14	30	35	56	100	Poor Precision	Good
10	01-Oct	29-Oct	49	67	73	63	12	19	30	68	100	Good	Good
11	29-Oct	03-Dec	56	62	55	58	4	7	9	61	99	Good	Good
12	03-Dec	08-Jan	77	66	79	74	7	10	18	70	99	Good	Good

Dartford Bean Interchange Roadside (based on 11 periods of good data capture)	
Bias factor A	0.94 (0.88 – 1.01)
Bias B	6% (-1%-14%)
Diffusion Tubes Mean:	$62\mu\text{g}/\text{m}^3$
Mean CV (Precision):	10
Automatic Mean:	$58\mu\text{g}/\text{m}^3$
Data Capture for periods used:	99%
Adjusted Tubes Mean:	$58 (55-63)\mu\text{g}/\text{m}^3$

### Appendix 3 - Nitrogen dioxide diffusion tube results 2008

Site Ref	Location	Site type	X	Y	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Average	Corrected Annual Mean 2008
DA01	Lowfield Street	R	554190	173985	48	61	48	44	59	53	53	41	36	48	61	64	51	<b>48</b>
DA05 (A,B,C)	Ightham Cottages (triplicate)	R	558622	172771	66	62	62	72	51	58	61	56	47	63	58	74	61	<b>57</b>
DA07	Summerhouse Drive	B	550749	171924	23	46	28	28	30	22	22	22	26	17	35	41	28	27
DA10	London Road	R	559189	174872	46	65	60	65	50	56	47	42	24	36	52	60	50	<b>47</b>
DA14	Bow Arrow Lane	I	555484	174441	93	88	87	70	70	67	76	78	56	83	98	77	79	<b>74</b>
DA16	Princes Road 2	R	554108	173318	53	63	50	58	48	47	45	48	33	56	-	65	52	<b>48</b>
DA17	Shepherds Lane	R	552732	173689	51	81	44	53	52	45	48	45	34	45	58	62	52	<b>48</b>
DA18	Alkerden Lane	B	559734	174077	33	49	30	32	27	-	26	18	21	24	35	48	31	29
DA20	Elliot Road	R	555660	174863	51	66	40	65	53	46	53	31	34	56	54	59	51	<b>48</b>
DA21	Brentfield Road	R	555497	174025	35	49	41	46	40	43	25	34	46	29	49	58	41	39
DA22	Brent Way	R	555600	174030	71	76	56	74	61	59	63	75	32	-	79	65	65	<b>61</b>
DA23	The Brent	R	555751	173900	57	64	57	57	46	51	44	54	25	39	69	71	53	<b>50</b>
DA24	Wayville Rd	R	555632	173558	44	58	43	41	52	45	36	29	41	38	43	55	44	<b>41</b>
DA25	Queens Gardens	B	555801	173194	52	-	55	52	46	44	-	43	23	48	55	-	46	<b>44</b>
DA28	Ivy Villas	R	558472	174670	74	47	59	55	67	57	61	58	35	54	58	66	58	<b>54</b>
DA31	Taunton Rd (nr London Rd)	I	561215	174898	31	48	27	44	41	29	31	26	24	26	50	50	35	33

R= Roadside, B=Background. I=Intermediate. Exceedences of the annual mean objective are highlighted in bold.

### Appendix 3 (Continued) - Nitrogen dioxide diffusion tube results 2008

Site Ref	Location	Site Type	X	Y	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Average	Corrected Annual Mean 2008
DA34	The Brent II	R	555373	173763	53	55	59	60	60	30	49	42	22	45	59	54	49	<b>46</b>
DA35	Highfield Road	R	553848	173994	72	79	41	57	58	46	52	54	56	53	67	62	58	<b>55</b>
DA36	Burnham Road	R	553281	175290	35	39	32	53	44	35	34	35	30	29	56	46	39	37
DA37	Watling Street	R	556734	173456	35	57	41	46	53	43	38	28	40	33	50	-	42	40
DA38	London Road 3	R	558331	174596	43	63	48	58	46	38	41	38	18	25	-	-	42	39
DA39	Park Road	R	555129	173802	38	63	45	40	55	44	38	35	35	46	-	56	45	<b>42</b>
DA40	West Hill	R	553463	174215	32	46	36	47	-	-	-	-	-	-	-	-	40	34
DA41	Church Hill	R	554123	172805	52	60	46	55	48	53	43	43	35	55	59	63	51	<b>48</b>
DA43	Overy Liberty	R	554580	173992	63	86	64	87	72	73	58	60	49	76	67	79	70	<b>65</b>
DA44	Brent Close	R	555656	174053	66	72	57	60	43	47	37	60	39	60	58	58	55	<b>52</b>
DA45	Milestone Road	B	555964	174098	49	58	43	39	46	40	39	38	32	42	49	51	44	<b>41</b>
DA47	Westgate Road	R	553938	174308	38	52	34	44	40	41	32	29	46	46	46	56	42	40
DA48	Hawley Road	R	555297	171327	39	52	58	50	44	44	33	41	14	42	59	56	44	<b>42</b>
DA49	St Albans Road	R	554902	173893	43	53	47	40	51	47	43	45	32	35	58	60	46	<b>43</b>
DA50	A2/Bridge	R	553783	172319	46	51	46	51	47	49	45	43	28	49	47	59	47	<b>44</b>
DA51	Cornwall Road	R	555068	175653	38	53	38	51	48	-	36	23	27	30	-	62	41	38
DA52	Grange Crescent	B	555605	174358	54	63	27	45	49	49	46	48	22	54	55	-	47	<b>44</b>
DA53	Park (Off Swallow Close)	B	557693	174666	30	-	29	28	27	25	25	25	21	-	38	42	29	27
DA54	King Edward Avenue	B	553642	174616	29	41	35	24	30	23	27	23	26	35	42	41	31	29
DA55	Littlebrook Hospital	B	556012	174405	43	49	38	33	-	30	35	33	22	42	50	54	39	37
DA56	Cranford Road	B	554222	173460	32	53	31	35	-	-	30	28	27	37	47	50	37	35
DA57	Park Road II nr Downs rd	I	555290	173585	43	59	42	-	-	-	31	37	29	43	51	64	44	<b>42</b>
DA58	High Trees (The Oaks, BAL)	B	555831	174230	-	55	46	-	-	-	33	-	-	-	-	-	45	39

R= Roadside, B=Background, K=Kerbside, I=Intermediate. Exceedences of the annual mean objective are highlighted in **bold**.

### Appendix 3 (Continued) - Nitrogen dioxide diffusion tube results 2008

Site Ref	Location	Site Type	X	Y	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec	Average	Corrected Annual Mean 2008
DA59	Ivy Villas II	I	558458	174695	62	71	57	58	-	33	51	50	36	-	-	61	53	<b>50</b>
DA60	Burnham Road II	R	553895	174678	-	-	-	-	-	-	-	-	-	39	46	61	48	<b>40</b>
DA61	West Hill II	R	553578	174175	-	-	-	-	-	-	-	-	-	65	66	62	64	<b>53</b>
DA62	The Brent/London Road	R	555796	173902	-		-	-	-	-	-	-	-	-	59	63	61	<b>49</b>

R= Roadside, B=Background, K=Kerbside. Exceedences of the annual mean objective are highlighted in **bold**.

## Appendix 4 - DMRB Assessment Inputs

Site Ref	Road Name	Receptor	Distance to receptor (m)	AADT (2008)	% HDV	Speed (kph)	Street canyon?	Background Concentrations		
								2008 NO <sub>x</sub> Annual Mean (µg/m <sup>3</sup> )	2008 NO <sub>2</sub> Annual Mean (µg/m <sup>3</sup> )	2008 PM <sub>10</sub> Annual Mean (µg/m <sup>3</sup> )
1	M25 / A225 Hawley Road, Dartford	9 Hawley Road	23.1	100279	15.0	112.7	N	49.6	32.2	22.9
1	M25 / A225 Hawley Road, Dartford	9 Hawley Road	16.6	12899	4.4	58.3	N	49.6	32.2	22.9
2	M25 / A225 Hawley Road, Dartford	8 Hawley Road	30.8	100279	15.0	112.7	N	49.6	32.2	22.9
2	M25 / A225 Hawley Road, Dartford	8 Hawley Road	6.9	12899	4.4	58.3	N	49.6	32.2	22.9
3	Church Hill	34 Hawley Road	9.8	6958	4.4	20	N	39.9	27.5	22.6
3	A225 Hawley Road	34 Hawley Road	15.5	15768	4.4	20	N	39.9	27.5	22.6
4	Church Hill	10 Curates Walk	14.6	6958	4.4	48	N	37.1	26.1	21.3
4	A2	10 Curates Walk	22.4	89362	6.0	112	N	37.1	26.1	21.3
5	B260 Green Street Green Road	1-8 Oakley Court	11.5	11150	7.7	48	N	55.4	34.6	25.6
6	A225 Main Road Sutton At Hone	34 Main Road	4.8	14507	5.8	44	N	32.8	23.7	20.0
7	A2018 Old Bexley Lane	9 Andrews Place	8.8	19483	3.6	38	N	31.8	23.2	20.3
8	B260 Main Road, New Barn	1 Mabel Cottages	8.3	11870	7.7	51	N	23.4	18.1	18.1

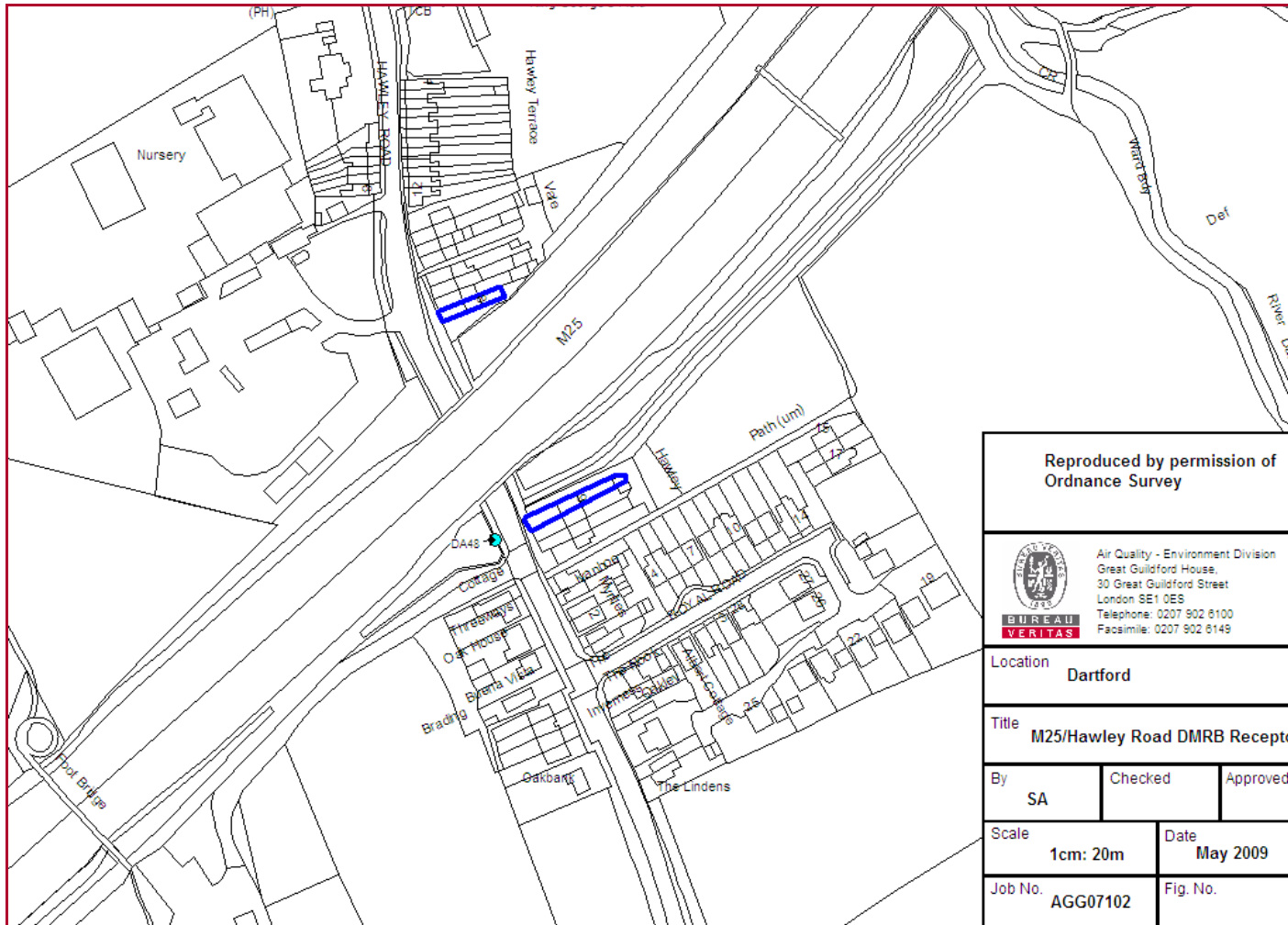
## Appendix 5 - DMRB Assessment Results

Site Ref	Road Name	Receptor	DMRB Assessment Results				Detailed assessment required?
			2008 NO <sub>x</sub> Annual Mean (µg/m <sup>3</sup> )	2008 NO <sub>2</sub> * Annual Mean (µg/m <sup>3</sup> )	2008 PM <sub>10</sub> Annual Mean (µg/m <sup>3</sup> )	2008 Number of exceedences of 24 hour PM <sub>10</sub>	
1	M25 / A225 Hawley Road, Dartford	9 Hawley Road	129.5	57	31.2	32	Y
2	M25 / A225 Hawley Road, Dartford	8 Hawley Road	120.9	55	30.3	29	Y
3	A225 Hawley Road/Church Hill	34 Hawley Road	71.2	40	26.8	17	Y
4	Church Hill/A2	10 Curates Walk	83.0	43	27.3	18	Y
5	B260 Green Street Green Road	1-8 Oakley Court	69.5	40	27.0	18	Y
6	A225 Main Road, Sutton at Hone	34 Main Road	55.5	33	22.5	7	N
7	A2018 Old Bexley Lane	9 Andrews Place	51.3	31	22.7	8	N
8	B260 Main Road, New Barn	1 Mabel Cottages	43.5	27	20.1	4	N

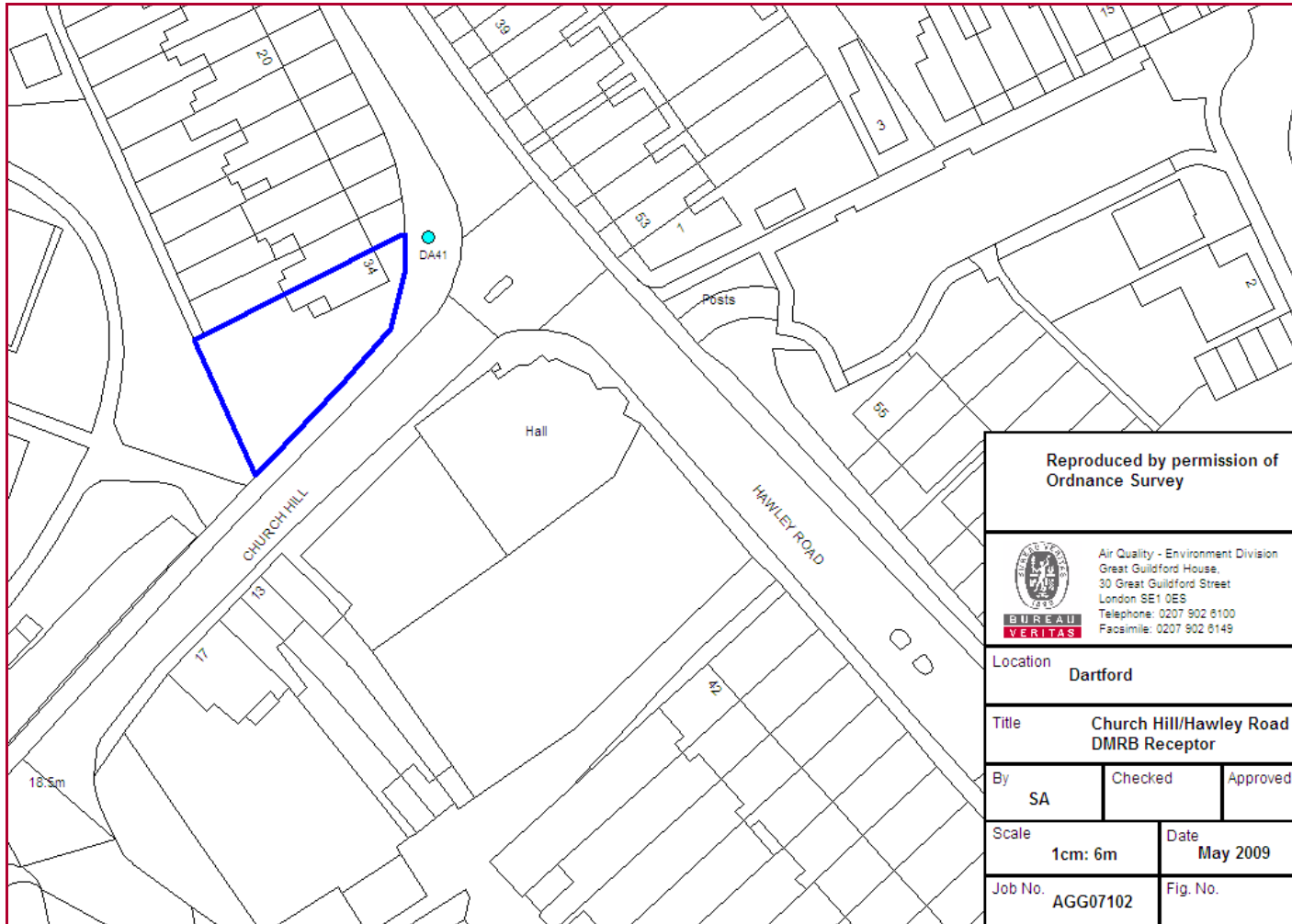
\* NO<sub>2</sub> concentrations calculated from NO<sub>x</sub> using the LAQM.TG (09) NO<sub>x</sub>:NO<sub>2</sub> conversion calculator.

## Appendix 6 - Maps of Locations DMRB Results indicate risk of exceedence of Air Quality Objectives

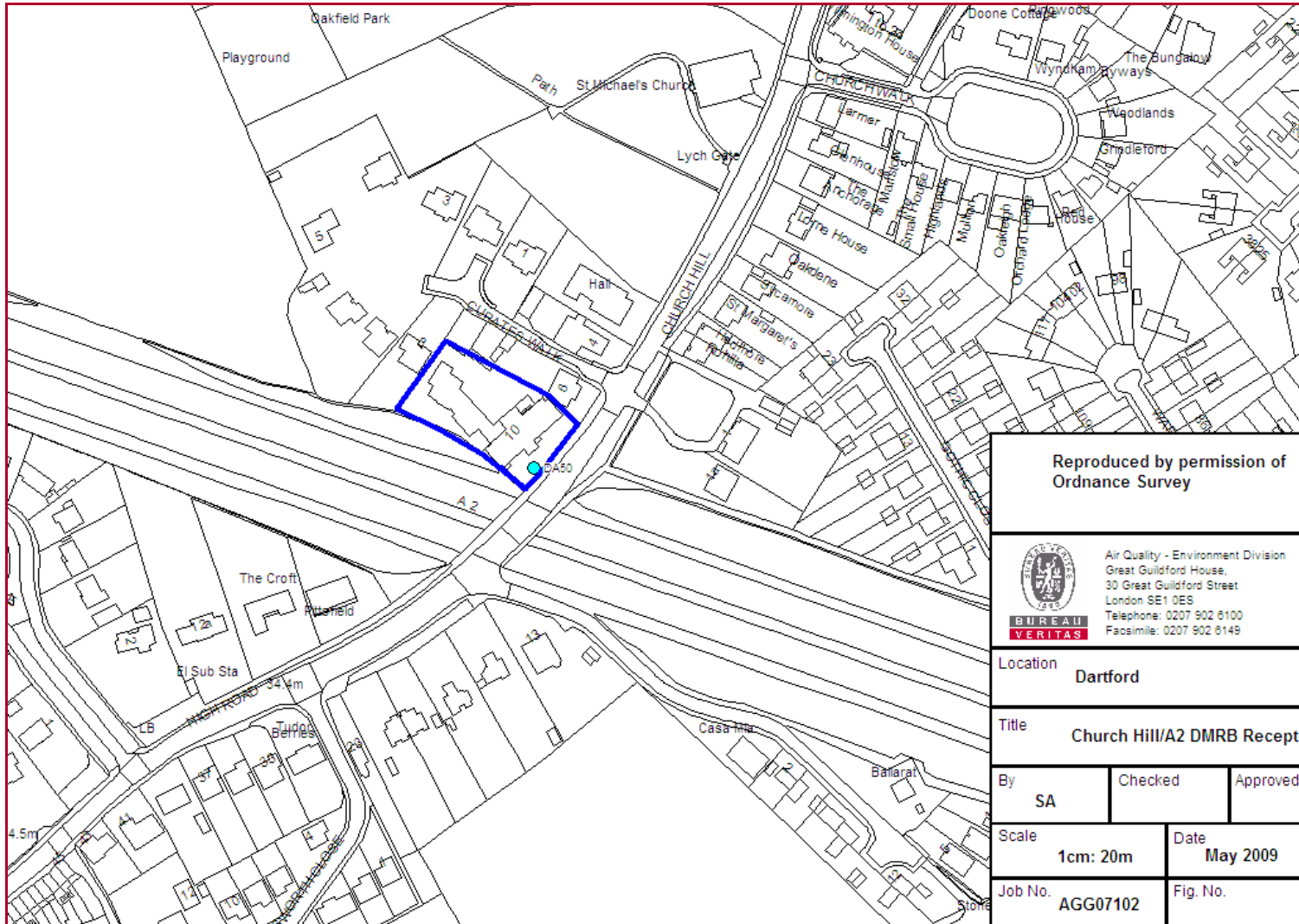
### M25 / A225 Hawley Road, Dartford




**A225 Hawley Road/Church Hill**

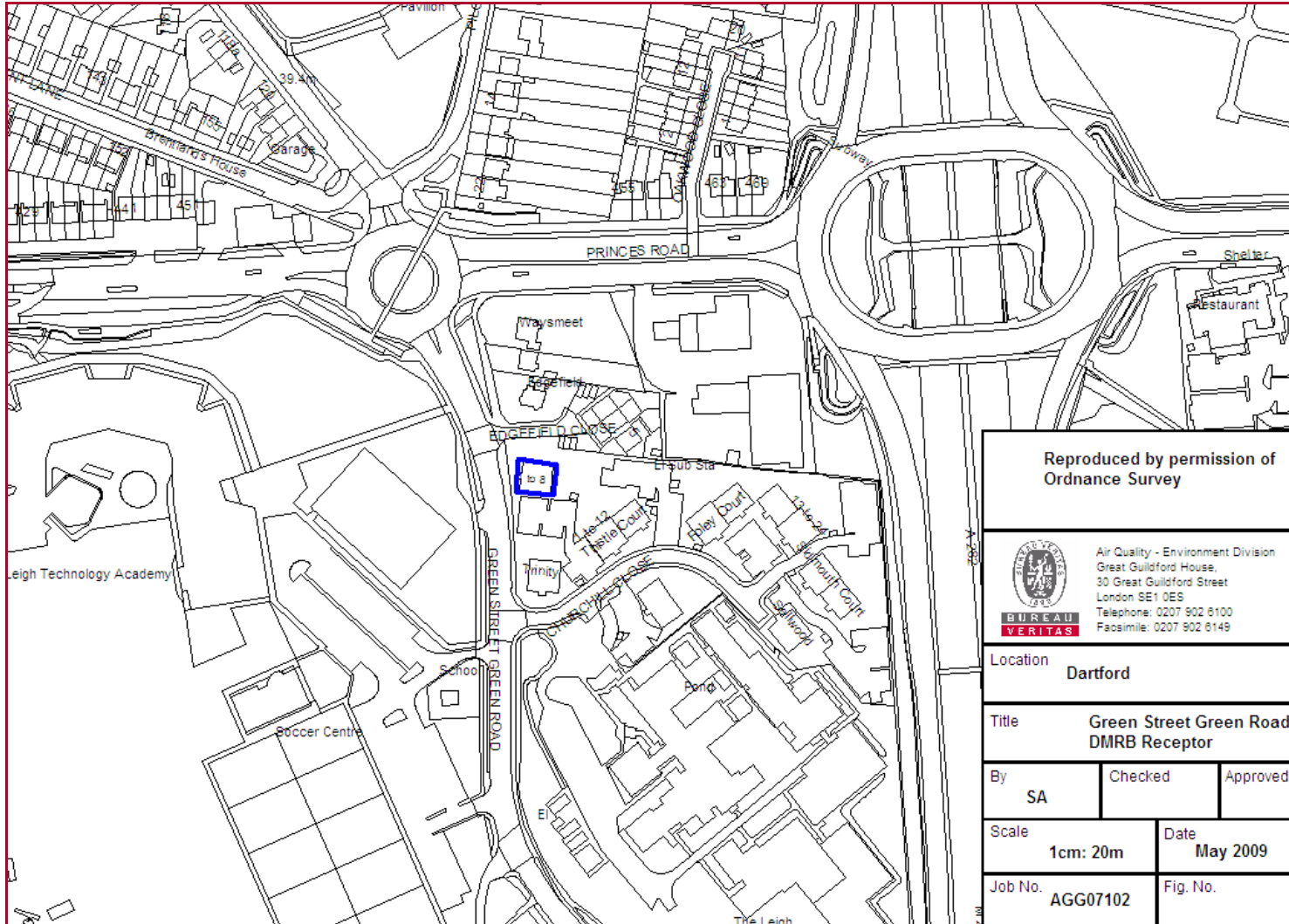


**Church Hill/A2**



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 Air Quality - Environment Division Great Guildford House, 30 Great Guildford Street London SE1 0ES Telephone: 0207 902 6100 Facsimile: 0207 902 6149		
Location <b>Dartford</b>		
Title <b>Church Hill/A2 DMRB Receptor</b>		
By <b>SA</b>	Checked	Approved
Scale <b>1cm: 20m</b>	Date <b>May 2009</b>	
Job No. <b>AGG07102</b>	Fig. No.	

**B260 Green Street Green Road**



## Appendix 7 - List of Industrial Processes

Process Name	Process Type	PG Note	X	Y	New source since USA 2006?	Existing process with new exposure?	Substantial change >30%?	Potentially significant release with respect to AQOs?	Complaints?	Nomogram screening assessment required?	Detailed Assessment Required?
Swanscombe Dry cleaners	Dry cleaners	PG6/46	560619	174529	Yes	N/A	N/A	No	No	No	No
Victoria Dry Cleaners	Dry cleaners	PG6/46	554144	174254	Yes	N/A	N/A	No	No	No	No
Evergreen Dry Cleaners	Dry cleaners	PG6/46	554140	174212	Yes	N/A	N/A	No	No	No	No
Capricorn Dry Cleaners	Dry cleaners	PG6/46	560070	168986	Yes	N/A	N/A	No	No	No	No
The Iron Inn Dry Cleaners	Dry cleaners	PG6/46	553241	174244	Yes	N/A	N/A	No	No	No	No
Lords Dry Cleaning Service	Dry cleaners	PG6/46	555210	173784	Yes	N/A	N/A	No	No	No	No
Greenhithe Dry Cleaners	Dry cleaners	PG6/46	555863	173916	Yes	N/A	N/A	No	No	No	No
Dartford Dry Cleaners	Dry cleaners	PG6/46	554075	173757	Yes	N/A	N/A	No	No	No	No
Drive In Dry Cleaners	Dry cleaners	PG6/46	555511	170896	Yes	N/A	N/A	No	No	No	No
Birchwood Dry Cleaners	Dry cleaners	PG6/46	551102	171624	Yes	N/A	N/A	No	No	No	No
Joydens Wood Service Station	Vapour Recovery (Petrol Filling Stations)	PG1/14	550696	171787	No	No	No	No	No	No	No
Dartford Express	Vapour Recovery (Petrol Filling Stations)	PG1/14	552964	174300	No	No	No	No	No	No	No
Longfield Service Station	Vapour Recovery (Petrol Filling Stations)	PG1/14	560135	169134	No	No	No	No	No	No	No
Elms Service Station	Vapour Recovery (Petrol Filling Stations)	PG1/14	555397	173380	No	No	No	No	No	No	No

## Appendix 7 (Continued) - List of Industrial Processes

Process Name	Process Type	PG Note	X	Y	New source since USA 2006?	Existing process with new exposure?	Substantial change >30%?	Potentially significant release with respect to AQOs?	Complaints?	Nomogram screening assessment required?	Detailed Assessment Required?
Burnham Service Station	Vapour Recovery (Petrol Filling Stations)	PG1/14	553508	175159	No	No	No	No	No	No	No
Winston Service Station (ROC UK Ltd)	Vapour Recovery (Petrol Filling Stations)	PG1/14	552761	173565	No	No	No	No	No	No	No
Vanguard Service Station	Vapour Recovery (Petrol Filling Stations)	PG1/14	559018	174877	No	No	No	No	No	No	No
Hawley Road Service Station (Shell UK)	Vapour Recovery (Petrol Filling Stations)	PG1/14	554662	172354	No	No	No	No	No	No	No
Dartford Service Station	Vapour Recovery (Petrol Filling Stations)	PG1/14	555604	173333	No	No	No	No	No	No	No
Greenhithe Service Station	Vapour Recovery (Petrol Filling Stations)	PG1/14	559019	174813	No	No	No	No	No	No	No
Asda	Vapour Recovery (Petrol Filling Stations)	PG1/14	558209	175048	No	No	No	No	No	No	No
Lancebox Limited	Mobile Concrete Crusher	PG3/16	560544	174963	Yes	N/A	N/A	No	No	No	No
Pinden Limited	Mobile Concrete Crusher	PG3/16	559540	169589	No	No	No	No	No	No	No
F.M. Conway Ltd	Mobile Concrete Crusher	PG3/16	551293	173758	No	No	No	No	No	No	No
J. Clubb Limited	Concrete & Batching Processes	PG3/1	555113	172665	No	No	No	No	No	No	No
F. M. Conway	Concrete & Batching Processes	PG3/1	551293	173758	No	No	No	No	No	No	No
Lafarge Redland Readymix Limited	Concrete & Batching Processes	PG3/1	558269	175163	No	No	No	No	No	No	No
Autotech Bodysshop Limited	Vehicle Re-sprayers	PG6/34	556074	173817	Yes	N/A	N/A	No	No	No	No
A. Pile & Sons	Vehicle Re-sprayers	PG6/34	555107	174363	No	No	No	No	No	No	No

### Appendix 7 (Continued) - List of Industrial Processes

Process Name	Process Type	PG Note	X	Y	New source since USA 2006?	Existing process with new exposure?	Substantial change >30%?	Potentially significant release with respect to AQOs?	Complaints?	Nomogram screening assessment required?	Detailed Assessment Required?
North Kent Commercials	Vehicle Re-sprayer	PG6/34	561188	174963	No	No	No	No	No	No	No
Corus – Dartford Service Centre	Painting of Metal & Plastic	PG6/35	555353	169281	No	No	No	No	No	No	No
Cray Metal Finishers	Powder coating	PG6/31	554251	174901	No	No	No	No	No	No	No
Howard Hunt (City) Limited	Printing	PG6/16	556198	175157	No	No	No	No	No	No	No
Bulldog Engineering Services Limited	Waste Oil Burner	PG1/1	562595	167917	No	No	No	No	No	No	No
MGS Auto	Waste Oil Burner	PG1/1	554685	173024	No	No	No	No	No	No	No
GlaxoSmithKline	Pharmaceuticals/organic chemicals	-	554850	174740	No	No	No	Yes	No	No	No