



**IPSWICH**  
BOROUGH COUNCIL

2015 Updating and Screening  
Assessment for

**IPSWICH BOROUGH COUNCIL**

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

February 2016

|                                |   |
|--------------------------------|---|
| <b>Local Authority Officer</b> | R Brooks  |
|                                |   |
| <b>Department</b>              | Environmental Health  |
| <b>Address</b>                 | Ipswich Borough Council, Grafton House,<br>15-17 Russell Road, Ipswich, Suffolk, IP1<br>2DE |
| <b>Telephone</b>               | 01473 432000  |
| <b>e-mail</b>                  | rebecca.brooks@ipswich.gov.uk   |
|                                |   |
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## Executive Summary

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the Air Quality Objectives are likely to be achieved.

Monitoring of annual average nitrogen dioxide levels using diffusion tubes, bias adjusted to increase accuracy, has identified exceedances outside of the existing Air Quality Management Areas. In addition some locations within the Air Quality Management Areas were identified as not exceeding the objective level. Ipswich Borough Council has already submitted a Detailed Assessment to Defra for appraisal (December 2015) suggesting changes to the Air Quality Management Area boundaries and suggesting one additional declaration.

This Updating and Screening Assessment Report has concluded that there is no need to proceed to a further Detailed Assessment for any pollutants within the borough. Screening work on traffic transport sources, following completion of the major traffic scheme 'Ipswich – Fit for the 21<sup>st</sup> Century', will be required and will be reported on in future air quality review and assessment submissions. In addition five biomass boilers are identified as requiring further screening work.

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# 1 Introduction

## 1.1 Description of Local Authority Area

Ipswich is the county town of Suffolk and is a multi-cultural centre for business, culture, entertainment and sport. Ipswich has a population of more than 130,000 and is home to University Campus Suffolk and Suffolk New College. The main routes into and out of Ipswich are congested during typical rush hour times and travel across Ipswich is restricted to certain routes by the River Orwell. Transport and traffic management are key strategic priorities for the town as the Waterfront and other areas of the town are undergoing significant redevelopment. In particular an area of 200ha to the north of Ipswich is identified through the adopted Core Strategy and Policies Development Plan Document for the development of housing and associated facilities prior to 2021 in part, and as a broad area for housing and associated facilities after 2021 on the remainder. Continuing the economic prosperity is dependent on people being able to move around the town for work, shopping and leisure. At present a significant number of these journeys are made by car.

'Ipswich - Transport Fit for the 21st Century' is a scheme to improve travel around Ipswich in the future, with the aim of offering an alternative to the car. The stated vision of the proposal (Suffolk County Council) is - "As the County Town of Suffolk, and a major growth point within the Haven Gateway sub region, Ipswich needs and deserves a sustainable transport system. 'Ipswich - Transport Fit for the 21st Century' is an integrated scheme designed to achieve a step change in travel behaviour, challenging and changing existing patterns of travel, and providing the foundation for Ipswich to thrive in the decades ahead. Our preferred approach is to influence patterns of travel in the Ipswich area, to reduce reliance on the car, particularly for peak hour travel. We can then begin to tackle congestion and associated air quality problems and our transport networks will be better placed to support development growth. Ipswich must maintain a vibrant economy to match its housing growth and investment in a sustainable transport system will prevent growing congestion. This investment is essential if we are to attract employers into the town and enhance Ipswich's position in delivering services to the wider county and sub-region. Achieving this outcome, which will require much better accessibility

of employment and housing sites for people without cars is the principal focus of our transport strategy for Ipswich, of which this Major Scheme is a key element”.

## 1.2 Purpose of Report

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

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

## 1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in **England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre  $\mu\text{g}/\text{m}^3$  (milligrams per cubic metre,  $\text{mg}/\text{m}^3$  for carbon monoxide) with the number of exceedances in each year that are permitted (where applicable).

**Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England**

| Pollutant                                   | Air Quality Objective  |                     | Date to be achieved by |
|---|--|---------------------|------------------------|
|   | Concentration  | Measured as         |                        |
| Benzene                                     | 16.25 µg/m <sup>3</sup>  | Running annual mean | 31.12.2003             |
|   | 5.00 µg/m <sup>3</sup>   | Running annual mean | 31.12.2010             |
| 1,3-Butadiene                               | 2.25 µg/m <sup>3</sup>   | Running annual mean | 31.12.2003             |
| Carbon monoxide                             | 10.0 mg/m <sup>3</sup>   | Running 8-hour mean | 31.12.2003             |
| Lead  | 0.5 µg/m <sup>3</sup>  | Annual mean         | 31.12.2004             |
|   | 0.25 µg/m <sup>3</sup>   | Annual mean         | 31.12.2008             |
| Nitrogen dioxide                            | 200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year   | 1-hour mean         | 31.12.2005             |
|   | 40 µg/m <sup>3</sup>   | Annual mean         | 31.12.2005             |
| Particles (PM <sub>10</sub> ) (gravimetric) | 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             |
| Sulphur dioxide                             | 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             |

## 1.4 Summary of Previous Review and Assessments

### Round 1

The first round of air quality review and assessment was completed in March 2001 and consisted of three stages, each reported separately and progressively looking into more detailed analysis when required;

*Stage 1* comprised of an initial study to identify which pollutants required further investigation;



*Stage 2* required estimating, modelling or measuring pollutants where there was an indication that national objectives would not be achieved; and  
*Stage 3* involved using advanced modelling techniques and emissions inventories. The final assessment (third stage report) concluded that the Air Quality Objectives would be met. There were, however, some areas of concern where levels of nitrogen dioxide from road traffic pollution were expected to be close to reaching the objective level and the need to keep these under review was recognised.

## **Round 2**

In 2003, all local authorities were required to complete a second round of air quality reviews and assessments. The Government issued guidance to assist with this and to direct authorities on the methodology for completing the review. The first stage of the review was an Updating and Screening Assessment (USA). This was based on a checklist to identify those matters that had changed since the first review was completed in 2001 and which required further assessment. The USA covered new monitoring data, new sources of pollution and other changes that affected air quality. The Council's USA, completed in December 2003, concluded that further detailed assessments of nitrogen dioxide from road traffic sources and particulate matter from an industrial source were required to determine whether air quality objectives would be exceeded in 2005. In July 2005, further Detailed Assessments were completed in respect of the impact of road traffic on concentrations of nitrogen dioxide in St Margaret's Street, Norwich Road/Chevallier Street junction and the Star Lane gyratory system/St Helen's Street. The assessment was completed using a dispersion model, traffic and meteorological data and an ambient real time continuous monitor to produce concentration plots for 2005 and 2010.

The results of the detailed assessments for nitrogen dioxide indicated that the annual mean objective nitrogen dioxide level would be exceeded along most of the roads under study. In places, the exceedance of the 40µg/m<sup>3</sup> annual mean standard extended 50 metres from the kerb into residential areas.

Under Section 83(1) of the Environment Act 1995, local authorities have to designate areas with a predicted exceedance of the Air Quality Objectives as Air Quality Management Areas (AQMAs). Ipswich Borough Council declared three AQMAs on the 11th of April 2006:

- Ipswich Air Quality Management Order No 1, 2006: Norwich Road, Chevallier Street and Valley Road.

This junction is located on one of the main routes into Ipswich town centre with four roads leading into a double mini roundabout (the extent of the AQMA is shown in Map 1). Generally, the area around this junction is open with some green space and buildings set back from the road. However, there is a public house (with flat above) and some residential flats that are both located adjacent to the junction. In addition, one road, Chevallier Street, leading from the roundabout has terraced properties facing directly onto a pavement.

- Ipswich Air Quality Management Order No 2, 2006: Junction of Crown Street with Fonnereau Road and St Margaret's Street and St Margaret's Plain

This AQMA includes four roads all leading off each other (the extent of the AQMA is shown in Map 1). There are main traffic lights at the junction of St Margaret's Street and St Margaret's Plain and pedestrian crossing lights just beyond the junction of Crown Street and Fonnereau Road. The area along St Margaret's Street was partially a street with canyon like properties. St Margaret's Street has historically been flanked by flats on one side, and a vacant building on the other. The vacant building has been demolished but historic permission has been given for this to be turned into residential dwellings. There are residential buildings on all roads within the AQMA.

- Ipswich Air Quality Management Order No 3, 2006: Star Lane gyratory system and St. Helens Street/Grimwade Street.

The gyratory system is a circular network of one-way roads located next to the docks (the extent of the AQMA is shown in Map 1). There are many residential dwellings (mainly high-rise flats) within these areas and some commercial and office buildings. Further development of the Gyratory system and Dockside is ongoing, although slower in recent years. Traffic flow through many of the areas of this AQMA can be congested.

The Department for Environment, Food and Rural Affairs (DEFRA) also requires that local authorities should submit annual air quality Progress Reports in-between three yearly USAs. Ipswich Borough Council completed a Progress Report in September 2005.

### Round 3

The third round of review and assessment commenced in 2006 and Ipswich Borough Council completed its USA in January 2008. The USA concluded that four of the seven prescribed pollutants were likely to meet their Air Quality Objectives and as such a Detailed Assessment was not required. However, it was found that further screening works for Benzene, Nitrogen Dioxide (NO<sub>2</sub>) and particulates (PM<sub>10</sub>) were required, as well as a Detailed Assessment of both NO<sub>2</sub> and PM<sub>10</sub> at the Yarmouth Road/ Bramford Road and Chevallier Street Junction.

The Detailed Assessment, recommended in the USA, was completed in draft in December 2009 and finalised August 2010, and concluded that there were likely to be exceedances of the annual mean NO<sub>2</sub> objective at this location. It was unlikely that the hourly objective would be exceeded. The predicted exceedances of the annual mean objective were attributed to slow moving vehicles, congestion and queuing traffic.

A new AQMA was declared in December 2010 and is shown on Map 1:

- Ipswich Air Quality Management Order No. 4, 2010: Bramford Road/Yarmouth Road/Chevallier Street junction.

For the pollutant PM<sub>10</sub>, modelling indicated a very unlikely risk of exceeding the annual mean PM<sub>10</sub> objective in the base year and the future year of 2010.

The screening works resulting from the round 3 USA have been completed as part of round 4 USA. At the advice of DEFRA, the information usually included in a progress report has also been incorporated into the round 4 documents.

### Round 4

The fourth round of review and assessment began in 2009. The USA was completed in January 2010. The USA concluded that five of the seven prescribed pollutants were likely to meet the Air Quality Objectives. However, it was found that a Detailed Assessment for NO<sub>2</sub> was required for the Civic Drive/St Matthew's Street Junction and St Helen's Street, along with a Detailed Assessment of both NO<sub>2</sub> and PM<sub>10</sub> at a Biomass Boiler on Nacton Road. The Detailed Assessment of NO<sub>2</sub> and PM<sub>10</sub> of the Biomass Boiler on Nacton Road was completed in September 2011 and concluded that there was no need for any further assessments of this process. Further screening for NO<sub>2</sub> and PM<sub>10</sub> at the Biomass boiler at the Reg Driver Centre, Christchurch Park was also required and was reported in the 2010 Progress Report

which was completed in October 2010. It was found that the emissions rates from the Reg Driver Centre were well below those requiring further investigation or screening. The 2011 Progress Report highlighted a small number of locations that exceeded the nitrogen dioxide objective level outside of the existing Air Quality Management Areas, all of which have been investigated as part of previous or ongoing assessments, or are very close to an AQMA boundary where they have been reviewed as part of the 2015 Detailed Assessment.

Particulate monitoring in the Borough showed no exceedances of the PM<sub>10</sub> objectives over the course of 2010.

The Detailed Assessment of the St Matthews Street roundabout area in 2012 indicated that concentrations of nitrogen dioxide were above air quality objective values along parts of St Matthews Street either side of the Civic Drive Roundabout. Based on this detailed assessment and review of the monitoring data within the areas under assessment it was concluded that specific areas along St Matthew's Street either side of the roundabout be considered for declaration as Air Quality Management Areas. Similarly, a Detailed Assessment undertaken in 2012 indicated that concentrations of nitrogen dioxide were above air quality objective values along parts of St Helen's Street and Woodbridge Road. Based on this Detailed Assessment and review of the monitoring data within the areas under assessment it was concluded that further areas along St Helen's Street and Woodbridge Road be considered for declaration as Air Quality Management Areas.

## **Round 5**

The fifth round of review and assessment began in 2012. The 2012 USA concluded that there were continuing exceedances of the Nitrogen Dioxide annual average objective levels within the AQMA areas. Overall the 2011 diffusion tube assessment indicated a slight decline in the majority of the Nitrogen Dioxide levels in the borough although it was impossible to say at that stage if it was an ongoing pattern.

The 2013 and 2014 Progress Reports concluded that some locations within, and outside of the existing AQMAs indicated exceedances of the nitrogen dioxide annual average objective level. A Detailed Assessment was required.

**Round 6**

A Detailed Assessment, outlining proposed changes to the AQMA boundaries, was submitted to Defra in December 2015. It is awaiting appraisal, approval and consultation.

**Summary of LAQM reporting**

The various stages of the previous review and assessments are summarised in Table 1.

**Table 1.2: Summary of previous review and assessments carried out by Ipswich Borough Council.**

| Round | Date          | Type of Assessment                | Conclusions/Outcome  |
|-------|---------------|-----------------------------------|--|
| 1     | March 2001    | Final Assessment                  | Predicted that the Air Quality Objectives would be met. Areas of concern where levels of nitrogen dioxide from road traffic pollution were expected to be close to reaching the objective level were kept under review.        |
| 2     | December 2003 | Updating and Screening Assessment | Concluded that further detailed assessments of nitrogen dioxide from road traffic sources and particulate matter from an industrial source was required to determine whether Air Quality Objectives would be exceeded in 2005. |
|       | July 2005     | Detailed Assessment               | Concluded that the annual mean objective   |

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|   |                |                                   |  |
|---|----------------|-----------------------------------|--|
|   |                |                                   | pollution level would be exceeded along most of the roads under study.   |
|   | April 2006     |                                   | Declaration of 3 AQMAs.  |
| 3 | January 2007   | Progress Report                   |  |
|   | January 2008   | Updating and Screening Assessment | Concluded that four of the seven prescribed pollutants were likely to meet their Air Quality Objectives and as such a Detailed Assessment was not required. Recommended further screening works for benzene, nitrogen dioxide and particulates and a Detailed Assessment of both nitrogen dioxide and particulates at the Yarmouth Road/Bramford Road and Chevalier Street junction. |
|   | January 2008   | Further Assessment                |  |
|   | September 2008 | AQ Action Plan                    |  |
|   | December 2009  | Detailed Assessment               | Completed draft December 2009. Submitted December 2009. Finalised August   |

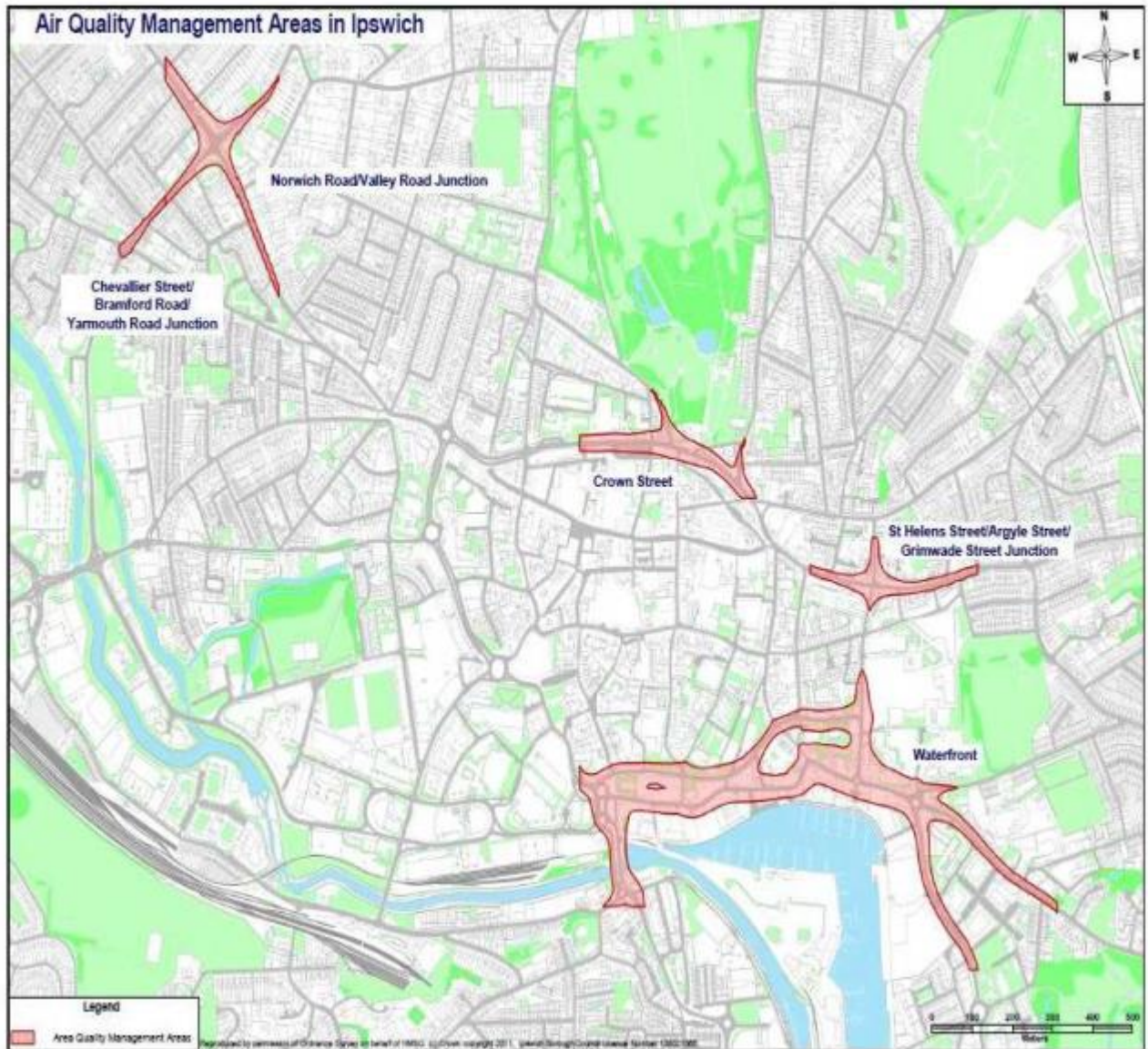
|   |              |                                   |   |
|---|--------------|-----------------------------------|---|
|   |              |                                   | 2010. Concluded that there are likely exceedances of the nitrogen dioxide annual mean objective at the Bramford Road/Yarmouth Road/Chevallier Street junction.  |
| 4 | January 2010 | Updating and Screening Assessment | Concluded that a Detailed Assessment for nitrogen dioxide is required at St Matthew's Street and St Helen's Street. A Detailed Assessment was also required for a 2.90MW biomass combustion plant on Nacton Road for particulate matter with consideration given to nitrogen dioxide. Particulate matter and nitrogen dioxide emissions from the Reg. Driver Centre, Christchurch Park, also required further screening work. |
|   | October 2010 | Progress Report                   | Further investigation of emissions of particulate matter and nitrogen dioxide emissions from  |

|   |                |  |  |
|---|----------------|--|--|
|   |                |  | the Reg. Driver centre concluded that they are well below those requiring further investigation or screening. Particulate monitoring at one location within the borough show no exceedances of the objective levels. Six new or previously unidentified local developments were acknowledged as requiring further investigation during the next USA, scheduled for 2012. |
|   | December 2010  |  | Declaration of 1 AQMA.   |
|   | January 2011   | Progress Report  |  |
|   | September 2011 | Detailed Assessment of Biomass Combustion Plant, Nacton Road | Concluded no exceedances of objective levels.  |
|   | August 2012    | Detailed Assessment  | Concluded that specific areas along St Matthew's Street be declared as AQMA.   |
|   | August 2012    | Detailed Assessment  | Concluded that specific areas along St Helen's Street be declared as AQMA.   |
| 5 | January 2013   | Updating and   | Continuing   |



|   |               |                      |  |
|---|---------------|----------------------|--|
|   |               | Screening Assessment | <p>exceedances of the Nitrogen Dioxide annual average objective levels within the AQMA areas.</p> <p>Overall the diffusion tube assessment 2011 indicated a slight decline in the majority of the Nitrogen Dioxide levels in the borough although it was impossible to say at that stage if it will be an ongoing pattern.</p> |
|   | February 2014 | Progress Report      | <p>Diffusion tubes and Continuous Monitors located both within and outside of the existing AQMAs indicated exceedances of the nitrogen dioxide annual average objective level.</p>   |
|   | July 2014     | Progress Report      |  |
| 6 | December 2015 | Detailed Assessment  | Awaiting appraisal and approval.   |

Figure 1.1 Map of AQMA Boundaries 2015



A Detailed Assessment is currently awaiting appraisal with Defra. It identifies changes to the AQMA boundaries, and will be implemented if Defra approval and Council Executive approval is given.

## **2 New Monitoring Data**

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

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

During 2014 Ipswich Borough Council ran one Automatic Monitoring station which monitored nitrogen dioxide concentrations and was located within the Chevallier Street AQMA. The monitor at St Margaret's Street was closed down due to the age of the machine and difficulty/expense in keeping it running – historic results can be found in previous review and assessment reports.

Table 2.1 Details of Automatic Monitoring Sites

| Site Name         | Site Type      | X OS Grid Ref | Y OS Grid Ref | Pollutants Monitored | In AQMA? | Monitoring Technique | Relevant Exposure?  | Distance to kerb of nearest road | Does this location represent worst-case exposure? |
|-------------------|----------------|---------------|---------------|----------------------|----------|----------------------|---|----------------------------------|---|
| Chevallier Street | Urban Roadside | 615257        | 245349        | NO2                  | Y        | Automatic            | Y (next door residential properties equal distance from kerb, approx. 2.5m) | 2.5m                             | Y   |

### 2.1.2 Non-Automatic Monitoring Sites

During 2014, Ipswich Borough Council carried out non-automatic monitoring of NO<sub>2</sub> using diffusion tubes located at 69 different sites in the borough with a number of duplicate or triplicate tubes at chosen locations. The diffusion tubes monitor kerbside and roadside concentrations of NO<sub>2</sub> and 2 diffusion tubes monitor background concentrations of NO<sub>2</sub>.

During 2014 the tubes were supplied to Ipswich Borough Council from Environmental Scientifics Group. The preparation method was 50% TEA in Acetone. A summary of the QA/QC information is reported in Appendix A.

Table 2.2 Details of Non-Automatic Monitoring Sites

| Site Name                 | Tube No | Site Type        | OS Grid Ref   | Pollutants Monitored | In AQMA ? | Is Monitoring Co-located with a Continuous Analyser (Y/N) | Relevant Exposure?  | Estimated distance of diffusion tube to kerb of nearest road | Worst-case Location? |
|---------------------------|---------|------------------|---------------|----------------------|-----------|---|---|--|----------------------|
| Civic Drive               | DT1     | Urban Roadside   | 615999/244399 | NO <sub>2</sub>      | N         | N   | Yes. Residential properties located equal distance from kerb.                       | 3.8m   | Y                    |
| Chevallier St o/s no. 6&8 | DT2     | Urban Roadside   | 615142/245242 | NO <sub>2</sub>      | Y         | N   | Yes. Residential properties short distance back from tube location on traffic sign. | 1.7m   | Y                    |
| Dock St                   | DT3     | Urban Roadside   | 616379/243894 | NO <sub>2</sub>      | Y         | N   | Yes. Residential properties located approximately 4.6m from kerb.                   | 2.8m   | Y                    |
| Berner's St o/s No.31     | DT4     | Urban Roadside   | 615923/244923 | NO <sub>2</sub>      | N         | N   | Yes. Residential properties located 1.7m from kerb.                                 | 1.7m   | Y                    |
| Fore St                   | DT5     | Urban Roadside   | 616860/244147 | NO <sub>2</sub>      | Y         | N   | No.   | 1.7m   | Y                    |
| King's Avenue             | DT6     | Urban Background | 617299/244412 | NO <sub>2</sub>      | N         | N   | Located in park as background reading.  | 14.6m  | N/A                  |
| Bramford Rd o/s 205       | DT7     | Urban Roadside   | 615004/245237 | NO <sub>2</sub>      | N         | N   | Yes. Residential downpipe attached to no. 205                                       | 3m   | Y                    |
| 122 Bramford Rd           | DT8     | Urban Roadside   | 615133/245201 | NO <sub>2</sub>      | N         | N   | Yes. Residential properties 3 m from kerb   | 1.5m   | Y                    |

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|   |      |                |               |                 |   |   |  |                          |     |
|---|------|----------------|---------------|-----------------|---|---|--|--------------------------|-----|
| 122 Bramford Rd                             | DT9  | Urban Roadside | 615133/245201 | NO <sub>2</sub> | N | N | Yes. Residential properties 3 m from kerb  | 1.5m                     | Y   |
| 122 Bramford Rd                             | DT10 | Urban Roadside | 615133/245201 | NO <sub>2</sub> | N | N | Yes. Residential properties 3 m from kerb  | 1.5m                     | Y   |
| St Margaret's St, Pipers Court co-located   | DT11 | Urban Roadside | 616578/244759 | NO <sub>2</sub> | Y | Y | Yes. Residential properties located approximately 2.2m from kerb.  | 2.2m                     | Y   |
| St Margaret's St, Pipers Court co-location  | DT12 | Urban Roadside | 616578/244759 | NO <sub>2</sub> | Y | Y | Yes. Residential properties located approximately 2.2m from kerb.  | 2.2m                     | Y   |
| Valley/Norwich Road                         | DT13 | Urban Roadside | 615361/245436 | NO <sub>2</sub> | Y | N | Yes. Residential approximately 5.5m from the kerb.   | 2.9m                     | Y   |
| Chevallier St, outside number 63 co-located | DT14 | Urban Roadside | 615283/245391 | NO <sub>2</sub> | Y | N | Yes. Residential properties located behind traffic sign on which tube is located.  | 2.6m                     | Y   |
| Tavern St                                   | DT15 | Urban Centre   | 616277/244641 | NO <sub>2</sub> | N | N | Yes (background). Shops located approximately 0.5m from kerb. Pedestrian-only road with limited traffic flow in the morning and evening for loading and unloading. | On pedestrianised street | N/A |
| Valley/Norwich Road                         | DT16 | Urban Roadside | 615361/245436 | NO <sub>2</sub> | Y | N | Yes. Residential approximately 5.5m from the kerb.   | 2.9m                     | Y   |
| Chevallier St, outside number 63 co-located | DT17 | Urban Roadside | 615283/245391 | NO <sub>2</sub> | Y | N | Yes. Residential properties located behind traffic sign on which tube is   | 2.6m                     | Y   |

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|  |      |                |               |                 |   |   | located.   |      |   |
|--|------|----------------|---------------|-----------------|---|---|--|------|---|
| 5 Yarmouth Rd                              | DT18 | Urban Roadside | 615092/245137 | NO <sub>2</sub> | N | N | Yes. Residential property located 2m from kerb.                                | 2m   | Y |
| St Margaret's St, Pipers Court co-location | DT19 | Urban Roadside | 616578/244759 | NO <sub>2</sub> | Y | Y | Yes. Residential properties located approximately 2.2m from kerb.              | 2.2m | Y |
| St Margaret's Plain/Fonnereau Road         | DT20 | Urban Roadside | 616455/244824 | NO <sub>2</sub> | Y | N | Yes. Flats and shops located approximately 2.2m from kerb.                     | 2.2m | Y |
| St Margaret's Plain                        | DT21 | Urban Roadside | 616490/244806 | NO <sub>2</sub> | Y | N | Yes. Residential located approximately 1.7m from kerb, 9m down road from tube. | 1.7m | Y |
| St Margaret's Plain/Northgate St           | DT22 | Urban Roadside | 616477/244790 | NO <sub>2</sub> | Y | N | Yes. Residential above shops located approximately 1.6m from kerb.             | 1.6m | Y |
| St Margaret's Green/ St Margaret's St      | DT23 | Urban Roadside | 616641/244781 | NO <sub>2</sub> | Y | N | Yes. Residential properties located approximately 3m from kerb.                | 3m   | Y |
| St Margaret's St                           | DT24 | Urban Roadside | 616659/244689 | NO <sub>2</sub> | Y | N | Yes. Residential properties located 3.5m from kerb.                            | 3.3m | Y |
| St Helen's St                              | DT25 | Urban Roadside | 616750/244578 | NO <sub>2</sub> | N | N | Yes. Flats located approximately 2.2m from kerb.                               | 1.3m | Y |
| St Helen's St/Grimwade St                  | DT26 | Urban Roadside | 616968/244510 | NO <sub>2</sub> | Y | N | Yes. Residential properties located approximately 3.6m from kerb.              | 3.6m | Y |
| St Helen's St/Argyle St                    | DT27 | Urban Roadside | 616961/244536 | NO <sub>2</sub> | Y | N | Yes. Flats located approximately 1.7m  | 1.5m | Y |



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|--|------|----------------|---------------|-----------------|---|---|--|------|---|
|  |      |                |               |                 |   |   | from kerb.   |      |   |
| 32/34 Chevallier St                      | DT28 | Urban Roadside | 615192/245289 | NO <sub>2</sub> | Y | N | Yes. Residential properties located approximately 3m from kerb     | 1.5m |   |
| Fore Hamlet                              | DT29 | Urban Roadside | 617102/244077 | NO <sub>2</sub> | Y | N | Yes. Flats located approximately 2.2m from kerb.                   | 2.2m | Y |
| Fore St                                  | DT30 | Urban Roadside | 616963/244106 | NO <sub>2</sub> | Y | N | Yes. Flats located approximately 7.7m from kerb.                   | 4m   | Y |
| Star Lane (opp. St Peters St) co-located | DT31 | Urban Roadside | 616336/244133 | NO <sub>2</sub> | Y | N | No. Hotel located across road. Proposed development sites in area. | 2.4m | N |
| Star Lane (opp. St Peters St) co-located | DT32 | Urban Roadside | 616336/244133 | NO <sub>2</sub> | Y | N | No. Hotel located across road. Proposed development sites in area. | 2.4m | N |
| Star Lane (opp St Peters St) co-located  | DT33 | Urban Roadside | 616336/244133 | NO <sub>2</sub> | Y | N | No. Hotel located across road. Proposed development sites in area. | 2.4m | N |
| College St                               | DT34 | Urban Roadside | 616466/244072 | NO <sub>2</sub> | Y | N | Yes. Residential properties located 1.7m from kerb.                | 1.7m | Y |
| Cobden Place                             | DT35 | Urban Roadside | 616743/244692 | NO <sub>2</sub> | N | N | Yes. Residential properties located 1.1m from kerb.                | 5.5m | Y |
| Franciscan Way/Wolsey St                 | DT36 | Urban Roadside | 616153/244242 | NO <sub>2</sub> | N | N | Yes. Residential properties located 1.85m from kerb.               | 1.9m | Y |
| Lower Brook St                           | DT37 | Urban Roadside | 616480/244163 | NO <sub>2</sub> | Y | N | No. Offices located 3.5m from kerb.                                | 2.8m | Y |
|  |      |                |               |                 |   |   |  |      |   |

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|--|------|----------------|---------------|-----------------|---|---|---|------|---|
| Civic Drive opp. no.1                        | DT38 | Urban Roadside | 615898/244789 | NO <sub>2</sub> | N | N | Yes. Residential above rehab centre 4m from kerb.                     | 1.5m | Y |
| Star Lane/Fore St                            | DT39 | Urban Kerbside | 616730/244246 | NO <sub>2</sub> | Y | N | No.   | 0.6m | Y |
| 131 Norwich Road                             | DT40 | Urban Roadside | 615457/245144 | NO <sub>2</sub> | Y | N | Yes Residential 4.5m from kerb.                                       | 1m   | Y |
| 69 Norwich Road                              | DT41 | Urban Roadside | 615562/245008 | NO <sub>2</sub> | N | N | Yes Residential above shop short distance behind tube.                | 1m   | Y |
| 8-10 Norwich Road                            | DT42 | Urban Kerbside | 615741/244899 | NO <sub>2</sub> | N | N | Yes On downpipe between no's.8&9.                                     | 1m   | Y |
| Yarmouth Rd/Bramford Rd                      | DT43 | Urban Roadside | 615107/245197 | NO <sub>2</sub> | Y | N | Yes. Residential properties located approximately 4.8m from kerb.     | 3.8m | Y |
| Bramford Road                                | DT44 | Urban Roadside | 615049/245234 | NO <sub>2</sub> | N | N | Yes. Residential properties located approximately 1.4m from kerb.     | 1.4m | Y |
| Chevallier St, Wellington Centre co-located  | DT45 | Urban Roadside | 615257/245349 | NO <sub>2</sub> | Y | Y | Yes. Residential properties short distance along road 6.4m from kerb. | 4.1m | Y |
| Chevallier St, Wellington Centre co-location | DT46 | Urban Roadside | 615257/245349 | NO <sub>2</sub> | Y | Y | Yes. Residential properties short distance along road 6.4m from kerb  | 4.1m | Y |
| Chevallier St, Wellington Centre co-location | DT47 | Urban Roadside | 615257/245349 | NO <sub>2</sub> | Y | Y | Yes. Residential properties short distance along road 6.4m from kerb. | 4.1m | Y |

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|------------------------------|------|----------------|---------------|-----------------|---|---|---|--------|---|
| Norwich Rd/Anglesea Road     | DT48 | Urban Roadside | 615397/245337 | NO <sub>2</sub> | Y | N | Yes. Residential located approximately 1.8m from kerb.                      | 1.8m   | Y |
| St Matthew's St              | DT49 | Urban Roadside | 615803/244872 | NO <sub>2</sub> | N | N | Yes. Residential properties located approximately 1.9m from kerb.           | 1.8m   | Y |
| Barrack Lane/St Matthew's St | DT50 | Urban Roadside | 615758/244885 | NO <sub>2</sub> | N | N | Yes. Residential above shops, 2m from kerb.                                 | 7m     | Y |
| St Matthew's St/Portman Rd   | DT51 | Urban Kerbside | 615765/244865 | NO <sub>2</sub> | N | N | Yes. Residential 3m from kerb.  | 0.9m   | Y |
| 60 St Matthew's St           | DT52 | Urban Roadside | 615822/244869 | NO <sub>2</sub> | N | N | Yes. Residential above shops<br>Downpipe o/s no.60 located 2.26m from kerb. | 2.14m  | Y |
| 67 St Matthew's St           | DT53 | Urban Roadside | 615817/244856 | NO <sub>2</sub> | N | N | Yes. Residential above shops<br>Downpipe o/s no.67 Located 2.15m from kerb. | 2.15m  | Y |
| St Matthew's St/Berners St   | DT54 | Urban Roadside | 615891/244863 | NO <sub>2</sub> | N | N | Yes. Residential above shops  | 8.95 m | Y |
| 21 Berner's St               | DT55 | Urban Roadside | 615912/244893 | NO <sub>2</sub> | N | N | Yes. Residential<br>Downpipe no.21 located 2.4m from kerb.                  | 2.25m  | Y |
| 32 Berner's St               | DT56 | Urban Roadside | 615928/244908 | NO <sub>2</sub> | N | N | No. Hotel 1.6m from kerb.<br>Downpipe                                       | 1.42m  | Y |
| 41-43 Berner's St            | DT57 | Urban Roadside | 615936/244977 | NO <sub>2</sub> | N | N | No. Hotel downpipe  | 8m     | Y |
| 58 Berner's St               | DT58 | Urban          | 615975/245034 | NO <sub>2</sub> | N |   | Yes. Residential  | 4.1m   | Y |

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|--|------|----------------|---------------|-----------------|---|---|--|-------|---|
|  |      | Roadside       |               |                 |   | N | Street lamp A779 o/s no.58 located 5m from kerb.                     |       |   |
| St. Matthew's St Roundabout co-located | DT59 | Urban Roadside | 615921/244841 | NO <sub>2</sub> | N | N | No. Shop 12.7m to receptor<br>Sign o/s no.26                         | 2.8m  | Y |
| St. Matthew's St Roundabout co-located | DT60 | Urban Roadside | 615921/244841 | NO <sub>2</sub> | N | N | No. Shop 12.7m to receptor<br>Sign o/s no.26                         | 2.8m  | Y |
| St. Matthew's St Roundabout co-located | DT61 | Urban Roadside | 615921/244841 | NO <sub>2</sub> | N | N | No. Shop 12.7m to receptor<br>Sign o/s no.26                         | 2.8m  | Y |
| 27 St. Matthew's St                    | DT62 | Urban Roadside | 615926/244804 | NO <sub>2</sub> | N | N | No. Offices above shop located 6.7m to kerb.<br>Signpost o/s Iceland | 1.8m  | Y |
| St Matthew's St o/s no. 19             | DT63 | Urban Roadside | 615952/244785 | NO <sub>2</sub> | N | N | No. Offices above shop located 3.4m to receptor<br>Downpipe no.19    | 3.4m  | Y |
| 13-15 Norwich Road co-located          | DT64 | Urban Kerbside | 615686/244936 | NO <sub>2</sub> | N | N | Yes (on lamp post between no.'s 13&15)                               | 0.97m | Y |
| 13-15 Norwich Road co-located          | DT65 | Urban Kerbside | 615686/244936 | NO <sub>2</sub> | N | N | Yes (on lamp post between no.'s 13&15)                               | 0.93m | Y |
| 30 Woodbridge Rd                       | DT66 | Urban Roadside | 616804/244667 | NO <sub>2</sub> | N | N | Yes. Façade of residential property no.30A                           | 3.5m  | Y |
| Woodbridge Rd/Blanch St                | DT67 | Urban Roadside | 616886/244672 | NO <sub>2</sub> | N | N | Yes. Residential lamp post 6.8m to kerb.                             | 1.3m  | Y |
| 62 Woodbridge                          | DT68 | Urban          | 616901/244655 | NO <sub>2</sub> | N |   | Yes. Residential   | 3.2m  | Y |

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|--|------|----------------|---------------|-----------------|---|---|--|-------|---|
| Rd                                     |      | Roadside       |               |                 |   | N | above shop.  |       |   |
| 2-4 Argyle St                          | DT69 | Urban Roadside | 616974/244589 | NO <sub>2</sub> | Y | N | Yes. Residential on downpipe garage o/s Nos. 2-4             | 4.5m  | Y |
| 11 Argyle St                           | DT70 | Urban Roadside | 616962/244572 | NO <sub>2</sub> | Y | N | Yes. Residential Lamp post 716 o/s no.11                     | 1.2m  | Y |
| 93 St. Helen's St                      | DT71 | Urban Roadside | 617027/244536 | NO <sub>2</sub> | Y | N | Yes. Downpipe attached to IBH Flat no.93                     | 1.5m  | Y |
| 125 St. Helen's St                     | DT72 | Urban Roadside | 617119/244534 | NO <sub>2</sub> | Y | N | Yes. Downpipe No.125   | 1.5m  | Y |
| Regent St/St Helen's St                | DT73 | Urban Roadside | 617120/244518 | NO <sub>2</sub> | Y | N | Lamp post A3175  | 1m    | Y |
| 25 Grimwade St                         | DT74 | Urban Roadside | 616948/244438 | NO <sub>2</sub> | N | N | Yes. Downpipe o/s No. 25                                     | 3m    | Y |
| 28 Grimwade St                         | DT75 | Urban Roadside | 616928/244360 | NO <sub>2</sub> | N | N | Yes. Downpipe at façade of residential property              | 3.15m | Y |
| St Helen's St/Grimwade St              | DT76 | Urban Roadside | 616948/244518 | NO <sub>2</sub> | Y | N | Downpipe o/s No.44   | 3m    | Y |
| St Helen's St                          | DT77 | Urban Roadside | 616899/244539 | NO <sub>2</sub> | Y | N | Downpipe o/s No.41 Albury court                              | 1.5m  | Y |
| 7 Orchard St co-located                | DT78 | Urban Roadside | 616867/244583 | NO <sub>2</sub> | N | N | Yes. Lamp post o/s no.7                                      | 1.4m  | Y |
| 7 Orchard St co-located                | DT79 | Urban Roadside | 616867/244583 | NO <sub>2</sub> | N | N | Yes. Lamp post o/s no.7                                      | 1.4m  | Y |
| St Helen's St – County Hall co-located | DT80 | Urban Roadside | 616819/244543 | NO <sub>2</sub> | Y | N | No. Empty commercial property. Downpipe entrance county hall | 2m    | Y |

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|  |      |                |               |                 |   |   |  |       |   |
|--|------|----------------|---------------|-----------------|---|---|--|-------|---|
| St Helen's St – County Hall co-located | DT81 | Urban Roadside | 616819/244543 | NO <sub>2</sub> | Y | N | No. Empty commercial property. Downpipe entrance county hall | 2m    | Y |
| St Helen's St – County Hall co-located | DT82 | Urban Roadside | 616819/244543 | NO <sub>2</sub> | Y | N | No. Empty commercial property. Downpipe entrance county hall | 2m    | Y |
| 29 Bond St                             | DT83 | Urban Roadside | 616788/244497 | NO <sub>2</sub> | N | N | Yes. Road Sign no.345 o/s no.29                              | 1.65m | Y |
| Carr St/Major's Corner                 | DT84 | Urban Kerbside | 616697/244595 | NO <sub>2</sub> | N | N | No. Commercial   | 0.5m  | Y |
| 5 Old Foundry Rd                       | DT85 | Urban Roadside | 616677/244622 | NO <sub>2</sub> | N | N | Yes, Residential on Pole A1640 o/s no.5                      | 1.4m  | Y |

## **2.2 Comparison of Monitoring Results with Air Quality Objectives**

### **2.2.1 Nitrogen Dioxide**

#### **Automatic Monitoring Data**

Table 2.3 summarises the results of the automatic monitoring of nitrogen dioxide within the Ipswich borough compared to the annual average objective.

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

| Site ID           | Site Type      | Within AQMA? | Valid Data Capture for period of monitoring % | Valid Data Capture 2014 % | Annual Mean Concentration $\mu\text{g}/\text{m}^3$ |      |      |      |      |
|-------------------|----------------|--------------|---|---------------------------|--|------|------|------|------|
|                   |                |              |   |                           | 2010   | 2011 | 2012 | 2013 | 2014 |
| Chevallier Street | Urban Roadside | Y            | N/A   | 78%                       | 34   | 31   | 34   | 45*  | 29   |

\* The results for the monitoring obtained at Chevallier Street increased significantly in 2013. The likely cause is very high results during the months of January to April which have influenced the annual average. The machine was changed in May and concentrations reduced. It is unknown why this occurred as both machines were serviced and data ratified to Defra specifications.



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

| Site ID           | Site Type      | Within AQMA? | Valid Data Capture for period of monitoring % | Valid Data Capture 2014 % | Number of Exceedences of Hourly Mean (200 $\mu\text{g}/\text{m}^3$ ) |      |      |      |      |
|-------------------|----------------|--------------|---|---------------------------|--|------|------|------|------|
|                   |                |              |   |                           | 2010   | 2011 | 2012 | 2013 | 2014 |
| Chevallier Street | Urban Roadside | Y            | N/A   | 77.79                     | 0  | 1    | 3    | 0    | 0    |

## Diffusion Tube Monitoring Data

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2014

| Tube No | Location                  | Site Type        | In AQMA? | Triplicate or Co-located Tube | Full Calendar Year Data Capture 2014 (Number of Months) <sup>a</sup> | Data with less than 9 months has been annualised (Y/N) | Confirm if data has been distance corrected (Y/N) | 2014 Annual Mean Concentration ( $\mu\text{g}/\text{m}^3$ ) – National Bias Adjustment factor = 0.81 |
|---------|---------------------------|------------------|----------|-------------------------------|--|--|---|--|
| DT1     | Civic Drive               | Urban Roadside   | N        | N                             | 12   | N/A  | N   | 28.3   |
| DT2     | Chevallier St o/s no. 6&8 | Urban Roadside   | Y        | N                             | 12   | N/A  | N   | <b>42.5</b>  |
| DT3     | Dock St                   | Urban Roadside   | Y        | N                             | 12   | N/A  | N   | 28.8   |
| DT4     | Berner's St o/s No.31     | Urban Roadside   | N        | N                             | 12   | N/A  | N   | 33.4   |
| DT5     | Fore St                   | Urban Roadside   | Y        | N                             | 12   | N/A  | N   | <b>39.8</b>  |
| DT6     | King's Avenue             | Urban Background | N        | N                             | 12   | N/A  | N   | 16   |
| DT7     | Bramford Rd o/s 205       | Urban Roadside   | N        | N                             | 12   | N/A  | N   | 32.4   |

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|      |  |                         |   |   |    |     |   |             |
|------|--|-------------------------|---|---|----|-----|---|-------------|
| DT8  | 122 Bramford Rd                            | Urban Roadside          | N | Y | 12 | N/A | N | 32.7        |
| DT9  | 122 Bramford Rd                            | Urban Roadside          | N | Y | 12 | N/A | N | 33.1        |
| DT10 | 122 Bramford Rd                            | Urban Roadside          | N | Y | 12 | N/A | N | 32.9        |
| DT11 | St Margaret's St, Pipers Court             | Urban Roadside          | Y | Y | 11 | N/A | N | <b>43.5</b> |
| DT12 | St Margaret's St, Pipers Court co-location | Urban Roadside          | Y | Y | 11 | N/A | N | <b>43.1</b> |
| DT13 | Valley/Norwich Road                        | Urban Roadside          | Y | N | 12 | N/A | N | 35.1        |
| DT14 | Chevallier St                              | Urban Roadside          | Y | N | 12 | N/A | N | <b>46.7</b> |
| DT15 | Tavern St                                  | Urban Centre background | N | N | 11 | N/A | N | 25          |
| DT16 | Valley/Norwich Road                        | Urban Roadside          | Y | Y | 12 | N/A | N | 33.2        |
| DT17 | Chevallier St                              | Urban Roadside          | Y | Y | 12 | N/A | N | <b>47.4</b> |
| DT18 | 5 Yarmouth Rd                              | Urban Roadside          | N | N | 12 | N/A | N | 29.5        |
| DT19 | St Margaret's St, Pipers Court co-location | Urban Roadside          | Y | N | 11 | N/A | N | <b>40.8</b> |
| DT20 | St Margaret's Plain/Fonnereau Road         | Urban Roadside          | Y | N | 11 | N/A | N | 32.6        |

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|------|----------------------------------|----------------|---|---|----|-----|---|-------------|
| DT21 | St Margaret's Plain              | Urban Roadside | Y | N | 12 | N/A | N | 36.2        |
| DT22 | St Margaret's Plain/Northgate St | Urban Roadside | Y | N | 12 | N/A | N | 38.3        |
| DT23 | St Margaret's Green              | Urban Roadside | Y | N | 12 | N/A | N | 23          |
| DT24 | St Margaret's St                 | Urban Roadside | Y | N | 12 | N/A | N | <b>42.2</b> |
| DT25 | St Helen's St                    | Urban Roadside | N | N | 12 | N/A | N | <b>41.1</b> |
| DT26 | St Helen's St/Grimwade St        | Urban Roadside | Y | N | 12 | N/A | N | 32          |
| DT27 | St Helen's St/Argyle St          | Urban Roadside | Y | N | 12 | N/A | N | 36.8        |
| DT28 | 32/34 Chevallier St              | Urban Roadside | Y | N | 12 | N/A | N | 35.2        |
| DT29 | Fore Hamlet                      | Urban Roadside | Y | N | 12 | N/A | N | 29.8        |
| DT30 | Fore St                          | Urban Roadside | Y | N | 12 | N/A | N | 29.3        |
| DT31 | Star Lane (opp. St Peters St)    | Urban Roadside | Y | Y | 12 | N/A | N | 32.4        |
| DT32 | Star Lane (opp. St Peters St)    | Urban Roadside | Y | Y | 12 | N/A | N | 30.5        |
| DT33 | Star Lane (opp. St Peters St)    | Urban Roadside | Y | Y | 11 | N/A | N | 32.9        |

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|------|--|----------------|---|---|----|-----|---|-------------|
| DT34 | College St                                   | Urban Roadside | Y | N | 12 | N/A | N | <b>41.6</b> |
| DT35 | Cobden Place                                 | Urban Roadside | N | N | 12 | N/A | N | 27.5        |
| DT36 | Franciscan Way/Wolsey St                     | Urban Roadside | N | N | 12 | N/A | N | 27.9        |
| DT37 | Lower Brook St                               | Urban Roadside | Y | N | 11 | N/A | N | 24.1        |
| DT38 | Civic Drive opp. no.1                        | Urban Roadside | N | N | 12 | N/A | N | 35          |
| DT39 | Star Lane/Fore St                            | Urban Kerbside | Y | N | 12 | N/A | N | 38.9        |
| DT40 | Norwich Road                                 | Urban Roadside | Y | N | 12 | N/A | N | 27          |
| DT41 | Norwich Road                                 | Urban Roadside | N | N | 12 | N/A | N | 36.9        |
| DT42 | Norwich Road between 8 and 10                | Urban Roadside | N | N | 12 | N/A | N | 34.2        |
| DT43 | Yarmouth Rd/Bramford Rd                      | Urban Roadside | Y | N | 12 | N/A | N | 37          |
| DT44 | Bramford Road                                | Urban Roadside | N | N | 12 | N/A | N | 36.7        |
| DT45 | Chevallier St, Wellington Centre             | Urban Roadside | Y | Y | 12 | N/A | N | 29.6        |
| DT46 | Chevallier St, Wellington Centre co-location | Urban Roadside | Y | Y | 12 | N/A | N | 29.3        |

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|------|--|-------------------|---|---|----|-----|---|-------------|
| DT47 | Chevallier St,<br>Wellington Centre<br>co-location | Urban<br>Roadside | Y | Y | 12 | N/A | N | 28.6        |
| DT48 | Norwich<br>Rd/Anglesea<br>Road                     | Urban<br>Roadside | Y | N | 11 | N/A | N | 27.1        |
| DT49 | St Matthew's St                                    | Urban<br>Roadside | N | N | 11 | N/A | N | <b>41.6</b> |
| DT50 | Barrack Lane/St<br>Matthew's St                    | Urban<br>Roadside | N | N | 12 | N/A | N | 24.9        |
| DT51 | St Matthew's<br>St/Portman Rd                      | Urban Kerbside    | N | N | 12 | N/A | N | 36.3        |
| DT52 | St Matthew's St<br>o/s 60                          | Urban<br>Roadside | N | N | 12 | N/A | N | <b>44.6</b> |
| DT53 | St Matthew's St<br>o/s 67                          | Urban<br>Roadside | N | N | 12 | N/A | N | <b>49.1</b> |
| DT54 | St Matthew's<br>St/Berners St                      | Urban<br>Roadside | N | N | 12 | N/A | N | 30.5        |
| DT55 | Berner's St o/s 21                                 | Urban<br>Roadside | N | N | 12 | N/A | N | 29.8        |
| DT56 | Berner's St o/s 32                                 | Urban<br>Roadside | N | N | 12 | N/A | N | 27.4        |
| DT57 | Berner's St o/s<br>41-43                           | Urban<br>Roadside | N | N | 12 | N/A | N | 25.3        |
| DT58 | Berner's St o/s 58                                 | Urban<br>Roadside | N | N | 12 | N/A | N | 25          |
| DT59 | St. Matthew's St<br>Roundabout                     | Urban<br>Roadside | N | Y | 11 | N/A | N | 32          |

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|      |                             |                |   |   |    |     |   |             |
|------|-----------------------------|----------------|---|---|----|-----|---|-------------|
| DT60 | St. Matthew's St Roundabout | Urban Roadside | N | Y | 10 | N/A | N | 35.8        |
| DT61 | St. Matthew's St Roundabout | Urban Roadside | N | Y | 11 | N/A | N | 32.5        |
| DT62 | St. Matthew's St o/s 27     | Urban Roadside | N | N | 12 | N/A | N | 38.2        |
| DT63 | St Matthew's St o/s no. 19  | Urban Roadside | N | N | 12 | N/A | N | 36.8        |
| DT64 | Norwich Road o/s 13-15      | Urban Kerbside | N | Y | 11 | N/A | N | <b>51.7</b> |
| DT65 | Norwich Road o/s 13-15      | Urban Kerbside | N | Y | 12 | N/A | N | <b>51</b>   |
| DT66 | 30 Woodbridge Rd            | Urban Roadside | N | N | 12 | N/A | N | 38.4        |
| DT67 | Woodbridge Rd/Blanch St     | Urban Roadside | N | N | 12 | N/A | N | 30          |
| DT68 | 62 Woodbridge Rd            | Urban Roadside | N | N | 11 | N/A | N | <b>46.2</b> |
| DT69 | Argyle St o/s 2-4           | Urban Roadside | Y | N | 12 | N/A | N | 27.4        |
| DT70 | Argyle St o/s 11            | Urban Roadside | Y | N | 12 | N/A | N | 32.5        |
| DT71 | St. Helen's St o/s 93       | Urban Roadside | Y | N | 12 | N/A | N | 24.4        |
| DT72 | St. Helen's St o/s 125      | Urban Roadside | Y | N | 12 | N/A | N | 37.9        |

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|      |                              |                |   |   |    |     |   |      |
|------|------------------------------|----------------|---|---|----|-----|---|------|
| DT73 | Regent St/St Helen's St      | Urban Roadside | Y | N | 12 | N/A | N | 22.4 |
| DT74 | Grimwade St o/s 25           | Urban Roadside | N | N | 12 | N/A | N | 25.5 |
| DT75 | Grimwade St o/s 28           | Urban Roadside | N | N | 12 | N/A | N | 23.1 |
| DT76 | St Helen's St/44 Grimwade St | Urban Roadside | Y | N | 12 | N/A | N | 36.5 |
| DT77 | St Helen's St – Albury Ct    | Urban Roadside | Y | N | 12 | N/A | N | 26.6 |
| DT78 | 7 Orchard St                 | Urban Roadside | N | Y | 12 | N/A | N | 23.2 |
| DT79 | 7 Orchard St                 | Urban Roadside | N | Y | 12 | N/A | N | 22.6 |
| DT80 | St Helen's St – County Hall  | Urban Roadside | Y | Y | 12 | N/A | N | 34.2 |
| DT81 | St Helen's St – County Hall  | Urban Roadside | Y | Y | 12 | N/A | N | 34.7 |
| DT82 | St Helen's St – County Hall  | Urban Roadside | Y | Y | 12 | N/A | N | 36.1 |
| DT83 | 29 Bond St                   | Urban Roadside | N | N | 12 | N/A | N | 31.3 |
| DT84 | Carr St/Major's Corner       | Urban Kerbside | N | N | 12 | N/A | N | 26.8 |
| DT85 | 5 Old Foundry Rd             | Urban Roadside | N | N | 12 | N/A | N | 31.5 |



Ipswich Borough Council monitored nitrogen dioxide using diffusion tubes in strategic locations around the borough. As can be seen from the results table above, there were 16 exceedances of the objective level. Nine of these were within existing AQMAs.

Of the tubes **showing exceedance of the objective level**, most were representative of public exposure. However, ten are in locations slightly closer to the kerb than the public exposure and therefore require fall off with distance calculations (also included in the list are two locations where the receptor is significantly closer to the kerb than the monitoring location):

| Tube Number | 2014 Annual Mean Concentration (µg/m <sup>3</sup> ) – National Bias Adjustment factor = 0.81 | Fall off distance corrected result |
|-------------|--|------------------------------------|
| 2           | 42.5   | 39.4                               |
| 14          | 46.7   | <b>45.7</b>                        |
| 17          | 47.4   | <b>46.3</b>                        |
| 24          | 42.2   | <b>41.6</b>                        |
| 25          | 41.1   | 39                                 |
| 35          | 27.4   | 31.6                               |
| 49          | 41.6   | <b>41.4</b>                        |
| 50          | 24.9   | 27.4                               |
| 52          | 44.6   | <b>44.3</b>                        |
| 64          | 51.7   | <b>49.6</b>                        |
| 65          | 51   | <b>48.9</b>                        |
| 68          | 46.2   | <b>45.8</b>                        |

A number of tubes are not directly related to relevant exposure but they help to define boundaries.

Bias adjusting to the national bias adjustment factor reduced the tube results significantly. It was unfortunate that the tubes could not be adjusted to the local factor but the automatic monitor (Chevallier Street) had low data capture.

Historically, the St Margaret's Street monitor was used to bias adjust the tubes co-located on the monitor. The tubes have been adjusted to the national figure for 2014 and the results have reduced. They should therefore be used with caution and will be moved to a more open position for 2015.

There were no monitoring locations where the annual mean was  $> 60\mu\text{g}/\text{m}^3$  and therefore no indication of a potential exceedance of the  $\text{NO}_2$  hourly mean air quality objective level.

Table 2.6 Results of Nitrogen Dioxide Diffusion Tubes (2011 to 2014)

| Site ID | Site Name                       | Site Type        | Within AQMA? | Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$ |  |   |  |
|---------|---------------------------------|------------------|--------------|--|--|---|--|
|         |                                 |                  |              | 2011<br>(Bias Adjustment<br>Factor = 0.84)                             | 2012<br>(Bias Adjustment<br>Factor = 0.79) | 2013<br>(Bias Adjustment<br>Factor = 0.8) | 2014<br>(Bias Adjustment<br>Factor = 0.81) |
| DT1     | Civic Drive                     | Urban Roadside   | N            | 29.9   | 26.9                                       | 27.8                                      | 28.3                                       |
| DT2     | Chevallier St o/s no. 6&8       | Urban Roadside   | Y            | <b>46.4</b>  | 38.2                                       | 39.7                                      | <b>42.5</b>                                |
| DT3     | Dock St                         | Urban Roadside   | Y            | 32.7   | 30.3                                       | 30.8                                      | 28.8                                       |
| DT4     | Berner's St o/s No.31           | Urban Roadside   | N            | 39.5   | 38.3                                       | 34.5                                      | 33.4                                       |
| DT5     | Fore St                         | Urban Roadside   | Y            | <b>40.3</b>  | 38.5                                       | <b>41.0</b>                               | <b>39.8</b>                                |
| DT6     | King's Avenue                   | Urban Background | N            | 17.2   | 21.8                                       | 17.3                                      | 16   |
| DT7     | Bramford Rd o/s 205             | Urban Roadside   | N            | 37.9   | 33.5                                       | 33.0                                      | 32.4                                       |
| DT8     | 122 Bramford Rd                 | Urban Roadside   | N            | 36.1   | 33.2                                       | 35.2                                      | 32.7                                       |
| DT9     | 122 Bramford Rd                 | Urban Roadside   | N            | 36.9   | 34.9                                       | 35.5                                      | 33.1                                       |
| DT10    | 122 Bramford Rd                 | Urban Roadside   | N            | 35.1   | 32.4                                       | 34.1                                      | 32.9                                       |
| DT11    | St Margaret's St, Piper's Court | Urban Roadside   | Y            | <b>45.3</b>  | <b>43.2</b>                                | 39.4 <sup>1</sup>                         | <b>43.5</b>                                |

| Site ID | Site Name                                   | Site Type               | Within AQMA? | Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$ |  |   |  |
|---------|---|-------------------------|--------------|--|--|---|--|
|         |   |                         |              | 2011<br>(Bias Adjustment<br>Factor = 0.84)                             | 2012<br>(Bias Adjustment<br>Factor = 0.79) | 2013<br>(Bias Adjustment<br>Factor = 0.8) | 2014<br>(Bias Adjustment<br>Factor = 0.81) |
| DT12    | St Margaret's St, Piper's Court co-location | Urban Roadside          | Y            | <b>43.6</b>  | <b>44.8</b>                                | 39.1 <sup>1</sup>                         | <b>43.1</b>                                |
| DT13    | Valley/Norwich Road                         | Urban Roadside          | Y            | <b>40.6</b>  | 37.9                                       | 34.1                                      | 35.1                                       |
| DT14    | Chevallier St                               | Urban Roadside          | Y            | <b>49.4</b>  | <b>47.6</b>                                | <b>49.0</b>                               | <b>46.7</b>                                |
| DT15    | Tavern St                                   | Urban Centre background | N            | 29.8   | 29.3                                       | 25.8                                      | 25   |
| DT16    | Valley/Norwich Road                         | Urban Roadside          | Y            | 39.7   | 35.2                                       | 35.7                                      | 33.2                                       |
| DT17    | Chevallier St                               | Urban Roadside          | Y            | <b>54.2</b>  | <b>49.4</b>                                | <b>50.7</b>                               | <b>47.4</b>                                |
| DT18    | 5 Yarmouth Rd                               | Urban Roadside          | N            | 30.3   | 31.6                                       | 31.1                                      | 29.5                                       |
| DT19    | St Margaret's St, Piper's Court co-location | Urban Roadside          | Y            | <b>42.4</b>  | <b>44.0</b>                                | 39.5 <sup>1</sup>                         | <b>40.8</b>                                |
| DT20    | St Margaret's Plain/Fonnereau Road          | Urban Roadside          | Y            | 36.7   | 29.9                                       | 32.6                                      | 32.6                                       |
| DT21    | St Margaret's Plain                         | Urban Roadside          | Y            | 38.3   | 37.4                                       | 37.0                                      | 36.2                                       |
| DT22    | St Margaret's Plain/Northgate St            | Urban Roadside          | Y            | <b>40.8</b>  | 36.6                                       | 38.2                                      | 38.3                                       |
| DT23    | St Margaret's Green                         | Urban Roadside          | Y            | 24.9   | 24.8                                       | 22.8                                      | 23   |

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| Site ID | Site Name                     | Site Type      | Within AQMA? | Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$ |  |   |  |
|---------|-------------------------------|----------------|--------------|--|--|---|--|
|         |                               |                |              | 2011<br>(Bias Adjustment<br>Factor = 0.84)                             | 2012<br>(Bias Adjustment<br>Factor = 0.79) | 2013<br>(Bias Adjustment<br>Factor = 0.8) | 2014<br>(Bias Adjustment<br>Factor = 0.81) |
| DT24    | St Margaret's St              | Urban Roadside | Y            | <b>43.4</b>  | 39.1                                       | <b>40.8</b>                               | <b>42.2</b>                                |
| DT25    | St Helen's St                 | Urban Roadside | N            | <b>46.4</b>  | <b>43.0</b>                                | 39.7                                      | <b>41.1</b>                                |
| DT26    | St Helen's St/Grimwade St     | Urban Roadside | Y            | 36.4   | 31.7                                       | 33.0                                      | 32   |
| DT27    | St Helen's St/Argyle St       | Urban Roadside | Y            | <b>46.6</b>  | <b>42.1</b>                                | <b>43.7</b>                               | 36.8                                       |
| DT28    | 32/34 Chevallier St           | Urban Roadside | Y            | <b>43.3</b>  | 38.5                                       | 37.4                                      | 35.2                                       |
| DT29    | Fore Hamlet                   | Urban Roadside | Y            | 33.6   | 32.4                                       | 32.9                                      | 29.8                                       |
| DT30    | Fore St                       | Urban Roadside | Y            | 30.4   | 30.5                                       | 28.5                                      | 29.3                                       |
| DT31    | Star Lane (opp. St Peters St) | Urban Roadside | Y            | 37.5   | 33.4                                       | 35.2                                      | 32.4                                       |
| DT32    | Star Lane (opp. St Peters St) | Urban Roadside | Y            | 36.3   | 35.6                                       | 33.7                                      | 30.5                                       |
| DT33    | Star Lane (opp. St Peters St) | Urban Roadside | Y            | 37.7   | 33.1                                       | 34.3                                      | 32.9                                       |
| DT34    | College St                    | Urban Roadside | Y            | <b>42.9</b>  | <b>42.1</b>                                | 38.5                                      | <b>41.6</b>                                |
| DT35    | Cobden Place                  | Urban Roadside | N            | 28.5   | 29.5                                       | 26.9                                      | 27.5                                       |
| DT36    | Franciscan Way/Wolsey St      | Urban Roadside | N            | 33.2   | 31.0                                       | 30.1                                      | 27.9                                       |
| DT37    | Lower Brook St                | Urban Roadside | Y            | 28.4   | 25.5                                       | 27.0                                      | 24.1                                       |

| Site ID | Site Name                                    | Site Type      | Within AQMA? | Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$ |  |   |  |
|---------|--|----------------|--------------|--|--|---|--|
|         |  |                |              | 2011<br>(Bias Adjustment<br>Factor = 0.84)                             | 2012<br>(Bias Adjustment<br>Factor = 0.79) | 2013<br>(Bias Adjustment<br>Factor = 0.8) | 2014<br>(Bias Adjustment<br>Factor = 0.81) |
| DT38    | Civic Drive opp. no.1                        | Urban Roadside | N            | 36.5   | 34.1                                       | 35.7                                      | 35   |
| DT39    | Star Lane/Fore St                            | Urban Kerbside | Y            | <b>42.2</b>  | <b>42.6</b>                                | <b>40.8</b>                               | 38.9                                       |
| DT40    | Norwich Road                                 | Urban Roadside | Y            | n/a  | 28.9                                       | 27.0                                      | 27   |
| DT41    | Norwich Road                                 | Urban Roadside | N            | n/a  | 36.8                                       | 34.6                                      | 36.9                                       |
| DT42    | Norwich Road between 8 and 10                | Urban Roadside | N            | n/a  | 36.9                                       | 36.8                                      | 34.2                                       |
| DT43    | Yarmouth Rd/Bramford Rd                      | Urban Roadside | Y            | <b>42.5</b>  | <b>39.9</b>                                | 37.4                                      | 37   |
| DT44    | Bramford Road                                | Urban Roadside | N            | <b>40.3</b>  | <b>39.7</b>                                | 37.1                                      | 36.7                                       |
| DT45    | Chevallier St, Wellington Centre             | Urban Roadside | Y            | 32.5   | 31.3                                       | 29.1                                      | 29.6                                       |
| DT46    | Chevallier St, Wellington Centre co-location | Urban Roadside | Y            | 32.3   | 30.2                                       | 29.6                                      | 29.3                                       |
| DT47    | Chevallier St, Wellington Centre co-location | Urban Roadside | Y            | 32.3   | 30.4                                       | 30.0                                      | 28.6                                       |
| DT48    | Norwich Rd/Anglesea Road                     | Urban Roadside | Y            | 29.5   | 28.1                                       | 27.9                                      | 27.1                                       |

| Site ID | Site Name                    | Site Type      | Within AQMA? | Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$ |  |   |  |
|---------|------------------------------|----------------|--------------|--|--|---|--|
|         |                              |                |              | 2011<br>(Bias Adjustment<br>Factor = 0.84)                             | 2012<br>(Bias Adjustment<br>Factor = 0.79) | 2013<br>(Bias Adjustment<br>Factor = 0.8) | 2014<br>(Bias Adjustment<br>Factor = 0.81) |
| DT49    | St Matthew's St              | Urban Roadside | N            | 43.1   | 38.3                                       | 42.3                                      | 41.6                                       |
| DT50    | Barrack Lane/St Matthew's St | Urban Roadside | N            | 28.5   | 30.8                                       | 26.0                                      | 24.9                                       |
| DT51    | St Matthew's St/Portman Rd   | Urban Kerbside | N            | 38.2   | 33.5                                       | 35.4                                      | 36.3                                       |
| DT52    | St Matthew's St o/s 60       | Urban Roadside | N            | 49.5   | 46.7                                       | 47.6                                      | 44.6                                       |
| DT53    | St Matthew's St o/s 67       | Urban Roadside | N            | 50.5   | 46.0                                       | 44.2                                      | 49.1                                       |
| DT54    | St Matthew's St/Berners St   | Urban Roadside | N            | 33.0   | 34.6                                       | 30.5                                      | 30.5                                       |
| DT55    | Berner's St o/s 21           | Urban Roadside | N            | 32.2   | 33.0                                       | 32.4                                      | 29.8                                       |
| DT56    | Berner's St o/s 32           | Urban Roadside | N            | 33.1   | 32.3                                       | 25.9                                      | 27.4                                       |
| DT57    | Berner's St o/s 41-43        | Urban Roadside | N            | 28.7   | 29.9                                       | 26.6                                      | 25.3                                       |
| DT58    | Berner's St o/s 58           | Urban Roadside | N            | 28.8   | 27.7                                       | 26.8                                      | 25   |
| DT59    | St. Matthew's St Roundabout  | Urban Roadside | N            | 38.1   | 35.8                                       | 34.1                                      | 32   |
| DT60    | St. Matthew's St Roundabout  | Urban Roadside | N            | 37.1   | 35.8                                       | 35.2                                      | 35.8                                       |
| DT61    | St. Matthew's St Roundabout  | Urban Roadside | N            | 35.6   | 35.7                                       | 33.4                                      | 32.5                                       |
| DT62    | St. Matthew's St o/s 27      | Urban Roadside | N            | 43.0   | 38.5                                       | 39.2                                      | 38.2                                       |

| Site ID | Site Name                       | Site Type         | Within AQMA? | Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$ |  |   |  |
|---------|---------------------------------|-------------------|--------------|--|--|---|--|
|         |                                 |                   |              | 2011<br>(Bias Adjustment<br>Factor = 0.84)                             | 2012<br>(Bias Adjustment<br>Factor = 0.79) | 2013<br>(Bias Adjustment<br>Factor = 0.8) | 2014<br>(Bias Adjustment<br>Factor = 0.81) |
| DT63    | St Matthew's St<br>o/s no. 19   | Urban<br>Roadside | N            | n/a  | 39.2                                       | 37.9                                      | 36.8                                       |
| DT64    | Norwich Road<br>o/s 13-15       | Urban<br>Kerbside | N            | n/a  | <b>58.8</b>                                | <b>52.4</b>                               | <b>51.7</b>                                |
| DT65    | Norwich Road<br>o/s 13-15       | Urban<br>Kerbside | N            | n/a  | <b>56.8</b>                                | <b>53.5</b>                               | <b>51</b>                                  |
| DT66    | 30 Woodbridge<br>Rd             | Urban<br>Roadside | N            | <b>42.6</b>  | <b>40.9</b>                                | 37.5                                      | 38.4                                       |
| DT67    | Woodbridge<br>Rd/Blanch St      | Urban<br>Roadside | N            | 33.5   | 29.2                                       | 28.9                                      | 30   |
| DT68    | 62 Woodbridge<br>Rd             | Urban<br>Roadside | N            | <b>49.7</b>  | <b>47.4</b>                                | <b>47.6</b>                               | <b>46.2</b>                                |
| DT69    | Argyle St o/s 2-<br>4           | Urban<br>Roadside | Y            | 30.7   | 26.9                                       | 29.2                                      | 27.4                                       |
| DT70    | Argyle St o/s 11                | Urban<br>Roadside | Y            | 36.7   | 38.3                                       | 36.0                                      | 32.5                                       |
| DT71    | St. Helen's St<br>o/s 93        | Urban<br>Roadside | Y            | 25.9   | 30.0                                       | 26.7                                      | 24.4                                       |
| DT72    | St. Helen's St<br>o/s 125       | Urban<br>Roadside | Y            | 39.5   | <b>40.3</b>                                | 39.1                                      | 37.9                                       |
| DT73    | Regent St/St<br>Helen's St      | Urban<br>Roadside | Y            | 25.6   | 27.2                                       | 25.2                                      | 22.4                                       |
| DT74    | Grimwade St<br>o/s 25           | Urban<br>Roadside | N            | 29.9   | 29.4                                       | 28.7                                      | 25.5                                       |
| DT75    | Grimwade St<br>o/s 28           | Urban<br>Roadside | N            | 25.8   | 26.8                                       | 24.4                                      | 23.1                                       |
| DT76    | St Helen's St/44<br>Grimwade St | Urban<br>Roadside | Y            | <b>41.0</b>  | 38.1                                       | 35.7                                      | 36.5                                       |
| DT77    | St Helen's St –<br>Albury Ct    | Urban<br>Roadside | Y            | 32.5   | 30.1                                       | 29.5                                      | 26.6                                       |



| Site ID | Site Name                      | Site Type      | Within AQMA? | Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$ |  |   |  |
|---------|--------------------------------|----------------|--------------|--|--|---|--|
|         |                                |                |              | 2011<br>(Bias Adjustment<br>Factor = 0.84)                             | 2012<br>(Bias Adjustment<br>Factor = 0.79) | 2013<br>(Bias Adjustment<br>Factor = 0.8) | 2014<br>(Bias Adjustment<br>Factor = 0.81) |
| DT78    | 7 Orchard St                   | Urban Roadside | N            | 28.0   | 25.9                                       | 24.7                                      | 23.2                                       |
| DT79    | 7 Orchard St                   | Urban Roadside | N            | 26.5   | 28.0                                       | 25.0                                      | 22.6                                       |
| DT80    | St Helen's St –<br>County Hall | Urban Roadside | Y            | <b>40.6</b>  | 38.2                                       | 36.1                                      | 34.2                                       |
| DT81    | St Helen's St –<br>County Hall | Urban Roadside | Y            | <b>44.2</b>  | <b>40.3</b>                                | 36.2                                      | 34.7                                       |
| DT82    | St Helen's St –<br>County Hall | Urban Roadside | Y            | <b>41.0</b>  | 39.5                                       | 36.3                                      | 36.1                                       |
| DT83    | 29 Bond St                     | Urban Roadside | N            | 32.9   | 32.1                                       | 31.0                                      | 31.3                                       |
| DT84    | Carr St/Major's<br>Corner      | Urban Kerbside | N            | 29.8   | 30.6                                       | 28.8                                      | 26.8                                       |
| DT85    | 5 Old Foundry<br>Rd            | Urban Roadside | N            | 33.3   | 33.6                                       | 30.8                                      | 31.5                                       |

<sup>1</sup> The monitor and tubes at St Margaret's Street were in a recess of a building (tube numbers 11, 12, 19). As such the tube results are bias adjusted to a local factor. However, the local factor is not always available and to ensure consistency for this trend table they have been reported here adjusted to the national factor each year. The results are lower than when adjusted to the local factor.

**2.2.2 PM<sub>10</sub>**

Ipswich Borough Council does not monitor for particulate matter.

**2.2.3 Sulphur Dioxide**

Ipswich Borough Council does not monitor for Sulphur Dioxide.

**2.2.4 Benzene**

Ipswich Borough Council does not monitor for Benzene.

**2.2.5 Other pollutants monitored**

Ipswich Borough Council does not monitor for any other pollutants.

**2.2.6 Summary of Compliance with AQS Objectives**

Ipswich Borough Council has measured concentrations of nitrogen dioxide above the annual mean objective at relevant locations outside of the AQMA. A **2015 Detailed Assessment** has been submitted to Defra for approval.

### 3 Road Traffic Sources

'Ipswich – Transport Fit for the 21<sup>st</sup> Century' project is a scheme implemented by Suffolk County Council as the Highways Authority across the Ipswich borough. The aim of the scheme is to improve travel around the town and to help support future growth. The scheme includes refurbished bus stations, a state of the art computerised traffic management and information system (UTMC), real time bus information and improvements to make it easier to walk and cycle around Ipswich. This should impact positively on traffic levels and congestion.

The impact of the effects of the proposed development will be considered in future air quality review and assessment reports as the scheme is implemented and validated, along with screening assessments of any roads or junctions affected by the changes.

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

Ipswich 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.

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

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

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

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

#### 3.4 Junctions

There have been a number of junction changes across Ipswich following the implementation of the Suffolk County Councils (as Highways Authority) 'Ipswich –

Transport fit for the 21<sup>st</sup> Century' project. The impacts of the scheme will be discussed and assessed in future air quality review submissions.

Ipswich Borough Council confirms that there are no new/newly identified busy junctions/busy roads that can be assessed in this round of air quality review and assessment.

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

There are a number of new roads constructed within Ipswich:

Pownall Road was constructed in 2007 and is a link road between Fore Hamlet and Duke Street. It is a much quieter, more open road than the two it links, and is less congested. There are no areas of poor air quality identified around it and no reason to suspect that there will be exceedances along the road. If traffic data becomes available the road will be screened but at this moment in time it is difficult to justify the cost of obtaining data.

James Bennett Avenue and Crane Boulevard were built in 2013. They serve a commercial park and there are no relevant receptors within the area.

Ipswich Borough Council has assessed new/proposed roads meeting the criteria in Section A.5 of Box 5.3 in TG(09), and concluded that it will not be necessary to proceed to a Detailed Assessment.

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

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

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

The bus service and Old Cattle Market and Tower Ramparts bus stations have undergone upgrading, as part of the 'Ipswich – Transport fit for the 21<sup>st</sup> Century'

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project. The work is unlikely to have impacted negatively on traffic flows or contributed to poor air quality. The aim of the works is to encourage more sustainable travel and the effects of the works will be reported in future air quality submissions.

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

## 4 Other Transport Sources

### 4.1 Airports

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

### 4.2 Railways (Diesel and Steam Trains)

#### 4.2.1 Stationary Trains

There are two areas of sidings where locomotives are potentially idling/stationery for more than 15 minutes. However, there are no areas within 15m of the stationery locomotives where individuals would be exposed and as such there is no need for a detailed assessment.

Ipswich 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.

#### 4.2.2 Moving Trains

The railway line through the Ipswich borough boundary does have significant diesel freight railway traffic and the potential for long term exposure within 30m of the track. However, there are no known areas where background annual mean nitrogen dioxide concentration is above  $25\mu\text{g}/\text{m}^3$ . Additionally, Ipswich is not one of the local authorities listed in TG (09), Table 2, who need to consider emissions from moving diesel locomotives. It is therefore concluded that it is not necessary to progress to a Detailed Assessment.

Ipswich 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, and background annual mean nitrogen dioxide concentrations above  $25\mu\text{g}/\text{m}^3$ .

### 4.3 Ports (Shipping)

The Port of Ipswich is located within the Borough. The Port is equipped to handle Containers, dry bulks, forest products, general cargo, liquid bulks and Ro-Ro's. Relevant exposure is present within 1km of the berths and main areas of manoeuvring. Ipswich Borough Council has been informed that there were 1196 large ship movements into Ipswich port during 2014. This figure is under 5000 and as such, following guidance within T.G (09), there is no need to progress to a Detailed Assessment for this potential source of pollutant.

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

## 5 Industrial Sources

### 5.1 Industrial Installations

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

Within the neighbouring local authority area of Mid Suffolk, an application was made to the Environment Agency for an Environmental Permit for an 'energy from waste' facility at Lodge Lane, Great Blakenham. The Environmental Permit was granted and the facility began operation in December 2014. The facility meets the requirements of the Waste Incineration Directive and continuous monitoring shows that pollutants are consistently below the limit stated in the permit. During the application process an air quality assessment was submitted showing that relevant emission limits (under the Environmental Permitting Regulations 2010) would be met. An air quality assessment for local air quality management purposes was included in the planning application, and assessed by both the Local District and County Councils. The air quality modelling predicted no significant air quality impacts and no exceedances of the Air Quality Objectives. As such there is no reason for a Detailed Assessment of this process.

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

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

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



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

Ipswich Borough Council confirms that there are no identified new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority which could impact on local air quality.

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

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

## **5.3 Petrol Stations**

There are no new petrol stations within the Ipswich borough meeting the specified criteria. A proposal for a new site on Stoke Park Drive has been received and, if built, will be assessed during future reports.

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

## **5.4 Poultry Farms**

Ipswich Borough Council confirms that there are no poultry farms meeting the specified criteria.

## 6 Commercial and Domestic Sources

### 6.1 Biomass Combustion – Individual Installations

A Biomass Boiler at the following location has been assessed:

Environment Agency, Cobham Road – assessed as per the procedure set out in Section D.1a of chapter 5, TG(09). The conclusion is that no Detailed Assessment is required.

The following Biomass Boiler installations require screening:

- 158 London Road and Westerfield House Humber Doucy Lane – biomass boilers are proposed to be installed. These have not been assessed and will both require further screening if installed.
- Ipswich Hospital Energy Centre; Sainsbury's at Hadleigh Road; and Ormiston Endeavor Academy (Ipswich Thurleston High School) have installed biomass boilers that require screening.

The 2014 Progress Report stated that Cedars Park school biomass boiler would require screening – this was incorrect as the school is outside of the Ipswich Borough Council boundary.

The screening work will be carried out and reported in future submissions to Defra.

Ipswich Borough Council has assessed the biomass combustion plant at Cobham Road, and concluded that it will not be necessary to proceed to a Detailed Assessment.

**Ipswich Borough Council has concluded that it will be necessary to complete screening on 5 biomass boiler installations as listed above.**

## 6.2 Biomass Combustion – Combined Impacts

Ipswich Borough Council does not hold any information concerning the number or type of small biomass combustion plants in the domestic or commercial sector. The suggested procedure in the technical guidance of identifying solid-fuel appliances in a 500x500m square would require considerable work in obtaining the information. There are no areas known to the local authority where the burning of solid fuels is particularly high and where there is a risk of an exceedance of the objective level for PM<sub>10</sub>.

It is therefore proposed to keep the combined impact of small biomass combustion plants under review until such time that the guidance on the identification and assessment of these combined impacts has been developed.

Ipswich Borough Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

## 6.3 Domestic Solid-Fuel Burning

There are no known areas of the borough where significant coal/smokeless fuel burning take place.

Surveying the borough on a winters evening did not result in any obvious areas where smoke was 'hanging' around as a result of domestic burning.

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

## 7 Fugitive or Uncontrolled Sources

Dust emissions from a number of uncontrolled and fugitive sources can give rise to elevated PM<sub>10</sub> concentrations. Areas to consider are:

- Quarrying and mineral extractions
- Landfill sites
- Coal and material stockyards or materials handling
- Major construction works
- Waste management sites.

There are no new quarries; mineral extraction sites; landfill sites; coal and material stockyards/ material handling yards; or waste management sites within the Borough. New haulage roads would have been constructed on the large construction sites and during the building of the Ipswich chord railway line but these did not result in significant dust complaints.

Any complaints of dust or smoke from both residential and commercial/industrial premises are investigated. Since 2012 there has been one dust complaint that has resulted in a notice being served to control the dust.

Fugitive dust from significant construction sites is also controlled through conditions requiring a dust management plan on the planning permission.

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

## **8 Conclusions and Proposed Actions**

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

Ipswich Borough Council has measured concentrations of nitrogen dioxide above the annual mean objective at relevant locations outside of the AQMAs. A Detailed Assessment has been submitted to Defra for approval.

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

Ipswich Borough Council has identified five biomass boiler installations that require further screening.

Further screening work on the impacts on traffic flows, roads and congestion of the 'Ipswich – Transport fit for the 21<sup>st</sup> Century' project is required as data becomes available.

### **8.3 Proposed Actions**

Further screening work, as identified above, will be carried out in future air quality review submissions.

Ipswich Borough Council has not identified any need to proceed to a Detailed Assessment other than that already completed and submitted to Defra for assessment as a result of high monitoring results (annual average nitrogen dioxide).

## 9 References

DEFRA, 2009. Part IV of the Environment Act 1995, Local Air Quality Management. Technical Guidance, LAQM TG (09). London: DEFRA.

DEFRA, 2009. Part IV of the Environment Act 1995, Local Air Quality Management. Policy Guidance PG (09). London: DEFRA.

DEFRA, 2007. The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. London: DEFRA.

Environment Act 1995. c.25, London: HMSO.

# Appendices

## Appendix A: QA/QC Data

### Diffusion tube preparation method

Nitrogen dioxide diffusion tubes are supplied by Environmental Scientifics Group. The exposed tubes are analysed in accordance with Environmental Scientifics Group standard operating procedure which complies with the guidelines set out in DEFRA's 'Diffusion Tubes For Ambient NO<sub>2</sub> Monitoring: Practical Guidance'. The analysis of diffusion tube samples to determine the amount of nitrogen dioxide present on the tubes is within the scope of their UKAS schedule. Environmental Scientifics Group participates in the WASP scheme and is currently ranked as a category good laboratory.

A control tube is sent with each month's tubes.

### Diffusion tube bias adjustment factors

Where possible a local bias adjustment factor is used – but this is reliant on obtaining good data capture from the local continuous monitors and on the placement of the tubes being at locations comparable to the analyser site. Where a local factor is not available, national data, which is available on the air quality review website, is used to bias adjust the diffusion tubes.

### QA/QC of Automatic Monitoring

The automatic monitors are routinely calibrated every 4 weeks by an Ipswich Borough Council Environmental Protection Officer. They are audited and serviced twice a year by contractors.

All data collected from the automatic monitors is managed by external consultants to quality procedures developed under the UK National Network. The data management processes represent best practice and fully meet the requirements set out in LAQM TG (09).

All data are screened and scaled (on the basis of site calibrations) and the final data sets presented within this report have benefited from a full process of data ratification.