

2009 Air Quality Updating and  
Screening Assessment for  
*Restormel Borough Council*

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

October 2009

<b>Local Authority Officer</b>	<a href="#">Graham Martin</a>
--------------------------------	-------------------------------

<b>Department</b>	<a href="#">Environmental Health</a>
<b>Address</b>	<a href="#">Council Offices, 39 Penwinnick Road, St Austell</a>
<b>Telephone</b>	<a href="#">01726 223552</a>
<b>e-mail</b>	<a href="mailto:graham.martin@cornwall.gov.uk">graham.martin@cornwall.gov.uk</a>

# Executive Summary

Part IV of the Environment Act 1995 places a statutory duty on the Council to review and assess, annually, local air quality in the Borough with regard to seven specified "pollutants of concern".

Having considered each pollutant, it is concluded that the National Air Quality Objectives for carbon monoxide, benzene, 1, 3-butadiene, lead, Sulphur dioxide and PM<sub>10</sub> will be met. There will be no requirement to undertake a further, more detailed, assessment of these pollutants.

With regard to Nitrogen dioxide the updated Progress report 2008 indicated the strong possibility of exceedences of the NO<sub>2</sub> objective at certain sensitive locations in St Austell. Therefore a more detailed survey was commissioned focussing on levels at the most vulnerable sites. This detailed monitoring commenced in February 2009 and will continue until January 2010. In addition, one further junction in St Austell has been identified as one causing potentially elevated levels of NO<sub>2</sub> at neighbouring residential premises and a small screening survey (diffusion tube) is recommended. The results of these surveys will not be available until 2010.

# Table of contents

<b>1</b>	<b>Introduction</b>	<b>4</b>
1.1	Description of Local Authority Area	4
1.2	Purpose of Report	5
1.3	Air Quality Objectives	5
1.4	Summary of Previous Review and Assessments	7
<b>2</b>	<b>New Monitoring Data</b>	<b>8</b>
2.1	Summary of Monitoring Undertaken	8
2.2	Comparison of Monitoring Results with AQ Objectives	8
<b>3</b>	<b>Road Traffic Sources</b>	<b>13</b>
3.1	Narrow congested streets with residential properties close to the kerb	13
3.2	Busy streets where people may spend 1-hour or more close to traffic	13
3.3	Roads with high flow of buses and/or HGVs.	13
3.4	Junctions and busy roads	13
3.5	New roads constructed or proposed since the last round of review and assessment	14
3.6	All roads with significantly changed traffic flows.	14
3.7	Bus and coach stations	14
<b>4</b>	<b>Other Transport Sources</b>	<b>15</b>
4.1	Airports	15
4.2	Railways (diesel and steam trains)	15
4.3	Ports (shipping)	15
<b>5</b>	<b>Industrial Sources</b>	<b>16</b>
5.1	New or Proposed Industrial Installations	16
5.2	Major fuel (petrol) storage depots	16
5.3	Petrol stations	16
5.4	Poultry farms	16
<b>6</b>	<b>Commercial and Domestic Sources</b>	<b>17</b>
6.1	Biomass combustion – Individual Installations	17
6.2	Biomass combustion – Combined Impacts	17
6.3	Domestic Solid-Fuel Burning	17
<b>7</b>	<b>Fugitive or Uncontrolled Sources</b>	<b>19</b>
<b>8</b>	<b>Conclusions and Proposed Actions</b>	<b>20</b>
8.1	Conclusions from New Monitoring Data	20

8.2	Conclusions from Assessment of Sources	20
8.3	Proposed Actions	20
<b>9</b>	<b>References</b>	<b>21</b>

## **Appendices**

Appendix A	QA/QC
Appendix 2	DMRB calculations

# 1 Introduction

## 1.1 Description of Local Authority Area

The Borough of Restormel is a largely rural area of 174 square miles (45000ha) spanning the middle of the Cornish peninsula.

Physically the district is bounded by the sea to the North & South with rivers on the other two sides, the Fowey River to the east and the Fal and Gannel Rivers to the west. Both the north and south coasts have important tourist locations in areas important for their attractive landscapes. Inland the area is dominated by the China Clay industry which occupies Hensbarrow Downs and which is almost entirely within Restormel. Elsewhere a variety of important landscapes exist ranging from the lowland heaths of Goss Moor area to the exposed St Breock Downs. Incised into the district are a number of attractive and important river valleys flowing north and south including the Luxulyan Valley and the Fowey Valley which enters the sea in a spectacular ria.

It has a resident population of approx 100000, with the majority living in scattered small settlements outside the two major towns of St Austell and Newquay. In summer, tourists swell this number very considerably.

The industries of the district have been very much determined by these geographical characteristics; fishing and tourism along the coast whilst inland the China Clay industry carries forward the long traditions of mining in Cornwall. Likewise the settlement pattern has developed in response to these physical and economic characteristics as well as a reflection of the Celtic culture in Cornwall. Dispersed hamlets and mining villages are common, however St Austell and Newquay have grown into the two major towns: St Austell as the centre of the China Clay industry and Newquay as a major tourist centre. Elsewhere, historic towns from the medieval period such as Grampound, Fowey, Lostwithiel and St Columb Major continue to fulfil important roles in the life of the community as well as providing four of the districts most impressive Conservation areas.

Restormel is undergoing change, the population of the district has been growing from just over 78,000 in 1981 to about 93,000 by 2001. Economic change has also taken place; traditional employment such as that in agriculture and China Clay has declined, and new employment opportunities have been slow to develop, resulting in above-average unemployment, which is particularly severe in some areas. With wages below average consequential social problems can develop and the need to provide affordable housing and allocate sites for new employment opportunities are closely linked to contaminated land issues. New housing development and employment development is directed primarily to Newquay and St Austell but also to a number of key rural towns and villages, namely: St Dennis, St Blazey, St Columb, Indian Queens/Fraddon/St Columb Road, Roche, Fowey, Lostwithiel and Mevagissey. Expansion of some of these settlements onto areas of abandoned metalliferous mining is occurring; together with redevelopment of brownfield sites, where former industrial type uses have ceased, eg petrol filling stations.

In terms of the "pollutants of concern" (see section 1.3) the major sources of potential pollution within the district are traffic exhaust emissions, especially at certain points prone to relatively high traffic flows at low speeds and particulate matter associated with china clay production. There are no other large/intensive

industrial sources. Although there is widespread use of solid fuels in domestic premises the density of such usage is not thought to be significant.

There is no monitoring for Ozone (O<sub>3</sub>), Sulphur dioxide (SO<sub>2</sub>) or Particulate matter (PM<sub>10</sub>) in the district although it does experience occasional episodes of relatively high levels of ozone during the Summer which tend to be associated with movement of air masses from the European continent. Likewise, there are likely to be occasional episodes of high levels of particulate matter too. Monitoring for these pollutants has, however, been undertaken in recent years in other parts of Cornwall and not been found to exceed AQO thresholds (see appendix C); these results can be taken as indicative of exposure in the district. There has been no monitoring for benzene, lead or 1,3butadiene anywhere in Cornwall.

In terms of local concern and complaint the two most common are domestic bonfires and odour associated with spreading of waste (sewage & agricultural).

## **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 (AQO) applicable to LAQM in England are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre (µg/m<sup>3</sup>) and milligrammes per cubic metre (mg/m<sup>3</sup>) for carbon monoxide, with the number of exceedences in each year that are permitted (where applicable).

**Table 1.1 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	
<b>Benzene</b>	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
<b>1,3-Butadiene</b>	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
<b>Carbon monoxide</b>	10.0 $\text{mg}/\text{m}^3$	Running 8-hour mean	31.12.2003
<b>Lead</b>	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
<b>Nitrogen dioxide</b>	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
<b>Particles (PM<sub>10</sub>) (gravimetric)</b>	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
<b>Sulphur dioxide</b>	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**

The first Review and Assessment of Local Air Quality (R&A), in 2000, concluded that the AQOs then set for the pollutants set out in table 1.1 were likely to be met.

The second R&A, in 2004, concluded that there had been a possibility of a breach of the PM<sub>10</sub> objective in the vicinity of certain china clay operations. A very detailed, two year long, study commenced in 2003 to examine this possibility. The results of this study were published in 2007 and concluded that the objectives would, in fact, be met. The 2004 R&A also concluded that the other objectives would be met.

During 2006, work elsewhere in Cornwall into Nitrogen dioxide exposure from traffic emissions (which in 2007 led to the declaration of an Air Quality Management Area (AQMA) in Camborne-Redruth and, in 2008 in Bodmin) prompted another monitoring exercise in St Austell. Both these AQMAs are in areas of relatively low traffic volumes in slow moving congested areas in very close proximity to sensitive locations. St Austell has areas with similar traffic characteristics. An 18month long screening study commenced in October 2006. (see section 2 & 3 below). This study, as reported in the updated Progress report 2008, indicated the strong possibility of exceedences of the NO<sub>2</sub> objective at certain sensitive locations in St Austell. Therefore a more detailed survey was commissioned focussing on levels at the most vulnerable sites. This detailed monitoring commenced in February 2009 and will continue until January 2010.

## **2 New Monitoring Data**

### **2.1 Summary of Monitoring Undertaken since last progress report**

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

The Council has not carried out, or been associated with, any automatic /continuous monitoring in the Borough since 2005, following the conclusion of the study into dust associated with the china clay industry.

#### **2.1.2 Non-Automatic Monitoring**

In February 2009 a twelve month long study began looking into NO<sub>2</sub> levels at kerbside and residential facades along a stretch of Holmbush Road, St Austell. This study uses diffusion tubes at 28 sites. Data from this monitoring is not currently available.

### **2.2 Comparison of Monitoring Results with AQ Objectives**

#### **2.2.1 Nitrogen Dioxide**

See section 2.1.2 above

A recent planning and environmental permit application for a municipal waste incinerator contained previously unpublished data concerning automatic and diffusion tube monitoring in the vicinity of St Dennis for a twelve month period in 2006-07.

#### **Automatic Monitoring Data**

No monitoring undertaken by the Council.

A continuously monitoring device was installed at St Dennis school for the period Jan 06-Feb 07 in connection with the planning application noted above. The summary results are shown in table 2.1. The values shown are consistent with results from previously reported monitoring. However no QA/QC information was provided with this information.

Location	Within AQMA?	Data Capture % (approx)	Annual mean concentrations (2006-07)* ( $\mu\text{g}/\text{m}^3$ ) NO <sub>2</sub>	No of exceedences of one hour average value of 200 $\mu\text{g}/\text{m}^3$	Maximum hourly average value $\mu\text{g}/\text{m}^3$ NO <sub>2</sub>
St Dennis school	N	94.5	7.7	0	54

**Table 2.1 Nitrogen dioxide at St Dennis School 2006-07**

\*Feb 2006-Jan 2007

### Diffusion Tube Monitoring Data

Preliminary data is not currently available for the Holmbush Road study. This will be reported in the 2010 progress report.

#### 2.2.2 PM<sub>10</sub>

No monitoring undertaken by the Council.

A recent planning application contained previously unpublished data concerning automatic and diffusion tube monitoring in the vicinity of St Dennis for a twelve month period in 2006-07. Monitoring was carried out using the beta attenuation method (BAM). Summary results are shown in table 2.2a. It is assumed that these values are corrected so as to be directly comparable to the reference method.

**Table 2.2a Results of PM<sub>10</sub> Automatic Monitoring: Comparison with Annual Mean Objective**

Site ID	Location	Within AQMA?	Data Capture % (approx)	Annual mean concentrations (2006-07)* ( $\mu\text{g}/\text{m}^3$ )	No of exceedences of daily 24 hour mean value of 50 $\mu\text{g}/\text{m}^3$
<b>PM<sub>10</sub></b>	St Dennis school	No	81	<b>19.8</b>	5
<b>PM<sub>2.5</sub></b>	St Dennis school	No	91	<b>10.9</b>	n/a

\* Feb 2006-Jan 2007 for PM<sub>10</sub> and April 2006-March 2007 for PM<sub>2.5</sub>

These results are consistent with others for the same location in previous years obtained using different methods although no other QA/QC information or raw data is available.

A local company has also been monitoring PM<sub>10</sub> at three other locations associated with the china clay industry. Two different PM<sub>10</sub> measuring devices were used for this purpose-Tapered Element Oscillating Microbalance (TEOM), a mass-vibration method; and an Osiris (a light scattering detection method). Results shown in table 2.2b have been corrected by a factor of 1.3, except for the Par Green site. These results are consistent with previously monitored levels at these locations, with the same equipment. No QA/QC information is available.

**Table 2.2b PM<sub>10</sub> levels associated with china clay areas**

Pollutant & monitoring technique	Location	Within AQMA?	Data Capture % (approx)	Annual mean concentrations (2008-09)* (µg/m <sup>3</sup> )	No of exceedences of daily 24 hour mean value of 50 µg/m <sup>3</sup>
<b>PM<sub>10</sub></b> (TEOM)	Par	N	90	<b>22.1</b>	<b>2</b>
<b>PM<sub>10</sub></b> (TEOM)	Treviscoe	N	81	<b>23.7</b>	<b>2</b>
<b>PM<sub>10</sub></b> (Osiris)	Par Green	N	93	<b>23.2**</b>	<b>13</b>

*\* April 2008-Mar 2009 \*\* not factored by 1.3*

A local parish council has been monitoring PM<sub>10</sub> at a location on the margins of the china clay area. An Osiris unit was used for this purpose and results are shown in table 2.2c. These results have been corrected by a factor of 1.3.

**Table 2.2c PM<sub>10</sub> levels associated with china clay areas**

Site ID	Location	Within AQMA?	Data Capture % (approx)	Annual mean concentrations (2008-09)* (µg/m <sup>3</sup> )	No of exceedences of daily 24 hour mean value of 50 µg/m <sup>3</sup>
<b>PM<sub>10</sub></b> (Osiris)	St Stephen	N	65	<b>24.0</b>	1

*\*April-November 2008 only*

The annual mean is again consistent with previous years, but there are fewer exceedences than in previous years.

### 2.2.3 Sulphur Dioxide

The Council has not undertaken any monitoring for this pollutant in the district.

A recent planning application contained previously unpublished data concerning automatic monitoring at St Dennis school for a twelve month period in 2006-07. The results (table 2.3) show compliance with the Air Quality objectives and the monthly averages are consistent with those previously reported from diffusion tube monitors at the same location.

**Table 2.3 SO<sub>2</sub> levels at St Dennis 2006 (from a continuous monitor)**

month	Maximum 15 min average SO <sub>2</sub> (µg/m <sup>3</sup> )	No of exceedences of 266(µg/m <sup>3</sup> ) : 15 min mean	Maximum 1 hour average SO <sub>2</sub> (µg/m <sup>3</sup> )	No of exceedences of 350(µg/m <sup>3</sup> ) : 1 hour mean	Maximum 24 hour average SO <sub>2</sub> (µg/m <sup>3</sup> )	No of exceedences of 350(µg/m <sup>3</sup> ) : 24 hour mean	Monthly average SO <sub>2</sub> (µg/m <sup>3</sup> )	% data capture
Feb 06	44	0	38	0	21	0	11.0	79
Mar 06	30	0	24	0	14	0	10.0	89
Apr 06	32	0	24	0	15	0	9.4	98
May 06	36	0	27	0	16	0	9.7	98
Jun 06	421	2	189	0	21	0	9.7	94
Jul 06	1113	3	480	1	30	0	11.0	97
Aug 06	14	0	13	0	9	0	9.5	8
Sep 06	-	-	-	-	-	-		-
Oct 06	29	0	18	0	19	0	5.3	80
Nov 06	219	0	78	0	10	0	5.8	96
Dec 06	567	1	196	0	13	0	5.0	97
Jan 07	40	0	33	0	6	0	2.0	98
Summary	1113	6	480	1	30	0	8	
UK Air quality standard	266	35	350	24	125	3	50	

### 2.2.4 Benzene

The Council has not undertaken any monitoring for this pollutant in the district.

### 2.2.5 Other pollutants monitored

The Council has not undertaken any monitoring for any other pollutant in the district.

### Carbon monoxide

A recent planning application contained previously unpublished data concerning automatic monitoring at St Dennis school for a twelve month period in 2006-07. The results shown in table 2.4 are well below the AQO standard.

**Table 2.4 Carbon monoxide levels outside St Dennis School 2006 (from a continuous monitor)**

Month	Maximum daily running 8-hour mean SO <sub>2</sub> (µg/m <sup>3</sup> )	% data capture
Feb 06	1356	81
Mar 06	1740	98
Apr 06	379	92
May 06	390	99
Jun 06	460	99
Jul 06	376	99
Aug 06	380	95
Sep 06	576	99
Oct 06	939	99
Nov 06	1504	98
Dec 06	1747	98
Jan 07	2320	99
UK Air quality standard	10000	

## **3 Road Traffic Sources**

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

Restormel 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.

As a result of previous assessments extensive monitoring is currently taking place in the Holmbush Road area of St Austell.

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

Restormel confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic, which have not been subject to assessment or monitoring previously. Therefore there is no need to proceed to conducting a detailed assessment on these grounds.

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

Restormel confirms that there are no new/newly identified roads of the order of 10000 per day or more with high flows of buses/HGVs. Therefore there is no need to proceed to conducting a detailed assessment on these grounds.

### **3.4 Junctions**

A newly identified location is present at the junction of Edgcumbe Road with Truro Road., St Austell. This junction lies on a hill and is controlled by a permanent set of traffic lights. There is a residential façade within 4m of the centre of the carriageway. Stationary traffic at this point is a common feature throughout the day. Previous assessments have equated this site with similar junctions elsewhere in the town which have been subject to diffusion tube monitoring in the recent past. Results for those locations have not indicated there to be a likelihood of a breach of Objective.

However experience elsewhere has suggested the importance of very close proximity to stationary traffic as a significant factor as regards exposure; and in the case of this junction, one domestic premises is about 1m from the kerb. Therefore it may be exposed to a greater extent than its previously measured counterparts were (2-3m). The results obtained for Holmbush Road in 2006-08 suggests a re-assessment of this junction would be prudent.

A screening assessment using the DMRB model was undertaken in accordance with the method at Example 1 in the guidance accompanying the model (see appendix 1

for details). This produced a value of  $19.6\mu\text{g}/\text{m}^3$  for the annual mean exposure for  $\text{NO}_2$  and therefore well below the AQO. However this value is significantly below what would have been expected given experience in similar nearby circumstances. It is known that in congested or canyon like areas the DMRB model tends to underestimate exposure. Comparing a run of the DMRB model on a stretch of Holmbush road with the measured kerbside levels shows that the DMRB model predicts a value approx half of that measured.

Restormel 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. However the level of confidence with this conclusion is low therefore a screening diffusion tube will be deployed for better site-specific information.

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

Restormel confirms that there are no new/proposed roads (with traffic flows of order of 10000 per day which have arisen since the previous assessment. Therefore there is no need to proceed to conducting a detailed assessment on these grounds.

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

Restormel confirms that there are no new/newly identified roads with significantly changed traffic flows, ie there are no roads with traffic flows of over 10000 per day which have experienced increases in traffic flow of the order of 25% in recent years. Therefore there is no need to proceed to conducting a detailed assessment on these grounds.

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

Restormel confirms that there are no relevant bus stations in the Local Authority area ie with greater than 2500 movement per day nor are there relevant locations within 10m of existing stations. Therefore there is no need to proceed to conducting a detailed assessment on these grounds.

## **4 Other Transport Sources**

### **4.1 Airports**

Restormel confirms that there are no airports in the Local Authority area with throughput of over 10m passengers per annum and background levels of NO<sub>2</sub> around this airport are of the order of 10µg/m<sup>3</sup> or less. Therefore there is no need to proceed to conducting a detailed assessment on these grounds.

### **4.2 Railways (Diesel and Steam Trains)**

#### **4.2.1 Stationary Trains**

Restormel confirms that there are no locations where diesel or steam trains are regularly (three or more times daily) stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m. Therefore there is no need to proceed to conducting a detailed assessment on these grounds.

#### **4.2.2 Moving Trains**

Restormel confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m. Therefore there is no need to proceed to conducting a detailed assessment on these grounds.

### **4.3 Ports (Shipping)**

Restormel confirms that there are no ports or shipping that meet the specified criteria (at least 5000 large ship movements a year within 250 m of relevant locations) within the Local Authority area. Therefore there is no need to proceed to conducting a detailed assessment on these grounds.

## **5 Industrial Sources**

### **5.1 Industrial Installations**

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

No new or industrial installations have been built since the last assessment. Planning permission has been granted for a bio-gas plant at Fraddon; its environmental permit, however has not yet been issued. The environmental assessment accompanying the application did not indicate the likelihood of breaches of AQOs in its vicinity. Therefore there is no need to proceed to conducting a detailed assessment on these grounds.

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

Restormel 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. Therefore there is no need to proceed to conducting a detailed assessment on these grounds.

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

Restormel has assessed new/proposed industrial installations and concluded that it will not be necessary to proceed to a Detailed Assessment. Therefore there is no need to proceed to conducting a detailed assessment on these grounds.

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

There are no major fuel (petrol) storage depots within the Local Authority area. Therefore there is no need to proceed to conducting a detailed assessment on these grounds.

### **5.3 Petrol Stations**

Restormel confirms that there are no petrol stations meeting the specified criteria (throughput of over 2000m<sup>3</sup> and with relevant locations within 10m)

### **5.4 Poultry Farms**

Restormel confirms that there are no poultry farms meeting the specified criteria (hundreds of thousands of birds within 100m of relevant location). Therefore there is no need to proceed to conducting a detailed assessment on these grounds.

## 6 Commercial and Domestic Sources

### 6.1 Biomass Combustion – Individual Installations

Restormel confirms that there are no known biomass combustion plant in the Local Authority area with a minimum 50kW rating

### 6.2 Biomass Combustion – Combined Impacts

Restormel confirms that there are no biomass combustion plant in the Local Authority area and concluded that it will not be necessary to proceed to a Detailed Assessment for PM<sub>10</sub>.

The guidance (Box 5.8 D1b) suggests assessing the number of solid fuelled appliances of various types where their occurrence is likely to be most dense (in 500mx500m squares), and from that deriving an emissions factor which can then estimate the likely PM<sub>10</sub> level.

In the Restormel area there are areas of size approx 25 ha which are almost entirely residential in nature; some of these premises are fuelled by coal or wood. The greatest number of such appliances can be expected settlements such as St Dennis, St Stephen, Penwithick, Mevagissey, St Columb Major and parts of St Blazey, St Austell & Newquay, largely because of the age and provenance of the housing and the socio-economic makeup of occupiers. In terms of numbers they amount to no more than a couple of hundred at most (a very worse case assumption). Other areas may well have their appliances more closely grouped eg Coombe, Nanpean, but because of their relatively small total number (a dozen to a couple of dozen), when normalised to an area of 25ha their density will be much lower than in the identified towns.

Estimating the emissions in the identified towns should therefore provide a conservative assessment for the much smaller areas too. The comments made by local coal merchants, noted in the 2004R&A, about the relatively few number of customers continue to be valid.

As it happens the village of St Dennis is one of the areas in the Borough likely to have the densest occurrence of such appliances. The built-up area of the village is approx 25ha. Intermittent PM<sub>10</sub> monitoring in the village since 1997 (see previous assessments and table 2.2a above) has not indicated a likelihood of breach of AQ Objective and therefore lends credence to this assessment.

Planning permission for a municipal waste incinerator at St Dennis was recently refused.

### 6.3 Domestic Solid-Fuel Burning

Restormel has assessed areas of significant domestic solid fuel use, and concluded that it will not be necessary to proceed to a Detailed Assessment for SO<sub>2</sub>.

The guidance (Box D2) suggests assessing the number of solid fuelled appliances of various types where their occurrence is likely to be in excess of 100 per 500x500m squares. It is not thought that such densities do occur in the locations mention in para 6.2 above, although some may perhaps approach values of 70. One such location is St Dennis. The continuous monitoring recorded in Table 2.3 shows that during Winter 2006-07 there was only one occasion when the 15 minute mean exceeded 266µg/m<sup>3</sup>

The predicted background mass-SO<sub>2</sub> emissions in the national emissions inventory ([www.NAEI.org.uk/data\\_warehouse.php](http://www.NAEI.org.uk/data_warehouse.php)) suggest a mass emission of about 0.8 tonnes/year for a 1000mx1000m square containing St Dennis which is the 5<sup>th</sup> highest for any such area in the borough (the highest being 2.0 tonnes/yr). These values are a fraction of those found elsewhere in the country which have been associated with multiple exceedences of the 15 min mean. Given the results in table 2.3 and the relatively low level of predicted emissions in the other densely populated parts of the borough, there is good reason to believe therefore that the AQO will not be breached.

## **7 Fugitive or Uncontrolled Sources**

Restormel has identified potential sources of fugitive particulate matter such as from the china clay industry. Previous assessments have looked in detail at these sources and concluded that breach of AQO was unlikely. Since that assessment routine monitoring by Imerys Minerals PLC and St Stephen-in-Brannel Parish Council have not suggested that any deterioration has occurred (see section 2.2.2 above). Furthermore the recent economic downturn has meant that there has been significantly less activity in terms of the extraction, drying and movement of china clay in the district. Therefore there is no need to proceed to conducting a detailed assessment on these grounds.

## **8 Conclusions and Proposed Actions**

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

Monitoring data that has come to light since last year's progress report, even though it relates to several years ago, has reinforced the assessment that there is little likelihood of the PM<sub>10</sub> or SO<sub>2</sub> objectives being exceeded.

Data is not yet available for ongoing NO<sub>2</sub> monitoring in St Austell.

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

The possibility of elevated levels of NO<sub>2</sub> at one road junction has been identified; this merits further investigation. Otherwise, the assessment has not identified candidates needing further consideration

### **8.3 Proposed Actions**

Monitoring will continue until 2010 in respect of NO<sub>2</sub> at kerbside and residential-façade locations in Holmbush road, St Austell. The results of this monitoring will be considered in a detailed assessment in 2010.

A screening survey of NO<sub>2</sub> around the Edgecumbe Road /Truro Road junction in St Austell will be carried out using a small number of diffusion tubes.

## 9 References

"Local Air Quality Management, Technical Guidance LAQM.TG(09)". DEFRA 2009

"Review and assessment of local air quality 2000": Restormel Borough Council

"Review and assessment of local air quality 2004": Restormel Borough Council

"An investigation of the china clay industry's impact on PM<sub>10</sub> in Cornwall" : The China Clay Area Dust Monitoring Forum 2007

"Review and assessment of local air quality Interim Progress Report 2008":  
Restormel Borough Council

"Review and assessment of local air quality Updated Progress Report 2008":  
Restormel Borough Council

"Cornwall Energy Recovery Centre: Environmental permit application Vol 4 and Annex E" 2008 SITA(UK)Ltd

National Atmospheric Emissions Inventory ([www.NAEI.org.uk/data\\_warehouse.php](http://www.NAEI.org.uk/data_warehouse.php))

"Final report on the diffusion tube monitoring of nitrogen dioxide in St Austell, October 2006 – March 2008": Air Quality Unit, Cornwall College



# Appendices

## Appendix A: QA/QC Data

No information was supplied in relation to the monitoring data carried out for the planning & permit application for the incinerator at St Dennis.

In relation to the NO<sub>2</sub> screening survey in St Austell 2006-08, tubes were supplied by Gradko International and used the preparation method 20% TEA (triethanolamine) in water. Tubes were exposed at the beginning of each month for one-month periods.

In field inter-comparison exercises and QC testing undertaken by the Workplace Analysis Scheme for Proficiency (WASP) programme for NO<sub>2</sub> diffusion tube analysis (operated by the Health and Safety Laboratory), tubes supplied by Gradko International (Type 1, 20% triethanolamine (TEA) in water) performed well and had a Relative Standard Deviation (RSD) of standardised results for 2003 of 7%; significantly below the median of 12% for all participating laboratories. For the period Jan 08-jan 09 this laboratory was rated as "good" in terms of performance (AEA May 2009).

Annual bias adjustment factors were applied to the raw values, as recommended by DEFRA.

Values recorded in 2006 were adjusted by a factor of 0.98 and all subsequent values by 0.89 (<http://www.uwe.ac.uk/aqm/review/diffusiontube300307.xls>).

# Appendix B: DMRB Calculations

In relation to the Edgcumbe Road/Truro Road junction

Table B1: Input Data

Location/ Receptor	Grid Ref	Background Concentrations			
		Year	NO <sub>x</sub>	NO <sub>2</sub>	PM <sub>10</sub>
Jcn Edgcumbe Road/Truro Road	00500 52500	2009	10.9	9.6	-

Table B2: DRMB parameters

Location/ Receptor	Link number	Distance from link centre to receptor (m)	Traffic flow & speed		Traffic composition		
			AADT (combined, veh/day)	Annual average speed (km/h)	Road type (A,B,C,D)	Total % LDV (<3.5t GVW)	Total % HDV (>3.5t GVW)
Jcn Edgcumbe Road/Truro Road	1	3.5	14100	10	A	97	3
	2	5.3	7800	10	A	96.7	3.3

Table B3: DMRB estimate of NO<sub>2</sub> level for 2009

Pollutant	Annual mean			
	Background concentration	Road traffic component	Total	Units
<b>CO</b>	0.00	0.36	0.36	mg/m <sup>3</sup>
<b>Benzene</b>	0.00	0.33	0.33	µg/m <sup>3</sup>
<b>1,3-butadiene</b>	0.00	0.28	0.28	µg/m <sup>3</sup>
<b>NO<sub>x</sub></b>	10.9	36.6	47.5	µg/m <sup>3</sup>
<b>NO<sub>2</sub></b>	9.6	9.7	19.3	µg/m <sup>3</sup>
<b>PM<sub>10</sub></b>	0.0	5.27	5.27	µg/m <sup>3</sup>

Table B4: Comparison of measured and modelled NO<sub>2</sub> values for selected locations in St Austell 2007, including sensitivity to change in traffic flow since 2005

Tube ref.	AADT 2005 traffic value	sensitivity traffic value	Distance-road centre to tube location (m)	2007 NO <sub>2</sub> background µg/m <sup>3</sup>	DRMB estimated NO <sub>2</sub> for 2007	DRMB estimated NO <sub>2</sub> for 2007sensitivity	actual measurement 2007 µg/m <sup>3</sup>
STA8	27600	30000	4.9	10.3	18.9	19.3	28.5
STA10	27600	30000	4.2	10.3	18.9	19.3	36.7
STA11	27600	30000	5.3	10.3	18.9	19.1	28.1
<b>STA19</b>	14500	16000	4.34	10.3	15.9	19.1	<b>43.6</b>
<b>STA30</b>	25900	31000	5.65	10.3	17.1	19.2	<b>41.5</b>
<b>STA31</b>	25900	31000	4.13	10.3	17.1	19.2	<b>62.5</b>
<b>STA32</b>	25900	31000	5.54	10.3	17.1	19.2	<b>42.2</b>
<b>STA33</b>	25900	31000	5.3	10.3	17.1	19.2	<b>45.9</b>
<b>STA34</b>	24900	31000	6.1	10.3	17	19.1	<b>44.3</b>
<b>STA35</b>	24900	31000	7.4	10.3	16.9	19	<b>48.9</b>
STA36	24900	31000	5.5	10.3	17.1	19.2	38.6



# APPENDIX C

## Recent continuous monitoring elsewhere in Cornwall

Pollutant	Year	Location	Summary of results			
SO <sub>2</sub>	2008	Saltash 1 roadside - continuous monitor		15-Minute Mean µg m <sup>-3</sup>	1-Hour Mean µg m <sup>-3</sup>	24-Hour Mean µg m <sup>-3</sup>
			Minimum value	0	0	0
			Average value	6.0	6.0	6.0
			Maximum value	136.2	66.1	17.2
			Data Capture	90%	90%	90%
PM <sub>10</sub>	2008	Landrake busy roadside - continuous monitor	Annual mean* 29.2µg m <sup>-3</sup> data capture 66%			
		Saltash roadside - continuous monitor	Annual mean* 20.3µg m <sup>-3</sup> data capture 89%			
		Callington roadside - continuous monitor	Annual mean* 24.0µg m <sup>-3</sup> data capture 74%			
		Saltash - continuous monitor	Annual mean* 22.2µg m <sup>-3</sup> data capture 81%			
O <sub>3</sub>	2008	Saltash 1 roadside - continuous monitor	Minimum value	0	µg m <sup>-3</sup>	Measured as daily max of running 8-Hour Mean
			Average value	64.5	µg m <sup>-3</sup>	Measured as daily max of running 8-Hour Mean
			Maximum value	158.9	µg m <sup>-3</sup>	Measured as daily max of running 8-Hour Mean
			Data Capture	97	%	