

Peterborough City Council



2009 Air Quality Updating and
Screening Assessment for
*PETERBOROUGH CITY
COUNCIL*

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

30 April 2009

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Executive Summary

The air quality review and assessment process forms part of local air quality management (LAQM) carried out by Peterborough City Council. LAQM provides a means of achieving improvements in air quality to help secure national air quality objectives. National air quality objectives are set out in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland.

The first Air Quality Review and Assessment in Peterborough was carried out by Peterborough City Council in 1998. Results showed the air quality objectives were likely to be achieved by the relevant deadline in all areas of the local authority. As a result no Air Quality Management Areas were required in Peterborough.

The second and third Air Quality Review and Assessment in Peterborough was carried out by Peterborough City Council in 2003 and 2006 respectively. Results showed the air quality objectives were likely to be achieved by the relevant deadline in all areas of the local authority except for the village of Thorney. A bypass was planned to bypass the village which was due to be completed by 2005, therefore, no Air Quality Management Areas were required in Peterborough.

The aim of this Updating and Screening Assessment (USA) of air quality in Peterborough is to identify matters that have changed since the last review and assessment which might lead to a risk of an air quality objective being exceeded.

The USA was carried out according to 'Local Air Quality Management Technical Guidance' LAQM.TG (09) and its update published in February 2009. The conclusion of the assessment is that all the air quality objectives listed in Table 1.0 will be met by the relevant deadlines, with the exception of SO₂ which will be exceeded due to an industrial process located outside Peterborough in Fenland District Council.

A detailed assessment for the pollutants listed in Table 1 is only necessary for the SO₂ 15 minute mean value, and I believe Fenland council has already acted on this. Peterborough City Council will review its Air Quality Strategy and carry out a further progress reports in 2010.

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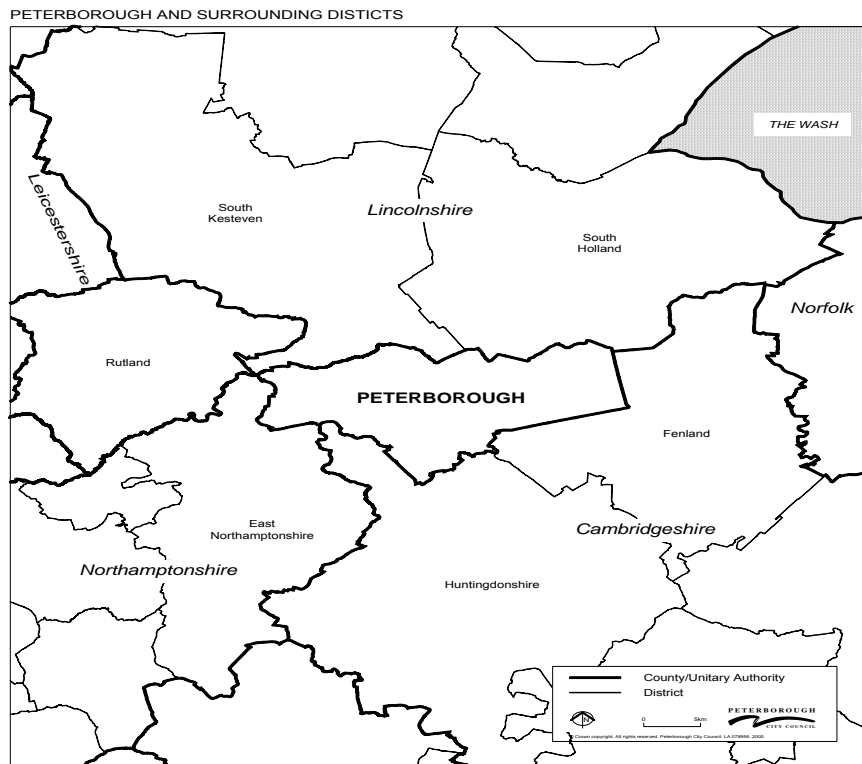
Figure 1 Peterborough and surrounding districts

1 Introduction

1.1 Description of Local Authority Area

Peterborough district covers an area of 343.44 km² and is made up of a variety of landscapes. Although dominated by the city of Peterborough, the eastern part of the district is composed of rich arable farmland, with the population dispersed across the flat land in many scattered farmsteads. In contrast, the western area is more undulating, with a more mixed farming economy and a population concentrated within the area's many villages. Figure 1 shows Peterborough and surrounding districts.

Figure 1 Peterborough and surrounding districts



From medieval times to the start of the Industrial Revolution, Peterborough was little more than a small market town on the edge of the Fens, though Henry VIII granted it city status in 1541. For many centuries the river was an important highway and the Customs House still stands today alongside the Town Bridge. Its real growth started in the mid-19th century, with the arrival of the railways. Peterborough soon became a major railway junction and attracted a number of heavy industrial companies.

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By the late 1960s, the New Towns programme had begun. Peterborough was designated a New Town in 1968, and the Peterborough Development Corporation was established to double the city's population in close partnership with the City Council. The Master Plan was to concentrate development in four new residential townships, each with a full range of social and economic facilities with the fourth township, Hampton, now being built to the south of the city. In April 1998 the City Council achieved Unitary Status and is now responsible for all local government services in the district.

The Draft East of England Plan or Regional Spatial Strategy (RSS) sets out the regional strategy for planning and development in the East of England to the year 2021, and reflects the Government's Sustainable Communities agenda (*Sustainable Communities: building for the future [ODPM, 2003]*), which includes Peterborough within the London-Stansted-Cambridge-Peterborough Growth Corridor. The Examination in Public Panel, which sat through November 2005 – March 2006, has recommended that Peterborough's total housing provision be increased to 25,000 dwellings and jobs provision to 20,000 over the plan period 2001-2021. This represents significant growth and a steep change in the rate of provision will be required in order to deliver this.

Peterborough is mid-way between the East Anglian coast and the Midlands and has excellent road and rail connections both north-south and east-west. The city is 78 miles from London, five miles from the A1(M), and less than 20 miles from the A14, which links the East Coast ports of Felixstowe and Harwich with the Midlands.

The city is on the East Coast main rail line, which links London with Leeds, York, Newcastle, Edinburgh and Glasgow while London itself is less than 50 minutes away by train. An east-west rail line links Peterborough with Norwich, Great Yarmouth, Leicester, Birmingham and beyond.

Climate

Peterborough is located in Cambridgeshire whose easterly location is furthest from the landfall of most Atlantic depressions, as a result its climate is one of the most 'continental' in Britain. The State of the Environment Report (Cambridgeshire and Peterborough) 1998 outlines Cambridgeshire's environment, a summary of which is given below.

Day-to-day weather conditions, and even seasonal averages in the region, are governed largely by which air masses most frequently affect the County. A period of westerly maritime air streams is likely to bring a spell of mild moist weather but as they tend to cool and dry as they cross western and central Britain, they are rarely as warm or wet as further west. A period under the influence of easterly continental air streams is likely to bring the most extreme conditions; hot dry spells in summer but very cold and sometimes snowy weather during the winter.

Cambridgeshire is one of the driest counties in the British Isles, only Essex is sometimes drier. Most places in the county receive, on average, less than 600mm of rain per annum. Precipitation is approximately equally distributed over the year.

Compared with other parts of Britain, East Anglia is hot and sunny in the summer but cold and frosty in the winter. Cambridgeshire's inland location within East Anglia provides some protection from cool onshore breezes that affect coastal parts of the region in summer.

Traffic impacts, includes one of the major sources contributing to the deterioration of air quality in Peterborough. **Prescribed Processes (A1), (A2) and (B)** also release significant quantities of specified pollutants into the atmosphere which may have an impact on air quality.

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 exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

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. This table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1. Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
Particles (PM₁₀) (gravimetric)	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

This USA was carried out according to Local Air Quality Management Technical Guidance LAQM. TG (03) and the LAQM.TG (03) update released in January 2006. It has indicated that all the air quality objectives listed in Table 2 will be met by the relevant deadlines, with the exception of SO₂ 15 minute mean value of 266 µg/m³. This exceedence is from an industrial source located in Fenland District Council. The 2010 PM₁₀ indicative limit values are likely to exceed as well, however, Peterborough City Council has no statutory obligation to assess air quality against these limit values but has done so in order to assist with long term planning. Air Quality Management Areas (AQMAs) are only required in areas where air quality objectives will not be achieved. In September 2006 Fenland District Council's Detailed Assessment declared an Air Quality Management Area based on modeling carried out by Hanson Brick Products in their Air Quality Management Plan (Hanson, 2004). This modeling indicated that the 15-minute sulphur dioxide objective was also being exceeded at relevant locations within Peterborough. Following consideration of the information supplied by Fenland District Council, Peterborough City Council determined an Air Quality management area to the north west of the works in April 2007. This AQMA was in relation to emissions of sulphur dioxide from a point source industrial premise exceeding the 15 minute mean objective level of 266 µg/m³ not to be exceeded more than 35 times a year.

Table 2 Peterborough City Council conclusion of air quality objectives

Pollutant	Air quality objective			Date to be achieved by	Achieved
	Concentration		Measured as		
Benzene	16.25	µg/m ³	Running annual mean	31.12.2003	Yes
	5.00	µg/m ³	Annual mean	31.12.2010	Yes
1,3-butadiene	2.25	µg/m ³	Running annual mean	31.12.2003	Yes
Carbon Monoxide	10.0	mg/m ³	Maximum daily running 8-hour mean	31.12.2003	Yes
Lead	0.5	µg/m ³	Annual mean	31.12.2004	Yes
	0.25	µg/m ³	Annual mean	31.12.2008	Yes
Nitrogen Dioxide	200	µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005	Yes
	40	µg/m ³	Annual mean	31.12.2005	Yes
Particles (PM ₁₀)	50	µg/m ³ not to be exceeded more than 35 times a year	24-hour mean	31.12.2004	Yes
	40	µg/m ³	Annual mean	31.12.2004	Yes
Sulphur dioxide	350	µg/m ³ not to be exceeded more than 24 times a year	1-hour mean	31.12.2004	Yes

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	125	$\mu\text{g}/\text{m}^3$ not to be exceeded more than 3 times a year	24-hour mean	31.12.2004	Yes
	266	$\mu\text{g}/\text{m}^3$ not to be exceeded more than 35 times a year	15-minute mean	31.12.2005	No

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

There were no Automatic Monitoring Sites for the period of this review and assessment.

2.1.2 Non-Automatic Monitoring

Peterborough City Council currently monitors Nitrogen Dioxide (NO₂) at 16 sites within the Local Authority Area. Other sites have been monitored around Peterborough in previous years but monitoring at these sites ceased following the completion of monitoring programmes for these locations. Only the current locations have been considered for this report. These sites are a mixture of urban background, roadside and kerbside. Table 3 and 4 shows the different site types and a brief description of the sites that were monitored in 2006 and 2007 respectively.

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Table 3 Details of Non- Automatic Monitoring Sites for NO₂ in 2006

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location ?
Example 1	Urban background	X 332395 Y 433175	NO ₂	Y	Y (1m)	3m	Y
Copeland	Urban Background		NO ₂	N	Y	N/A	
Lythmere	Urban Background		NO ₂	N	Y	N/A	
Stanground	Urban Background		NO ₂	N	N	N/A	
Walton	Roadside		NO ₂	N	N	5m	
Bourges Boulevard	Roadside		NO ₂	N	N	5m	
Fletton Parkway (1)	Roadside		NO ₂	N	N	5m	
Fletton Parkway(2)	Roadside		NO ₂	N	N	5m	
Thorney S1 (b)	Kerbside		NO ₂	N	Y	1m	
Thorney 2TA (1)	Kerbside		NO ₂	N	Y	1m	
Thorney 2TA (2)	Kerbside		NO ₂	N	Y	1m	
Thorney S7	Kerbside		NO ₂	N	Y	1m	
Thorney S3	Kerbside		NO ₂	N	Y	1m	
Thorney S4	Kerbside		NO ₂	N	Y	1m	
Thorney S5	Kerbside		NO ₂	N	Y	1m	
Thorney S6	Kerbside		NO ₂	N	Y	1m	
Thorney S2	Kerbside		NO ₂	N	Y	1m	

Table 4 Details of Non- Automatic Monitoring Sites for NO₂ in 2007

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location ?
Example 1	Urban background	X 332395 Y 433175	NO ₂	Y	Y (1m)	3m	Y
Copeland	Urban Background		NO ₂	N	Y	N/A	
Lythmere	Urban Background		NO ₂	N	Y	N/A	
Stanground	Urban Background		NO ₂	N	N	N/A	
Walton	Roadside		NO ₂	N	N	5m	
Bourges Boulevard	Roadside		NO ₂	N	N	5m	
Fletton Parkway (1)	Roadside		NO ₂	N	N	5m	
Fletton Parkway(2)	Roadside		NO ₂	N	N	5m	
Lincoln Road 1	Roadside		NO ₂	N	Y	5m	
Lincoln Road 2	Roadside		NO ₂	N	Y	5m	
Thoney by-pass	Roadside		NO ₂	N	N	5m	
Thorney S1 (b)	Kerbside		NO ₂	N	Y	1m	
Thorney 2TA (1)	Kerbside		NO ₂	N	Y	1m	
Thorney 2TA (2)	Kerbside		NO ₂	N	Y	1m	
Thorney S7	Kerbside		NO ₂	N	Y	1m	
Thorney S3	Kerbside		NO ₂	N	Y	1m	
Thorney S4	Kerbside		NO ₂	N	Y	1m	
Thorney S5	Kerbside		NO ₂	N	Y	1m	
Thorney S6	Kerbside		NO ₂	N	Y	1m	
Thorney S2	Kerbside		NO ₂	N	Y	1m	

All the results shown for the diffusion tubes are calculated after taking into account the laboratory bias. Laboratory bias must be determined and allowed for when using diffusion tubes, as there is considerable difference nationally in the performance of tubes prepared by different laboratories. The bias adjustment factor can be calculated by the collocation of tubes with a chemiluminescence monitor. However, if the local authority does not have a chemiluminescence monitor then they can obtain the bias factor from work undertaken by Air Quality Consultants Ltd on behalf of DEFRA see <http://www.uwe.ac.uk/aqm/review/examples/index.html> for how this was undertaken and the bias factors to be used.

Nitrogen Dioxide Diffusion Tubes are provided and analysed by Harwell Scientifics Limited. The samples are analysed in accordance with Harwell Scientifics standard operating procedure HS/GW1/1015 issue 7. The tubes are prepared by spiking acetone: triethanolamine (50:50) onto the grids prior to the tubes being assembled. The tubes are desorbed with distilled water and the extract analysed using a segmented flow autoanalyser with ultraviolet detection.

The techniques involved in the preparation and analysis of nitrogen dioxide are covered by methods listed in Harwell's UKAS schedule. In the WASP inter comparison scheme for comparing spiked

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Nitrogen Dioxide diffusion tubes, Harwell Scientifics is currently ranked as a Category Good laboratory. Further information on diffusion tube bias, including results of collocation studies from across the UK, is available on the Review and Assessment Helpdesk www.uwe.uk/aqm/review

2.2 Comparison of Monitoring Results with AQ Objectives

Peterborough City Council currently monitors Nitrogen Dioxide (NO₂) at 16 sites within the Local Authority Area. Other sites have been monitored around Peterborough in previous years but monitoring at these sites ceased following the completion of monitoring programmes for these locations. However in 2007 following the completion of a by-pass around the village of Thorney the majority of diffusion tubes have been moved to new locations around the councils borders.

2.2.1 Nitrogen Dioxide

Table 5 and 6 shows the nitrogen dioxide levels in micrograms per cubic metre ($\mu\text{g}/\text{m}^3$) for Peterborough's sites for the year 2006 and 2007 as well as the objective values for 2005 and the estimated values for 2010, using the conversion factor supplied in the technical guidance (LAQM.TG (09)). The UK objectives give the annual mean limit for nitrogen dioxide to be $40\mu\text{g}/\text{m}^3$ at relevant locations. Out of the 16 sites monitored in Peterborough in 2006 and 2007 no relevant locations exceeded the objectives. The only exceedence seen relate to kerbside locations for which objectives do not apply. (Local Air Quality Management: Technical Guidance p1-10)

Table 5 NO₂ in $\mu\text{g}/\text{m}^3$ levels for 2006, the estimated level for 2010 and the objective values.

Site Location	2006 $\mu\text{g}/\text{m}^3$³⁺	Estimated 2010 $\mu\text{g}/\text{m}^3$³⁺	2005 & 2010 $\mu\text{g}/\text{m}^3$ objective value
Copeland	19	16	40
Lythmere	18	16	40
Stanground	22	19	40
Walton	26	22	40
Bourges Boulevard	38	32	40
Fletton Parkway	41	35	40
Fletton Parkway	45	38	40
Thorney S1(b)	19	16	40
Thorney 2TA	24	21	40
Thorney 2TA	23	19	40
Thorney S7	21	17	40
Thorney S3	20	17	40
Thorney S4	23	20	40
Thorney S5	17	14	40
Thorney S6	22	19	40
Thorney S2	16	14	40

+ Values are bias adjusted

Table 6 NO₂ in µg/m³ levels for 2007 and the objective levels for 2005 & 2010.

Site Location	2007 ug/m ³⁺	2005 & 2010 ug/m ³ objective value
Copeland	20	40
Lythmere	17	40
Stanground	28	40
Walton	28	40
Bourges Boulevard	42	40
Fletton Parkway	47	40
Fletton Parkway	51	40
Thorney Village*	27	40
Wittering*	37	40
Hampton*	27	40
Fletton*	30	40
London Road*	40	40
Oundle Road	32	40
Lincoln Road (2TA1) *	35	40
Lincoln Road (2TA2) *	35	40
Thorney By-pass*	34	40
Thorney S1(b) *	17	40
Thorney 2TA*	23	40
Thorney 2TA*	21	40
Thorney S7*	18	40
Thorney S3*	22	40
Thorney S4*	20	40
Thorney S5*	27	40
Thorney S6*	15	40
Thorney S2*	17	40

+ Values are bias adjusted

* Not a full year's value (tube locations were changed following completion of Thorney Bypass)

Moreover, of the 16 sites monitored in 2008 no relevant locations exceeded the objectives. The only exceedences seen relate to kerbside locations for which objectives do not apply. However, Peterborough City Council received the response from DEFRA on the Progress Report 2006 in January 2007. In this DEFRA had the following comment.

“It is unclear from the large scale map provided in Appendix 1, where exactly the roadside diffusion tubes at Fletton Parkway (which are currently measuring exceedences of the annual mean objective) are located in relation to the closest properties in Hoylake Drive; however they are described as not being representative. It is recommended that the Council give consideration to moving these diffusion tubes to the façade of the closest residential properties in Hoylake Drive to Fletton Parkway as there appear to be a number of properties located around 10 m from the closest carriageway.”

In light of the above DEFRA recommendations the 2 diffusion tubes on Fletton Parkway have now been moved (July 2008) into Hoylake Drive. Since the slip road is no longer in use it has been calculated that the nearest properties to the closest carriageway are around 16m away. The new location has been chosen to reflect this.

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Table 7 NO₂ in µg/m³ levels for 2008 and the objective levels for 2005 & 2010.

Site Location	2008 ug/m ³⁺	2005 & 2010 ug/m ³ objective value
Copeland	24	40
Lythmere	23	40
Stanground	31	40
Walton	34	40
Bourges Boulevard	52	40
Fletton Parkway	49	40
Fletton Parkway	48	40
Thorney Village	34	40
Wittering	36	40
Hampton	23	40
Fletton	34	40
London Road	34	40
Oundle Road	29	40
Lincoln Road (2TA1)	40	40
Lincoln Road (2TA2)	37	40
Thorney By-pass	31	40

+ Values are bias adjusted

Diffusion Tube Monitoring Data

In half of the monitoring sites for the year 2008, the available valid data are less than 90%. This is as a result of the monitoring tubes being missing when collection took place, meaning analysis was not possible.

Table 8 Results of Nitrogen Dioxide Diffusion Tubes for 2008

Site ID	Location	Within AQMA?	Data Capture 2008 %	Annual mean concentrations
				2008 ($\mu\text{g}/\text{m}^3$) Adjusted for bias
A1	1 Example Site	N	95	
	Copeland	N	100	24
	Lythmere	N	100	23
	Stanground	N	100	31
	Walton	N	83	34
	Bourges Boulevard	N	100	52
	Fletton Parkway	N	92	49
	Fletton Parkway	N	100	48
	Thorney Village	N	83	34
	Wittering	N	83	36
	Hampton	N	100	23
	Fletton	N	100	34
	London Road	N	42	34
	Oundle Road	N	75	29
	Lincoln Road (2TA1)	N	50	40
	Lincoln Road (2TA2)	N	75	37
	Thorney By-pass	N	83	31

+ Values are bias adjusted

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Peterborough City 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

Peterborough City 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.

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

3.4 Junctions

Peterborough City Council confirms that there are no new/newly identified busy junctions/busy roads.

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

Peterborough City Council has assessed new/newly identified junctions meeting the criteria in section A.4 of Box 5.3 in TG(09), and concluded that it will not be necessary to proceed to a Detailed Assessment.

3.6 Roads with Significantly Changed Traffic Flows

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

3.7 Bus and Coach Stations

Peterborough City Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

Peterborough City Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

Diesel and coal-fired locomotives emit sulphur dioxide, which if stationary for periods of 15 minutes or more, may contribute to an exceedance of the 15-minute objective (DEFRA, 2003). However, Peterborough City 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

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

4.3 Ports (Shipping)

Peterborough City 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

Since the second round of review and assessment, there have been no new part A or B industrial processes authorised in Peterborough or the surrounding area with the potential to emit significant quantities of particles.

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

Peterborough City 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

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

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

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

5.2 Major Fuel (Petrol) Storage Depots

Peterborough City Council confirms there are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

Peterborough City Council has identified 8 of the current 21 petrol stations meeting the specified criteria, and **will need to proceed to a Detailed Assessment for benzene**. However, as the council is committed to ensure all the affected petrol stations fit the stage II vapour recovery systems prior to January 2010, we are of the opinion that the detailed assessment may not be necessary. A few of the affected locations has already submitted their application for the installation of the stage II vapour recovery system.

5.4 Poultry Farms

Peterborough City Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

Peterborough City Council confirms that there are no biomass combustion plants in the Local Authority area.

6.2 Biomass Combustion – Combined Impacts

Peterborough City Council confirms that there are no biomass combustion plants in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

Exceedence of the sulphur dioxide objectives may occur in areas where solid fuels are the predominant form of domestic heating; e.g. in an area of 500 x 500m where there may be more than 100 houses burning solid fuel as their primary source of heating (DEFRA, 2003).

The previous Updating and Screening Assessment concluded that there are no areas in Peterborough where burning solid fuel is the primary source of heating. No new housing developments in Peterborough have used solid fuel as the primary source of heating. Therefore a detailed assessment for sulphur dioxide from domestic coal burning in Peterborough is not required.

Therefore, Peterborough City Council can confirm that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

Quarries and landfill sites may be significant sources of PM₁₀. This is because at any location where dust is emitted, a proportion, (typically around 20%) will be present as PM₁₀. However, the significance and resultant impacts of dust emissions from these sources are dependant upon the amount of dust created, the proximity of dust sensitive locations to the sources of dust, and the prevailing meteorological conditions for that location.

However, with the exception of the previous sites identified in the previous report, there has been no substantiated complaint received regarding dust emissions from sites and therefore Peterborough City 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

This USA was carried out according to Local Air Quality Management Technical Guidance (LAQM TG 09). Monitoring has indicated that all the air quality objectives listed in Table 1 will be met by the relevant deadlines, with the exception of SO₂ 15 minute mean value. This exceedence is from an industrial source located in Fenland District Council of which an action plan has already been put in place by the council to contain and reduce the emissions. Air Quality Management Areas (AQMAs) are only required in areas where air quality objectives will not be achieved. A detailed Assessment may be required for Benzene in respect of petrol stations meeting the specified criteria in the technical guidance (see Section 5.3)

The by-pass built around the village of Thorney has reduced the levels of NO₂ to below the objective levels so the diffusion tubes in this area have been moved to new locations in the city.

8.2 Conclusions from Assessment of Sources

There has not been any significant increase in road traffic or any major new roads proposed. The second Local Transport Plan has been produced which is looking at reducing the impact of traffic even further while applications where air quality has been considered have all shown that air quality standards would not be exceeded. However, as said earlier on a Detailed Assessment may need to be undertaken for Benzene in respect of various petrol stations meeting the specified criteria in the technical guidance unless the stage II vapour recovery system is installed.

8.3 Proposed Actions

Previous Updating and Screening Assessment has not identified the need to proceed to a Detailed Assessment for any pollutant apart from SO₂ however, with the introduction of new criteria for benzene monitoring in respect of petrol stations, there may be a need to proceed to a detailed assessment in a few of these locations especially those which have not installed the stage II vapour recovery systems unless this is done.

9 References

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Environment Agency: <http://www.environment-agency.gov.uk>

Environment Agency Pollution Inventory: http://maps.environment-agency.gov.uk/wiyby/dataSearchController?topic=pollution&lang=_e)

Appendices

Appendix 1 Traffic and transport information 2008

Very busy Roads		2007 response	2008 response	2009 response
Single carriageway road with daily average traffic flows which exceed 80,000 vehicles per day	None		None	None
Dual carriageway (2 or 3 lane) with daily average traffic flows which exceed 120,000 vehicles a day	None		None	None
Motorways with daily average traffic flows which exceed 140,000	None		None	None
Busy road				
A road with more than 30,000 vehicles per day	Yes	A15 Lincoln Road 4 A15 Boongate A47 between Junctions 15-20 Town Rail Bridge A1139 Frank Perkins Parkway A1139 Fletton Parkway A1 north of the junction with the A1139 Fletton Parkway. A1260	A47 18 -19 A47 16 - 17 A47 15 - 16 A47 Slips - Junctions 17 - 18 A15 Town Bridge A15 Bourges Boulevard - Junctions 36 - 37 A15 Bourges Boulevard - Junction 18 A15 Bourges Boulevard - Junctions 36 - 40 A15 Lincoln Road North of Junction 18 A15 Rivergate A15 Lincoln Road - Junctions 44 - 45 A1139 Frank Perkins P/Way - Junction 8 A1139 Frank Perkins P/Way A1139 Fletton Parkway A1139 Fletton Parkway - Junctions 1 - 2 A1 North of Wansford A1 Near Water Newton A1 North of Junction 17 A1 East of Wansford A1 South of Junction 17 A1260 Nene Parkway A1260 Nene Parkway South of Junction 15 A1260 Serpentine Green	As 2008 but also including: A15 Paston Parkway – Jn 20 – 8. A47 Soke Parkway – Jn 19 – 20.
Busy junction				
A busy junction can be taken to be one with more than 10,000 vehicles per day	Yes	J18 J36 J40 J41 J42	A47 Junction 18 A15 Junction 36 A15 Junction 40 A15 Junction 41 A15 Junction 42 A15 Junction 18	No change

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		J18 J A15/B1443 J47 J22 J8	Junction A15/B1443 A15 Junction 47 A15 Junction 22 A15 Junction 8	
Heavy duty vehicles (buses & lorries)				
A proportion of heavy duty vehicles which exceed 25% of the daily vehicles per day	Yes		A47 Eye to Thorney (26%)	None – HGV %'s along the A47 between Eye and Thorney only average at about 16 / 17%
More than 2,500 heavy duty vehicles per day	Yes		A47 Thorney Bypass (East) A47 Thorney Bypass (West) A47 Eye - Thorney A47 West of Eye A47 Main - Junctions 17 - 18 A15 Paston Parkway - Junction 8 A15 Paston Parkway - Junctions 20 - 21 A15 Paston Parkway - Junctions 21 - 22 A605 West of A1 A1139 Frank Perkins P/Way - Junction 8 A1139 Frank Perkins P/Way A1139 Fletton Parkway A1139 Fletton Parkway - Junctions 1 - 2 A1 North of Wansford A1 Near Water Newton A1 North of Junction 17 A1 East of Wansford A1 South of Junction 17 A1260 Nene Parkway	As per 2008
New roads constructed/ planned since April 04				
Was there an air quality assessment undertaken for the new road	Yes	Changes to the A1073 improvement scheme	No change from 2007	
Is the traffic flow on the new road over 10,000 vehicles per day?	No new roads opened		n/a	
Significant increases				
Identify any roads with more than 10,000 vehicles per day that have had or expected to have an	None		A15 Rivergate (49%)	None

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increase in traffic flow of more than 25%				
Bus stations				
Collect information on the daily movement of buses at the station.		Mon-Fri. 1012 (+4.5%) Sat 967 (+10.6) Sun 227 (+6%)	Mon-Fri. 1043 (+3.1%) Sat 990 (+2.4%) Sun 242 (+6.6%)	Mon-Fri. 1088 (+4.3%) Sat 1028 (+3.8%) Sun 264 (+9.1%)
Roads with a significant traffic increase				
Identify any roads with more than 10,000 vehicles per day that have had or expected to have an increase in traffic flow of more than 25%	Yes		A15 Rivergate (49%)	

Appendix 2 LPT2 2008

Measure in LTP2	Impact on Air Quality	Scheme progress 2007/08	Scheme/Progress 2008/2009
Travel Choice			
Walking	More people walking and not driving will reduce the pollutants being released by vehicles.	Implementation of pedestrian crossings and dropped kerbs Variety of Smarter choices measures through the Travelchoice project.	Implementation of pedestrian crossings and dropped kerbs. Variety of Smarter choices measures through the Travelchoice project.
Cycling	More people cycling and not driving will reduce the pollutants being released by vehicles	Implementation of cycle parking and resurfacing of a section of the Green Wheel.	Improved cycle parking in inner urban areas of the city, signage audit on whole of primary cycle network. Improved crossing facility for cyclists on Bluebell Avenue (Dodds cycle route).
Buses	More people using public transport and not driving will reduce the pollutants being released by cars	Primary Public Transport Corridor enhancements at bus stops along Shrewsbury Avenue, Oundle Road and in Millfield. RTPI on bus equipment fitted on Stagecoach Citi 3 service along with replacement of antennas on all fitted vehicles. Completion of Stagecoach Citi 6 vehicles and purchase of the Local Link equipment. Site works for Stage 2 on street display installs.	PPTC corridor enhancements Lincoln Road to Mountsteven Avenue. various bus shelter improvements across the city. Stagecoach Citi 7 buses fitted with RTPI technology along with two spare vehicles. Improvements made to bus stops to enable RTPI and on street signs completed across the city for Stage 2.
Individualised Travel Marketing	More people using sustainable transport modes and not driving will reduce the pollutants being released by vehicles	All stages, 1 to 5 now completed. The first phase covered Gunthorpe, Paston, Dogsthorpe, Welland, Newark and Eastfield; phase two covered the 'Werrington corridor'; phase three covered Bretton; phase four is targeting areas of south Peterborough, starting in the Ortons and residents in Fletton and Stanground were contacted as phase five.	Scheme completed in 2008. Final behaviour research carried out in late 2008 (repeat of 2004 baseline, 4000 surveys plus 400 interview) showed an average 9% reduction in car driver trips.
Travel planning (business,	Reduced car use contributes to less	Travel plan awards ceremony held in	Travel plan awards ceremony held in

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residential and school)	pollutants emitted.	November 2007. 18 companies from Peterborough received awards for workplace travel plans. Residential and workplace travel plans (plus transport contributions) secured through the planning process.	October 2008. 15 companies from Peterborough received awards for workplace travel plans. Residential and workplace travel plans (plus transport contributions) secured through the planning process.
Traffic Management			
ITS	Vehicles release more pollutants when in stop start so free flowing vehicles will reduce air pollution.	Implementation of Real Time Passenger Information (RTPI) to provide departure times at bus stops has been advanced. Procurement of the Common Database is expected early in 2008/09.	RTPI continued installation. Urban Traffic Management Control (UTMC) to manage traffic during peak hours to maintain flow installed and operational.
Traffic Management	Vehicles release more pollutants when they are in stop/ start motion so ensuring free flowing traffic will improve air quality.	Congestion relief schemes progressing including Frank Perkins Parkway Junction 5 design and junction 8 detailed design.	Junction 5 delivered, A1073 weland road traffic calming design completed and initial consultation.
Speed Management	Lowering speeds may reduce air pollution and noise pollution.	Alexandra Road environmental/ traffic calming scheme and the implementation of a 20mph zone in Glinton being progressed.	A1073 traffic calming scheme design completed, Park Ward Managing traffic in urban residential areas complete, Alexandra Road traffic calming completed.
Parking	Vehicles release more pollutants when in stop start so free flowing vehicles will reduce air pollution.	Dogsthorpe verge and footway parking scheme underway.	Dogsthorpe verge and footway scheme completed
Other			
Safer Journeys to School	More families using alternative travel modes to access education should reduce the pollutants released by vehicles on the school run	Delivery of a range of schemes at schools to encourage sustainable travel including dropped crossing points, footway improvements, cycle parking and parent waiting shelters.	Leighton Primary School speed management of the bus lane completed. Parnwell school travel plan completed
Major Highways Schemes	Reducing journey times and improving traffic flows will reduce congestion and improve air quality	A15 Paston Parkway junction 21 – 22 dualling completed in February 2008. A1139 Fletton Parkway junctions 2 – 3 widening and A15 London Road access scheme due for completion in April 2008.	A15 Paston Parkway, London Road and Fletton Parkway completed. A1073 works commenced.

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Appendix 3 Breakdown of Peterborough City Council's air quality nuisance investigations 2008

Type	No of complaints
General request/advice air pollution	12
Smoke, domestic bonfires complaint	60
Smoke, industrial/commercial bonfires complaint	35
Smoke, domestic chimney complaint	5
Grit/dust complaint	6
Odour/fumes industrial/commercial complaint	17
Odour/fumes domestic complaint	24
Odour/fumes agricultural complaint	3
Odour unknown/other complaint	21
Total	183

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Appendix 4 January 2008 Nitrogen Dioxide diffusion tube full dataset (monthly mean values)

Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/07A/NA10S1	BORG	02/01/2008 13:30	30/01/2008 11:15	669.75	2.1	44.1	22.9	
PETE/07A/NA10S2	THORNEY	02/01/2008 16:00	30/01/2008 12:45	668.75	1.43	30.1	15.7	
PETE/07A/NA10S3	COPE	02/01/2008 11:30	30/01/2008 12:15	672.75	1.52	31.8	16.5	
PETE/07A/NA10S4	LYTH	02/01/2008 11:30	30/01/2008 12:00	672.50	1.23	25.7	13.4	
PETE/07A/NA10S5	WITT	02/01/2008 15:15	30/01/2008 11:45	668.50	1.36	28.6	14.9	
PETE/07A/NA10S6	LINCOLN							Missing
PETE/07A/NA10S7	LINCOLN							Missing
PETE/07A/NA10S8	WALT	02/01/2008 15:30	30/01/2008 12:30	669.00	1.74	36.6	19	
PETE/07A/NA10S9	STAN	02/01/2008 10:30	30/01/2008 11:00	672.50	1.59	33.3	17.3	

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Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/07A/NA10S10	HAMPTON	02/01/2008 10:45	30/01/2008 11:30	672.75	<0.03	<0.6	<0.3	
PETE/07A/NA10S11	FLETTON	02/01/2008 11:00	30/01/2008 11:00	672.00	2	41.8	21.8	
PETE/07A/NA10S12	LONDON	02/01/2008 10:15	30/01/2008 11:00	672.75	1.73	36.2	18.8	
PETE/07A/NA10S13	THORNEY BYPASS	02/01/2008 16:00	30/01/2008 12:45	668.75	1.81	38	19.8	
PETE/07A/NA10S14	DUNDLE							Missing
PETE/07A/NA10S15	PARKWAY	02/01/2008 10:30	30/01/2008 11:15	672.75	2.62	54.8	28.5	
PETE/07A/NA10S16	PARKWAY	02/01/2008 10:30	30/01/2008 11:15	672.75	2.58	54	28.1	

Peterborough City Council**February 2008 Nitrogen Dioxide diffusion tube full dataset (monthly mean values)**

Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/07A/NA11S1	BORG	30/01/2008 11:15	27/02/2008 09:30	670.25	3.09	65	33.8	
PETE/07A/NA11S2	THORNEY	30/01/2008 12:45	27/02/2008 12:15	671.50	1.9	39.8	20.7	
PETE/07A/NA11S3	COPE	30/01/2008 12:15	27/02/2008 11:30	671.25	1.7	35.6	18.5	
PETE/07A/NA11S4	LYTH	30/01/2008 12:00	27/02/2008 11:00	671.00	1.53	32.2	16.7	
PETE/07A/NA11S5	WITT	30/01/2008 11:45	27/02/2008 11:15	671.50	2.09	43.9	22.8	
PETE/07A/NA11S6	LINCOLN							MISSING
PETE/07A/NA11S7	LINCOLN							MISSING
PETE/07A/NA11S8	WALT	30/01/2008 12:30	27/02/2008 11:45	671.25	2.18	45.8	23.8	
PETE/07A/NA11S9	STAN	30/01/2008 11:00	27/02/2008 10:45	671.75	1.97	41.3	21.5	

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Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/07A/NA11S10	HAMPTON	30/01/2008 11:30	27/02/2008 11:00	671.50	1.75	36.7	19.1	
PETE/07A/NA11S11	FLETTON	30/01/2008 11:00	27/02/2008 10:30	671.50	2.17	45.6	23.7	
PETE/07A/NA11S12	LONDON							MISSING
PETE/07A/NA11S13	THORNEY BYBASS	30/01/2008 12:45	27/02/2008 12:15	671.50	1.87	39.2	20.4	
PETE/07A/NA11S14	OUNDLE	30/01/2008 11:00	27/02/2008 09:15	670.25	2.18	45.7	23.8	
PETE/07A/NA11S15	PARKWAY	30/01/2008 11:15	27/02/2008 10:30	671.25	3.34	70	36.4	
PETE/07A/NA11S16	PARKWAY	30/01/2008 11:15	27/02/2008 10:30	671.25	3.47	72.8	37.9	

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March 2008 Nitrogen Dioxide diffusion tube full dataset (monthly mean values)

Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total μg	$\mu\text{g m}^{-3}$	ppb	Comments
PETE/07A/NA12S1	Borg	27/02/2008 09:30	08/04/2008 13:45	988.25	3.36	48	24.9	
PETE/07A/NA12S2	Thorney	27/02/2008 12:15	08/04/2008 11:00	982.75	2.02	29	15.1	
PETE/07A/NA12S3	Cpoe	27/02/2008 11:30	08/04/2008 11:15	983.75	1.49	21.3	11.1	
PETE/07A/NA12S4	Lyth	27/02/2008 11:00	08/04/2008 12:30	985.50	1.6	22.8	11.9	
PETE/07A/NA12S5	Witt							Missing
PETE/07A/NA12S6	Lincoln							Missing
PETE/07A/NA12S7	Lincoln	27/02/2008 11:43	08/04/2008 10:30	982.78	2.62	37.6	19.5	
PETE/07A/NA12S8	Walt	27/02/2008 11:43	08/04/2008 10:30	982.78	2.5	35.8	18.6	
PETE/07A/NA12S9	Stan	27/02/2008 10:45	08/04/2008 13:15	986.50	2.31	32.9	17.1	

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Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/07A/NA12S10	Hampton	27/02/2008 11:00	08/04/2008 12:00	985.00	1.97	28.1	14.6	
PETE/07A/NA12S11	Fletton	27/02/2008 10:30	08/04/2008 13:15	986.75	2.58	36.8	19.1	
PETE/07A/NA12S12	Lundon							Missing
PETE/07A/NA12S13	Thorney By-Pass	27/02/2008 12:15	08/04/2008 10:45	982.50	2.46	35.3	18.3	
PETE/07A/NA12S14	Oundle	27/02/2008 09:15	08/04/2008 13:00	987.75	2.02	28.8	15	
PETE/07A/NA12S15	Parkway	27/02/2008 10:30	08/04/2008 13:30	987.00	4.17	59.5	30.9	
PETE/07A/NA12S16	Parkway	27/02/2008 10:30	08/04/2008 13:30	987.00	4.46	63.6	33.1	

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April 2008 Nitrogen Dioxide diffusion tube full dataset (monthly mean values)

Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/07A/NB1S1	Borg	08/04/2008 13:45	02/05/2008 14:30	576.75	2.34	57.1	29.7	
PETE/07A/NB1S2	Thorney							Missing
PETE/07A/NB1S3	Cope	08/04/2008 11:15	01/05/2008 12:30	553.25	1.08	27.5	14.3	
PETE/07A/NB1S4	Lyth	08/04/2008 12:30	01/05/2008 15:15	554.75	1.03	26.3	13.7	
PETE/07A/NB1S5	Witt							Missing
PETE/07A/NB1S6	Lincoln							Missing
PETE/07A/NB1S7	Lincoln	08/04/2008 10:30	01/05/2008 14:15	555.75	2.08	52.8	27.5	
PETE/07A/NB1S8	Walt							Missing
PETE/07A/NB1S9	Stan	08/04/2008 13:15	01/05/2008 15:30	554.25	0.72	18.4	9.5	Found On Floor Debris In Tube

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Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/07A/NB1S10	Hampton	08/04/2008 12:00	01/05/2008 15:45	555.75	1.13	28.6	14.9	
PETE/07A/NB1S11	Fletton	08/04/2008 13:15	01/05/2008 15:15	554.00	1.34	34.2	17.8	
PETE/07A/NB1S12	London							Missing
PETE/07A/NB1S13	Thorney By Pass							Missing
PETE/07A/NB1S14	Dundle	08/04/2008 13:00	01/05/2008 11:00	550.00	1.27	32.4	16.9	
PETE/07A/NB1S15	Parkway	08/04/2008 13:30	01/05/2008 15:30	554.00	2.2	56	29.1	
PETE/07A/NB1S16	Parkway	08/04/2008 13:30	01/05/2008 15:30	554.00	2.33	59.3	30.8	

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May 2008 Nitrogen Dioxide diffusion tube full dataset (monthly mean values)

Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/08A/NA1S1	Borg	01/05/2008 14:30	28/05/2008 15:00	648.50	3.02	65.5	34.1	
PETE/08A/NA1S2	Thorney	01/05/2008 12:15	28/05/2008 10:30	646.25	1.14	24.8	12.9	
PETE/08A/NA1S3	Cope	01/05/2008 12:30	28/05/2008 11:00	646.50	0.82	17.9	9.3	
PETE/08A/NA1S4	Lyth	01/05/2008 15:15	28/05/2008 14:00	646.75	0.95	20.7	10.7	
PETE/08A/NA1S5	Witt	01/05/2008 14:30	28/05/2008 11:15	644.75	2.47	54	28.1	
PETE/08A/NA1S6	Lincoln	01/05/2008 14:15	28/05/2008 15:15	649.00	1.23	26.7	13.9	
PETE/08A/NA1S7	Lincoln	01/05/2008 14:15	28/05/2008 15:15	649.00	1.04	22.6	11.8	
PETE/08A/NA1S8	Walt	01/05/2008 14:20	28/05/2008 15:15	648.92	1.57	34.1	17.7	
PETE/08A/NA1S9	Stan	01/05/2008 12:00	28/05/2008 13:30	649.50	1.35	29.3	15.2	

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Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/08A/NA1S10	Hampton	01/05/2008 15:45	28/05/2008 14:15	646.50	1	21.9	11.4	
PETE/08A/NA1S11	Fletton	01/05/2008 15:15	28/05/2008 14:45	647.50	1.14	24.8	12.9	
PETE/08A/NA1S12	London							Missing
PETE/08A/NA1S13	Thorney By Pass	01/05/2008 12:15	28/05/2008 10:30	646.25	1.02	22.2	11.6	Spider Web
PETE/08A/NA1S14	Oundle	01/05/2008 11:00	28/05/2008 11:30	648.50	1.14	24.7	12.8	
PETE/08A/NA1S15	Parkway	01/05/2008 15:30	28/05/2008 13:45	646.25	4.17	91	47.3	
PETE/08A/NA1S16	Parkway	01/05/2008 15:30	28/05/2008 13:45	646.25	2.54	55.3	28.7	

Peterborough City Council**June 2008 Nitrogen Dioxide diffusion tube full dataset (monthly mean values)**

Sample Number	Site	Date And Time ON	Date And Time OFF	Exposure Time (Hours)	Total μG	$\mu\text{G M}^3$	Ppb	Comments
PETE/08A/NA2S1	Borg	28/05/2008 15:00	02/07/2008 11:15	836.25	2.54	42.8	22.3	
PETE/08A/NA2S2	Thorney	28/05/2008 10:30	02/07/2008 11:00	840.50	2.38	39.8	20.7	Cobweb
PETE/08A/NA2S3	Cope	28/05/2008 11:00	02/07/2008 11:30	840.50	0.78	13	6.8	
PETE/08A/NA2S4	Lyth	28/05/2008 14:00	02/07/2008 11:45	837.75	0.96	16.2	8.4	
PETE/08A/NA2S5	Witt	28/05/2008 11:15	02/07/2008 15:15	844.00	1.8	30.1	15.6	
PETE/08A/NA2S6	Lincoln	28/05/2008 14:15	01/07/2008 16:00	817.75	1.87	32.2	16.7	
PETE/08A/NA2S7	Lincoln	28/05/2008 14:15	01/07/2008 16:00	817.75	1.71	29.4	15.3	
PETE/08A/NA2S8	Walt	28/05/2008 15:15	01/07/2008 15:45	816.50	1.36	23.4	12.2	
PETE/08A/NA2S9	Stan	28/05/2008 13:30	01/07/2008 14:30	817.00	1.73	29.8	15.5	

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Sample Number	Site	Date And Time ON	Date And Time OFF	Exposure Time (Hours)	Total μG	$\mu\text{G M}^{-3}$	Ppb	Comments
PETE/08A/NA2S10	Hampton	28/05/2008 14:15	01/07/2008 15:00	816.75	0.78	13.4	7	Spider In Tube
PETE/08A/NA2S11	Fletton	28/05/2008 14:45	02/07/2008 12:15	837.50	1.47	24.8	12.9	
PETE/08A/NA2S12	London							Missing
PETE/08A/NA2S13	Thorney By Pass	28/05/2008 10:30	02/07/2008 10:45	840.25	1.42	23.8	12.4	
PETE/08A/NA2S14	Oundle	28/05/2008 11:30	02/07/2008 12:45	841.25	0.97	16.2	8.4	
PETE/08A/NA2S15	Packway	28/05/2008 13:45	01/07/2008 14:45	817.00	2.67	46	23.9	
PETE/08A/NA2S16	Packway	28/05/2008 13:45	01/07/2008 14:45	817.00	2.7	46.5	24.2	

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July 2008 Nitrogen Dioxide diffusion tube full dataset (monthly mean values)

Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/08A/NA3S1	BORG	02/07/2008 11:15	30/07/2008 09:30	670.25	1.82	38.3	19.9	
PETE/08A/NA3S2	THORNEY	02/07/2008 11:00	30/07/2008 12:45	673.75	2.11	44.1	23	
PETE/08A/NA3S3	COPE	02/07/2008 11:30	30/07/2008 13:30	674.00	0.67	13.9	7.2	
PETE/08A/NA3S4	LYTH	02/07/2008 11:45	31/07/2008 16:00	700.25	0.79	15.9	8.2	
PETE/08A/NA3S5	WITT	01/07/2008 15:15	30/07/2008 13:15	694.00	1.24	25.2	13.1	
PETE/08A/NA3S6	LINCOLN	01/07/2008 16:00	30/07/2008 12:30	692.50	1.53	31.1	16.2	
PETE/08A/NA3S7	LINCOLN	01/07/2008 16:00	30/07/2008 12:30	692.50	1.55	31.6	16.4	
PETE/08A/NA3S8	WALT	01/07/2008 15:45	30/07/2008 12:00	692.25	1.09	22.2	11.6	
PETE/08A/NA3S9	STAN	01/07/2008 14:30	31/07/2008 15:45	721.25	1.07	21	10.9	

Peterborough City Council

Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/08A/NA3S10	HAMPTON	01/07/2008 15:00	30/07/2008 13:45	694.75	0.66	13.3	6.9	
PETE/08A/NA3S11	FLETTON	02/07/2008 12:15	31/07/2008 15:00	698.75	1.12	22.5	11.7	
PETE/08A/NA3S12	LONDON							MISSING
PETE/08A/NA3S13	THORNEY BY PASS	02/07/2008 10:45	30/07/2008 12:45	674.00	1.18	24.6	12.8	
PETE/08A/NA3S14	OUNDLE	02/07/2008 12:45	31/07/2008 16:15	699.50	0.87	17.5	9.1	
PETE/08A/NA3S15	PARKWAY	01/07/2008 14:45	31/07/2008 15:45	721.00	1.78	34.9	18.1	
PETE/08A/NA3S16	PARKWAY	01/07/2008 14:45	31/07/2008 15:45	721.00	2.13	41.6	21.6	

Peterborough City Council**August 2008 Nitrogen Dioxide diffusion tube full dataset (monthly mean values)**

Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/08A/NA4S1	Borg	31/07/2008 09:30	03/09/2008 14:00	820.50	2.03	34.9	18.2	
PETE/08A/NA4S2	Thorney	30/07/2008 12:45	03/09/2008 11:45	839.00	1.33	22.3	11.6	Black Paint On Tube
PETE/08A/NA4S3	Cope	30/07/2008 13:30	03/09/2008 10:45	837.25	0.97	16.3	8.5	
PETE/08A/NA4S4	Lyth	31/07/2008 16:00	03/09/2008 12:30	812.50	0.9	15.5	8.1	
PETE/08A/NA4S5	Witt	30/07/2008 13:15	03/09/2008 11:00	837.75	1.25	21.1	11	
PETE/08A/NA4S6	Lincoln							Missing
PETE/08A/NA4S7	Lincoln	30/07/2008 12:30	03/09/2008 12:15	839.75	1.57	26.3	13.7	
PETE/08A/NA4S8	Walt							Missing
PETE/08A/NA4S9	Stan	31/07/2008 15:45	03/09/2008 12:45	813.00	1.23	21.3	11.1	

Peterborough City Council

Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/08A/NA4S10	Hampton	30/07/2008 13:45	03/09/2008 13:00	839.25	0.81	13.5	7	
PETE/08A/NA4S11	Fletton	31/07/2008 15:00	03/09/2008 13:15	814.25	1.24	21.5	11.2	
PETE/08A/NA4S12	London	31/07/2008 15:15	03/09/2008 13:00	813.75	1.18	20.5	10.6	
PETE/08A/NA4S13	Thorney By-pass	30/07/2008 12:45	03/09/2008 11:30	838.75	1.68	28.2	14.6	
PETE/08A/NA4S14	Oundle Rd							Missing
PETE/08A/NA4S15	Stan 15 Hoy Lake	31/07/2008 15:45	03/09/2008 12:30	812.75	1.31	22.7	11.8	
PETE/08A/NA4S16	Stan 15 Hoy Lake	31/07/2008 15:45	03/09/2008 12:30	812.75	1.15	19.9	10.3	

Peterborough City Council**September 2008 Nitrogen Dioxide diffusion tube full dataset (monthly mean values)**

Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/08A/NA5S1	Borg	03/09/2008 14:00	01/10/2008 15:30	673.50	2.76	57.8	30	
PETE/08A/NA5S2	Thorney	03/09/2008 11:45	01/10/2008 14:45	675.00	1.51	31.6	16.4	
PETE/08A/NA5S3	Cope	03/09/2008 10:45	01/10/2008 13:45	675.00	1.07	22.3	11.6	
PETE/08A/NA5S4	Lyth	03/09/2008 12:30	01/10/2008 13:30	673.00	0.93	19.5	10.1	
PETE/08A/NA5S5	Witt	03/09/2008 11:00	01/10/2008 13:00	674.00	1.82	38	19.7	
PETE/08A/NA5S6	Lincoln	03/09/2008 12:15	01/10/2008 14:00	673.75	1.81	37.8	19.7	
PETE/08A/NA5S7	Lincoln	03/09/2008 12:15	01/10/2008 14:00	673.75	1.66	34.7	18	
PETE/08A/NA5S8	Walt	03/09/2008 12:00	01/10/2008 13:45	673.75	1.58	33.1	17.2	
PETE/08A/NA5S9	Stan	03/09/2008 12:45	01/10/2008 12:15	671.50	1.51	31.6	16.4	Insect In Tube

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Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/08A/NA5S10	Hampton	03/09/2008 13:00	01/10/2008 12:30	671.50	1.17	24.6	12.8	
PETE/08A/NA5S11	Fletton	03/09/2008 13:15	01/10/2008 11:00	669.75	1.53	32.1	16.7	
PETE/08A/NA5S12	London	03/09/2008 13:00	01/10/2008 11:00	670.00	1.48	31.2	16.2	
PETE/08A/NA5S13	Thorney By-Pass	03/09/2008 11:30	01/10/2008 15:00	675.50	1.2	25	13	
PETE/08A/NA5S14	Dundle Rd	03/09/2008 13:15	01/10/2008 11:15	670.00	1.5	31.6	16.4	
PETE/08A/NA5S15	Stan	03/09/2008 12:30	01/10/2008 12:15	671.75	1.21	25.3	13.2	
PETE/08A/NA5S16	Stan	03/09/2008 12:30	01/10/2008 12:15	671.75	1.24	26	13.5	

Peterborough City Council**October 2008 Nitrogen Dioxide diffusion tube full dataset (monthly mean values)**

Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/08A/NA6S1	Borg	01/10/2008 15:30	29/10/2008 15:00	671.50	2.3	48.3	25.1	
PETE/08A/NA6S2	Thorney	01/10/2008 14:45	29/10/2008 13:15	670.50	1.65	34.6	18	
PETE/08A/NA6S3	Cope	01/10/2008 13:45	29/10/2008 12:00	670.25	1.27	26.7	13.9	
PETE/08A/NA6S4	Lyth	01/10/2008 13:30	29/10/2008 14:30	673.00	1.2	25	13	
PETE/08A/NA6S5	Witt	01/10/2008 13:00	29/10/2008 12:30	671.50	1.42	29.9	15.5	
PETE/08A/NA6S6	Lincoln	01/10/2008 14:00	29/10/2008 15:15	673.25	2.77	58	30.1	
PETE/08A/NA6S7	Lincoln	01/10/2008 14:00	29/10/2008 15:15	673.25	2.47	51.7	26.9	
PETE/08A/NA6S8	Walt	01/10/2008 13:45	29/10/2008 15:15	673.50	1.72	35.9	18.7	
PETE/08A/NA6S9	Stan	01/10/2008 12:15	29/10/2008 13:30	673.25	1.5	31.3	16.3	

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Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/08A/NA6S10	Hampton	01/10/2008 12:30	29/10/2008 15:30	675.00	1.32	27.5	14.3	
PETE/08A/NA6S11	Fletton	01/10/2008 11:00	29/10/2008 15:45	676.75	1.8	37.5	19.5	
PETE/08A/NA6S12	London	01/10/2008 11:00	29/10/2008 14:45	675.75				Missing
PETE/08A/NA6S13	Thorney By-Pass	01/10/2008 15:00	29/10/2008 13:00	670.00				Missing
PETE/08A/NA6S14	Oundle Rd	01/10/2008 11:15	29/10/2008 14:15	675.00				Missing
PETE/08A/NA6S15	Stan	01/10/2008 12:15	29/10/2008 14:00	673.75				Missing
PETE/08A/NA6S16	Stan	01/10/2008 12:15	29/10/2008 14:00	673.75	1.79	37.4	19.4	

Peterborough City Council**November 2008 Nitrogen Dioxide diffusion tube full dataset (monthly mean values)**

Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/08A/NA7S1	BORG	29/10/2008 15:00	04/12/2008 15:00	864.00	3.71	60.6	31.5	
PETE/08A/NA7S2	THORNEY	29/10/2008 13:15	03/12/2008 14:00	840.75	2.1	35.3	18.3	
PETE/08A/NA7S3	COPE	29/10/2008 12:00	03/12/2008 15:00	843.00	1.83	30.6	15.9	
PETE/08A/NA7S4	LUTH	29/10/2008 14:30	03/12/2008 15:00	840.50	1.75	29.3	15.2	
PETE/08A/NA7S5	WITT	29/10/2008 12:30	03/12/2008 15:45	843.25	2.63	44	22.9	
PETE/08A/NA7S6	LINCOLN							MISSING
PETE/08A/NA7S7	LINCOLN							MISSING
PETE/08A/NA7S8	WALT	29/10/2008 15:15	03/12/2008 16:30	841.25	1.9	31.8	16.5	
PETE/08A/NA7S9	STAN	29/10/2008 13:30	04/12/2008 14:45	865.25	2.45	39.9	20.7	

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Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/08A/NA7S10	HAMPTON	29/10/2008 15:30	03/12/2008 15:15	839.75	2.02	34	17.7	
PETE/08A/NA7S11	FLETTON	29/10/2008 15:45	04/12/2008 14:30	862.75	2.48	40.6	21.1	
PETE/08A/NA7S12	LONDON	29/10/2008 14:45	04/12/2008 14:45	864.00	2.41	39.4	20.5	
PETE/08A/NA7S13	THORNEY-BY-PASS	29/10/2008 13:00	03/12/2008 13:00	840.00	2.19	36.7	19.1	
PETE/08A/NA7S14	OUNDLE RD	29/10/2008 14:15	03/12/2008 16:15	842.00	1.44	24.1	12.5	
PETE/08A/NA7S15	STAN	29/10/2008 14:00	04/12/2008 14:45	864.75	2.28	37.1	19.3	
PETE/08A/NA7S16	STAN	29/10/2008 14:00	04/12/2008 14:45	864.75	2.92	47.6	24.8	

Peterborough City Council**December 2008 Nitrogen Dioxide diffusion tube full dataset (monthly mean values)**

Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/08A/NA8S1	BORG	04/12/2008 15:00	07/01/2009 11:45	812.75	3.69	65.2	33.9	
PETE/08A/NA8S2	THORNEY	03/12/2008 14:00	07/01/2009 10:00	836.00	2.48	42.6	22.2	
PETE/08A/NA8S3	COPE	03/12/2008 15:00	07/01/2009 10:30	835.50	2.19	37.7	19.6	
PETE/08A/NA8S4	LUTH	03/12/2008 15:05	07/01/2009 11:00	835.92	1.89	32.5	16.9	
PETE/08A/NA8S5	WITT	03/12/2008 15:45	07/01/2009 10:45	835.00	2.64	45.3	23.5	
PETE/08A/NA8S6	LINCOLN	03/12/2008 14:30	07/01/2009 09:45	835.25	3.43	58.9	30.6	
PETE/08A/NA8S7	LINCOLN	03/12/2008 14:30	07/01/2009 09:45	835.25	2.84	48.7	25.3	
PETE/08A/NA8S8	WALT	03/12/2008 14:30	07/01/2009 09:45	835.25	2.74	47	24.4	
PETE/08A/NA8S9	STAN	04/12/2008 14:45	07/01/2009 11:30	812.75	2.56	45.2	23.5	

Peterborough City Council

Sample Number	Site	Date and Time ON	Date and Time OFF	Exposure Time (Hours)	Total µg	µg m ⁻³	ppb	Comments
PETE/08A/NA8S10	Hampton	03/12/2008 15:15	07/01/2009 11:00	835.75	2.44	41.9	21.8	
PETE/08A/NA8S11	Fletton	04/12/2008 14:30	07/01/2009 11:30	813.00	2.73	48.2	25	
PETE/08A/NA8S12	London	04/12/2008 14:45	07/01/2009 11:30	812.75	2.48	43.8	22.8	
PETE/08A/NA8S13	Thorney-By-Pass	03/12/2008 13:00	07/01/2009 10:15	837.25	2.69	46.1	24	
PETE/08A/NA8S14	Oundle Rd	03/12/2008 16:15	07/01/2009 11:30	835.25	2.46	42.3	22	Spider's Web in Tube
PETE/08A/NA8S15	Stan HI	04/12/2008 14:45	07/01/2009 11:15	812.50	2.75	48.5	25.2	
PETE/08A/NA8S16	Stan HI	04/12/2008 14:45	07/01/2009 11:15	812.50	2.99	52.8	27.4	