

### 3 Information Used to Support this Assessment

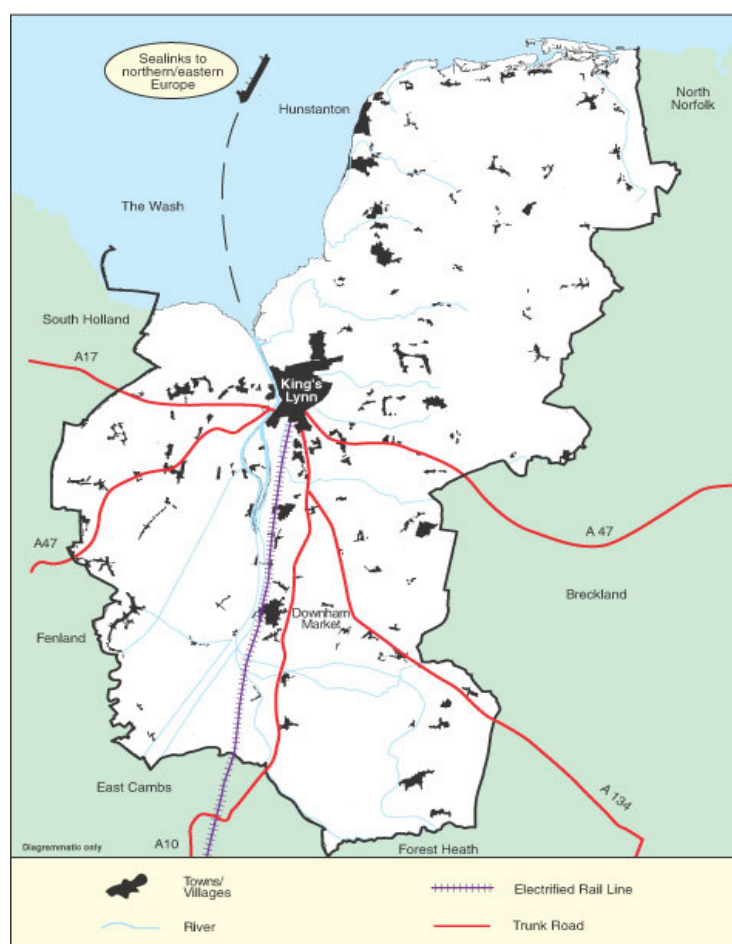
#### 3.1 THE FIRST AND SECOND ROUNDS OF AIR QUALITY REVIEW AND ASSESSMENT FOR KING'S LYNN AND WEST NORFOLK

The Borough Council of King's Lynn and West Norfolk has completed the following Review and Assessments of air quality to date:

- Stage 1 and Stage 2 (January 2001)
- Stage 3 (June 2001) and Stage 4 (April 2003)
- Updating and Screening Assessment (August 2003)
- Progress Report (November 2004)
- Detailed Assessment (November 2005)

The outcomes of these Review and Assessments are described in more detail in the following section.

**Figure 3.1:** Map of King's Lynn and West Norfolk Local Authority



Map from: [http://online.west-norfolk.gov.uk/local\\_plan/written/cpt1.htm](http://online.west-norfolk.gov.uk/local_plan/written/cpt1.htm)

### 3.1.1 The First Round – Stages 3 and 4

In the first round of the Review and Assessment process, the Borough Council of King's Lynn and West Norfolk completed Stage 3 and Stage 4 Review and Assessments. The Stage 3 assessment indicated likely exceedences of the daily mean objective for particulate matter (PM<sub>10</sub>) close to South Quay docks. As a result, the Borough Council of King's Lynn and West Norfolk declared an Air Quality Management Area (AQMA) that included specific residential properties close to South Quay docks. The Stage 3 assessment also showed it was possible, given the uncertainty in the assessment, that the annual average objective for nitrogen dioxide might be exceeded at receptors (housing) close to Railway Road in King's Lynn. However, it was considered more likely that the objective *would be met* and so an AQMA for nitrogen dioxide was not declared. Nevertheless, King's Lynn and West Norfolk Borough Council decided to carry out further assessment at Stage 4.

The monitoring and modelling in the Stage 4 assessment showed that it was likely that the objective for nitrogen dioxide *would be exceeded* on both sides of Railway Road between St Johns Terrace and Waterloo Street/Old Market Street, and on the east side only of Railway Road between Waterloo Street and Stanley Street. A reduction of 6 µgm<sup>-3</sup> to the annual mean NO<sub>2</sub> concentrations was needed to ensure concentrations at all relevant receptors in the area did not exceed 40 µgm<sup>-3</sup>.

Monitoring and modelling of particulate matter concentrations at South Quay confirmed that the 24-hour objective for PM<sub>10</sub> would not be met at residential locations on the quayside. The extent of the area of predicted exceedence coincided with the boundary of the existing Air Quality Management Area.

The following changes to AQMAs in King's Lynn and West Norfolk were therefore recommended:

AQMA	Changes recommended to the existing Air Quality Management Areas
South Quay	No change recommended - updated modelling and monitoring data support the current declaration
Railway Road	Declare a new AQMA for nitrogen dioxide covering buildings with facades on both sides of Railway Road between St Johns Terrace and Waterloo Street/Old Market Street and on the east side only of Railway Road between Waterloo Street and Stanley Street. Updated modelling and monitoring data indicate that there will be exceedences of the annual mean objective at these locations.

### 3.1.2 The Second Round

The second round of review and assessment commenced in August 2003 with an Updating and Screening Assessment, which updates the Stage 1 and 2 assessments previously undertaken for all pollutants identified in the Air Quality Regulations. Where a significant risk of exceedence is identified for a pollutant, the local authority must proceed to a Detailed Assessment, equivalent to the previous Stage 3 assessment. Where a local authority does not need to undertake a detailed assessment, a progress report is required instead.

The 2003 updating and screening assessment for King's Lynn and West Norfolk concluded that there were no significant changes since the Stage 4 assessment. It found potential exceedences of NO<sub>2</sub> from road traffic in King's Lynn and PM<sub>10</sub> from King's Lynn Quay port activities. As the Stage 4 had recently been completed and a new AQMA declared, it was not necessary for the Borough Council of King's Lynn and West Norfolk to proceed to a detailed assessment, as this would have repeated the same work. Instead they produced an air quality progress report in November 2004.

Based on new diffusion tube monitoring data, the 2004 Progress Report demonstrated that the Railway Road AQMA was still valid and there may be an exceedence of the NO<sub>2</sub> objectives. An extended monitoring survey was undertaken to determine NO<sub>2</sub> concentrations in the Southgate and Austin Street area in the form of an expanded diffusion tube survey study, combined with data from triplicate exposures with a continuous monitor located at Railway Road. [While PM<sub>10</sub> results from the automatic site at South Quay exceeded the daily PM<sub>10</sub> objective in 2002 and 2003, it was predicted that they might meet the objectives in 2004 due the effective application of an Action Plan.]

The Borough Council undertook a Detailed Assessment in 2005, focusing on areas where there were exceedences of the objectives with relevant exposure. The Detailed Assessment determined that exceedences of the annual mean objective for NO<sub>2</sub> were likely at locations outside of the current Railway Road Air Quality Management Area (AQMA) boundaries with relevant exposure, and therefore an extension to this was required. It was recommended that the extension should include residential properties along Railway Road, Blackfriars Road, and London Road as a minimum. PM<sub>10</sub> measurements made within the South Quay AQMA show there have been no exceedences of the air quality objectives during 2004 and 2005. Future exceedences were considered unlikely and it was recommended that the South Quay AQMA be revoked.

As a summary, previous review and assessment studies have predicted exceedences at some locations in the town of King's Lynn. As a result, AQMAs for NO<sub>2</sub> at Railway Road and PM<sub>10</sub> at South Quay were declared. Recent monitoring data has suggested that the South Quay AQMA could now be revoked (and was indeed revoked in June 2006) and conversely that the Railway Road AQMA should be extended to include all residential properties along Railway Road, Blackfriars Road, and London Road as a minimum. Both the existing and proposed (extended) Railway Road AQMA boundaries are shown in Appendix 6.

## 3.2 PROPOSED DEVELOPMENTS WHICH MAY AFFECT AIR QUALITY

This section considers any new developments in the local authority or in surrounding areas that may impact on local air quality and which need to be considered.

### 3.2.1 Industry

A number of new industrial processes have been identified since the previous round of Review and Assessment – these are described in Section 3.6 and are assessed in the relevant sections of this report.

### 3.2.2 Housing and Redevelopment

Commercial development plans to extend the existing Tesco store at Gaywood and plans to close the Jaeger premises at Hansa Road, King's Lynn, in order to accommodate new B&Q retail premises are expected. Air quality assessments in respect of the required construction works will be called for as and when planning applications are received. In addition are the St Nicholas Retail Park and the multi-storey car park, identified in the previous Progress Report, which are described in more detail below.

New residential schemes have been proposed at the area adjacent to St Peters Road (West Lynn), the former Dairy site at Queen Elizabeth Avenue, the former EDF site at Wootton Road, and at locations within the Nar Ouse Regeneration Area (NORA), all in King's Lynn. Air quality assessments in respect of the required construction works will be called for as and when planning applications are received.

#### 3.2.2.1 St Nicholas Retail Park

St Nicholas Retail Park, King's Lynn, has been granted planning permission, and as a retail park it is likely to affect traffic and therefore air quality. However, it is considered unlikely that the effect will significantly change traffic flows. The impact on air quality will be assessed by means of an NO<sub>2</sub> diffusion tube at Dobby Drive and a PM<sub>10</sub> Monitor (TEOM) at Edward Benefer Way.

#### 3.2.2.2 Multi-Storey Car Park

The new multi-storey car park in King's Lynn, identified in the previous Progress Report, has now been completed and was opened to the public in October 2005. Such a development has potential to affect traffic flows and therefore air quality. The Borough Council of King's Lynn and West Norfolk has confirmed that there are no receptors in the immediate vicinity of the car park. Its impact on the nearest residential streets will be monitored by diffusion tubes and the AQMS associated with the proposed extended Railway Road AQMA.

### **3.2.2.3 West Lynn Residential Development**

A residential development scheme has been proposed adjacent to St Peters Road, West Lynn. The scheme would be the first housing development of significant scale in the area since the mid twentieth century, when West Lynn first became an established residential area. It is intended that development of the site will commence in late 2006, with full occupancy of the whole site by 2010.

The proposed site covers an area of 1.93 hectares and lies on a former depot of the King's Lynn Dredging Company. It is bounded by St. Peters Road to the west, West Lynn drain and sluice to the north, the river Great Ouse and King's Lynn to the east and playing fields to the south. The former industrial buildings have already been demolished and the site is predominantly flat and laid to waste. The site is not within an AQMA.

Applied Environmental Research Centre (AERC) conducted an air quality assessment in 2005 to evaluate the predicted impacts arising from the development. Consideration was given to construction activities and resulting emissions. The assessment indicated that no significant air quality impacts would result from construction activities or changes in traffic flow associated with the completed residential development. AERC concluded that the proposed residential development on St Peters Road would not have any significant detrimental impacts on local air quality.

### **3.2.2.4 Nar Ouse Regeneration Area (NORA)**

NORA is the Nar Ouse Regeneration Area, King's Lynn. The Nar Ouse Regeneration Area aims to attract new investment in employment, housing, shopping and other local services, leisure uses and new open spaces. The development also involves the filling in of a waterway known as the Puny Drain. These developments will be subject to numerous planning applications and air quality assessments will be asked for as and when applications for development come in. None are available as yet.

### **3.2.3 Transport**

The NORA site will generate increased traffic flow along Nar Ouse Way as and when the various stages of development take place. This could also affect traffic flows within the Air Quality Management Area. It is intended that continued use of a diffusion tube at Kellard House, near to the junction of Nar Ouse Way with Southgates roundabout, will monitor any resultant changes in NO<sub>2</sub> levels.

## **3.3 AIR QUALITY MONITORING**

The Borough Council of King's Lynn and West Norfolk have undertaken monitoring of the following pollutants in their area:

- Nitrogen dioxide
- PM<sub>10</sub>
- Sulphur dioxide

Details of the type, location and parameters measured by the monitors in 2005 (diffusion tubes, continuous monitors and filter-pack samplers) are given in Appendix 1 where available.

### **3.3.1 Diffusion Tube Monitoring**

Nitrogen dioxide diffusion tube monitoring was carried out at 62 locations across the King's Lynn and West Norfolk Borough during 2005, which included four triplicate monitoring sites. In February 2006, this network was extended to 71 monitoring sites, with three being triplicate monitoring sites. A bias adjustment factor can be calculated from the automatic analyser and the co-located diffusion tubes at Railway Road. Diffusion tubes continue to be supplied and analysed by Gradko Laboratories, and are prepared using 20% TEA in water.

### **3.3.2 Continuous Monitoring**

Continuous monitoring data is currently available for King's Lynn and West Norfolk from two sites, South Quay, King's Lynn and Railway Road, King's Lynn. The former is to capture concentrations

of PM<sub>10</sub> as a result of port activities and the latter to capture concentrations of NO<sub>2</sub> and PM<sub>10</sub> as a result of traffic in the Railway Road street canyon.

Due to cessation of grain handling on South Quay, King's Lynn, the PM<sub>10</sub> monitoring station at this location will be moved to Dobby Drive, King's Lynn to monitor particulates around the main King's Lynn Dock area.

An OSIRIS dust monitor is maintained at Furlong Road, Stoke Ferry. This is a screening instrument close to a feed mill operated by Grampian Country Feeds Ltd. PM<sub>10</sub>, PM<sub>2.5</sub> and PM<sub>1</sub> data are collected at 15-minute intervals.

### **3.3.3 Filter-pack Sampling**

Sulphur dioxide concentrations have been measured at Stoke Ferry (Water Treatment Works) as part of the UK Acid Deposition Monitoring Network since 1986. This is a Defra-funded monitoring network, managed and quality-assured by AEA Technology. Borough Council personnel operate the site and change the filters on a monthly basis. The hydrogen peroxide bubbler method was employed until 2001, when it was superseded with the more sensitive filter-pack sampler. The nitric acid denuder sampler is now responsible for making sulphur dioxide measurements (2006 onwards).

## **3.4 DISTANCES OF RECEPTORS FROM ROADS**

The distance from the road of the nearest relevant receptor was taken from the NAEI traffic database. A conservative estimate was used where this data were not available.

## **3.5 ROAD TRAFFIC DATA**

### **3.5.1 Summary of Traffic Data Provided**

This section summarises the information used in this report; detailed information is given in Appendix 2. Appendix 2 lists the locations of the traffic flow and speed measurement points, flow and speed data and other relevant traffic statistics. Data were collated from a range of sources, specifically:

- Data provided by Norfolk County Council – 12-hour manual classified counts carried out in 2005 on roads making up a cordon around King's Lynn town centre.
- Data held in the National Atmospheric Emissions Inventory (NAEI, 2004) where no other data were available.

Where no average speed data were available, estimated speeds were used near receptors and junctions. Speeds slower than the national speed limits were assigned to sections of roads in areas close to junctions.

### **3.5.2 Proportion of HGVs**

Norfolk County Council provided percentages of cars, motorbikes, LGVs, HGVs (both rigid and articulated) and buses/coaches, taken from a 2005 traffic census around King's Lynn town centre. For other road links, the percentage of HGVs was taken from the estimates held in the 2004 National Atmospheric Emissions Inventory (NAEI) traffic database.

### **3.5.3 Base Year for Traffic**

For roads where the Norfolk County Council traffic census was carried out, the base year was 2005. The base year for traffic from the NAEI traffic database is 2004.

### **3.5.4 Traffic Growth**

The total number of vehicles crossing the King's Lynn town centre cordon showed a small increase in 2005, reversing the slight decline of the previous two years. An average growth of 0.6 % per

annum has been seen since 1997. The target set by the Local Transport Plan is for less than 10 % growth in town centre traffic between 2000 and 2006 (Norfolk County Council, 2006). To the 2005 census point, the increase has been just 1.6 %.

Traffic growth factors used in the DMRB traffic model were 1.013 to 2005 (regional factors derived by TEMPRO) and 1.097 to 2010 (national factors from the NRTF).

### **3.5.5 Distance from the Centre of the Road to the Kerbside and Receptors**

Road widths and distances of receptors from the road were taken from the NAEI traffic database. A conservative estimate was used where this data were not available.

## **3.6 PART A AND B INDUSTRIAL PROCESSES**

There are Part A and Part B industrial processes in the borough of King's Lynn and West Norfolk. A list of all current LAPPC and IPPC (Environment Agency regulated) processes is supplied in Appendix 3. All relevant processes on these lists are considered in this report.

The following new processes have been identified since the previous round of review and assessment (Progress Report 2004):

- Nine waste oil burners <0.4 MW
- One di-isocyanate process
- Two surface cleaning installations
- One timber processing unit

The following processes have since closed:

- Two waste oil burners <0.4 MW
- One petrol station
- One concrete batcher
- One concrete crusher
- Three paint spraying units
- One timber processing unit

## **3.7 SCREENING TOOLS**

Appendix 5 includes outline details of the DMRB and other screening tools used in the assessment.