

2016 Air Quality Annual Status Report (ASR)

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

June 2016

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Executive Summary: Air Quality in Our Area

Air Quality in Waveney District Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas^{1,2}.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion³.

Recently Defra have carried out a review of Local Air Quality Management and as a consequence have made changes to guidance and the reporting obligation of UK local authorities.

The main changes introduced in Local Air Quality Management , Policy Guidance (PG16) 2016, result in a change of focus and emphasis is now placed on reporting actions taken to improve air quality with less of a monitoring role. The annual report on local air quality that local authorities are required to draft and submit to Defra for approval, will now have a greater focus placed on what is being done locally to improve air quality and in particular reducing exposure to PM_{2.5}. The reason for the great concern about PM_{2.5} is that “there is no evidence of a safe level of exposure to or a threshold below which no adverse health effects occur”¹. The technical evidence shows that smaller particles are more closely associated with adverse health effects. Although there is no specific air quality objective in the National Strategy, the Government has set a target reduction value of 15% in the concentration of PM_{2.5} at urban sites to be achieved by the end of the period 2010 – 2020.

Waveney District Council will manage local air quality with these changes in mind by working in partnership with the following organisations;

Suffolk County Council;

Suffolk Coastal District Council;

¹ Environmental equity, air quality, socioeconomic status and respiratory health, 2010

² Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

³ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

Public Health England: and any other relevant organisations, or potential partners.

Meetings and contact is already in progress with some of the potential partners and it is hoped that the 2017 Air Quality Status Report will give a positive update.

Currently, Waveney District Council monitors the oxides of nitrogen concentration at a number of relevant receptors in the district of Waveney.

Generally the air quality within the Waveney District is good and **none of the national air quality standards are exceeded**. However, there is a national concern about poor air quality and in particular, micro particulates, known as PM_{2.5}'s and a challenging target has been set to reduce the local concentration by the year 2020.

Actions to Improve Air Quality

Waveney District Council has been active with Suffolk County Council in securing funding for a third crossing of the Lake Lothing from Central Government. A third crossing would reduce traffic congestion at the Lowestoft bascule bridge and improve air quality at this location. Free flowing traffic is not so polluting in terms of emissions of pollutants, so that actions to reduce traffic will have a positive effect on local air quality.

The Waveney District Council Planning and Development Team have recently produced a Cycle Strategy policy document and it is hoped that this will help remove some of the barriers preventing people from cycling more often and reduce the reliance on the car.

Highways England are looking at a number of options to improve traffic flow in the area of the Bascule Bridge and the biggest improvement is likely to come from putting **all** the Lowestoft traffic signals onto one Urban Traffic Management Control (UTMC) system. This should make it possible to set different signal timings to optimise traffic flow, not only at busy times, but to completely change the signal priorities when the Bascule Bridge lifts.

Local Priorities and Challenges

The impact of an ambitious development programme will have to be monitored over the period of the life of the new Local Plan, which is currently being drafted. There

has to be a balance when considering new development opportunities and those that are approved should not cause significant detriment to the local environment.

As funding has been agreed for a third crossing over the Lake Lothing, there will be a significant amount of work generated to ensure that the new bridge and infrastructure is not detrimental to air quality elsewhere in Lowestoft.

Concerns over poor air quality in the region of the Lowestoft Bascule Bridge caused by heavy traffic congestion remain and a monitoring programme using 4 triplicate sets of diffusion tubes was started in October 2015. The results of this work will be reviewed in September 2016.

The work needs to continue to promote and encourage a cultural shift from the use of motor vehicles to alternative forms of transport.

New working relationships with partner organisations and public bodies must be developed to formulate cohesive strategies with view to improving air quality within the Waveney District.

How to Get Involved

Waveney District Council is working to meet the challenge of meeting targets of reducing PM_{2.5} set by the Government, but it will also require a concerted public effort with each person doing their bit, by active travel planning and reducing the reliance on the motor car for travel. This will have other additional benefits as participants will be fitter and healthier by choosing to walk or cycle more regularly. Waveney District has produced a Cycle Strategy and this can be accessed via the East Suffolk Website. Cycling and walking are much cleaner, cheaper and healthier forms of travel, so there are a number of positive benefits. The Suffolk County Council Transport Plan estimates that 80% of people living within Lowestoft also work in the town which means that many journeys are short (www.suffolk.gov.uk/roads-and-transport/public-transport-bus-pass-and-transport-planning/transport-planning-strategy-and-plans/). The new East Suffolk air quality webpage, which is under construction will not only contain information about the quality of air in your area, but also provide you with practical information about adopting alternative modes of travel.

The www.greensuffolk.org/travel/travel-plan-support/ website gives advice on all aspects of the alternative greener travel options and free support is available to assist with travel plans and personal journey plans. You can obtain advice on safe

cycling routes and general supportive information from www.sustrans.org.uk/Cycle-Route-Maps/ , which is a charity devoted to promoting cycling as a healthier alternative form of transport.

Support is also available for businesses in the form of Suffolk County Council grants through a Travel Plan Grant Scheme. The scheme will offer businesses up to 50% match funding towards the cost and installation of initiatives to support healthier and greener travel in the workplace. The grants have a maximum ceiling of £1000 and to apply download an application form at www.greensuffolk.org/travel/travel-plan-support/business-support/, In the past grants have been used to purchase pool bikes to cut down on short car journeys during the day and other facilities such as the creation of secure storage for bicycles.

You could consider making your next car purchase an electric one and not only enjoy cheaper motoring, but also cleaner in respect of emissions to the atmosphere.

Details of local electric charging points can be found at www.zap-map.com/live/ and the site also gives general information about owning electric cars. The Office for Low Emission Vehicles (OLEV) provide grants for the installation of domestic plugin-charging points and this results in a deduction from the price of the vehicle at the point of sale by the dealership.

Smarter driving information is available from the Energy Saving Trust Website via the link <http://www.energysavingtrust.org.uk/travel>. By driving '*smarter*' you can both save money and reduce harmful emissions to the atmosphere.

For further information on national air quality, including the latest news, air pollution forecasts, the latest measured levels and a summary, interactive monitoring, and general information about air pollution, consult the Defra website <http://www.uk-air.defra.gov.uk>

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1 Local Air Quality Management

This report provides an overview of air quality in Waveney District Council during 2016. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) 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 an exceedance is considered likely the local authority must 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. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Waveney District Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of the objectives.

Waveney District Council currently does not have any AQMAs nor an air quality strategy, or similar document.

2.2 Progress and Impact of Measures to address Air Quality in Waveney District Council

An air quality monitoring programme has been retained, although Waveney District Council has not declared any Air Quality Management areas and monitoring has consistently indicated that there are no areas which are exceeding national air quality objectives.

A number of measures have been taken forward during the current reporting year of 2016 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1. More detail on these measures can be found below.

Waveney District Council expects the following measures to be completed over the course of the next reporting year:

- The new Waveney District Council Cycling Strategy has been published and agreed in Cabinet. This important document will identify areas where the cycle network can be improved and will further promote cycling as a healthy and green mode of transport.
- Air quality to be incorporated into the joint Waveney and Suffolk Coastal District Councils Environmental Policy and this is the document that drives sustainable procurement guidance. As a result, the reduction of harmful emissions will be a consideration in the way the Council delivers its services.

- A large number of the measures taken forward in respect of promoting alternatives modes of transport and active travel are ongoing and the results of the various projects will be monitored where possible.

The Waveney District Council has a number of priorities for the coming year and these are detailed below.

- Address PM_{2.5} by establishing a partnership and defining /defining roles with the Director of Public Health and Public Protection at Suffolk County Council and the Suffolk Health and Wellbeing Board because a coordinated and partnership approach to reducing the local PM_{2.5} concentration is likely to be more effective.
- Continue air quality monitoring at locations around the district, although there are currently no exceedances of the National Air Quality Objectives for NO₂.
- Complete the diffusion tube (triplicate) monitoring programme at the Bascule Bridge in Lowestoft and review the results.
- Where possible monitor and review the progress of the various projects outlined in Table 2.2.
- Design an interesting and informative Council website page that supports the work of the Air Quality Officer and provides useful link addresses to the public.
- Assess significant new development planning applications for air quality impacts.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
1	Redesign and update the air quality page(s) on the Council Website	Public information	Via the internet	Waveney and Suffolk Coastal District Councils	2016	2017	Updated Web page	N/A	Working party established	2017	Discussions have been held that identified this measure as a priority. Should provide links to other websites for specific information.
2	Greener travel information available on the Suffolk County Council website	Public Information	Via the internet	Suffolk County Council	N/A	Implemented	Number of hits	N/A	Ongoing	N/A	Sign posting function with links to travel plan and alternative modes of travel support.
3	Reducing pollutant emissions of the Councils during service delivery via the Joint Environmental Policy	Control	Sustainable Procurement guidance	Waveney and Suffolk Coastal District Councils	Currently	2017	The publication of a new document	N/A	First draft prepared	2017	To ensure that WDC and SCDC show community leadership as well as taking positive steps to reduce emissions

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Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
4	Air quality embedded in the WDC new Local Plan	Policy Guidance and Development	Air Quality Planning and Policy Guidance	Waveney District Council	2016	2018	Air quality considered in all relevant planning applications	N/A	Discussion with the Councils' Planning Policy Team and Consultation document submitted	N/A	To ensure that developments are appropriate and the air quality impacts are adequately assessed.
5	Waveney District Council Home working policy	Promoting Travel Alternatives	Encourage/Facilitate home - working	Waveney District Council	completed	Completed	Home –working policy adopted	N/A	Policy in place	Completed	Policy in place and the Councils are currently exploring technology options to allow staff to work from home
6	Promotion of travel alternatives in the local plan	Promoting Travel alternatives	Promotion of walking and cycling	Waveney District Council	N/A	N/A	Inclusion in the local plan	N/A	Discussions and Consultation document submitted	N/A	
7	Promotion of travel alternatives for Waveney District Council staff	Promoting Travel Alternatives	Promotion of cycling Promotion of walking	Waveney District Council	N/A	N/A	Council promotes cycling as a positive alternative form of travel for its staff The take up of the Council staff health and well being programme	N/A	Staff have been encouraged to use cycles for a number of years.	Ongoing	Changing and showering facilities provided at the Riverside Council Building shared with Suffolk CC. Engages staff in such projects as the 10000 step challenge.

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Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
8	Riverside Council Offices Travel Plan	Promoting Travel Alternatives	Travel plans	Waveney District Council and Suffolk County Council	N/A	N/A	Reduction in vehicle trips	N/A	Unable to determine at this time, but can be reviewed in the future.	Ongoing	
9	Provision of Electric cars at the Riverside	Promoting Low Emission Transport	Other	Waveney District Council and Suffolk County Council	N/A	N/A	Electric car Take-up	N/A	Infrastructure provided	Ongoing	Four cars and recharging infrastructure provided.
10	Separate cycle and pedestrian crossing across the Lake Lothing	Transport Planning and infrastructure	Cycle network	Waveney District Council and Suffolk County Council			Increase the popularity of walking and cycling as a means of getting to work	N/A	Funding bid accepted		Important link to the cycle network
11	Suffolk Car share	Alternatives to private vehicle use	Car and lift sharing schemes	Suffolk County Council	N/A	Implemented	Public take up	N/A	Review in 12 months	Ongoing	www.suffolkcarshare.com Free web based contact database.

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Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
12	Travel Planning Advice & support	Promoting Travel Alternatives	Personalised Travel Planning Workplace Travel Planning School Travel Plans	Suffolk County Council	N/A	Implemented	Take up by the public, business and schools	N/A	Review in 12 months	Ongoing	Advice and support at suffolktravelplans.com All schools have travel plans, which are reviewed when required during the planning application process. Gunton and Oulton Broad primary schools have been particularly engaged and have developed good practice.

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Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
13	Lowestoft Local Links workplace engagement project (www.green.suffolk.org/travel/lowestoft/)	Promoting Travel Alternatives	Intensive active travel campaign and infrastructure	Suffolk County Council	Completed	Implemented	10% reduction in car trips.	N/A	Project successfully finished	2015	Awarding winning scheme that has established a network of 150 organisations each actively promoting sustainable travel. Suffolk County Council have funding scheduled to ensure legacy for Lowestoft Local Links and sustainable transport promotion
14	Individualised Travel Marketing Project	Promoting Travel Alternatives	Personalised travel Planning	Suffolk County Council, Waveney District Council and Sustrans	Completed	October 2008	Significant increases in the use of sustainable and active travel modes	N/A	Achieved a reduction in car use –as driver trips of 13% and a net saving of 27.7 million car km per year against baseline levels	2009	Contributed to reducing traffic and increasing active travel during peak and off-peak periods (www.suffolkonboard.com/content/download/.../travelsmart+lowestoft+final+report.pdf)

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Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
15	Suffolk Walking Strategy	Promoting Travel Alternatives	Promotion of walking	Suffolk County Council	N/A	2015	Reverse the trend of walking less 10% fall in walking between 2003 and 2012	N/A	77% of the population of Suffolk are walking at least once a week for a minimum duration of 10 minutes (0.4% above the national average – DFT 2012/13))	2020	Review outcomes at the end of the period
16	Suffolk Cycling Strategy	Promoting Travel Alternatives	Promotion of cycling	Suffolk County Council	N/A	2015	Suffolk Transport Delivery Plan	N/A	Cycle towns review complete And the 2015 Suffolk a year of cycling programme launched March 2015 promoting events throughout Suffolk	N/A	Subject to periodic review.
17	Lowestoft Local Links workplace engagement project and the provision of a public cycle for hire Scheme	Transport Planning and Infrastructure	Public cycle hire scheme	Suffolk County Council	N/A	Implemented	Public take up	N/A	Scheme operating	ongoing	Review public take up

Waveney District Council

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
18	Improved bus and rail interchange at Lowestoft Station	Transport Planning and Infrastructure	Public transport improvements – interchanges stations and services	Suffolk County Council		Implemented		N/A	Infrastructure improvement complete	2015	
19	Improvement works at Oulton Broad North Station	Transport Planning and infrastructure	Public transport improvements – interchanges stations and services	Network Rail	N/A	July 2016	'Reduce the down time' of the level crossing barriers and improve the journey times for people using Bridge Road.	N/A	Work to begin in July 2016	November 2016	Heavy traffic congestion occurs in Bridge road with long tail backs, every thirty minutes when the level crossing-barriers are down.
20	UTMC traffic signal technology installed to control traffic at the Bridge.	Traffic Management	UTC, Congestion management traffic reduction	Highways England and Suffolk County Council	2015	April to May 2017	Reduction in traffic congestion	N/A	Ongoing		All of the Lowestoft traffic signals to be put onto to one Urban Traffic Management Control system.

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Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
21	Proposed third vehicular crossing of Lake Lothing	Traffic Management	Strategic highway improvements, re-prioritising road space away from cars, including Access Management, Selective vehicle priority, bus priority, High vehicle occupancy Lane.	Suffolk County Council	Since 2010	Still to be determined	New crossing which could result in a large reduction of congestion in Oulton Broad and the Lowestoft Town Centre	Still to be determined	Funding agreed	2020	Approximate costs in excess of £80million Three options for the location of the crossing are being considered

2.3 PM_{2.5} – Local Authority Approach to Reducing Emissions and or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of PM_{2.5} (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM_{2.5} has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

The Director of Public Health and Protection at Suffolk County Council has been engaged by the Suffolk Air Quality Group with view to agreeing a countywide strategy for reducing local PM_{2.5} concentrations.

Similarly, discussions have also taken place with view to forming a partnership and defining roles with the Suffolk Health and Wellbeing board. A briefing note was prepared to aid those discussions.

The Environmental Protection Team have fed into the draft local plan options consultation seeking to control fugitive emissions of PM_{2.5} from construction and demolition sites at the planning stage of developments by ensuring that developers use best practice and ensure that adequate air quality assessment is also a provided when required.

Waveney District Council, working in partnership with Suffolk County Council and other potential partners, is committed to promoting alternative forms of transport and modes of travel such as cycling, walking, car sharing and public transport with the aim of reducing the reliance on private cars.

Department of Transport statistics indicate that the take up of active travelling is mixed in Waveney with a fall in cycling as a mode of transport in the period 2010 to 2014, but in contrast a significant increase occurred in walking (around 10%). Both the Waveney DC and Suffolk CC Cycling Strategies recognise the need for continued promotion of cycling and for greater improvements to the cycling infrastructure.

The Waveney District Council Cycle Strategy (www.eastsuffolk.gov.uk) has considered infrastructure issues and put forward potential improvements to the cycle network with the aim of encouraging more people to cycle and remove existing

barriers. The document also provides supporting information about issues such as the design of development projects that should be taken into account when planning proposals are being prepared and determined. The document also discusses 'travel to work' data that 'shows the car to be dominant mode of transport to and from work in the District and accounts for 61% of Journeys. In Waveney, the proportion of commuter journeys completed by bike is 6.1% which is one third higher than the Country average of 3.9% and double the national average of 2.9%' It is also worth noting that 10.2% of journeys in Waveney were made on foot. Many of the trips to work are short and could easily be achieved by bike or by walking. Both traffic count figures and census data for Suffolk indicate that the number of cyclists using busy roads is falling and people are commuting to work less by cycling (Waveney Cycling Strategy 2016).

The measures listed in table 2.2 should impact positively in reducing emissions by promoting a change in travel culture and providing advice, support and the necessary infrastructure to encourage the use of other means of transport rather than the car. It is expected that all of the measures should have a positive impact on the PM_{2.5} concentration in the Waveney District by varying degrees.

Both the Individualised Travel Marketing Project and the Lowestoft Local Links workplace engagement project (www.greensuffolk.org/travel/lowestoft) appear to have been successful and the impact may be greater with the improvement of the cycling network infrastructure. The legacy of the Lowestoft Local Links workplace engagement project is to be followed up and Suffolk County Council has scheduled funding to complete this work.

The promotion of active travel in the form of cycling and walking within the District has wider benefits and has strong links to the Public Health Outcomes Framework in terms of improving the health and wellbeing of the population, as well as improving the local air quality.

The Public Health Outcomes Framework (PHOF) air quality indicator for Waveney is that 5.18 percent of mortality in persons in the age range 30+ years is attributable to poor air quality. This can be compared to the East of England mortality rate of 5.5% for the same period (www.phoutcomes.info/).

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The dedicated air quality page on the East Suffolk Website will provide information and encouragement to members of the public who are interested in 'doing their bit' in improving air quality and sign post people to other links.

No monitoring for PM_{2.5} is programmed for Waveney currently, unless a substantial source of pollution is identified that requires a detailed assessment.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

Waveney District Council has not undertaken any automatic (continuous) monitoring at any sites during the last year.

3.1.2 Non-Automatic Monitoring Sites

Waveney District Council undertook non- automatic (passive) monitoring of NO₂ at 12 sites during 2015 and a further 4 sites near the bascule Bridge have been monitored since October 2015. The results of the additional sites will be presented as the annual average mean of 4 triplicate sets and assessed in the 2017 ASR when a full year's data is available.

Table A. in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D.

Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

3.2 Individual Pollutants

Trend data has been included in this report using data from previous years monitoring and presented in graph form in Appendix A. The noticeable trend is that nitrogen dioxide concentration levels have continued to reduce at most locations over the past five years, with measured levels well below the national objectives.

The air quality monitoring results presented in this section are, where relevant, adjusted for bias and distance from relevant public exposure. Where the monitoring point is located a distance away from relevant public exposure an adjustment calculation is made to assess the pollutant concentration at the point of the exposure.

Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

There have been no exceedances of the national air quality objectives anywhere in the Waveney District in 2015.

Table A.2 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

Figure 1 in Appendix A shows the decreasing trend in the nitrogen dioxide concentration in the Waveney District.

For diffusion tubes, the full 2015 dataset of monthly mean values is provided in Appendix B.

3.2.2 Particulate Matter (PM₁₀)

Waveney District Council does not monitor concentration levels of particulate matter.

Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQM A?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
DT 1	Castleton Avenue	Roadside	650608	290476	NO ₂	N	17	1.9	N	3.0
DT 2	Fir Lane	Roadside	653220	293794	NO ₂	N	6	0.5	N	2.9
DT 3	Dutchman's Court	Roadside	651885	292105	NO ₂	N	5	2.4	N	2.4
DT 4	Golden Court	Roadside	652242	292955	NO ₂	N	4	2	N	2.4
DT 5	Saltwater Way	Roadside	652498	292751	NO ₂	N	6	3	N	2.4
DT 6	Yarmouth Road	Roadside	653049	295534	NO ₂	N	8.8	0.5	N	2.4
DT 7	Mill Road	Roadside	654470	292395	NO ₂	N	6.8	1.2	N	2.4
DT 8	St Margaret's Church Yard	Urban Background	654305	293914	NO ₂	N	N	N	N	2.4
DT 9	Belvedere Road (1)	Roadside	654651	292619	NO ₂	N	N	1	N	2.0
DT	Belvedere	Roadside	6546	2926	NO ₂	N	N	1	N	2.0

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Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
10	re Road (2)	e	19	19						
DT 11	Pier Terrace (1)	Roadside	654658	292598	NO ₂	N	7	3	N	2.4
DT 12	Pier Terrace (2)	Roadside	654658	292598	NO ₂	N	0	11	N	2.4
DT 13	Trinity Street	Roadside	633661	289813	NO ₂	N	0	1	N	2.2
DT 14	Ingate, Beccles (1)	Roadside	642614	289906	NO ₂	N	0	1	N	2.4
DT 15	Ingate, Beccles (2)	Roadside	642614	289906	NO ₂	N	4	2	N	2.4

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(2) N/A if not applicable.

Table A.2 – Details of Non-Automatic Monitoring Sites, either side of the Bascule Bridge.

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
PT 1	Pier Terra	Roadside	654788	292824	NO ₂	N	0.5	3.0	N	2.2

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Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
	ce									
PT 2	Pier Terrace	Roadside	654781	292814	NO ₂	N	0.2	4	N	2.2
PT 3	Pier Terrace	Roadside	654703	292636	NO ₂	N	0.5	2.5	N	2.2
PT 4	Pier Terrace	Roadside	654685	292621	NO ₂	N	0	4	N	2.2

Table A.2 – Annual Mean NO₂ Monitoring Results

Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2015 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³)			
				2011	2012	2013	2014
Roadside	Diffusion Tube	n/a	91.6	16.7	15.7	16.2	15.2
Roadside	Diffusion Tube	n/a	100	21.1	20.1	19.5	19.4
Roadside	Diffusion Tube	n/a	100	23.5	21.7	21.7	22.8
Roadside	Diffusion Tube	n/a	100	31.9	27.3	29.4	27.7
Roadside	Diffusion Tube	n/a	100	26.3	24.2	25.6	21.8
Roadside	Diffusion Tube	n/a	83	18.6	16.8	17.8	18.2
Roadside	Diffusion Tube	n/a	100	22.8	20.9	19.6	18.7
Roadside	Diffusion Tube	n/a	91.6	17.8	16.3	16.5	16.5
Roadside	Diffusion Tube	n/a	100	32.8	29.2	24	29.3
Roadside	Diffusion Tube	n/a	100	32.8	30.0	25.7	31.2
Roadside	Diffusion Tube	n/a	100	35.1	30.8	35.3	29.9
Roadside	Diffusion Tube	n/a	100	N/A	25.8	26.0	25.2
Roadside	Diffusion Tube	n/a	100	N/A	N/A	31.4	29.5
Roadside	Diffusion Tube	n/a	100	35.4	31.2	32.3	31.6
Roadside	Diffusion Tube	n/a	100	N/A	25.1	33.2	23.9

Notes: Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

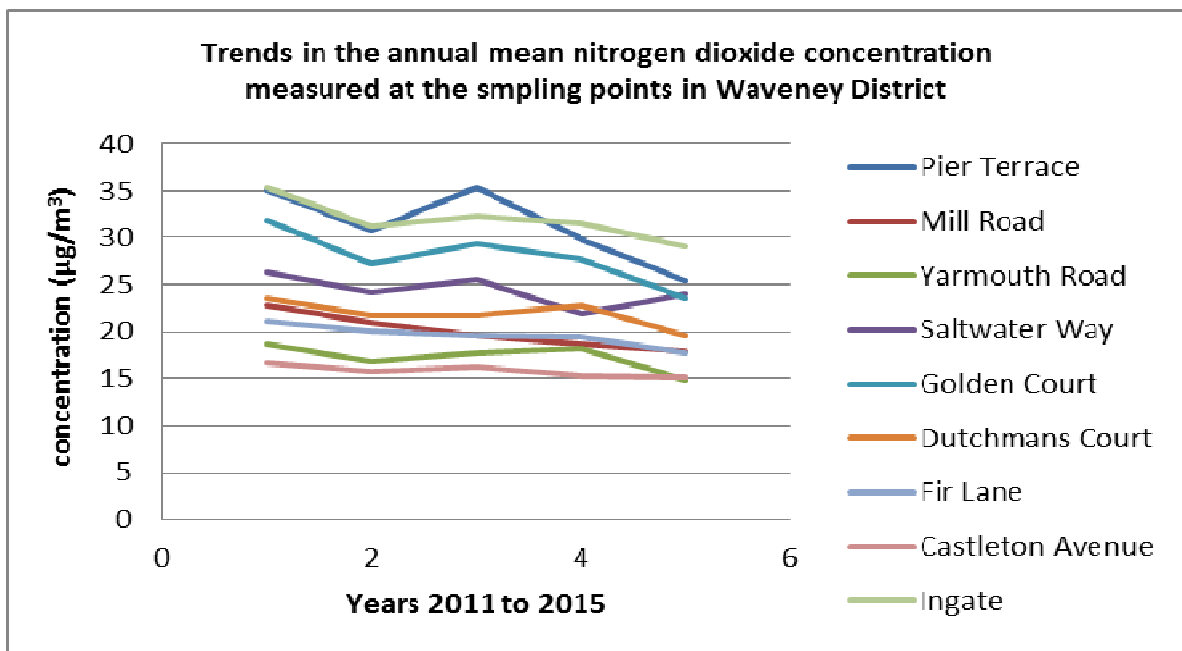
(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Technical Guidance LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Where necessary the values represent the relevant public exposure and the ‘NO₂ fall-off with distance’ calculator has been used to calculate the concentration of pollutant at the façade of the nearest relevant receptor.

Figure 1: Five year trend of the Annual Mean Nitrogen Dioxide Concentration in Waveney District



The trend at most locations in the 4 year period between 2011 and 2015 has been one of reduction in nitrogen dioxide concentration at the sampling points. In 2013 there was a marked increase in the concentration measured at the Pier Terrace (DT11), but this has not continued as a trend with a further two years of reductions in 2014/15. There was a slight increase in the measured concentration in Saltwater Way in 2015, which was contrary to the trend elsewhere in the Waveney

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District. The annual mean objective for nitrogen dioxide that **must not be exceeded is 40 µg/m³** and there is a significant headroom at all locations within Waveney.

Appendix B: Full Monthly Diffusion Tube Results for 2015

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2015

Site ID	NO ₂ Mean Concentrations (µg/m ³)													Annual Mean	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted ⁽¹⁾	
Castleton Avenue	33.5	25.1	28.4	22.4	18.9	25.9	19.5	26.2	27.9	25.9	-	17.7	24.7	19.5	
Ingate Beccles 1	43.7	33.7	-	32.3	31.7	37.1	29.6	36.0	36.0	40.4	33.8	40.7	35.9	28.4	
Saltwater Way	35.9	37.3	34.4	35.9	25.3	29.5	46.6	28.3	36.9	40.8	37.2	26.0	32.7	25.8	
Fir Lane	32.1	35.8	24.3	23.5	17.6	24.4	22.5	19.7	27.4	32.2	34.4	37.9	27.7	21.8	
Mill Road	31.2	19.6	29.9	23.0	19.2	23.9	15.2	21.6	25.7	37.8	31.0	20.2	24.9	19.6	
Golden Court	36.1	30.6	45.7	39.1	30.7	32.6	20.5	32.8	33.4	30.0	20.8	29.4	31.8	25.1	
Yarmouth Road	21.0	21.1	26.3	-	-	24.7	16.9	22.4	26.2	28.1	18.8	18.4	22.4	17.7	
Pier Terrace 1	43.1	35.0	48.1	34.4	34.9	40.0	28.1	39.2	29.4	34.3	27.7	27.7	35.2	27.8	
St Margaret's Road	21.0	24.0	17.8	12.6	9.6	15.1	10.7	11.6	14.4	21.1	14.0	-	15.6	12.3	
Belvedere Road 1	44.8	50.1	43.4	34.4	32.7	42.3	31.3	36.5	37.6	38.4	41.9	39.7	39.4	31.1	
Belvedere Road 2	45.5	48.1	34.7	38.8	27.6	41.8	33.2	35.5	35.7	33.6	41.0	33.0	37.4	29.5	
Dutchmans Court	29.6	29.5	32.1	21.7	22.1	28.4	20.7	26.2	26.3	31.0	22.5	27.6	26.5	20.9	
Trinity Street, Bungay	46.5	42.8	43.6	35.1	32.9	34.8	28.6	34.2	41.1	37.8	24.4	20.4	35.2	27.8	
Pier Terrace 2	35.1	35.2	27.9	31.0	24.4	30.0	25.5	29.0	34.0	45.0	34.1	24.4	31.3	24.7	

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Site ID	NO ₂ Mean Concentrations (µg/m ³)													
	Ja n	Fe b	Ma r	Ap r	Ma y	Ju n	Jul	Au g	Se p	Oct	No v	De c	Annual Mean	
													Raw Data	Bias Adjusted ⁽¹⁾
Ingate, Beccles 2	37. 3	32. 9	36. 4	29. 8	28. 8	35. 2	29. 8	32. 7	41. 3	39. 9	25. 0	21. 7	32. 6	25.7

(1) See Appendix C for details on bias adjustment

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

No significant changes to sources have occurred since the Updating and Screening Assessment was submitted in 2015.

In October 2015, four triplicate sets of diffusion tubes were positioned at the Bascule Bridge in the Lowestoft Town Centre, for a monitoring period of twelve months. It is too soon to report back on the results in this report.

Diffusion tubes are particularly useful:

- when simple, indicative techniques will suffice;
- to give an indication of longer-term average NO₂ concentrations;
- for indicative comparison with the Air Quality Strategy Objectives based on the annual mean;
- for highlighting areas of high NO₂ concentration; and
- where installation of an automatic analyser is not feasible

They are useful for identifying areas of high NO₂ concentration, particularly when dealing with sources such as traffic emissions, which do not change much from day to day.

Factor from Local Co-location Studies (if available)

Waveney District Council did not undertake a local co-location study.

Diffusion Tube Bias Adjustment Factors

Waveney District Council has used the national bias adjustment factor of 0.79, spreadsheet version 06/16, available on the LAQM website. The factor of 0.79 was obtained from a sample of 26 separate studies of ESG Scientifics, Didcot, results.

QA/QC of Automatic Monitoring

No longer applicable, as the automatic continuous air quality located in Belvedere Road, Lowestoft was decommissioned by Suffolk County Council in 2012..

QA/QC of Diffusion Tube Monitoring

The diffusion tubes used in Waveney District Council are supplied and analysed by ESG Scientifics at Didcot. The tubes were prepared by spiking acetone:triethanolamine (50:50) into the grids prior to the tubes being assembled. The tubes were desorbed with distilled water and the extract analysed using a segmented flow auto-analyser with ultraviolet detection. The samples were analysed in accordance with ESG Scientifics standard operating procedure ANU/SOP/1015 issue 1, which meets the guidelines set out in DEFRA's 'Diffusion Tubes For Ambient no2 Monitoring practical Guidance' .

The results were initially calculated assuming an ambient temperature of 11°C, and the reported values adjusted to 20 °C to allow for direct comparison with EU limits.

Please note that the reported results are not bias adjusted by ESG Scientifics.

The diffusion tubes are stored and installed by Waveney District Council in accordance with the "NO₂ Diffusion Tubes for LAQM:Guidance Note for Local Authorities"

Summary of Laboratory Performance in AIR/WASP NO₂ Proficiency Testing Scheme (April 2013 – February 2015).

Reports are prepared by HSL for BV/NPL on behalf of Defra and the Devolved Administrations.

Background

AIR is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). AIR PT is a new scheme, started in April 2014, which combines two long running PT schemes: LGC Standards STACKS PT scheme and the HSL WASP PT scheme.

AIR offers a number of test samples designed to test the proficiency of laboratories, undertaking analysis of chemical pollutants in ambient indoor, stack and workplace air. One such sample is the AIR NO₂ test sample type, which is distributed to participants on a quarterly basis.

AIR NO₂ PT forms an integral part of the UK NO₂ Network's QA/QC, and is a useful tool in assessing the analytical performance of those laboratories supplying diffusion tubes to Local Authorities for use in the context of Local Air Quality Management (LAQM).

With consent from the participating laboratories, LGC Standards provides summary proficiency testing data to the LAQM Helpdesk for hosting on the webpages, at <http://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html>.

This information is updated on a quarterly basis following completion of each AIR PT round.

ESG Scientifics, at Didcot achieved a score of satisfactory during 2015.

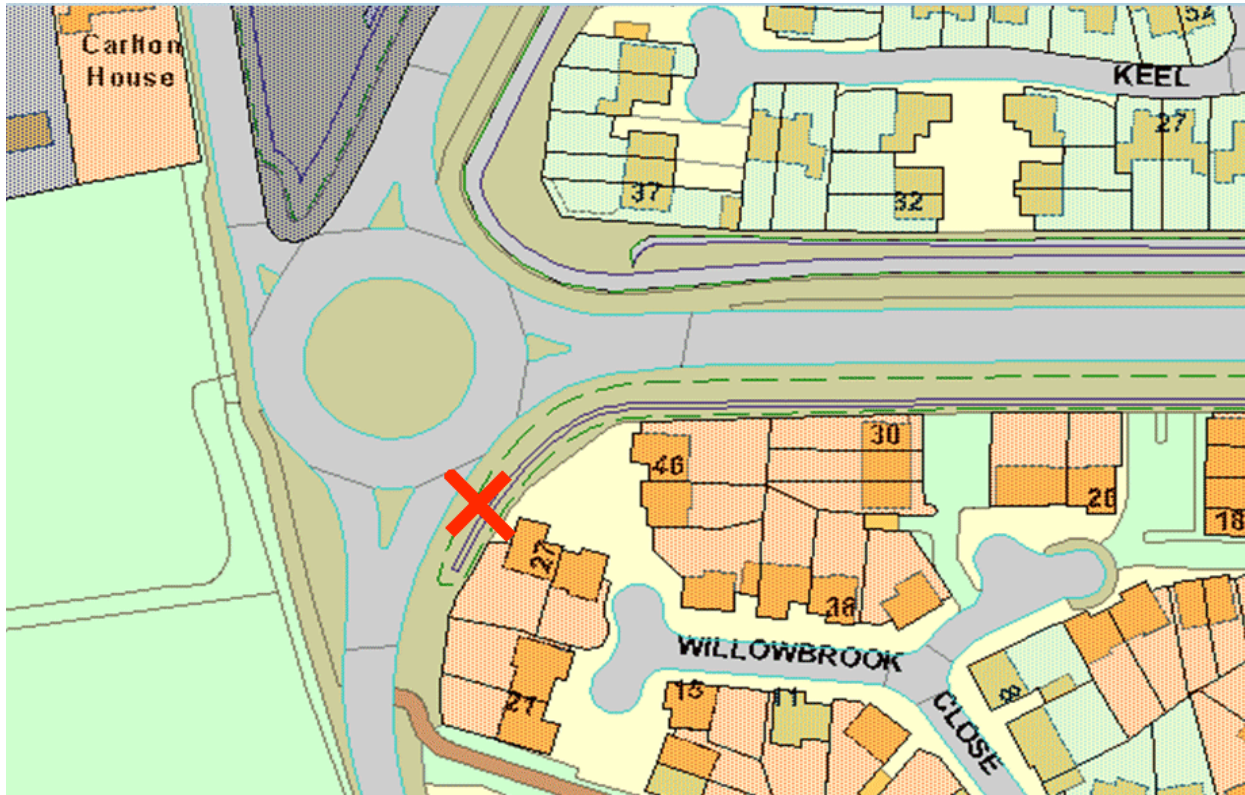
Method used to predict NO₂ Concentrations at Different Distances from the Road

The monitoring sites are located in the areas of concern to represent the worst-case public exposure, but it is not always possible to measure concentrations at the desired location because of practical reasons and in most cases the relevant public exposure is located a short distance away. The calculator described in LAQM. TG(09) has been used to predict concentrations at the nearest point of relevant public exposure. Results derived in this way will have a greater uncertainty than measured data and this uncertainty increases as the distance between the measuring location and relevant receptor grows larger.

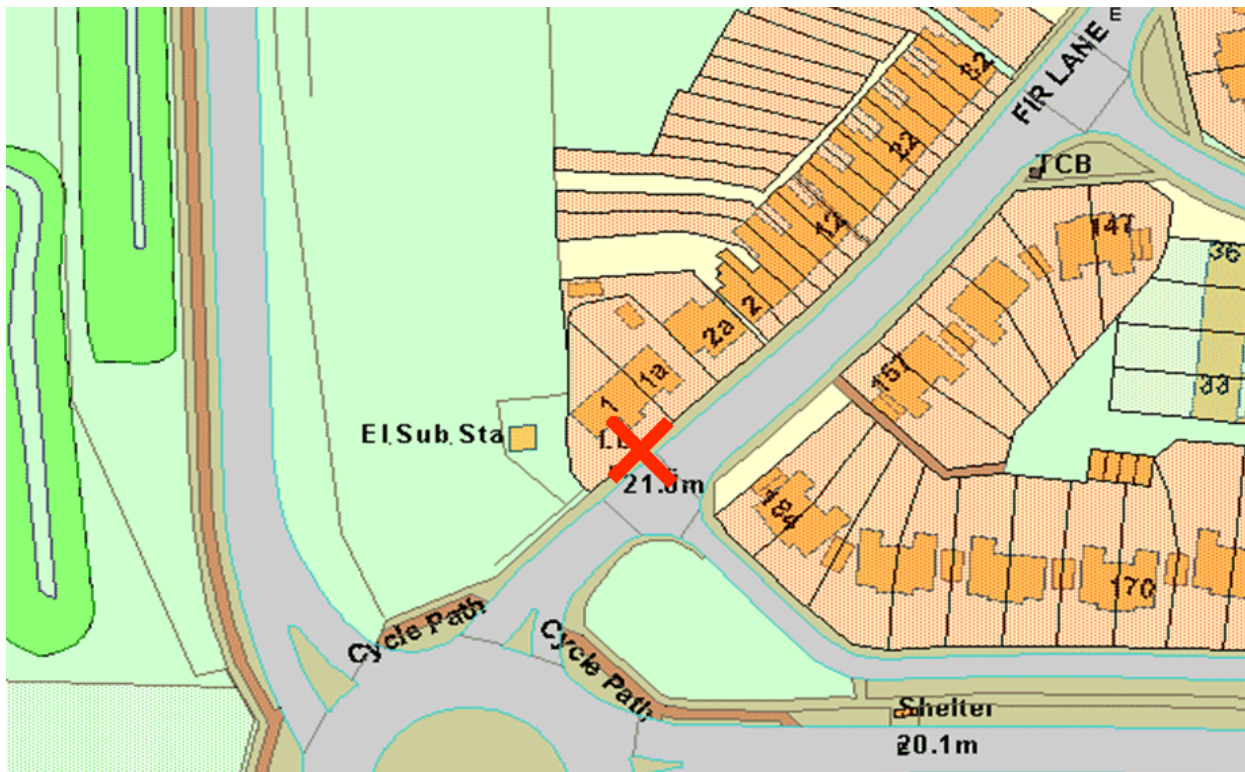
The calculator as a spreadsheet is available on <http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>

The local background concentration in $\mu\text{g}/\text{m}^3$ of the appropriate year (2015) has been obtained from the national maps published at <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2011>

Appendix D: Map(s) of Monitoring Locations



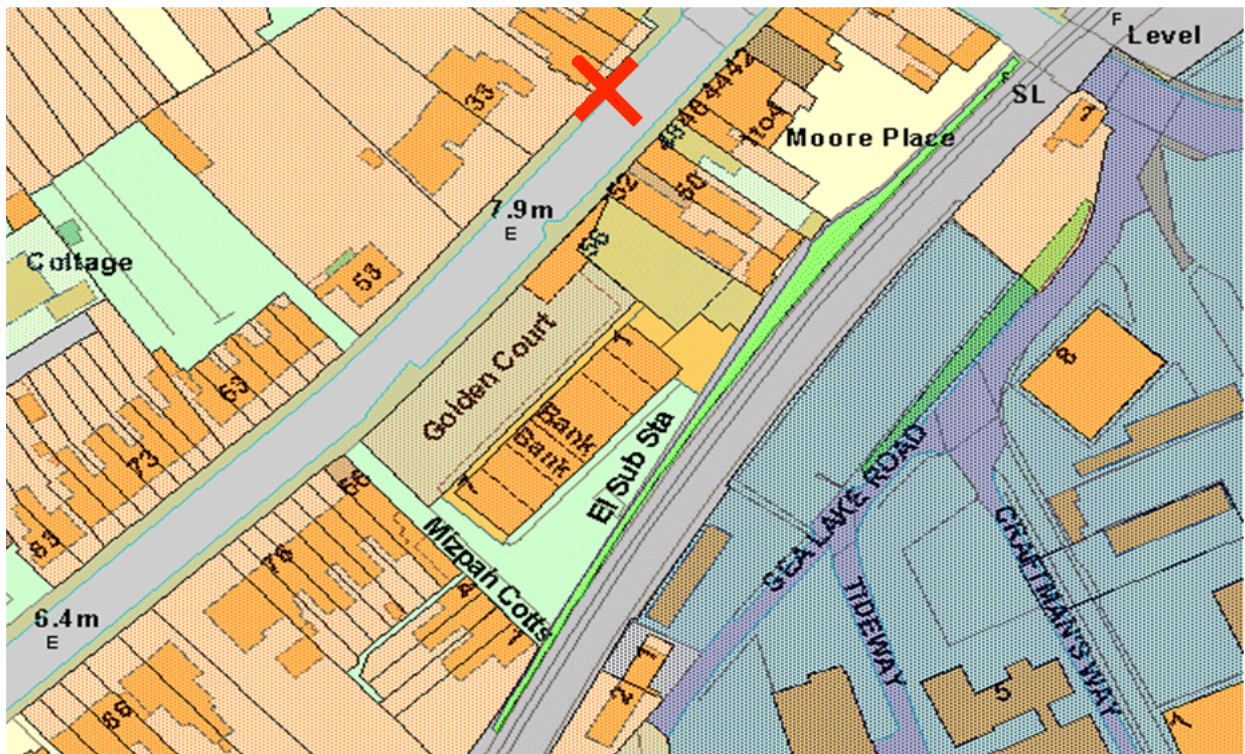
Diffusion Tube Site DT1: Castleton Avenue, Carlton Colville



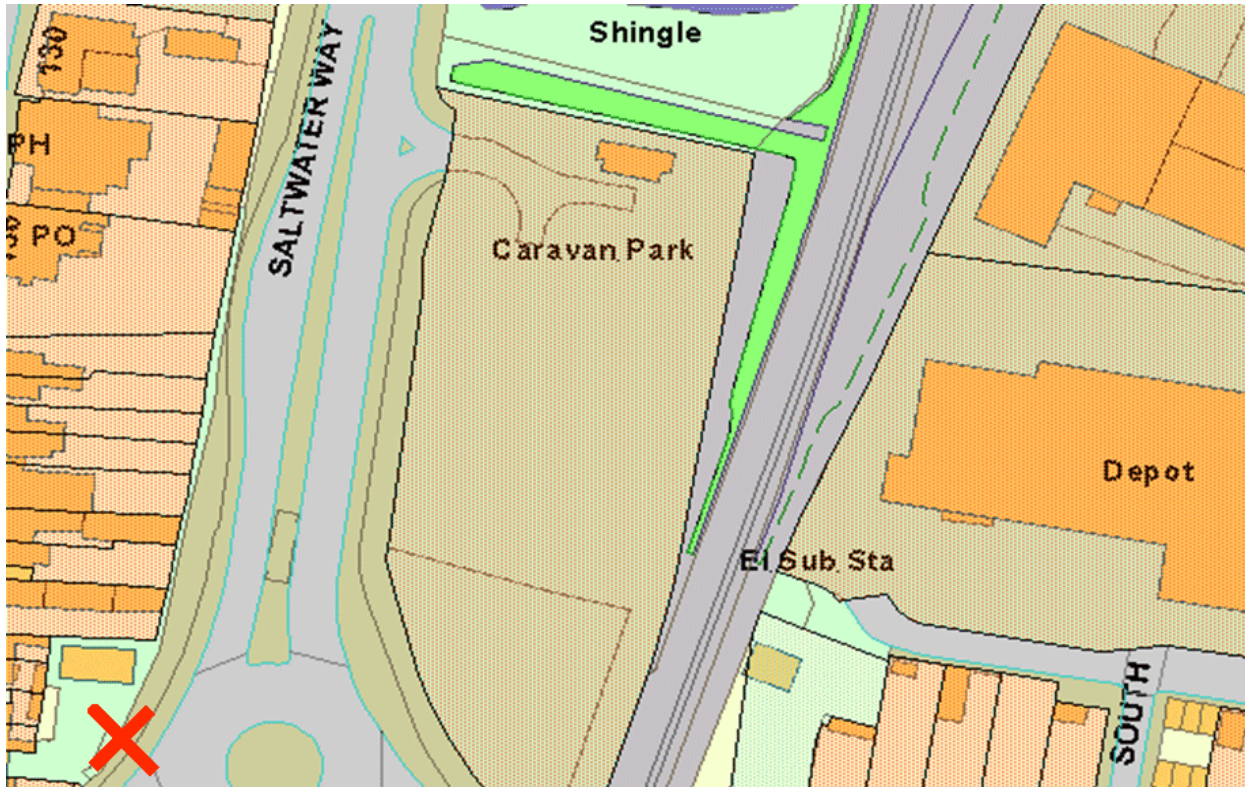
Diffusion Tube Site DT2: Fir Lane, Lowestoft



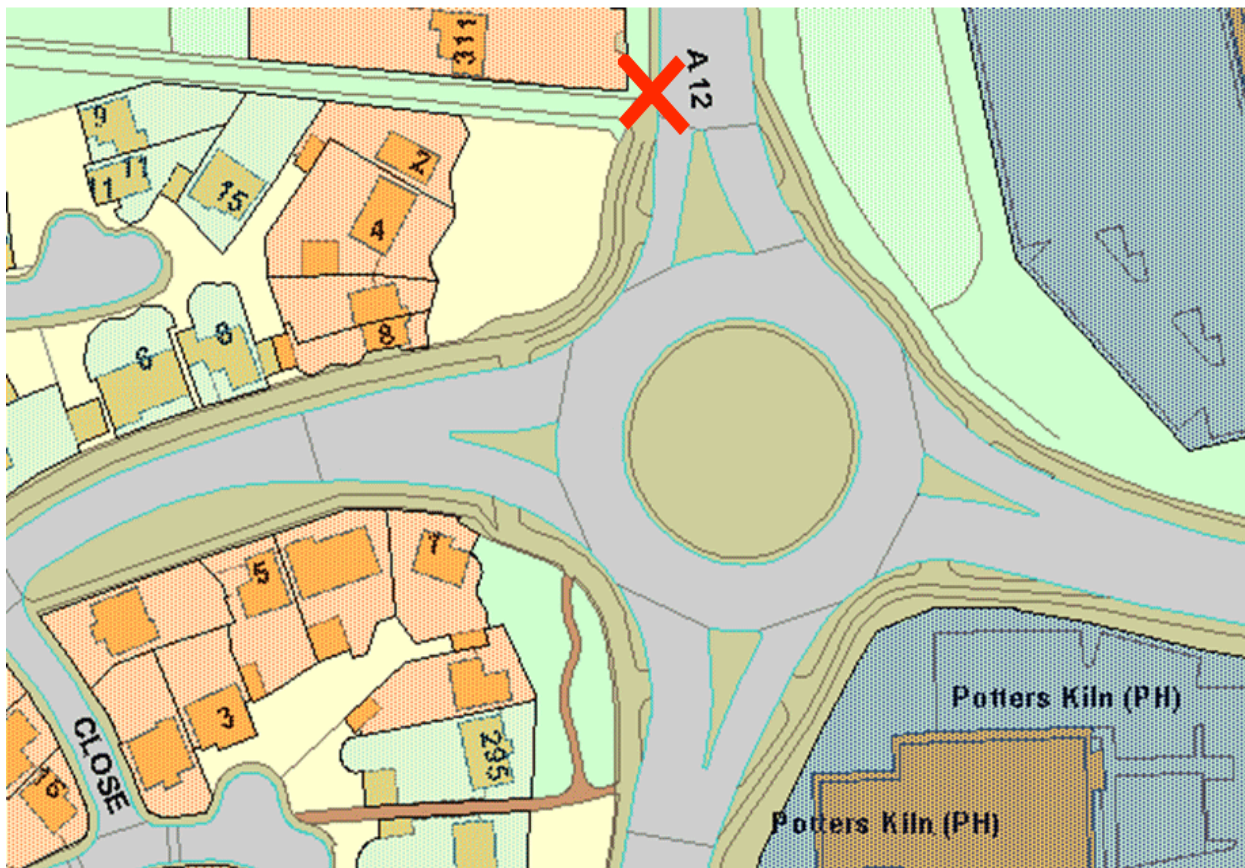
Diffusion tube site DT3 :The Flying Dutchman, Cotmer Road, Oulton Broad



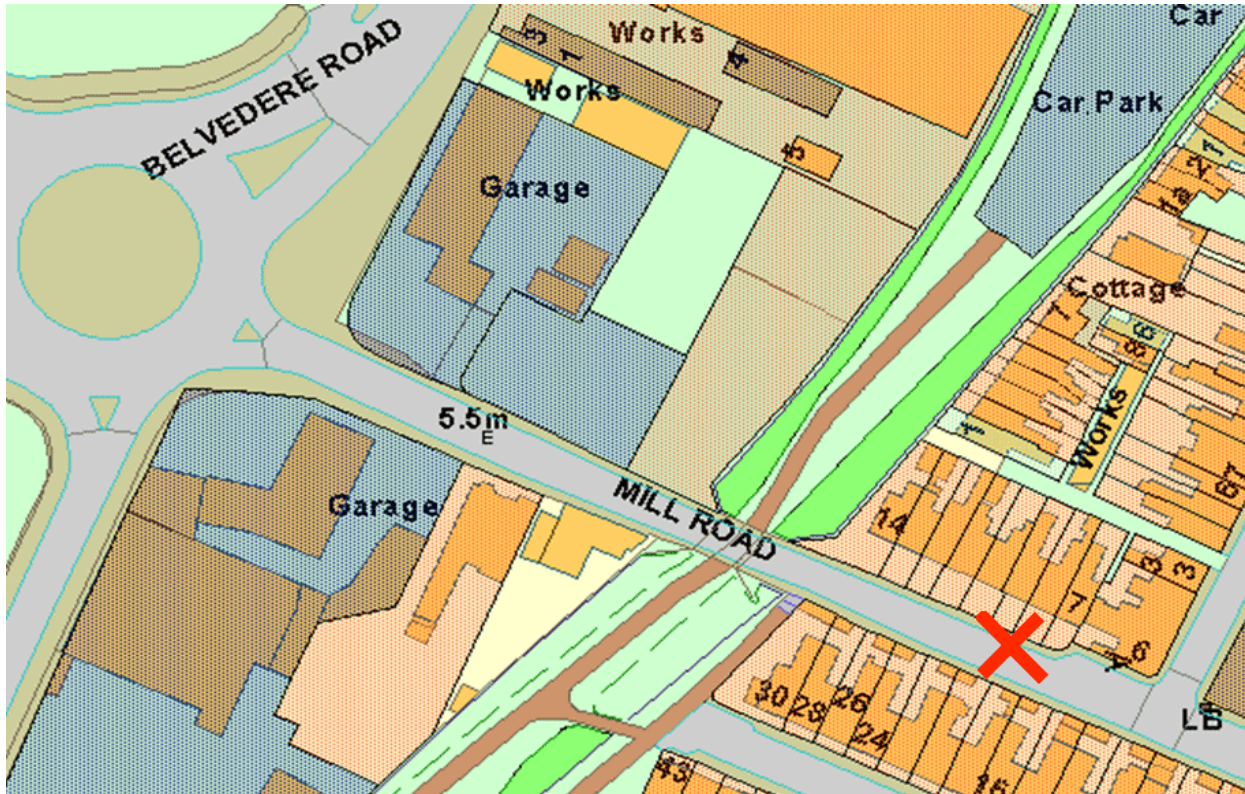
Diffusion Tube Site DT4 : Golden Court, Bridge Road, Oulton Broad



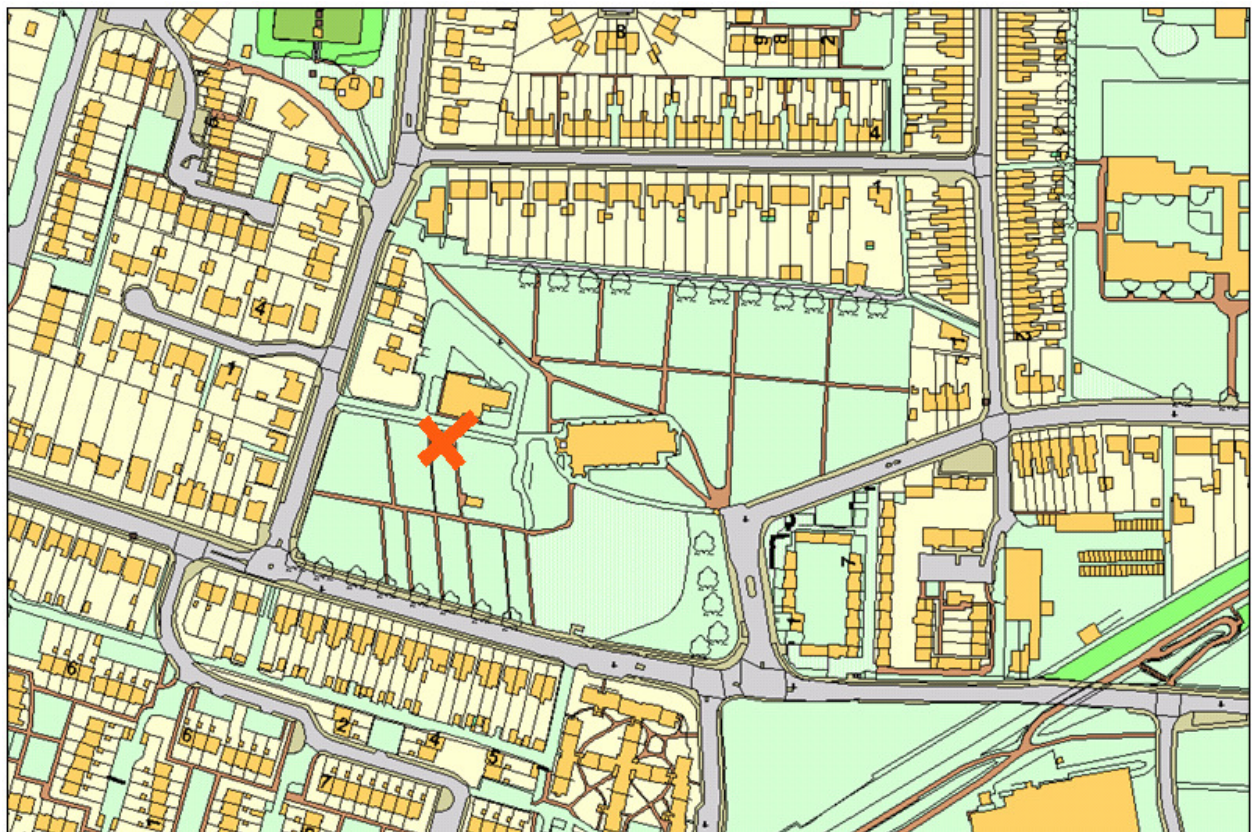
Diffusion Tube Site DT5 : Saltwater Way, Oulton Broad



Diffusion Tube Site DT6 : Yarmouth Road, Lowestoft



Diffusion Tube Site PN7 : Mill Road, Lowestoft



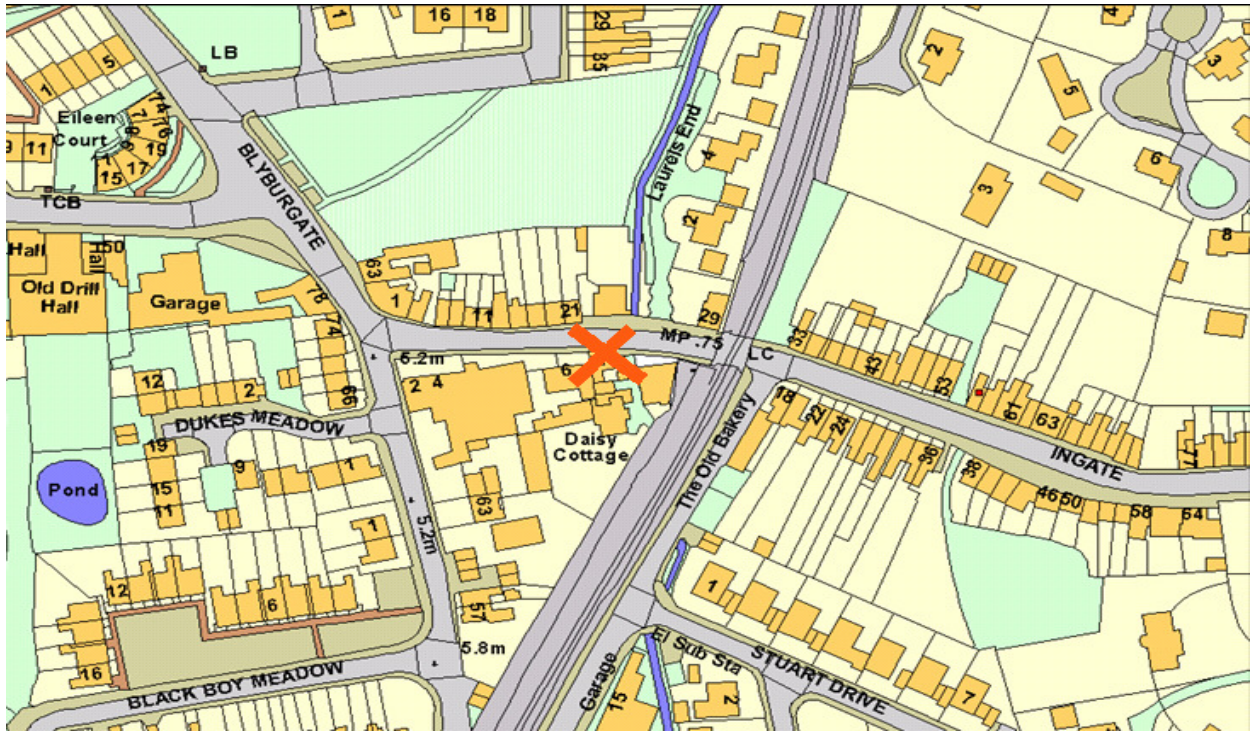
Diffusion Tube Monitoring Site DT8 St Margaret's Churchyard



Diffusion Tube Site DT9/10/11/12 : Pier Terrace/Belvedere Road, Lowestoft



Diffusion tube sites DT13 : Trinity Street, Bungay



Diffusion Tube Site DT14/15 : Ingate, Beccles

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective ⁴	
	Concentration	Measured as
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

⁴ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Please add a description of any abbreviation included in the ASR – An example is provided below.

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide
...	...

References

Air Quality Review and Assessment Progress Report on Air Quality In Waveney (2007), AEA Technology plc, Report AEAT/ENV/R/2562

Air Quality Review and Assessment Progress Report on Air Quality in Waveney (2008), AEA Technology plc, Report AEAT/ENV/R/2645

Air Quality Updating and Screening Assessment Report on Air Quality in Waveney I (2009), AEA Technology plc, Report AEAT/ENV/R/2805.

Air Quality Review and Assessment Progress Report on Air Quality in Waveney District (2010)

Air Quality Review and Assessment Progress Report on Air Quality in Waveney District (2011)

Air Quality Updating and Screening Assessment on Air Quality in Waveney District (2012)

Air Quality Review and Assessment Progress Report on Air Quality in Waveney District (2013)

Air Quality Review and Assessment Progress Report on Air Quality in Waveney District (2014)

Air Quality Updating and Screening Assessment on Air Quality in Waveney District (2015)

Department for Environment, Food and Rural Affairs (2007), The Air Quality Strategy for England, Scotland, Wales and Northern Ireland.

Department for Environment, Food and Rural Affairs, Part IV of the Environment Act 1995.

Local Air Quality Management, Technical Guidance, LAQM. TG (16), April 2016

Defra, Local Air Quality Management Policy Guidance (PG16), April 2016

The Air Quality (England) Regulations 2000(SI 928, The Air Quality (England) (Amendment) Regulations 2002 (SI3043)

The Stationary Office (1995), The Environment Act1995, Part IV

UK National Air Quality Information, accessed at <http://www.airqualityengland.co.uk/laqm>

Waveney District Council

Local Air Quality Management: Note on Predicting NO₂ Concentrations, April 2012, prepared for DEFRA by Bureau Veritas (laqm.defra.gov.uk/review and [assessment/tools/background-maps](http://laqm.defra.gov.uk/assessment/tools/background-maps))

Local Air Quality Management 2014 NO_x NO₂ PM₁₀ CSV Format Background Maps at <http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2011>.

NO₂ Diffusion Tubes for LAQM: Guidance Note for Local Authorities, Prepared for Defra and the Devolved Administrations, AEAT/env/r/2140/Issue 1, March 2006.

Air Quality Consultants Ltd, Nitrogen Dioxide fall off with Distance Calculator accessed on the Local Air Quality Management Support Website at <http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>

Air Quality Consultants Ltd Spreadsheet of Bias Adjustment Factors (09/15) accessed on the Local Air Quality Management Support Website at <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>