2012 Air Quality Updating and Screening Assessment for

Telford and Wrekin Council

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

Date (29th August, 2013)

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Executive Summary

In agreement with DEFRA, Telford and Wrekin Council have undertaken more of a comprehensive review of all relevant data from 2004, as opposed to undertaking a full Updating and Screening Assessment.

This review has shown that the air quality within the Borough of Telford and Wrekin shows very good compliance with AQ objectives, and that levels of pollutants within the Borough are relatively stable. They also show that emissions from Ironbridge Power Station have decreased with time, and that emissions from the open cast coal mine are negligible.

This would indicate that all measures undertaken to ensure the wholesomeness of the air quality of the Borough are currently working.

However, it is noted that an Air Quality Strategy is required, especially in light of the Boroughs plans to increase the numbers of homes and businesses within the Borough. This is to ensure the continued wholesomeness of the air of the Borough.

No further assessments are required for any of the pollutants monitored within the Borough.

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1 Introduction

1.1 Description of Local Authority Area

The borough of Telford and Wrekin is a predominantly rural area on the north-eastern edge of Shropshire. The borough has a population of 167,200 (2009 estimate, Telford and Wrekin Council) covering 29,000 hectares with its major settlement being Telford, which incorporated the existing towns of Dawley, Madeley, Oakengates and Wellington upon its construction as a New Town. The market town of Newport is the boroughs second largest populated area.

The main sources of air pollution in Telford and Wrekin are emissions from busy roads. The M54 traverses the Borough across the main central urban area, and the majority of the main roads within the Borough are also focussed in this area, including the A41, the A518, the A5, A442, A4169, and the A4640.

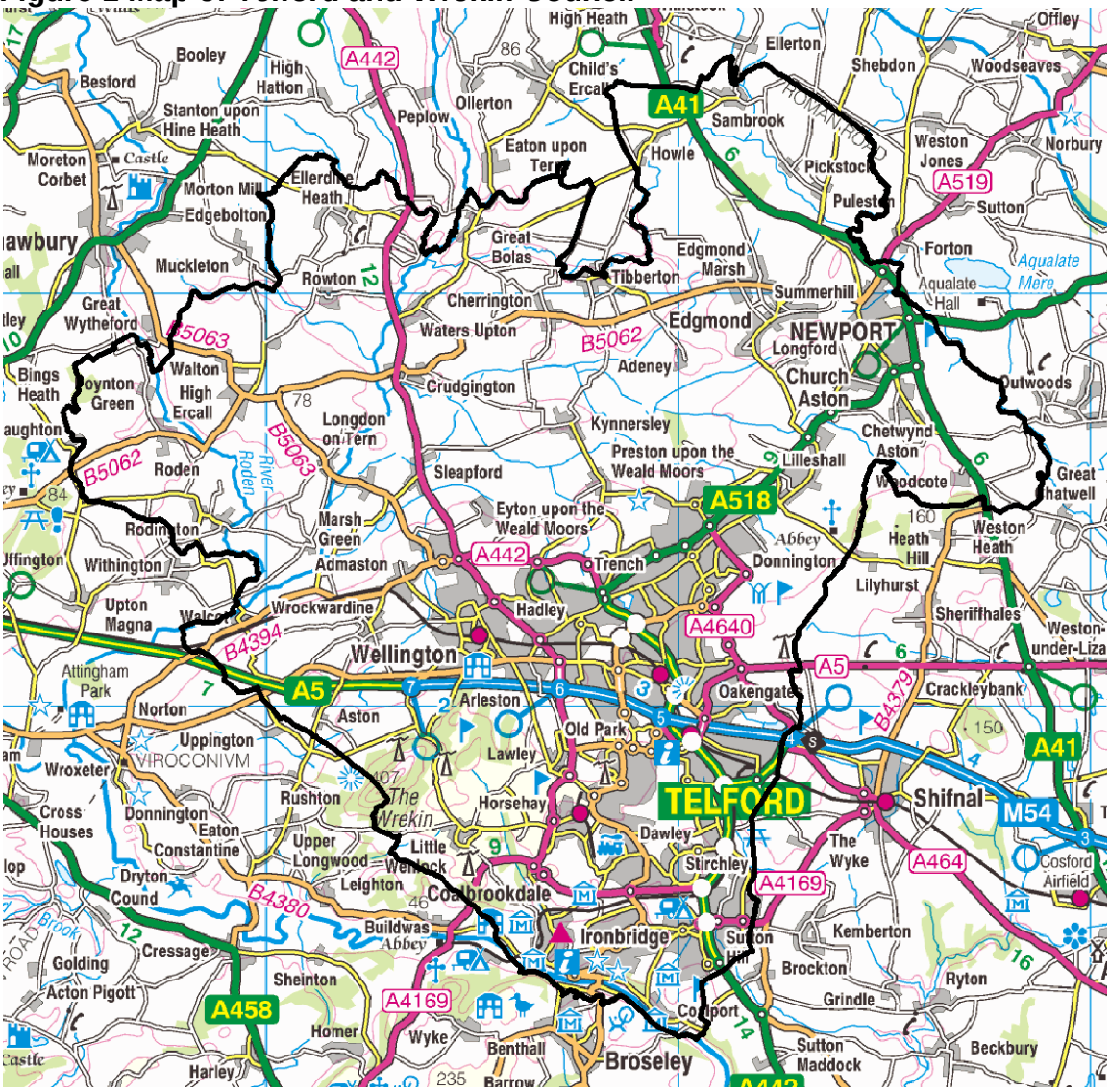
There are a number of registered Part A processes 27 A1 and 10 A2 processes), 43 part B processes, 17 petrol stations, 6 dry cleaning installations and 3 small waste oil burners within Telford (see Appendix A). There is a main railway line traversing the centre of the Borough, as well as a rail freight terminal. A branch line to this supplies the Ironbridge Power Station. The Power Station at Ironbridge is also a source of emissions, although it is situated outside the Borough.

1.2 Purpose of Report

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

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

Figure 1 Map of Telford and Wrekin Council



1.3 Air Quality Objectives

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

Table 1 Air Quality Objectives included in Regulations for the purpose of LAQM in England

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu g/m^3$	Running annual mean	31.12.2003
	5.00 $\mu g/m^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu g/m^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu g/m^3$	Annual mean	31.12.2004
	0.25 $\mu g/m^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu g/m^3$	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu g/m^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu g/m^3$, 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 table below outlines the work undertaken so far, the conclusions of the reports, and the summaries of any further action.

Table 2 Summaries of Reports

Year	Outcomes	Summaries
1998	PR	Prediction of exceedances
1999	PR	Prediction of exceedances
2000	USA	Not significantly affected by emissions (CO, Benzene, 1,3-Butadiene, Pb, SO_2, PM_{10}); any breaches will be negligible
2001	PR	Prediction of exceedances
2002	PR	Declaration of AQMA
2003	USA	Exceedances of SO_2 from Ironbridge Power Station, and of NO_2 from road traffic emissions in Ironbridge Gorge. Review of AQMAs determined there would be no exceedances by 2005.
2004	PR	Detailed assessment of NO_2 and SO_2 from Ironbridge Power Station and vehicular traffic. Objectives will be met in 2005 so no further work is necessary.
2005	PR	No exceedances of relevant air quality objectives, Revocation of AQMA
2006	USA	No exceedances of relevant air quality objectives
2007	PR	No exceedances of relevant air quality objectives
2008	PR	No exceedances of relevant air quality objectives
2009	USA	No exceedances of relevant air quality objectives
2011	PR	No exceedances of relevant air quality objectives (includes data from 2010)

Currently, Telford and Wrekin do not have an air quality strategy. However, as part of this assessment process, it is considered that one needs to be implemented. This will ensure that air quality is given the significance it deserves, and will enshrine the Council's commitment to ensure that new development within the Borough will demonstrate zero impact.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

There are currently three automatic monitoring stations within the Borough. Two of these are utilised by E.ON and monitor emissions from the Ironbridge Power Station to fulfil a condition on their environmental permit, issued via the Environment Agency. The information from these stations is shared with the Council. These stations monitor SO_2, NO, and NO_2.

The third station is utilised by UK Coal in order to fulfil a condition on their environmental permit with regards to their open-cast colliery at Huntington Lane, issued by the Council. This station monitors PM_{10}, $PM_{2.5}$ and PM_1.

Figure 2 Map of Automatic Monitoring Sites

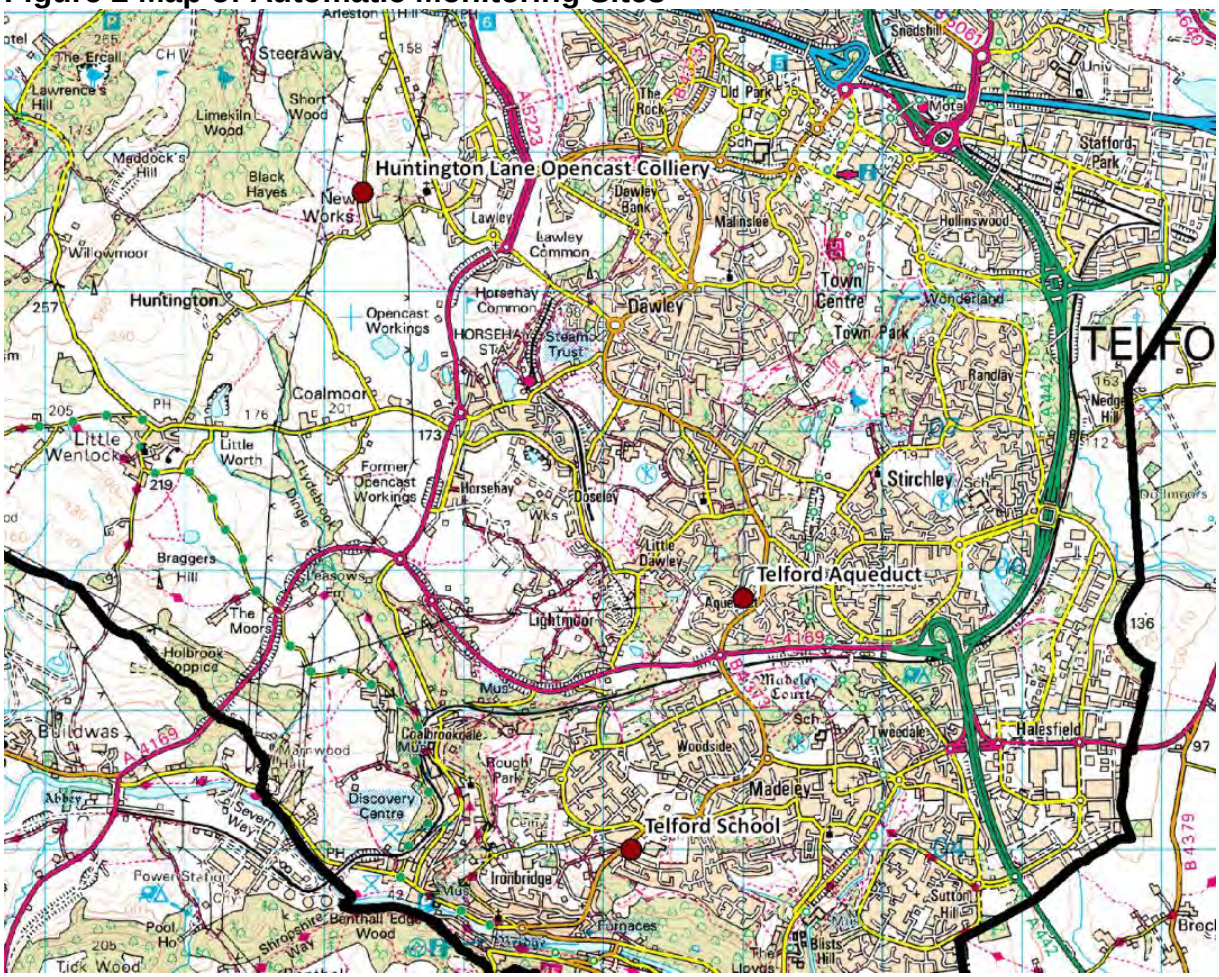


Table 3 Details of Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	Monitoring Technique	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
Telford Aqueduct	Urban backgrd.	369000	305800	SO_2, NO, NO_2	Fluorescence (SO_2), chemiluminescence (NO, NO_2)	N	Y (25.2)	55.5	Y
Telford School	Urban backgrd.	368200	304000	SO_2, NO, NO_2	Fluorescence (SO_2), chemiluminescence (NO, NO_2)	N	Y (15)	130	Y
Huntington Lane Opencast Colliery, New Works Lane	Rural.	366270	308713	PM_{10}, $PM_{2.5}$, PM_1,	Turnkey Instruments TOPAS laser nephelometer	N	Y (6.2)	34.4	Y

2.1.2 Non-Automatic Monitoring Sites

Up until March 2011 Telford & Wrekin Council operated diffusion tubes for nitrogen dioxide at 12 locations within the authority. These included four triplicate tubes site located at various points across the Borough to enable the Council to have confidence in the precision of the results, as well as one blank tube that is analysed. For various reasons, Telford and Wrekin Council decided that it would no longer rely upon diffusion tube monitoring to assess the air quality within the Borough. After consultation with DEFRA (who ratified this decision), diffusion tube monitoring was ceased after March 2011.

Nitrogen dioxide diffusion tubes used by Telford & Wrekin Council were supplied and analysed by Gradko Laboratories. The tubes were prepared using the 50% TEA in acetone method, in line with procedures in the Practical Guidance.

Gradko Laboratories are listed on the WASP – Annual Performance Criteria for NO_2 Diffusion Tubes used in Local Air Quality Management (LAQM) Rounds 97-118. Gradko have always rated as either Good, or 100%, apart from Rounds 109 and 115, when they rated 87.5% and 37.5% respectively.

Telford and Wrekin Council has not compared the diffusion tubes with the reference in a co-location study due to the tube locations being disparate from the automatic stations. However, the national study was used to derive the bias adjustment factors used in the analysis.

Further details of the diffusion tube QA/QC, including bias adjustment factors, is available in Appendix A.

Figure 3 Map of Non-Automatic Monitoring Sites

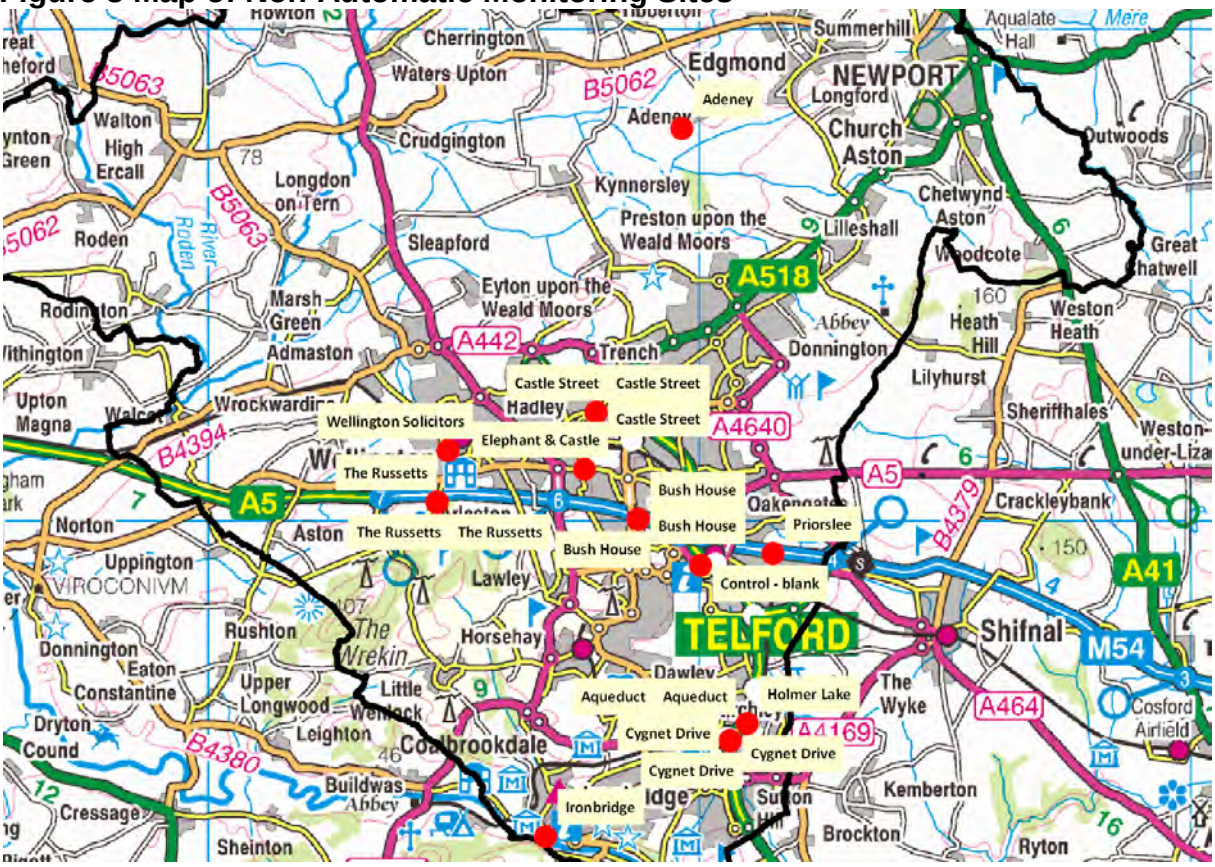


Table 4 Details of Non-Automatic Monitoring Sites

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?
1; Holmer Lake	Intermediate	370963	305913	NO_2	N	Y (87.8)	41.7	Y
2, Cygnet Drive	Intermediate	370612	305540	NO_2	N	Y (14.1)	24	Y
3, Cygnet Drive	Intermediate	370612	305540	NO_2	N	Y (14.1)	24	Y
4, Cygnet Drive	Intermediate	370612	305540	NO_2	N	Y (14.1)	24	Y
5, Aqueduct	Intermediate	368997	305843	NO_2	N	Y (25.2)	55.5	Y
6, Aqueduct	Intermediate	368997	305843	NO_2	N	Y (25.2)	55.5	Y
7, Ironbridge	Intermediate	366855	303608	NO_2	N	Y (52.7)	3.2	Y
8, Bush House	Intermediate	368752	310043	NO_2	N	Y (8.9)	11.3	Y
9, Bush House	Intermediate	368752	310043	NO_2	N	Y (8.9)	11.3	Y
10, Bush House	Intermediate	368752	310043	NO_2	N	Y (8.9)	11.3	Y
11, Elephant & Castle	Intermediate	367660	311066	NO_2	N	Y (13.2)	33.5	Y
12, The Russetts	Intermediate	364663	310393	NO_2	N	Y (14.4)	24.2	Y
13, The Russetts	Intermediate	364663	310393	NO_2	N	Y (14.4)	24.2	Y
14, The Russetts	Intermediate	364663	310393	NO_2	N	Y (14.4)	24.2	Y
15, Wellington Solicitors	Roadside	364867	311447	NO_2	N	Y (103.1)	14.7	Y
16, 17 Castle Street	Roadside	367901	312223	NO_2	N	Y (6.3)	0.8	Y
17, 17 Castle Street	Roadside	367901	312223	NO_2	N	Y (6.3)	0.8	Y
18, 17 Castle Street	Roadside	367901	312223	NO_2	N	Y (6.3)	0.8	Y
19, Adeney	Rural backgrd.	369688	317965	NO_2	N	300	29.4	N
20, Priorslee	Intermediate façade	371431	309412	NO_2	N	Y - 10.2	57.7	Y

2.2 Comparison of Monitoring Results with AQ Objectives

Telford and Wrekin Council rely on data relating to two pollutants from three separate monitoring locations, utilising continuous automatic monitoring. Up until April 2011, Telford and Wrekin Council also monitored the air of the borough using a number of diffusion tubes at various locations.

2.2.1 Nitrogen Dioxide

Diffusion tube analysis for the period January 2004 to March 2011 was analysed. In March 2011, a decision was taken to suspend diffusion tube monitoring in liaison with DEFRA, due to the excellent air quality within the Borough. To monitor the efficacy of this decision, a more comprehensive analysis of the data gathered to date will be undertaken, including regression analysis. This will be used to predict, from the monitoring results, and taking account of the inherent uncertainties within the whole diffusion tube approach, when the air quality may exceed the relevant air quality guideline values, and recommend a course of action with regards to reinstating diffusion tube monitoring, especially in light of the imminent closure of the open cast coal mine. The NO_2 diffusion tube results for 2004-2011 are shown in Table 5 below

See Figure 4 and Table 5 above that show the location of all diffusion tubes locations and relevance to air quality assessment.

Percentage data capture rates for each site for 2004 – 2011 are shown in Table 2.3. There were a number of sites that had less than 75% monitoring data, per annum. For these sites (5 Aqueduct, 6 Aqueduct, 11 Elephant & Castle), the analysis results were annualised using adjustment factors calculated from urban background monitors in the region using the method described in Box 3.2 in TG(09). These are detailed in Appendix B.

The annual mean for each site from 2004 is shown in Table 5. Having regards to the annual mean, this has not been exceeded once at any monitoring site for the entire period. The highest annual mean recorded is 29 $\mu g/m^3$ at the three Bush House sites (8, 9 and 10) in 2008.

Automatic Monitoring Data

Automatic monitoring is undertaken at three different locations within the borough. This monitoring is undertaken as a requirement of an environmental permit. However, the data is still applicable to the Council in monitoring the air quality of its borough. These are the two monitoring stations in the south of the borough that are used to monitor emissions from the E.ON owned power station at Ironbridge, that is out of borough.

Percentage data capture rates for each site for 2004 – 2011 are shown in Table 5. Only one site had less than 90% data capture (Telford Aqueduct, 2010 at 76%), so there was no need for these results to be annualised using adjustment factors calculated from urban background monitors in the region using the method described in Box 3.2 in TG(09).

Analysis of the entire monitoring data set from 2004 shows that there are no exceedances of either the one hour mean, or the annual mean. For more details of these, please see Table 6 and 7 below.

Table 5 Results of non-Automatic Monitoring of Nitrogen Dioxide: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Annual Mean Concentration μg/m³						
			2004[a, b]	2005[a, b]	2006[a, b]	2007[a, b]	2008[a, b]	2009[a, b]	2010[a, b]
1; Holmer Lake	Intermediate	N	15 (100%)	17 (100%)	17 (100%)	16 (92%)	19 (100%)	16 (100%)	17 (92%)
2, Cygnet Drive	Intermediate	N	16 (100%)	17 (100%)	19 (100%)	18 (100%)	22 (100%)	18 (100%)	20 (100%)
3, Cygnet Drive	Intermediate	N	16 (100%)	18 (100%)	19 (100%)	19 (100%)	22 (100%)	19 (100%)	20 (100%)
4, Cygnet Drive	Intermediate	N	17 (100%)	18 (100%)	19 (100%)	19 (100%)	22 (100%)	19 (100%)	21 (100%)
5, Aqueduct	Intermediate	N	9 (67%) (1.3)	12 (83%)	10 (58%) (1)	12 (75%)	11 (83%)	9 (67%)(1.45)	13 (92%)
6, Aqueduct	Intermediate	N	9 (67%) (1.3)	11 (83%)	11 (58%) (1)	13 (75%)	12 (83%)	9 (67%)(1.45)	13 (92%)
7, Ironbridge	Intermediate	N	11 (83%)	13 (83%)	13 (100%)	13 (100%)	14 (92%)	13 (100%)	14 (100%)
8, Bush House	Intermediate	N	18 (100%)	20 (100%)	24 (100%)	24 (92%)	29 (100%)	24 (100%)	26 (100%)
9, Bush House	Intermediate	N	21 (100%)	20 (100%)	24 (100%)	24 (92%)	29 (100%)	24 (100%)	24 (100%)
10, Bush House	Intermediate	N	20 (100%)	21 (100%)	25 (100%)	23 (92%)	29 (100%)	23 (100%)	25 (100%)
11, Elephant & Castle	Intermediate	N	12 (25%) (1.05)	13 (33%) (1.23)	20 (92%)	19 (92%)	19 (92%)	19 (83%)	19 (67%)(1.11)
12, The Russetts	Intermediate	N	14 (100%)	15 (83%)	17 (92%)	18 (100%)	20 (100%)	18 (100%)	18 (100%)
13, The Russetts	Intermediate	N	14 (100%)	15 (83%)	17 (92%)	18 (100%)	19 (100%)	18 (100%)	18 (100%)
14, The Russetts	Intermediate	N	15 (100%)	16 (83%)	17 (92%)	18 (100%)	20 (100%)	18 (100%)	18 (100%)
15, Wellington Solicitors	Roadside	N	16 (100%)	16 (100%)	19 (100%)	19 (100%)	21 (100%)	19 (100%)	20 (100%)
16, 17 Castle Street	Roadside	N	19 (100%)	20 (100%)	20 (100%)	24 (100%)	25 (100%)	24 (100%)	22 (100%)
17, 17 Castle Street	Roadside	N	19 (100%)	21 (100%)	21 (100%)	24 (100%)	25 (100%)	24 (100%)	22 (100%)
18, 17 Castle Street	Roadside	N	17 (100%)	20 (100%)	21 (100%)	25 (100%)	25 (100%)	25 (100%)	23 (100%)
19, Adeney	Rural Backgrd	N	8 (92%)	6 (75%)	10 (100%)	9 (100%)	6 (75%)	9 (100%)	9 (83%)
20, Priorslee	Intermediate façade	N	14 (75%)	20 (100%)	23 (83%)	24 (83%)	23 (83%)	24 (92%)	22 (92%)

[a] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

[b] Means should be "annualised" as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.

Below are two trend charts for the automatic monitoring stations at Telford School and Aqueduct. Both charts demonstrate a significant reduction in annual means over the period of analysis, particularly the monitoring point at Telford Aqueduct. This can be compared to the trend lines that utilises the entire data set. These show that although the trend to decreased levels is still apparent, it is less dramatic.

Figure 4 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Telford School

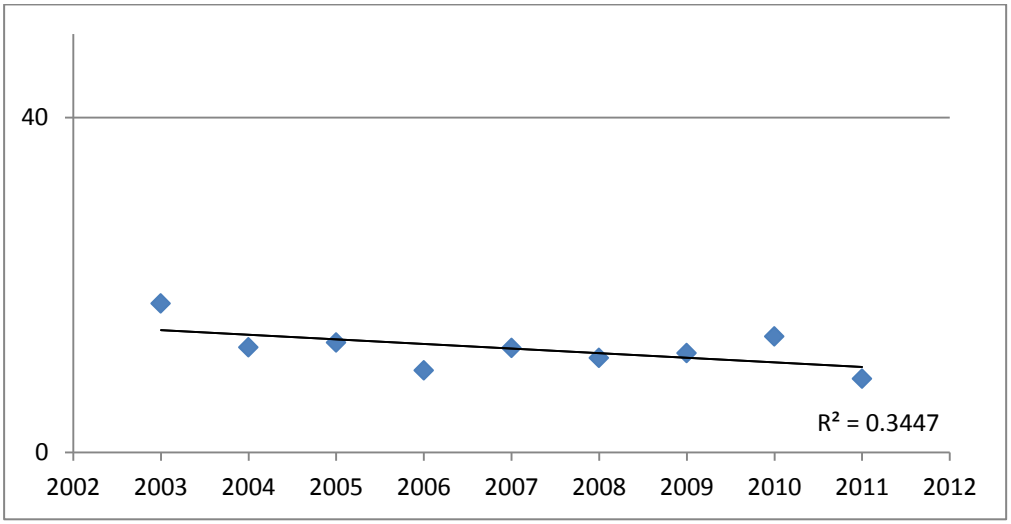


Figure 5 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Telford Aqueduct

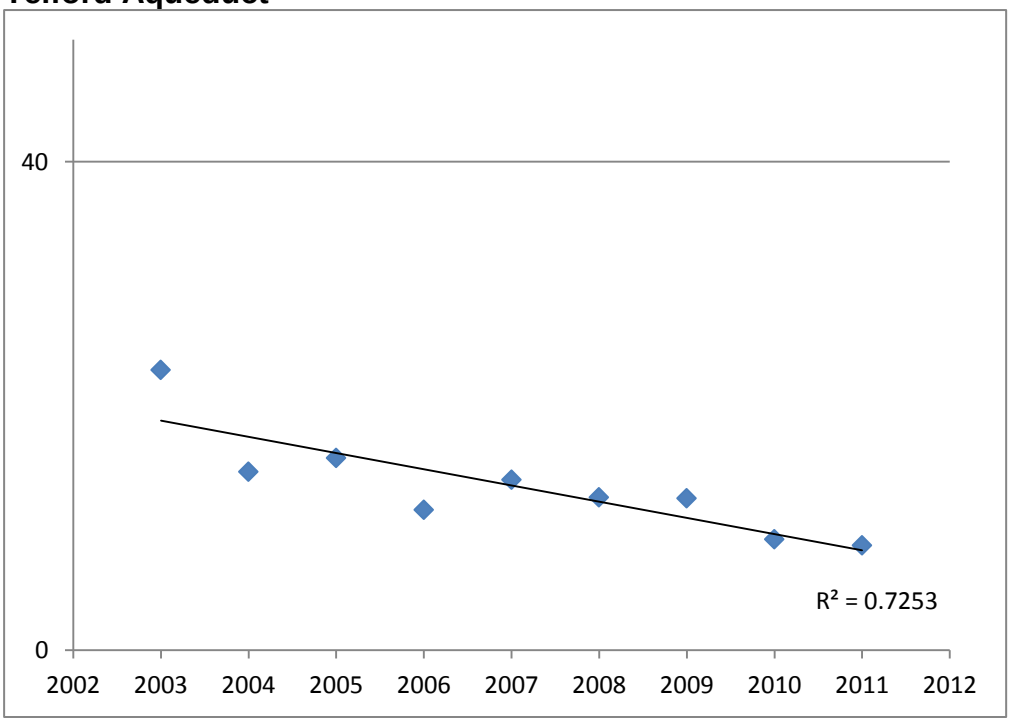
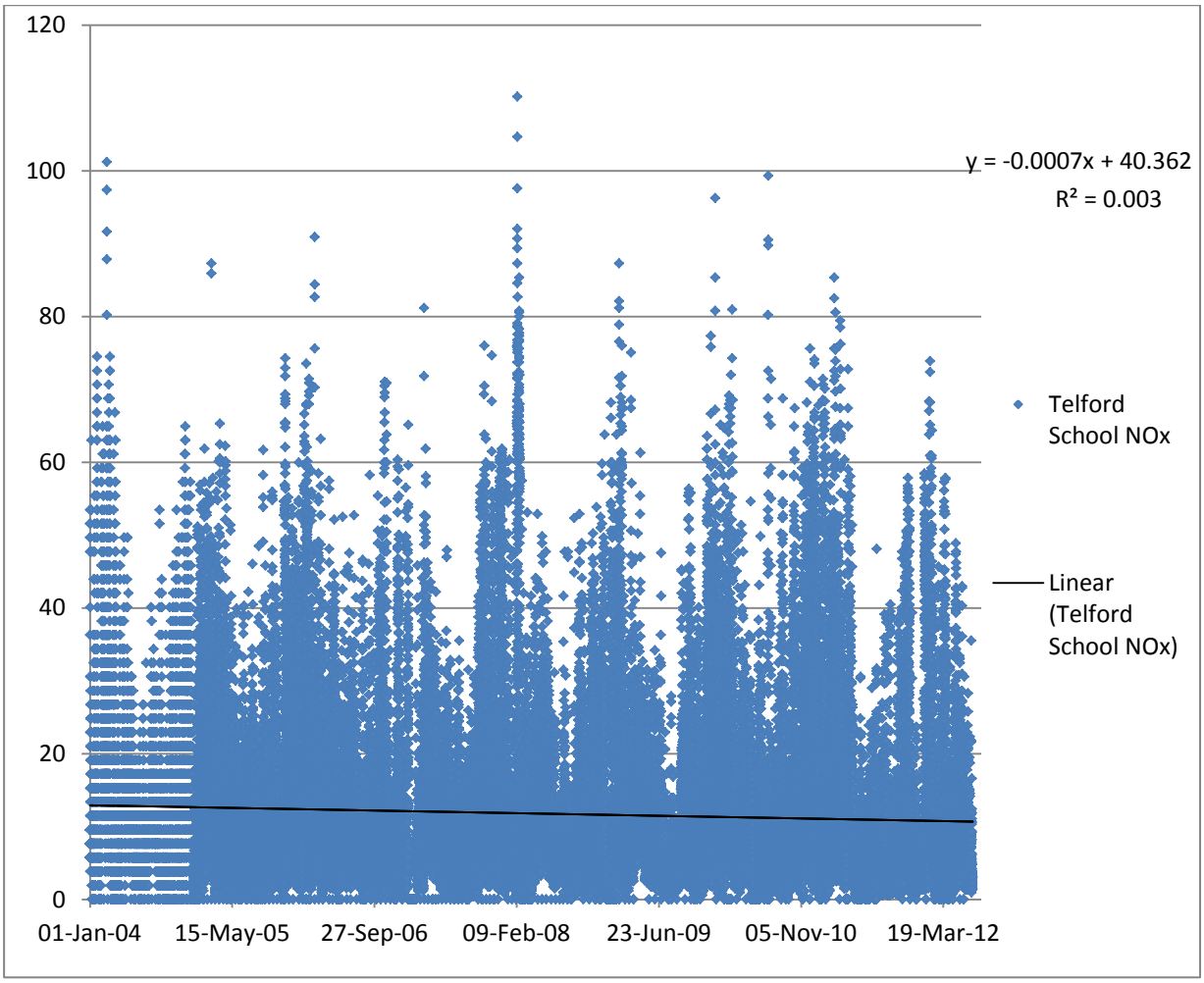
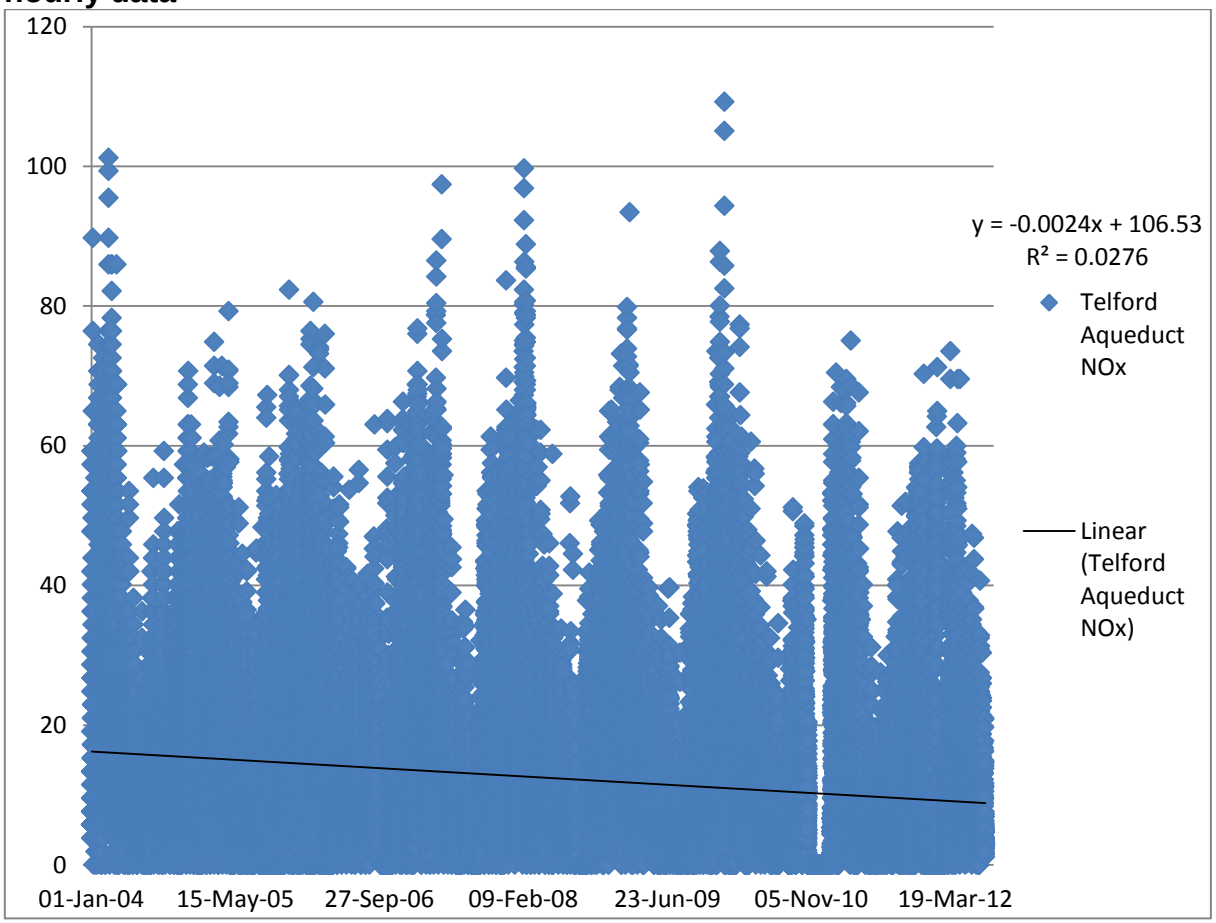


Figure 6 Nitrogen Dioxide Concentrations measured at Telford School, hourly data



Patterns in the data are apparent when the data set is taken as a whole. Of particular note is the apparent seasonality of the data, showing troughs and peaks that correspond to summer and winter respectively. This is likely a reflection for the increase in demand for power during the winter months.

Figure 7 Nitrogen Dioxide Concentrations measured at Telford Aqueduct, hourly data



Patterns in the data are apparent when the data set is taken as a whole. Of particular note is the apparent seasonality of the data, showing troughs and peaks that correspond to summer and winter respectively. This is likely a reflection for the increase in demand for power during the winter month.

Table 6 Results of Automatic Monitoring of Nitrogen Dioxide: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Annual Mean Concentration 40μg/m^3							
			2004 [b]	2005 [b]	2006 [b]	2007 [b]	2008 [b]	2009 [b]	2010* [c]	2011 [c]
Telford Aqueduct	Urban backgrd.	N	15 (98%)	16 (93%)	11 (90%)	14 (92%)	13 (91%)	12 (96%)	9 (76%)	9 (90%)
Telford School	Urban backgrd.	N	13 (96%)	13 (99%)	10 (93%)	12 (99%)	11 (95%)	12 (100%)	14 (95%)	9 (96%)

[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

Table 7 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour mean Objective

Site ID	Site Type	Within AQMA?	Number of Exceedances of Hourly Mean (200 μg/m^3)							
			2004 [b]	2005 [b]	2006 [b]	2007 [b]	2008 [b]	2009 [b]	2010 [b, c]	2011 [b]
Telford Aqueduct	Urban backgrd.	N	0 (98%)	0 (93%)	0 (90%)	0 (92%)	0 (91%)	0 (96%)	0 (76%)(61)	0 (90%)
Telford School	Urban backgrd.	N	0 (96%)	0 (99%)	0 (93%)	0 (99%)	0 (95%)	0 (100%)	0 (95%)	0 (96%)

[ub] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%.)

[c] If the period of valid data is less than 90%, include the 99.8th percentile of hourly means in brackets

Table 8 Percentile data for NOx monitoring, 2004-2011, Telford School

Year	90th Percentile	95th Percentile	98th Percentile	99th Percentile	99.9th Percentile	Maximum Hourly Value
2004	42	52	60	65	91	101
2005	29	36	44	48	59	87
2006	30	38	48	55	71	91
2007	22	31	41	47	65	82
2008	29	42	56	63	83	110
2009	26	33	43	50	71	87
2010	28	36	45	51	69	96
2011	35	44	54	60	77	99

Table 9 Percentile data for NOx monitoring, 2004-2011, Telford Aqueduct

Year	PM_{10} 90th Percentile	PM_{10} 95th Percentile	PM_{10} 98th Percentile	PM_{10} 99th Percentile	PM_{10} 99.9th Percentile	PM_{10} Maximum Hourly Value
2004	48	57	67	73	94	101
2005	32	41	48	53	64	75
2006	35	43	51	58	74	82
2007	26	36	48	54	66	77
2008	35	47	57	63	85	101
2009	30	39	50	56	71	93
2010	31	40	50	55	78	109
2011	24	33	44	51	66	75

Diffusion Tube Monitoring Data

Diffusion tube data from 2004 to 2011 has been analysed to provide a comparison with air quality objectives, over and above those of a normal Progress Report. The results of this assessment will be extrapolated into the future (with the inherent uncertainties noted) to determine when the air quality within the Borough will be above the relevant air quality objective. All data has been appropriately bias adjusted.

A decision was made in early 2011 to discontinue with the diffusion tube monitoring within the Borough. This was due to the fact that data from previous years had showed good compliance with air quality objectives, with very little variation. DEFRA confirmed that they had no objection to this decision. This analysis supports this assumption. As such, no monitoring data from 2011 is reported.

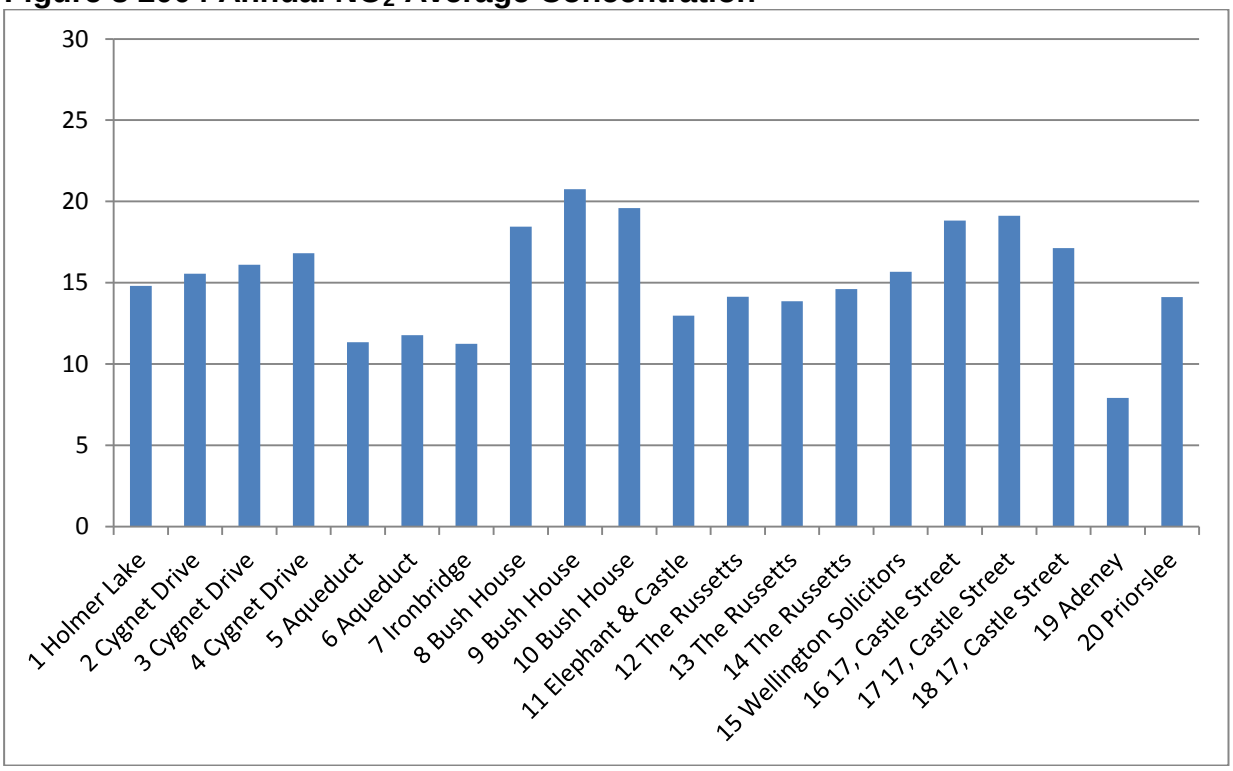
Table 10 Results of Nitrogen Dioxide Diffusion Tubes (2004 to 2011)

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) μg/m^3							
			2004 (Bias Adjustment Factor = 1.1)	2005 (Bias Adjustment Factor = 1.1)	2006 (Bias Adjustment Factor = 1)	2007 (Bias Adjustment Factor = 1)	2008 (Bias Adjustment Factor = 0.94)	2009 (Bias Adjustment Factor = 0.97)	2010 (Bias Adjustment Factor = 1.11)	2011 (Bias Adjustment Factor = N/A)
1	1 Holmer Lake	N	15	17	17	16	19	16	17	N/A
2	2 Cygnet Drive	N	16	17	19	18	22	18	20	N/A
3	3 Cygnet Drive	N	16	18	19	19	22	19	20	N/A
4	4 Cygnet Drive	N	17	18	19	19	22	19	21	N/A
5	5 Aqueduct	N	11	12	10	12	11	12	13	N/A
6	6 Aqueduct	N	12	11	11	13	12	13	13	N/A
7	7 Ironbridge	N	11	13	13	13	14	13	14	N/A
8	8 Bush House	N	18	20	24	24	29	24	26	N/A
9	9 Bush House	N	21	20	24	24	29	24	24	N/A
10	10 Bush House	N	20	21	25	23	29	23	25	N/A
11	11 Elephant & Castle	N	13	16	20	19	19	19	19	N/A
12	12 The Russetts	N	14	15	17	18	20	18	18	N/A

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) μg/m^3							
			2004 (Bias Adjustment Factor = 1.1)	2005 (Bias Adjustment Factor = 1.1)	2006 (Bias Adjustment Factor = 1)	2007 (Bias Adjustment Factor = 1)	2008 (Bias Adjustment Factor = 0.94)	2009 (Bias Adjustment Factor = 0.97)	2010 (Bias Adjustment Factor = 1.11)	2011 (Bias Adjustment Factor = N/A)
13	**13 The Russetts**	N	14	15	17	18	19	18	18	N/A
14	**14 The Russetts**	N	15	16	17	18	20	18	18	N/A
15	**15 Wellington Solicitors**	N	16	16	19	19	21	19	20	N/A
16	**16 17, Castle Street**	N	19	20	20	24	25	24	22	N/A
17	**17 17, Castle Street**	N	19	21	21	24	25	24	22	N/A
18	**18 17, Castle Street**	N	17	20	21	25	25	25	23	N/A
19	**19 Adeney**	N	8	6	10	9	6	9	9	N/A
20	**20 Priorslee**	N	14	20	23	24	23	24	22	N/A

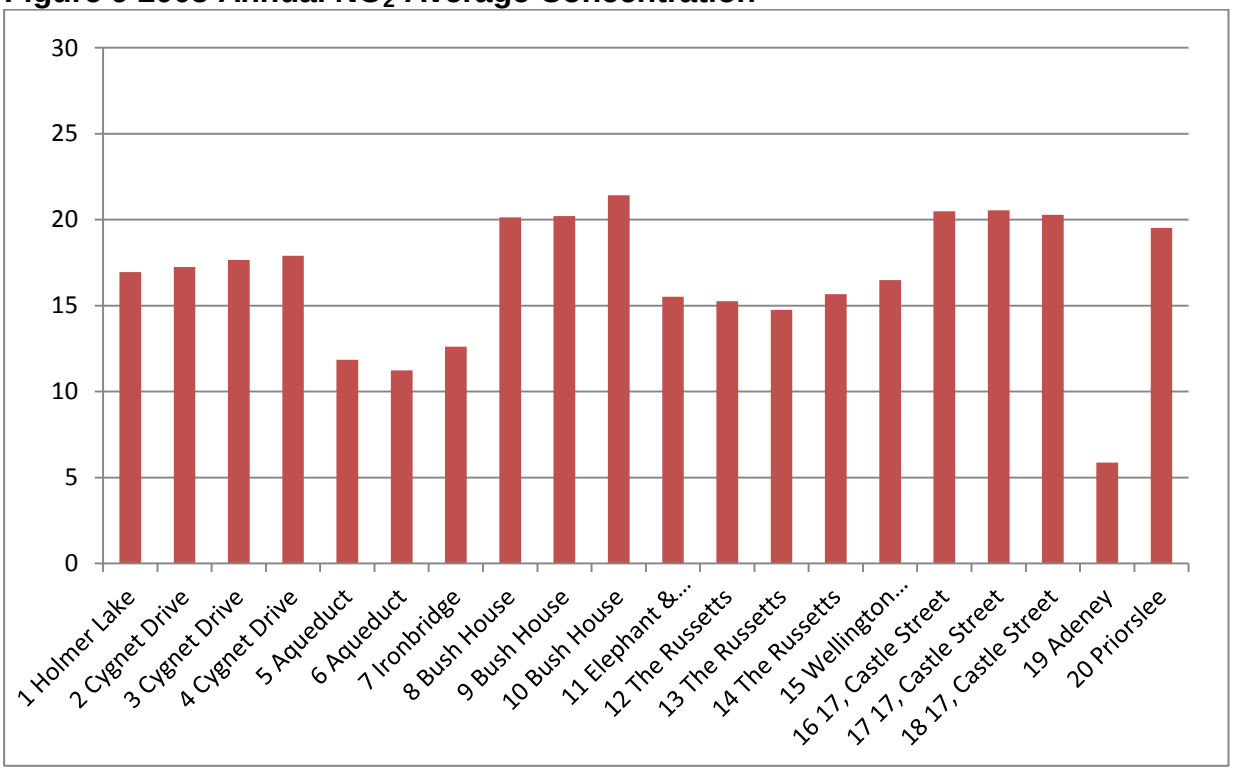
Below are graphs demonstrating the average yearly value for NO_2 from the diffusion tube monitoring network. These cover the years 2004 to 2011.

Figure 8 2004 Annual NO_2 Average Concentration



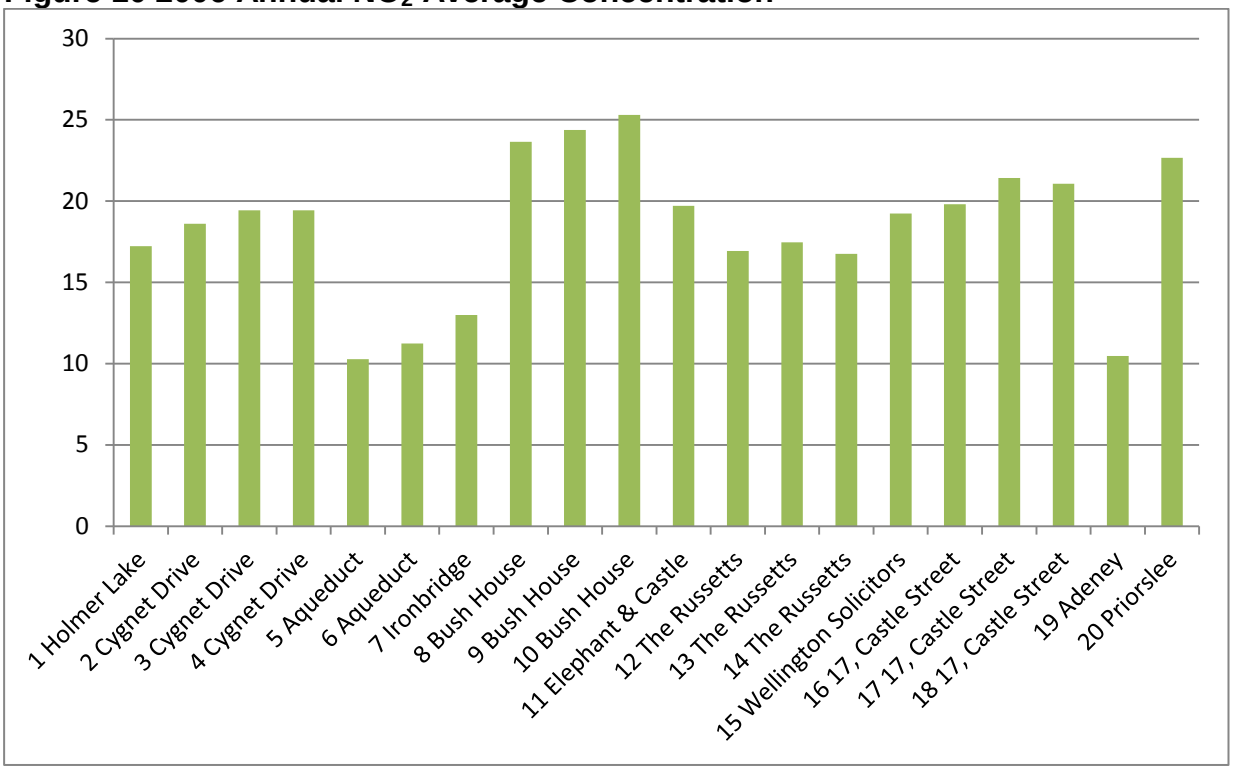
This is the graph for the 2004 data set. The average concentration of NO_2 within the Borough from the diffusion tube network was 15mg/m^3. This is considerably below the air quality objective of 40. The highest single average value recorded was 21 mg/m^3 at one of the Bush House tubes.

Figure 9 2005 Annual NO_2 Average Concentration



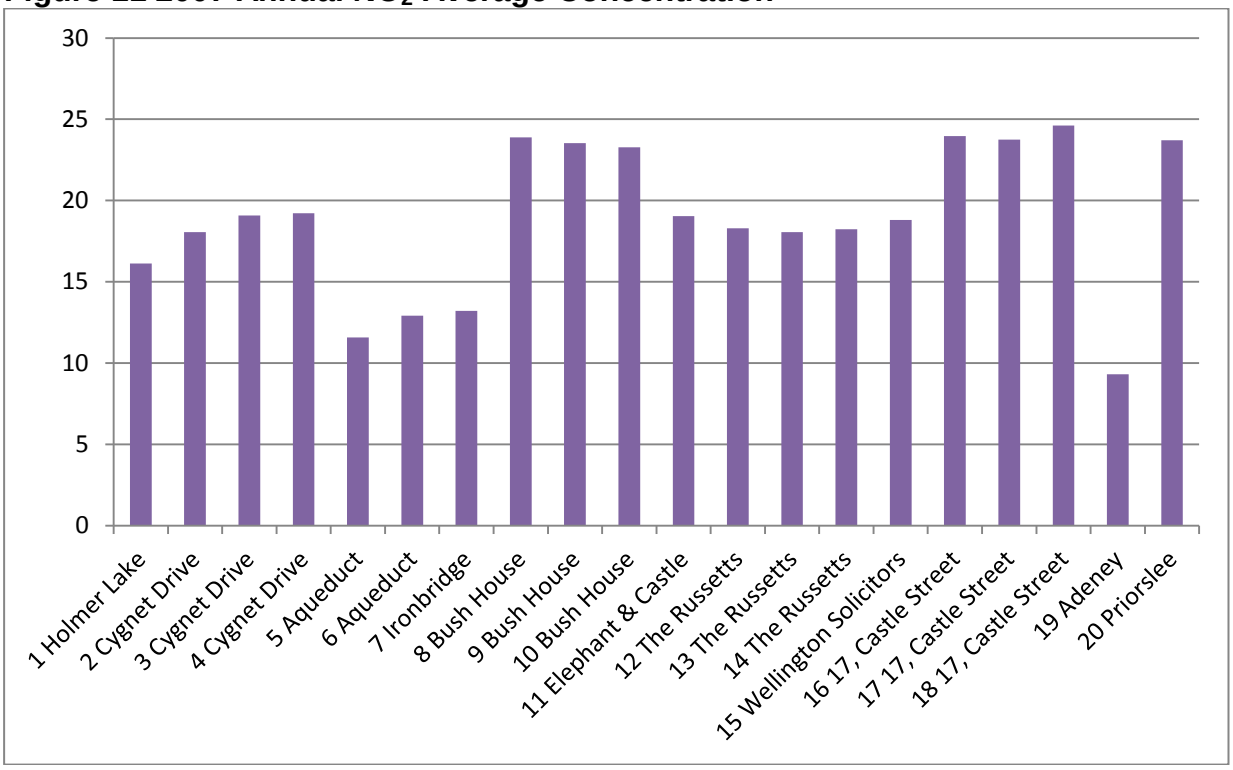
This is the graph for the 2005 data set. The average concentration of NO_2 within the Borough from the diffusion tube network was 17mg/m^3. This is considerably below the air quality objective of 40. The highest single average value recorded was 21 mg/m^3 at one of the Bush House tubes.

Figure 10 2006 Annual NO_2 Average Concentration



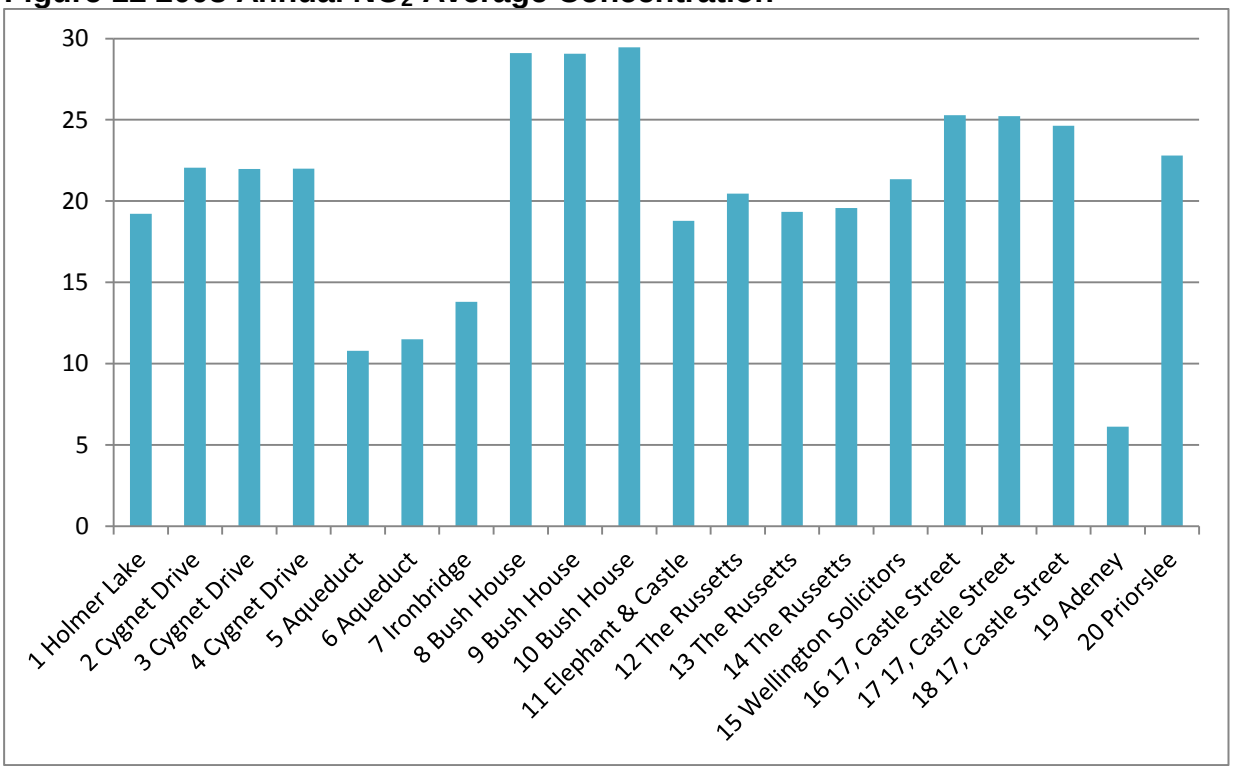
This is the graph for the 2006 data set. The average concentration of NO_2 within the Borough from the diffusion tube network was 18mg/m^3. This is considerably below the air quality objective of 40. The highest single average value recorded was 25 mg/m^3 at one of the Bush House tubes.

Figure 11 2007 Annual NO_2 Average Concentration



This is the graph for the 2007 data set. The average concentration of NO_2 within the Borough from the diffusion tube network was 19mg/m^3. This is considerably below the air quality objective of 40. The highest single average value recorded was 25 mg/m^3 at one of the Castle Street tubes.

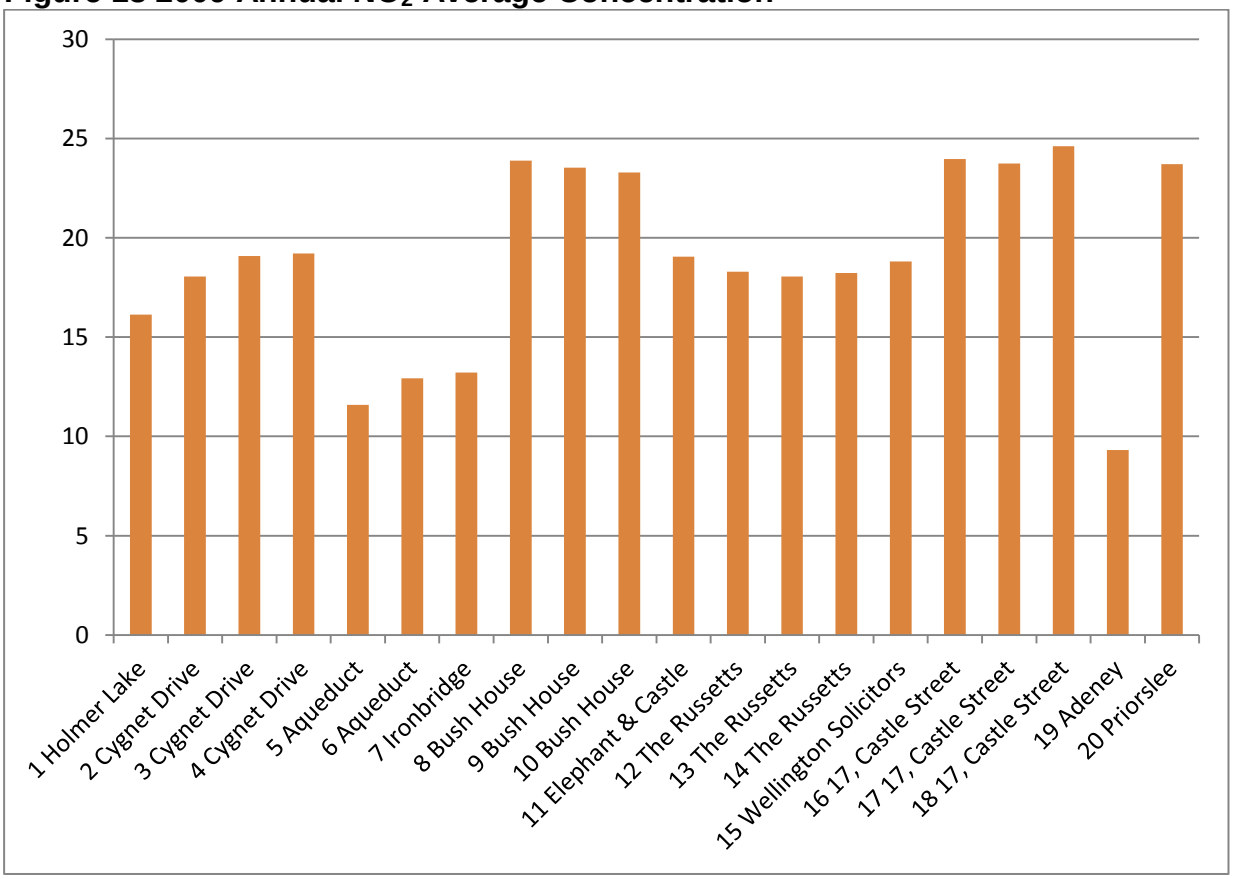
Figure 12 2008 Annual NO_2 Average Concentration



This is the graph for the 2008 data set. The average concentration of NO_2 within the Borough from the diffusion tube network was 21mg/m^3. This is considerably below the air

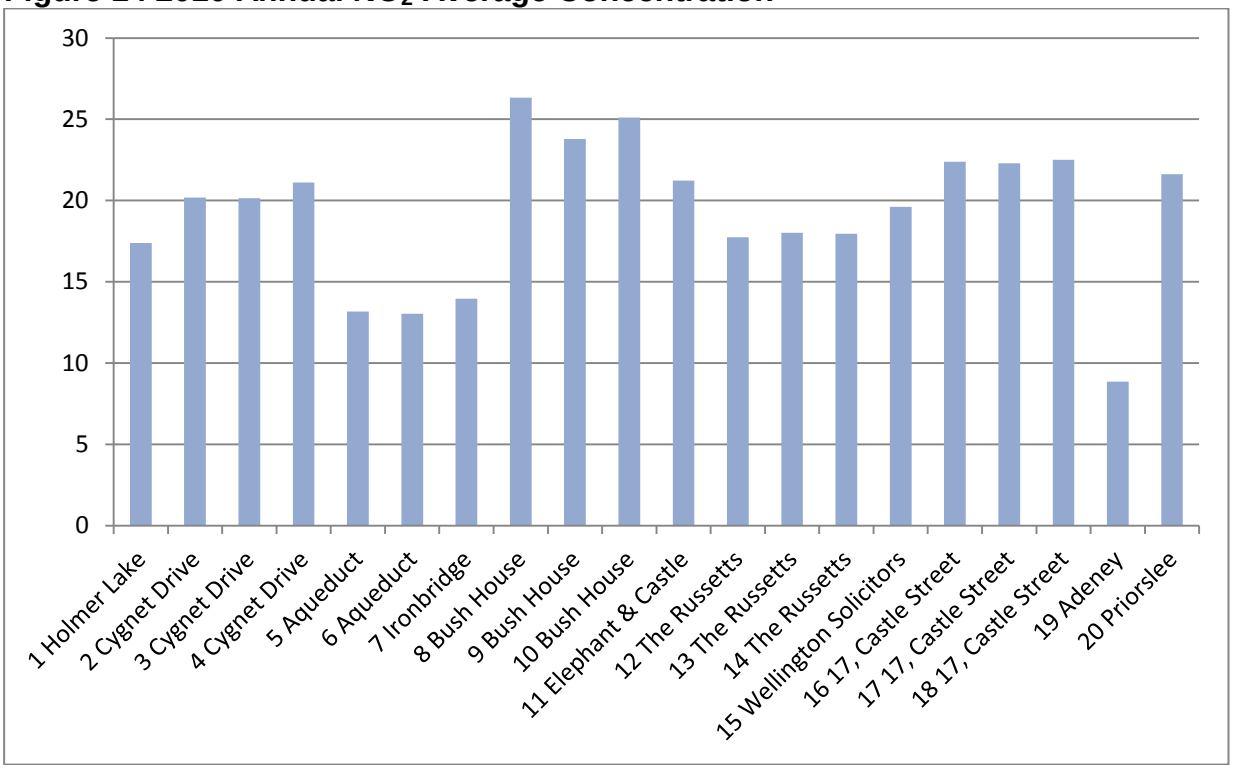
quality objective of 40. The highest single average value recorded was 29 mg/m^3 at one of the Bush House tubes.

Figure 13 2009 Annual NO_2 Average Concentration



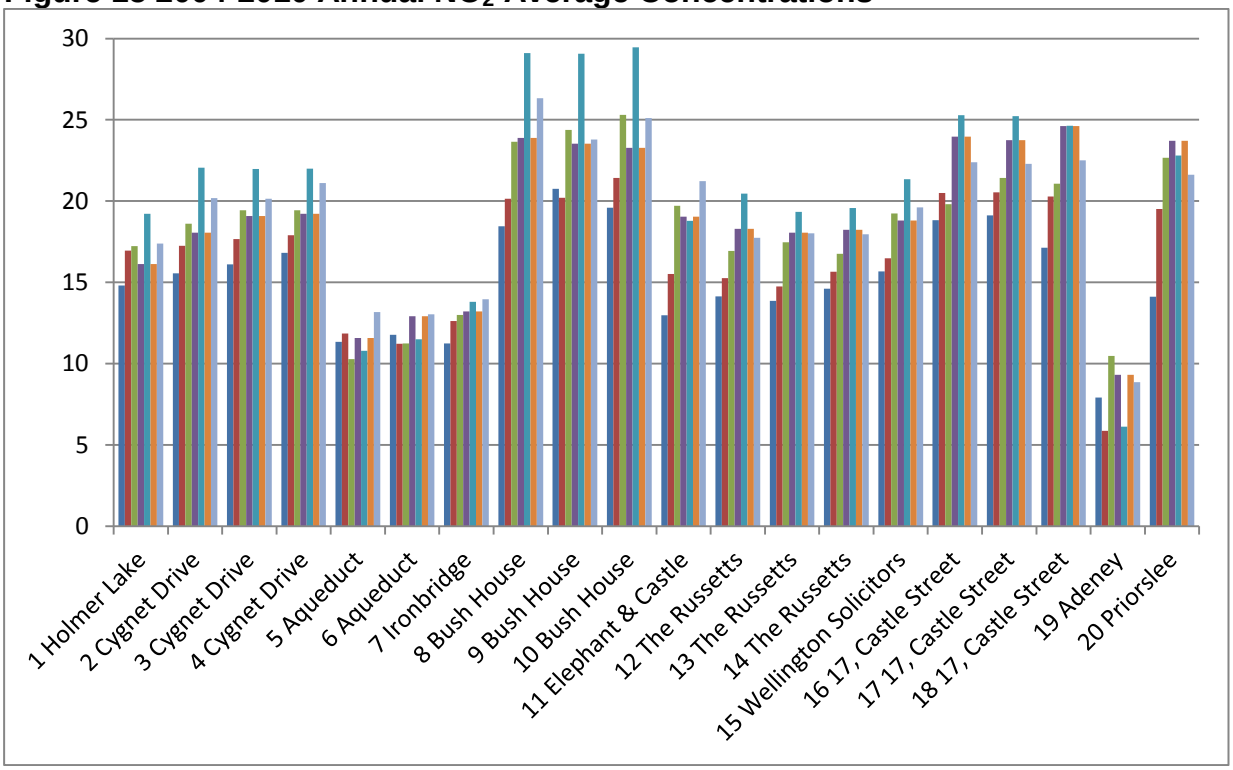
This is the graph for the 2009 data set. The average concentration of NO_2 within the Borough from the diffusion tube network was 19mg/m^3. This is considerably below the air quality objective of 40. The highest single average value recorded was 25 mg/m^3 at one of the Castle Street tubes.

Figure 14 2010 Annual NO_2 Average Concentration



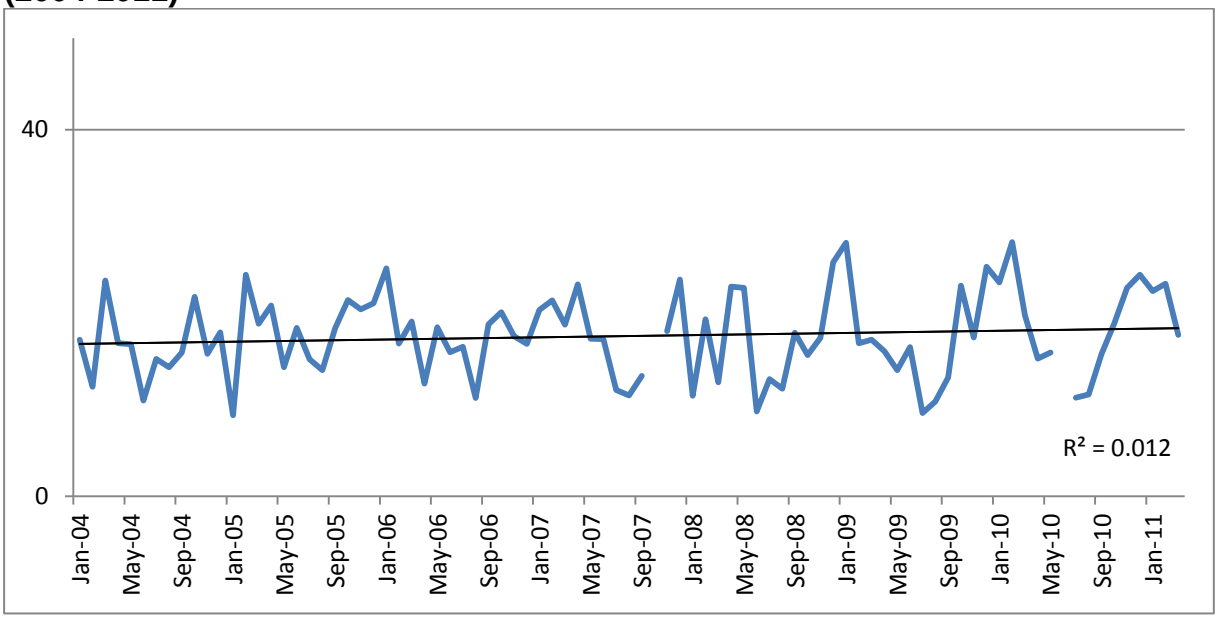
This is the graph for the 2010 data set that finished in March 2011. The average concentration of NO_2 within the Borough from the diffusion tube network was 19mg/m^3. This is considerably below the air quality objective of 40. The highest single average value recorded was 26 mg/m^3 at one of the Castle Street tubes.

Figure 15 2004-2010 Annual NO_2 Average Concentrations



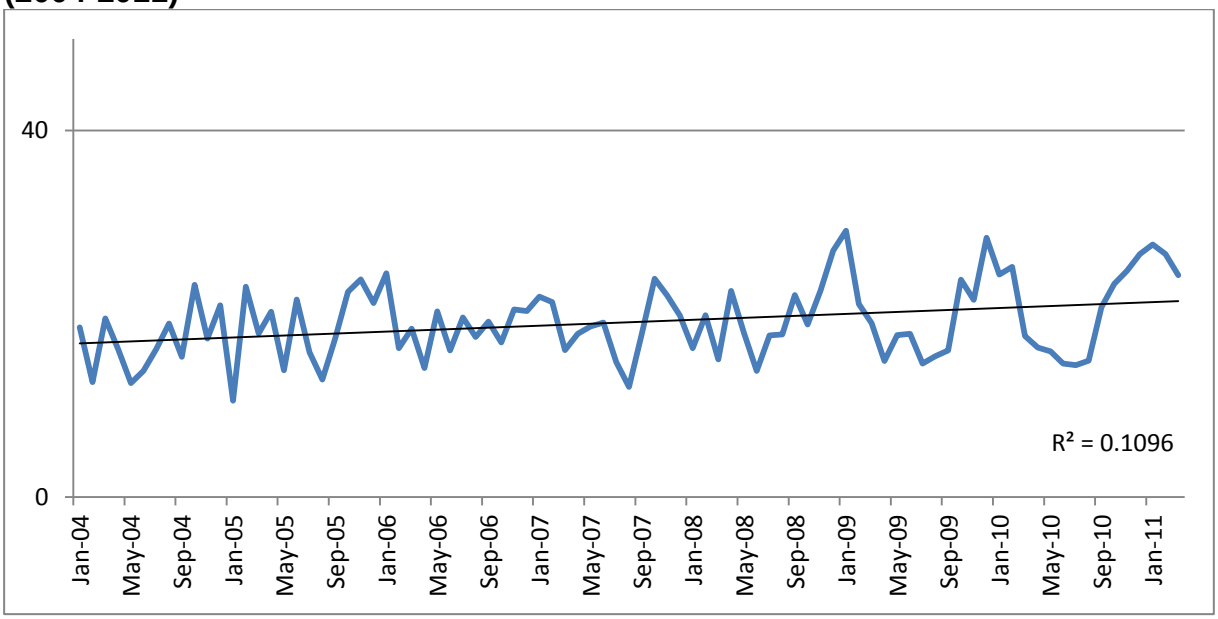
This graph shows all the data sets combines, and shows an interesting general pattern of slowly increasing NO_2 concentrations across each tube location, followed by a decrease to when monitoring ceased.

Figure 16 Trends in Monthly NO_2 Concentrations measured at Holmer Lake (2004-2011)



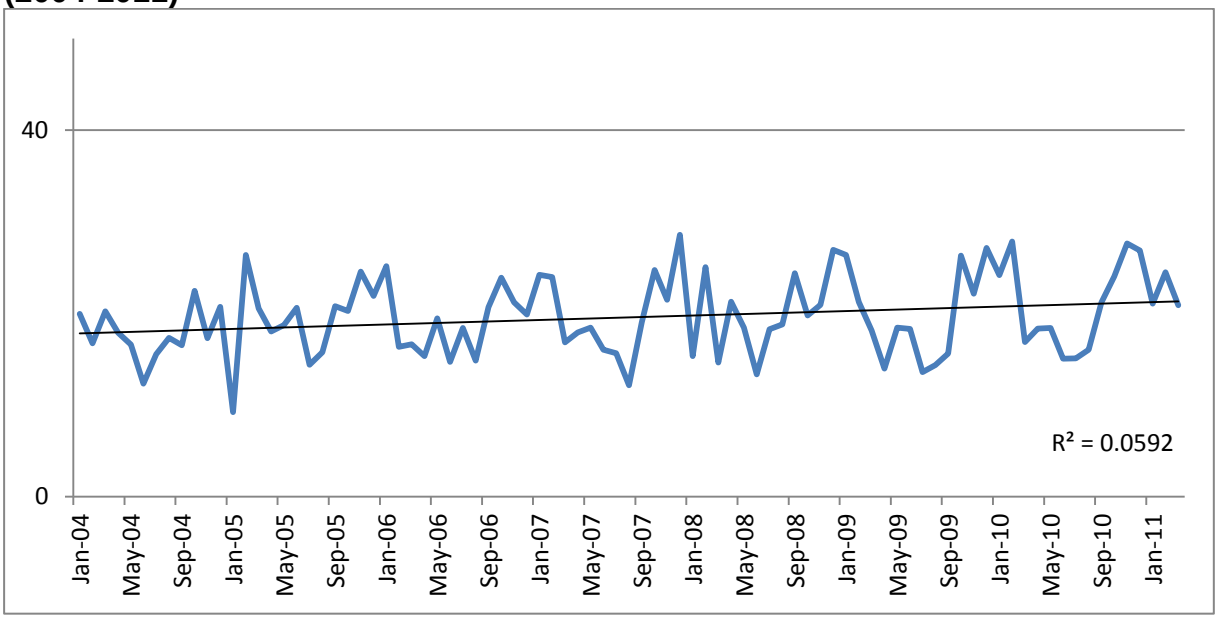
The trend line for the diffusion tube situated at Holmer Lake shows a slight increase over time; this can be compared with the graph in the 2011 report which shows a slight decrease, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 46 in Appendix C), indicates that the air quality objective will be breached in in approximately 80 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

Figure 17 Trends in Monthly NO_2 Concentrations measured at Cygnet Drive (2004-2011)



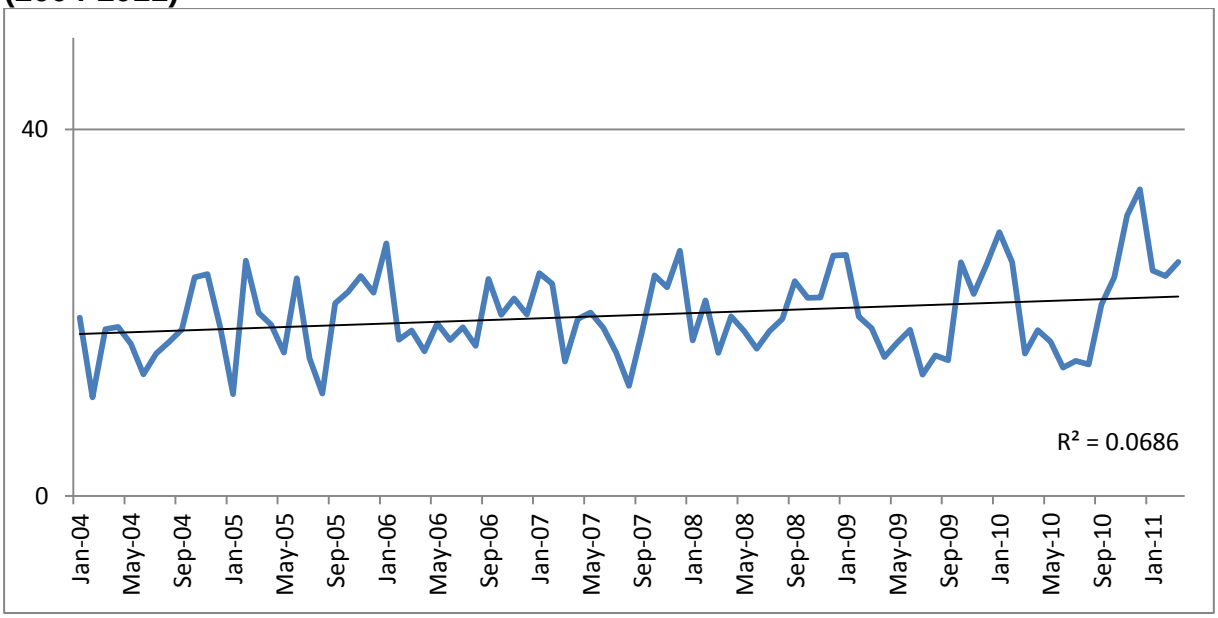
The trend line for the diffusion tube situated at Cygnet Drive shows a slight increase over time; this can be compared with the graph in the 2011 report which shows a slight decrease, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 47 in Appendix C), indicates that the air quality objective will be breached in 10 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

Figure 18 Trends in Monthly NO_2 Concentrations measured at Cygnet Drive (2004-2011)



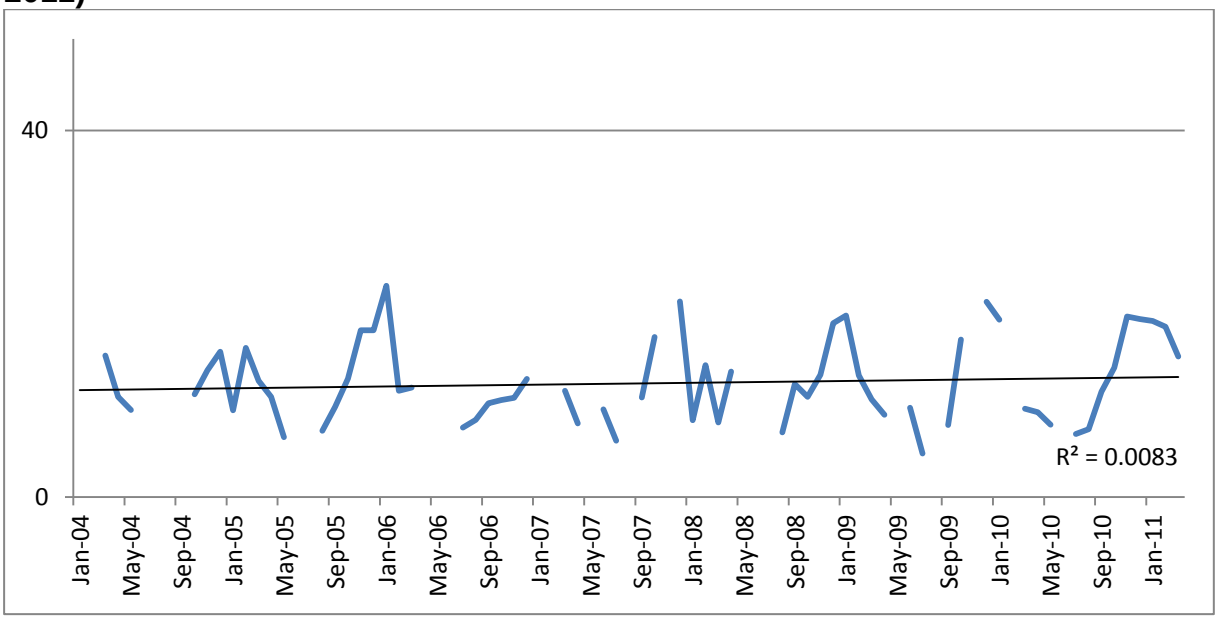
The trend line for the diffusion tube situated at Cygnet Drive shows a slight increase over time; this can be compared with the graph in the 2011 report which shows a slight decrease, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 48 in Appendix C), indicates that the air quality objective will be breached in 20 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

Figure 19 Trends in Monthly NO_2 Concentrations measured at Cygnet Drive (2004-2011)



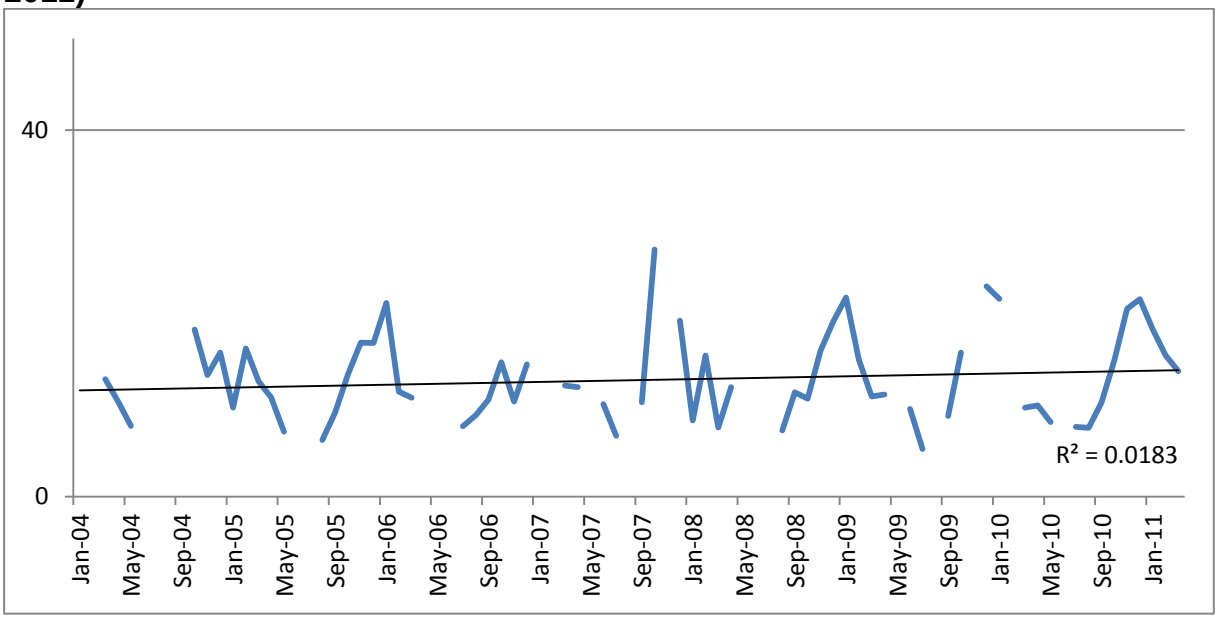
The trend line for the diffusion tube situated at Cygnet Drive shows a slight increase over time; this can be compared with the graph in the 2011 report which shows a slight decrease, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 49 in Appendix C), indicates that the air quality objective will be breached in 30 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

Figure 20 Trends in Monthly NO_2 Concentrations measured at Aqueduct (2004-2011)



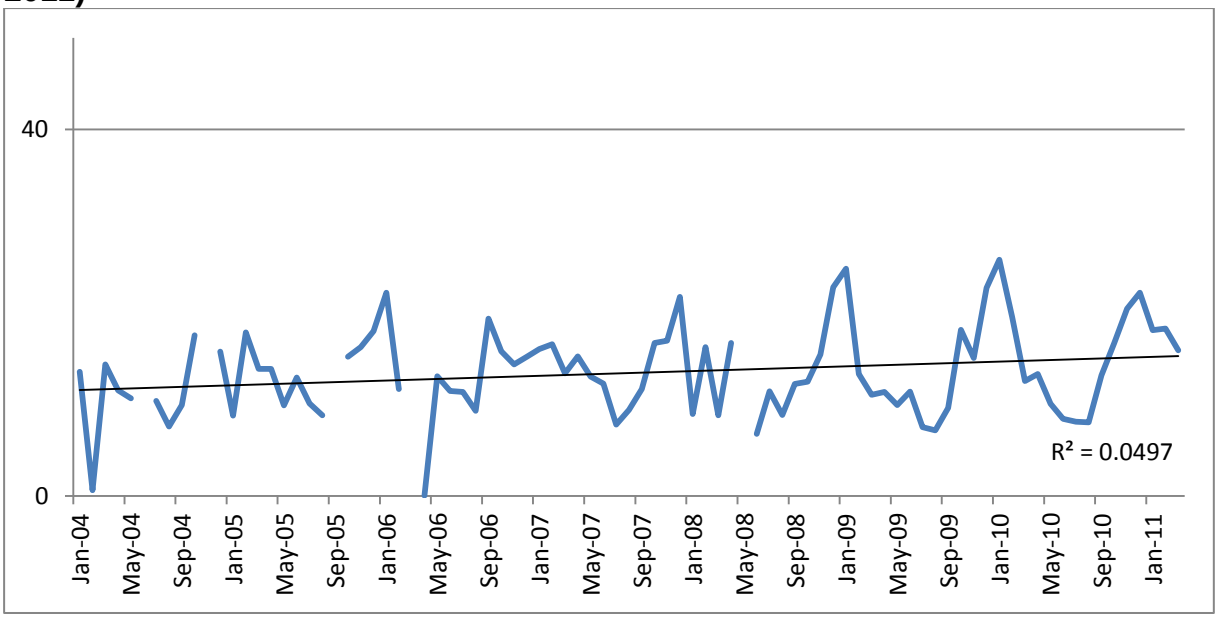
The trend line for the diffusion tube situated at Aqueduct shows a slight increase over time; this can be compared with the graph in the 2011 report which shows a slight decrease, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 50 in Appendix C), indicates that the air quality objective will be breached in 40 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

Figure 21 Trends in Monthly NO_2 Concentrations measured at Aqueduct (2004-2011)



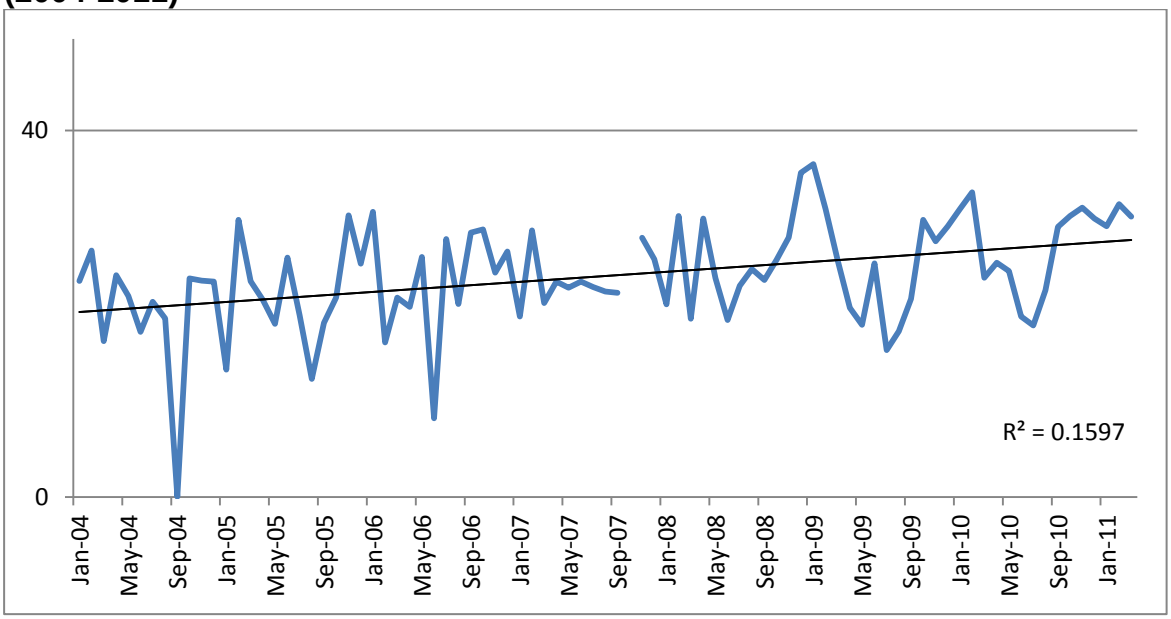
The trend line for the diffusion tube situated at Aqueduct shows a slight increase over time; this can be compared with the graph in the 2011 report which shows a slight decrease, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 51 in Appendix C), indicates that the air quality objective will be breached in 90 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

Figure 22 Trends in Monthly NO_2 Concentrations measured at Ironbridge (2004-2011)



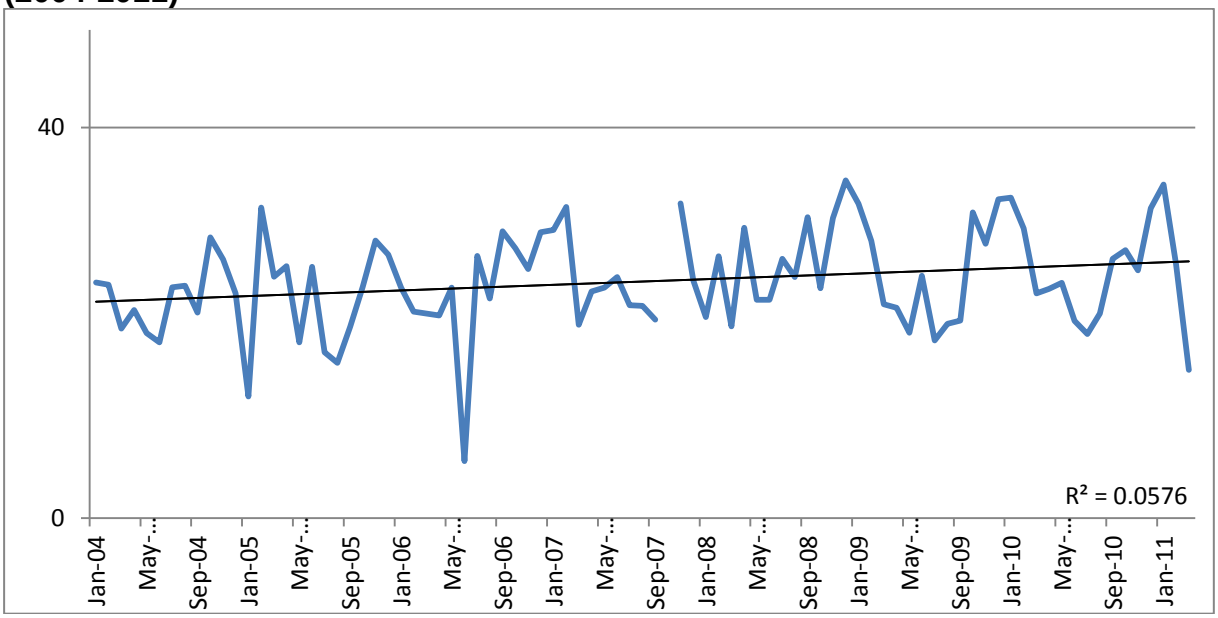
The trend line for the diffusion tube situated at Ironbridge shows a slight increase over time; this can be compared with the graph in the 2011 report which shows a slight decrease, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 52 in Appendix C), indicates that the air quality objective will be breached in 70 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

Figure 23 Trends in Monthly NO_2 Concentrations measured at Bush House (2004-2011)



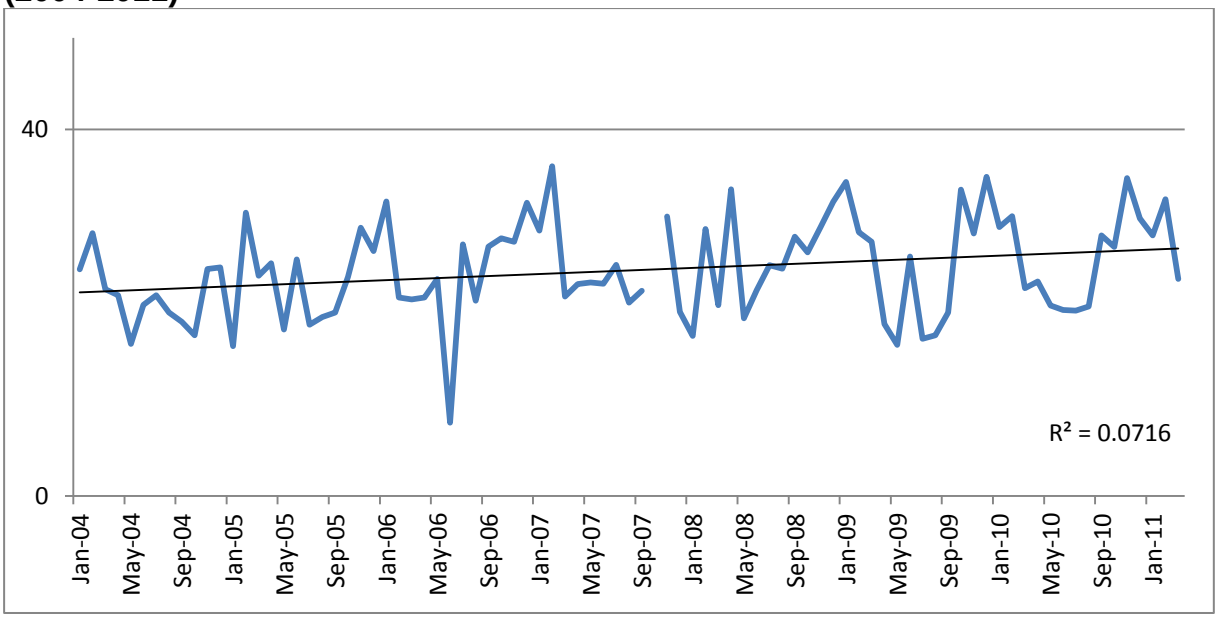
The trend line for the diffusion tube situated at Bush House shows a slight increase over time; this can be compared with the graph in the 2011 report which shows a slight decrease, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 53 in Appendix C), indicates that the air quality objective will be breached in 6 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

Figure 24 Trends in Monthly NO_2 Concentrations measured at Bush House (2004-2011)



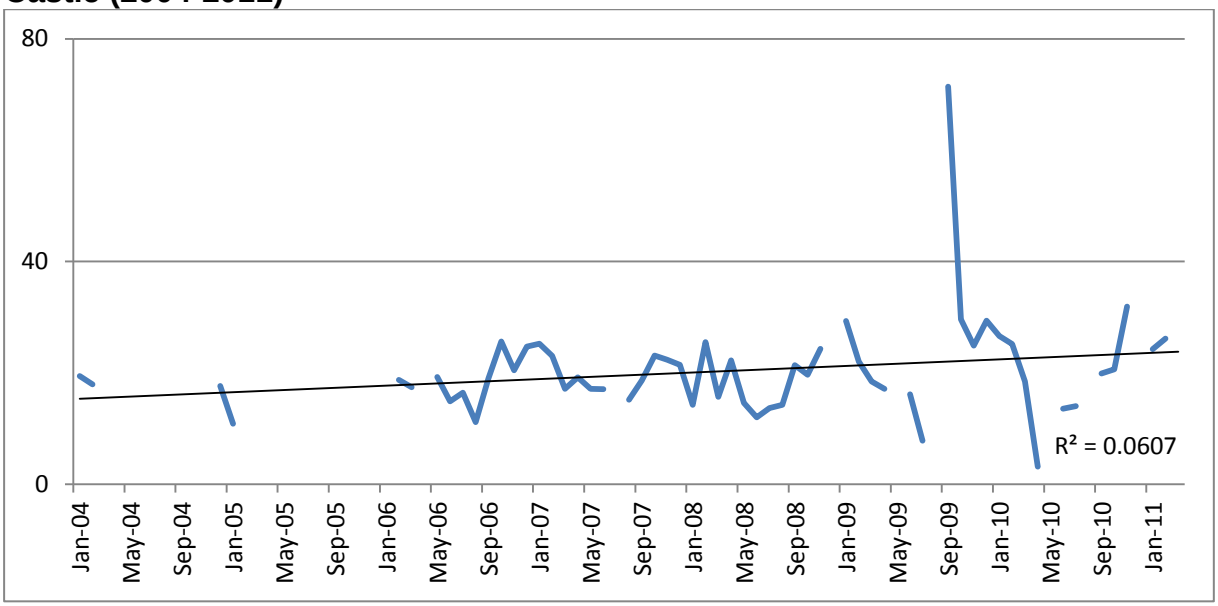
The trend line for the diffusion tube situated at Bush House shows a slight increase over time; this can be compared with the graph in the 2011 report which shows a slight decrease, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 54 in Appendix C), indicates that the air quality objective will be breached in 15 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

Figure 25 Trends in Monthly NO_2 Concentrations measured at Bush House (2004-2011)



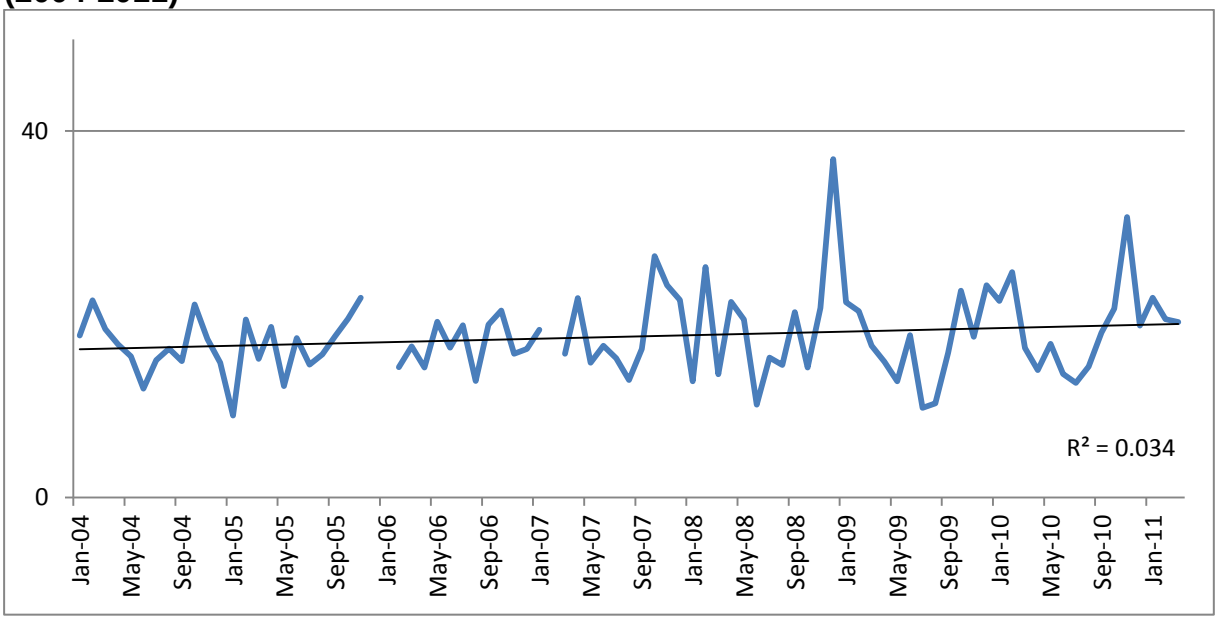
The trend line for the diffusion tube situated at Bush House shows a slight increase over time; this can be compared with the graph in the 2011 report which shows a slight decrease, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 55 in Appendix C), indicates that the air quality objective will be breached in 10 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

Figure 26 Trends in Monthly NO_2 Concentrations measured at Elephant & Castle (2004-2011)



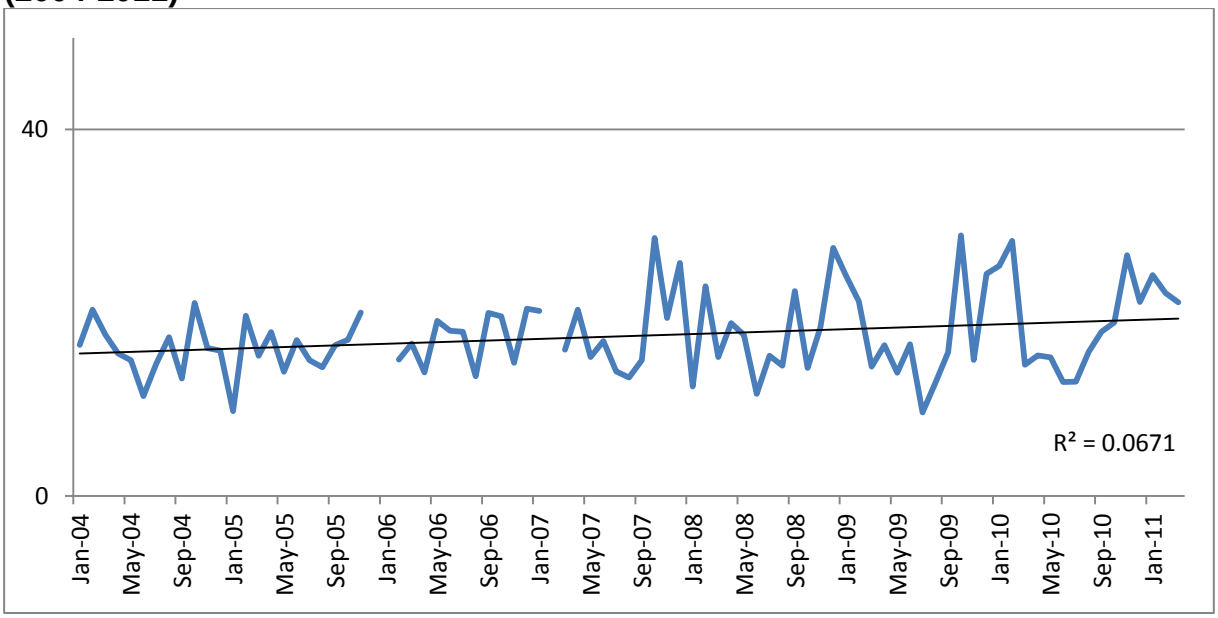
The trend line for the diffusion tube situated at Elephant & Castle shows a slight increase over time; this can be compared with the graph in the 2011 report which shows a slight decrease, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 56 in Appendix C), indicates that the air quality objective will be breached in 15 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

Figure 27 Trends in Monthly NO_2 Concentrations measured at The Russetts (2004-2011)



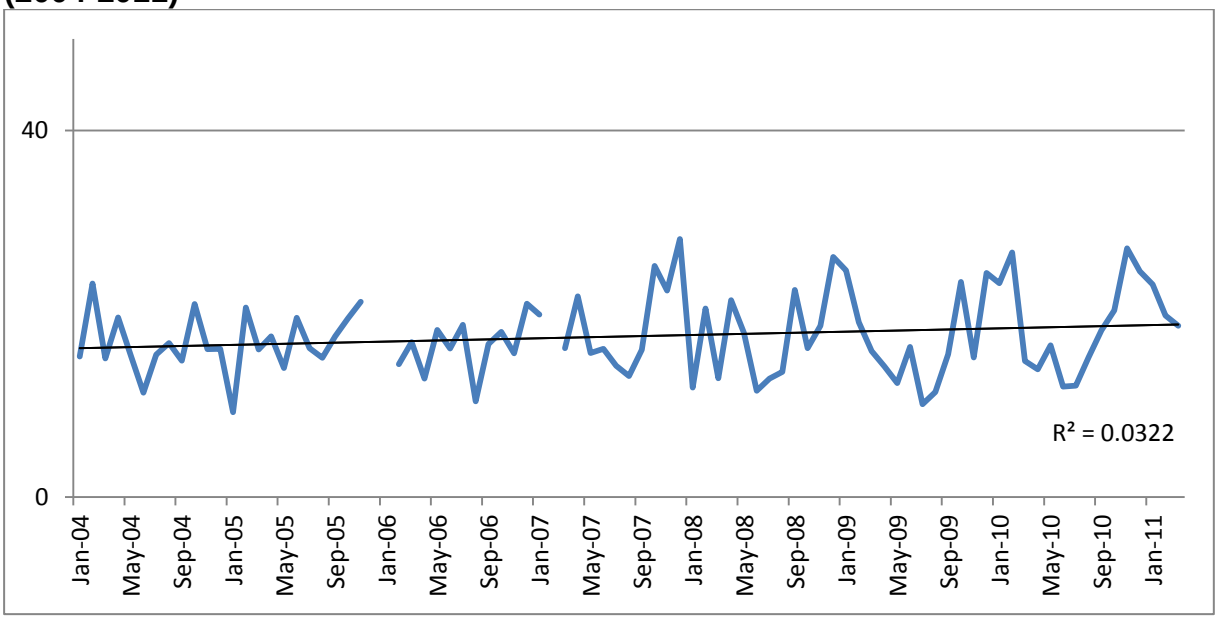
The trend line for the diffusion tube situated at The Russetts shows a slight increase over time; this can be compared with the graph in the 2011 report which shows a slight decrease, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 57 in Appendix C), indicates that the air quality objective will be breached in 25 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

Figure 28 Trends in Monthly NO_2 Concentrations measured at The Russetts (2004-2011)



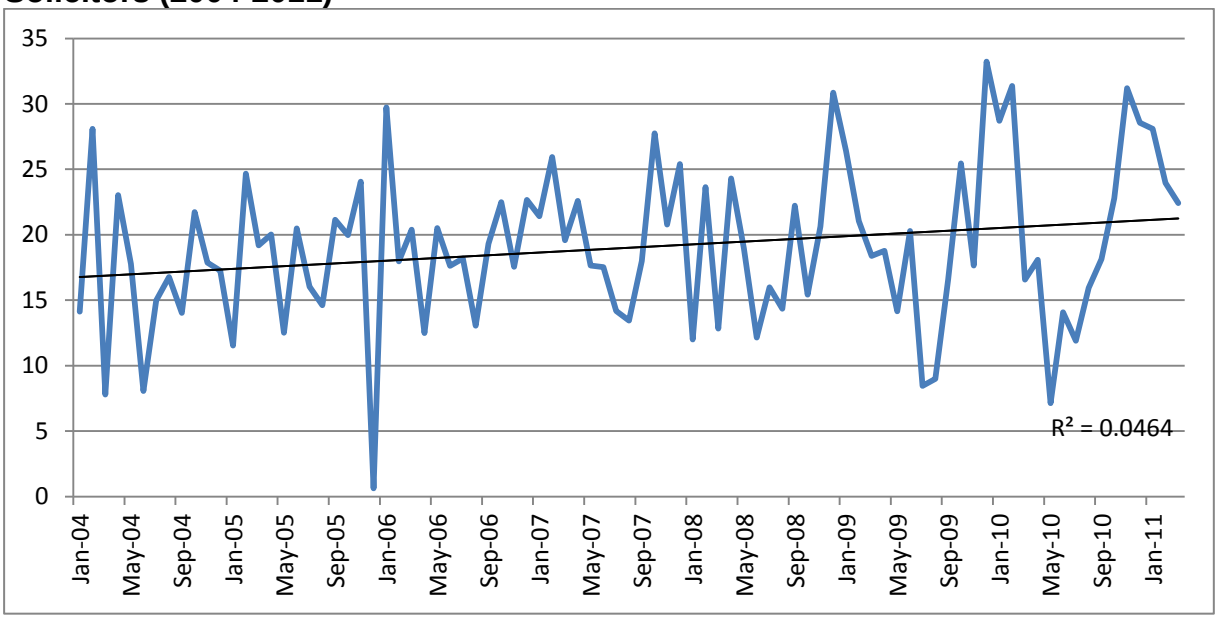
The trend line for the diffusion tube situated at The Russetts shows a slight increase over time; this can be compared with the graph in the 2011 report which shows a slight decrease, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 58 in Appendix C), indicates that the air quality objective will be breached in 25 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

Figure 29 Trends in Monthly NO_2 Concentrations measured at The Russetts (2004-2011)



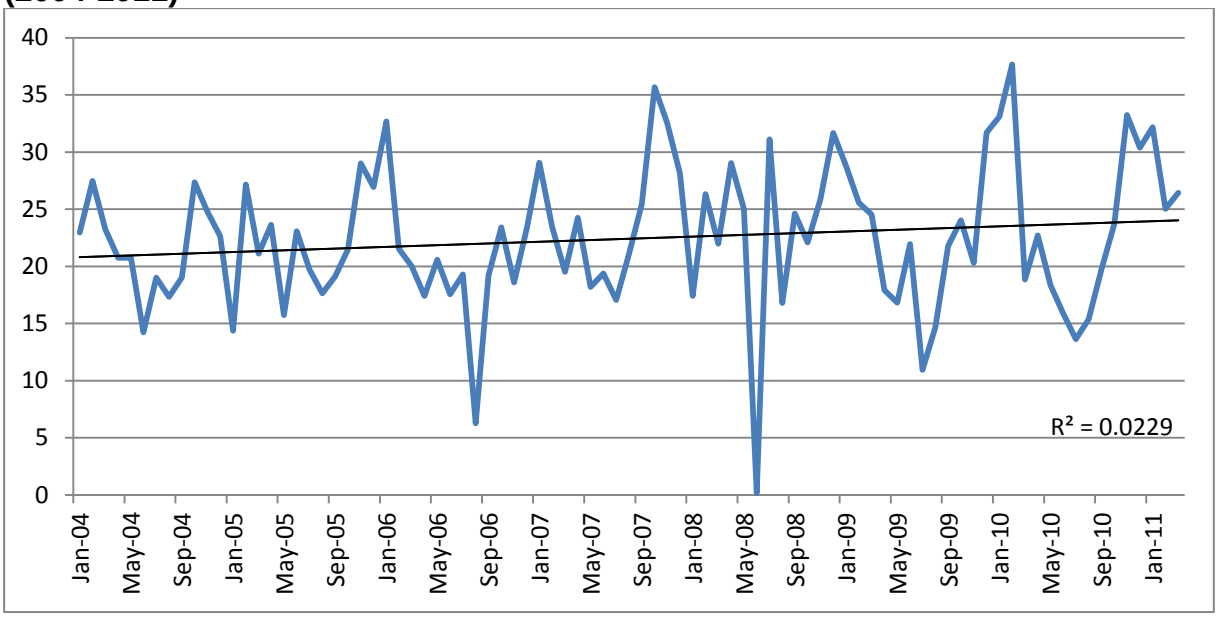
The trend line for the diffusion tube situated at The Russetts shows a slight increase over time; this can be compared with the graph in the 2011 report which shows a slight decrease, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 59 in Appendix C), indicates that the air quality objective will be breached in 30 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

Figure 30 Trends in Monthly NO_2 Concentrations measured at Wellington Solicitors (2004-2011)



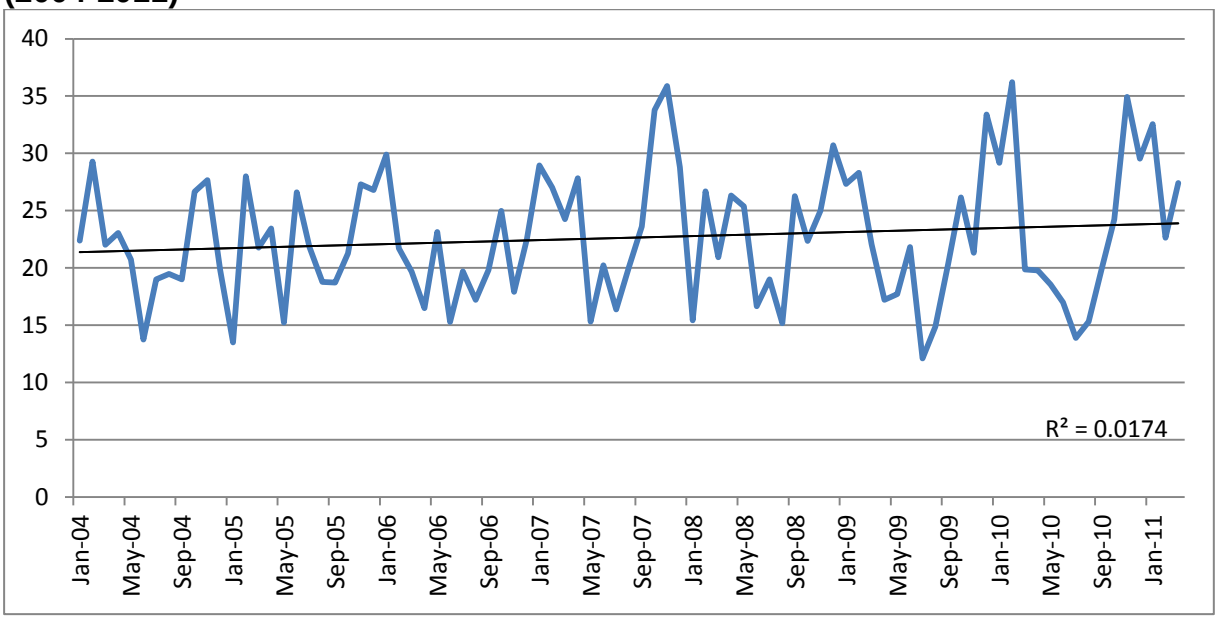
The trend line for the diffusion tube situated at Wellington Solicitors shows a slight increase over time; this can be compared with the graph in the 2011 report which shows a slight decrease, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 60 in Appendix C), indicates that the air quality objective will be breached in 25 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

Figure 31 Trends in Monthly NO_2 Concentrations measured at Castle Street (2004-2011)



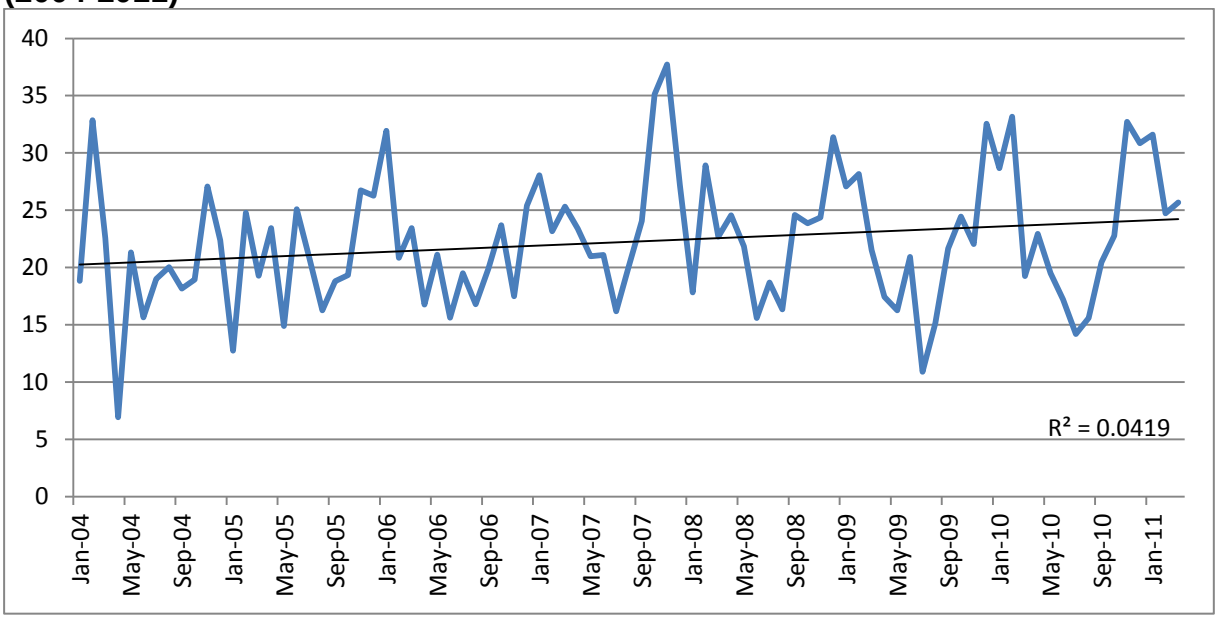
The trend line for the diffusion tube situated at 17 Castle Street shows a slight increase over time; this can be compared with the graph in the 2011 report which shows a slight decrease, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 61 in Appendix C), indicates that the air quality objective will be breached in 25 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

Figure 32 Trends in Monthly NO_2 Concentrations measured at Castle Street (2004-2011)



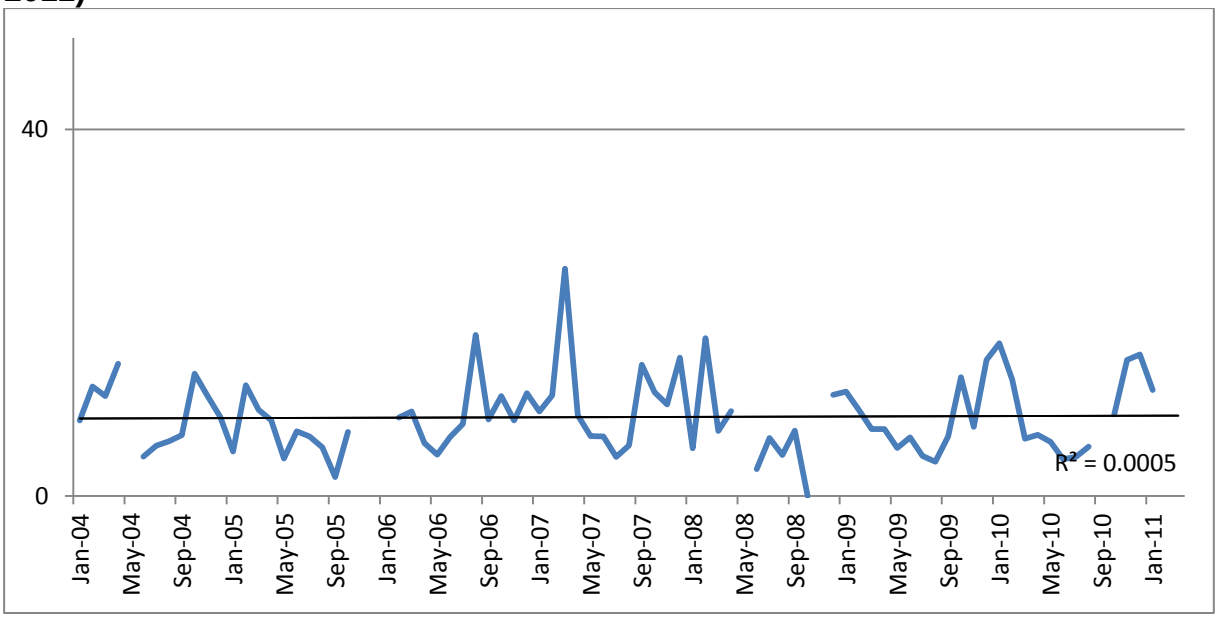
The trend line for the diffusion tube situated at 17 Castle Street shows a slight increase over time; this can be compared with the graph in the 2011 report which shows a slight decrease, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 62 in Appendix C), indicates that the air quality objective will be breached in 20 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

Table 10 Trends in Monthly NO_2 Concentrations measured at Castle Street (2004-2011)



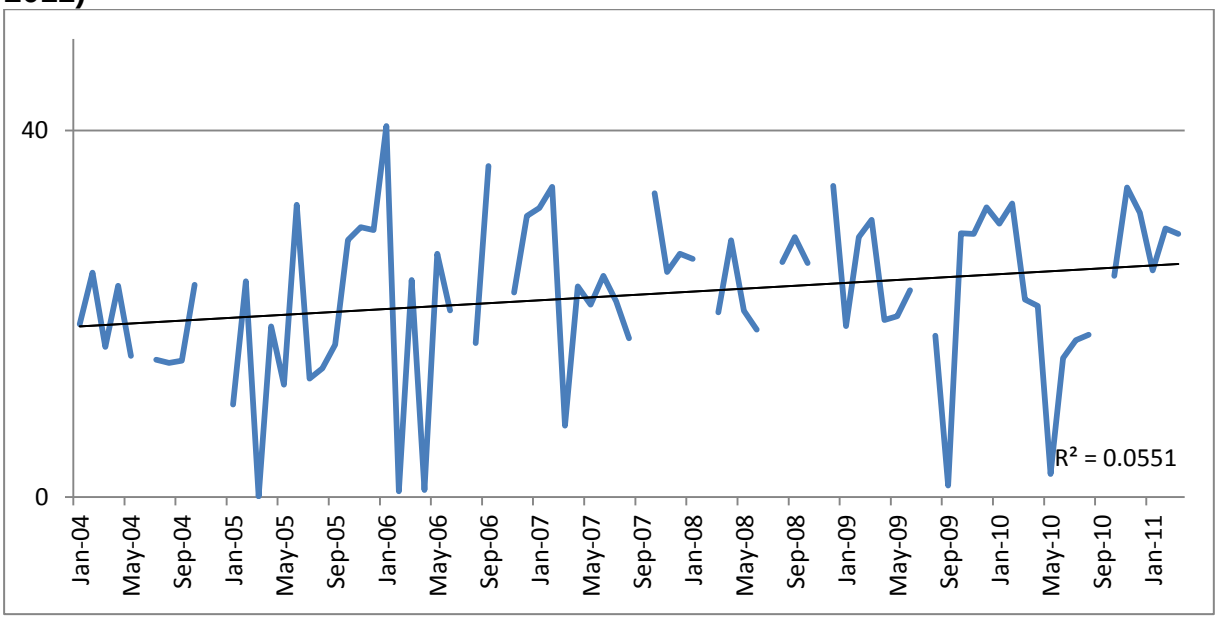
The trend line for the diffusion tube situated at 17 Castle Street shows a slight increase over time; this can be compared with the graph in the 2011 report which shows a slight decrease, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 63 in Appendix C), indicates that the air quality objective will be breached in 10 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

Table 11 Trends in Monthly NO_2 Concentrations measured at Adeney (2004-2011)



The trend line for the diffusion tube situated at Adeney shows no increase over time; this can be compared with the graph in the 2011 report which shows a slight increase, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 64 in Appendix C), indicates that the air quality objective will be breached in 160 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

Table 12 Trends in Monthly NO_2 Concentrations measured at Priorslee (2004-2011)



The trend line for the diffusion tube situated at Priorslee shows a slight increase over time; this can be compared with the graph in the 2011 report which shows a slight decrease, as well as highlighting the benefits of using a more extensive dataset when making regulatory decisions. The R^2 value indicates that the trend line does not correlate very well to the population used to derive it. However, extrapolating the trend line forward (Figure 65 in Appendix C), indicates that the air quality objective will be breached in 10 years. There are inherent uncertainties in the diffusion tube monitoring and sampling process, as well as the bias adjustment procedure and the extrapolation process. However, even taking these uncertainties into account, it is thought that the air quality in this part of the Borough will remain below the air quality objective for the foreseeable future.

A comparison between the continuous monitoring and the diffusion tube data shows an interesting dichotomy. Whilst the automatic monitoring data demonstrates a decrease over time, the diffusion tube data shows an increase (albeit small) over time. As there are no breaches of any of the air quality objectives, it is not considered necessary to evaluate this any further as it is not considered currently significant. However, Telford & Wrekin Council propose to continue assessing data provided under the planning regime for major development proposals, which will enable us to continue to provide a level of comfort as to whether any air quality objectives are breached. It may be necessary to undertake further diffusion tube monitoring in the future.

2.2.2 PM_{10}

PM_{10} is monitored at a dedicated facility located at the Huntingdon Open Cast Colliery, in fulfilment of a condition on their environmental permit:

"**5.0 Air Quality**

5.1 Continuous particulate monitoring of PM_{10} and $PM_{2.5}$ size fraction dust shall be conducted as per table 5. The Continuous emission monitors (CEM's) shall have an alarm set at the 1 hour average AQO limit for PM_{10} as detailed in table 5. Any breach of that limit shall alert onsite personnel via telemetry link. Any activated alarms shall be recorded, investigated and reported to the Regulator within 48 hours.

Table 5 Air Quality Monitoring

Monitoring Location	Monitoring Method	Phase of mining	Frequency	AQO Limit
Rose Villa*	Topas	All phases	Continuous	Annual mean PM_{10} 40 µg m^{-3} $Pm_{2.5}$ 25 µg m^{-3} 24 hour mean PM_{10} 50 µg m^{-3} 1 hour average trigger levels PM_{10} 100 µg m^{-3} $Pm_{2.5}$ 50 µg m^{-3}
Lower Huntington Farm*	Osiris	Phases 1/2A	Continuous	
The Uplands*	Osiris	Phases 2A/2C	Continuous	
New works Lane Junction*	Osiris	Phases 2D-3	Continuous	

*Or at other location(s) to be agreed with the regulator

5.2 Results of air quality monitoring shall be submitted to the regulator upon request. Any additional monitoring or sampling should be submitted at the request of the regulator and within time frames mutually agreed.

The results shall be tabulated and submitted in MS Excel format and shall be sent to the following email address.
Environmental.health@telford.gov.uk"

Monitoring at this location began in 2007 to determine the background levels of particulates; prior to this there was no monitoring point within the Borough. Monitoring is currently still being undertaken.

Monitoring shows that in general, the annual mean concentration values of PM_{10} coming into the Borough from the west (the general wind direction) are never breached, and that the activities of the coal mine are not adding anything to the PM_{10} load of the area. There are a few, highly elevated, spikes of PM_{10} concentration as shown by the number of breaches of the 24 hour mean exceedances, but it is suspected that this is actually due to fog, mist or dew as opposed to any pollution incidents. An analysis of the data shows that

this is likely the case for the majority (if not all) of the breaches, as opposed to issues with pollution or bonfires.

As a group, the breaches all tend to be accumulated in winter, or when weather conditions are very still (as demonstrated by the associated wind data that is submitted with the monitoring data), and all occur from late night, until early to mid morning..

Table 13 Results of Automatic Monitoring of PM_{10}: Comparison with Annual Mean Objective

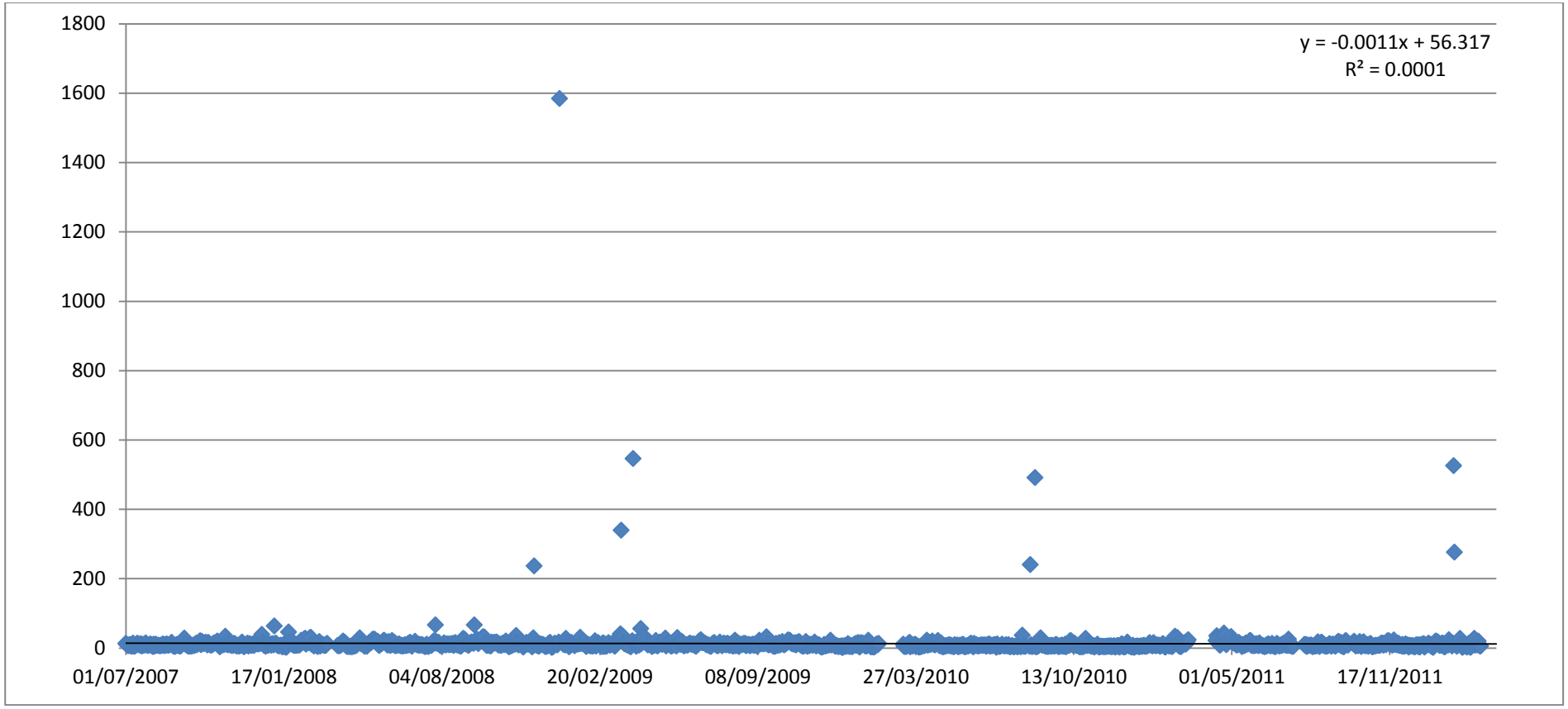
Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration μg/m³			
					2008	2009	2010	2011
1	Background/Industrial	N	93	NA	11(99%)	18 (92%)	14 (92%)	10 (87%)

Table 14 Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %	Confirm Gravimetric Equivalent	Number of Exceedances of 24-Hour Mean (50 μg/m³)			
					2008	2009	2010	2011
1	Background/Industrial	N	93	NA	3	6	2	2

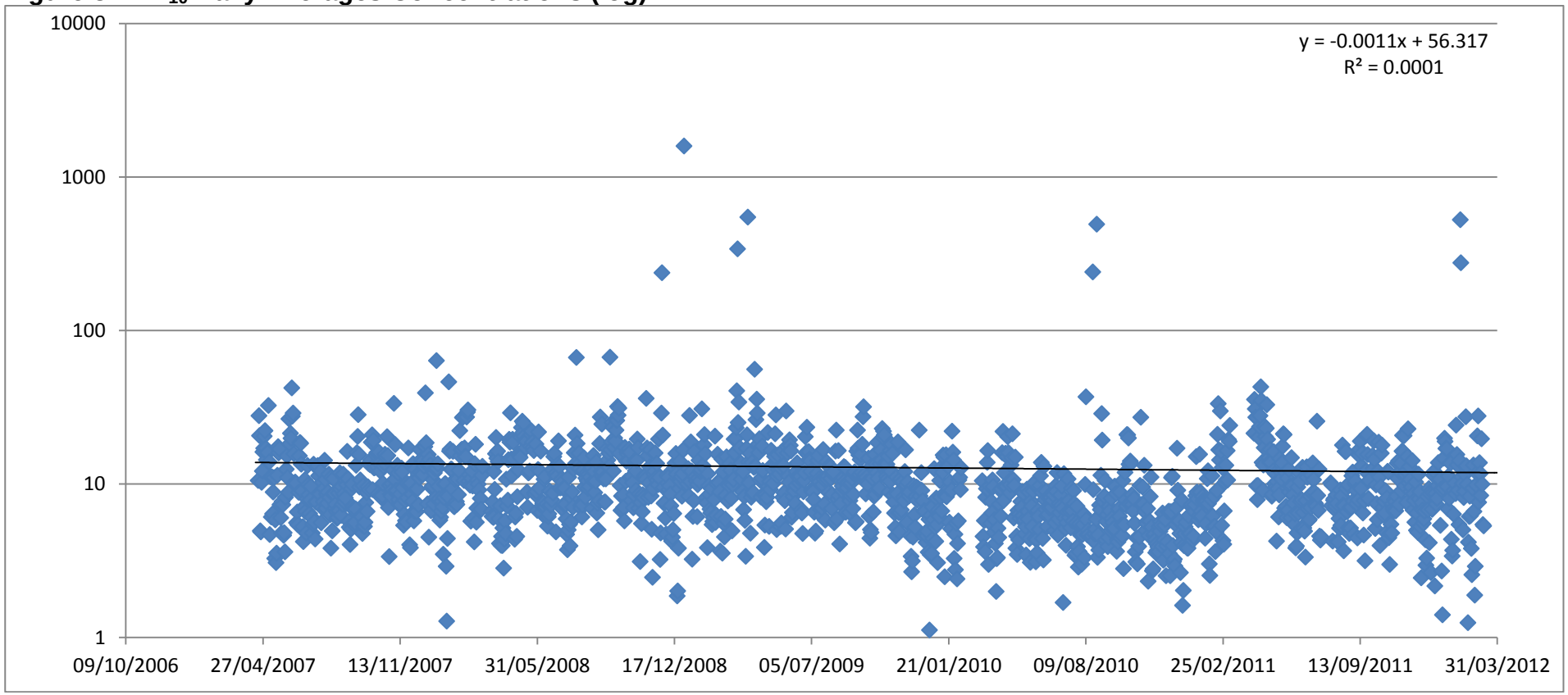
Figure 33 PM_{10} Daily Averages Concentrations

Two trend charts are inserted here to enable an adequate interpretation of the underlying data; a normal, and a log graph..



The data from the colliery is shown in the graph above. As can be seen, the overwhelming vast majority of the data is well under the 50 $\mu g/m^3$ air quality objective. Those values that are significantly over 200$\mu g/m^3$ can be considered outliers, and not representative of the monitoring data as a whole. It is also probable from studying the data at these points that the exceedances are related to events of fog, mist or dew. Given that the analyser is a laser nephelometer that is particularly susceptible to this kind of interference, it is felt that attributing these elevated levels as PM_{10} events would lead to inaccurate summaries of the air quality within the Borough.

Figure 34 PM_{10} Daily Averages Concentrations (log)



The logged version of the data helps to show the distribution of the clustered data more effectively. It confirms that there are relatively few exceedances of 50µg/m^3, and that in general most of the recordings are below 10µg/m^3. This can be confirmed by looking at the percentiles of the data set on an annual basis, as shown in the Table 11 below.

Table 15 Percentile data for PM_{10} monitoring, 2007-2011

Year	PM_{10} 90th Percentile	PM_{10} 95th Percentile	PM_{10} 98th Percentile	PM_{10} 99th Percentile	PM_{10} 99.9th Percentile	PM_{10} Maximum Hourly Value
2007	17	22	30	37	82	412
2008	20	25	34	44	1,730	4,722
2009	17	21	28	31	758	3,578
2010	13	19	25	32	531	2,513
2011	19	23	30	35	68	461

As is evident from this data, it is less than 1% of the monitoring data that exceed the twenty-four hour mean. This puts into perspective the exceedances of the twenty four hour mean, and further supports the conclusion that climatic conditions are the major cause of any exceedance. Taking this into account, it is surmised that the levels of PM_{10} within Telford and Wrekin are well within the air quality objectives.

2.2.3 Sulphur Dioxide

SO_2 is monitored at two automatic monitoring points located downwind of Ironbridge Power Station in fulfilment of a condition on their environmental permit:

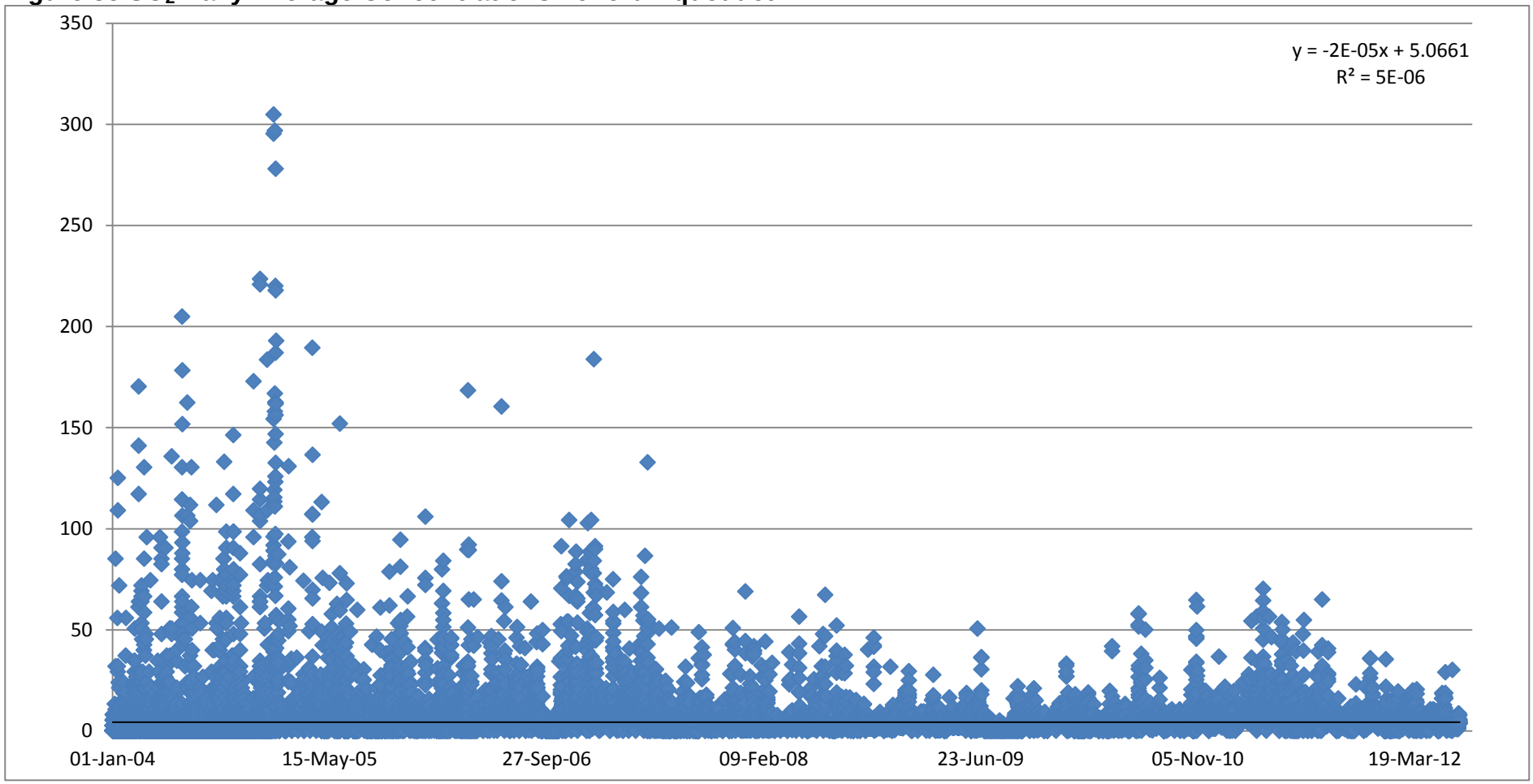
> **"3.6 Monitoring**
> 3.6.1 The operator shall, unless otherwise agreed in writing by the Agency, undertake the monitoring specified in the following tables in schedule 4 to this permit:
> (a) point source emissions specified in tables S4.1, S4.2 and S4.3;
> (b) annual limits specified in table S4.4; and
> (c) surface water specified in table S4.5.
>
> 3.6.2 The operator shall maintain records of all monitoring required by this permit including records of the taking and analysis of samples, instrument measurements (periodic and continual), calibrations, examinations, tests and surveys and any assessment or evaluation made on the basis of such data.
>
> 3.6.3 Monitoring equipment, techniques, personnel and organisations employed for the emissions monitoring programme specified in condition 3.6.1 shall have either MCERTS certification or MCERTS accreditation (as appropriate) unless otherwise agreed in writing by the Agency.
>
> 3.6.4 Permanent means of access shall be provided to enable sampling/monitoring to be carried out in relation to the emission points specified in schedule 4 tables S4.1, S4.2 and S4.3 unless otherwise specified in that schedule.
>
> 3.6.5 Within 6 months of the issue of this permit (unless otherwise agreed in writing by the Agency) the site reference data identified in the site protection and monitoring programme shall be collected and submitted to the Agency."

The assessment of emissions from this location was undertaken with data from 2004 onwards. Monitoring at the locations is still ongoing.

See below each graph for a comment on what the data is showing.

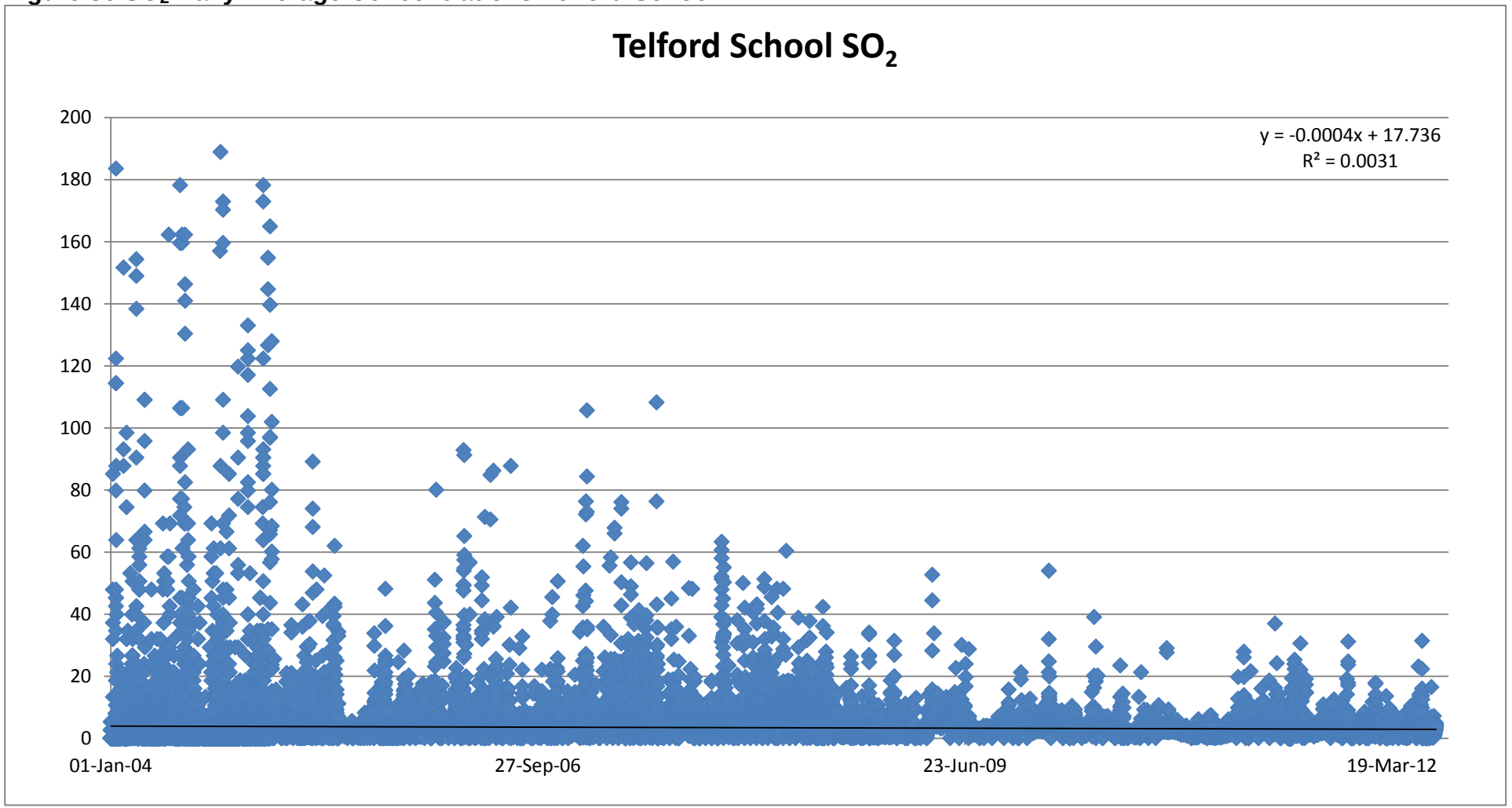
The graphs and tables below demonstrate not only compliance with the relevant air quality objectives, but also how the vast majority of all the monitoring data from the power station for SO_2 is significantly below the air quality objective

Figure 35 SO_2 Daily Average Concentrations Telford Aqueduct



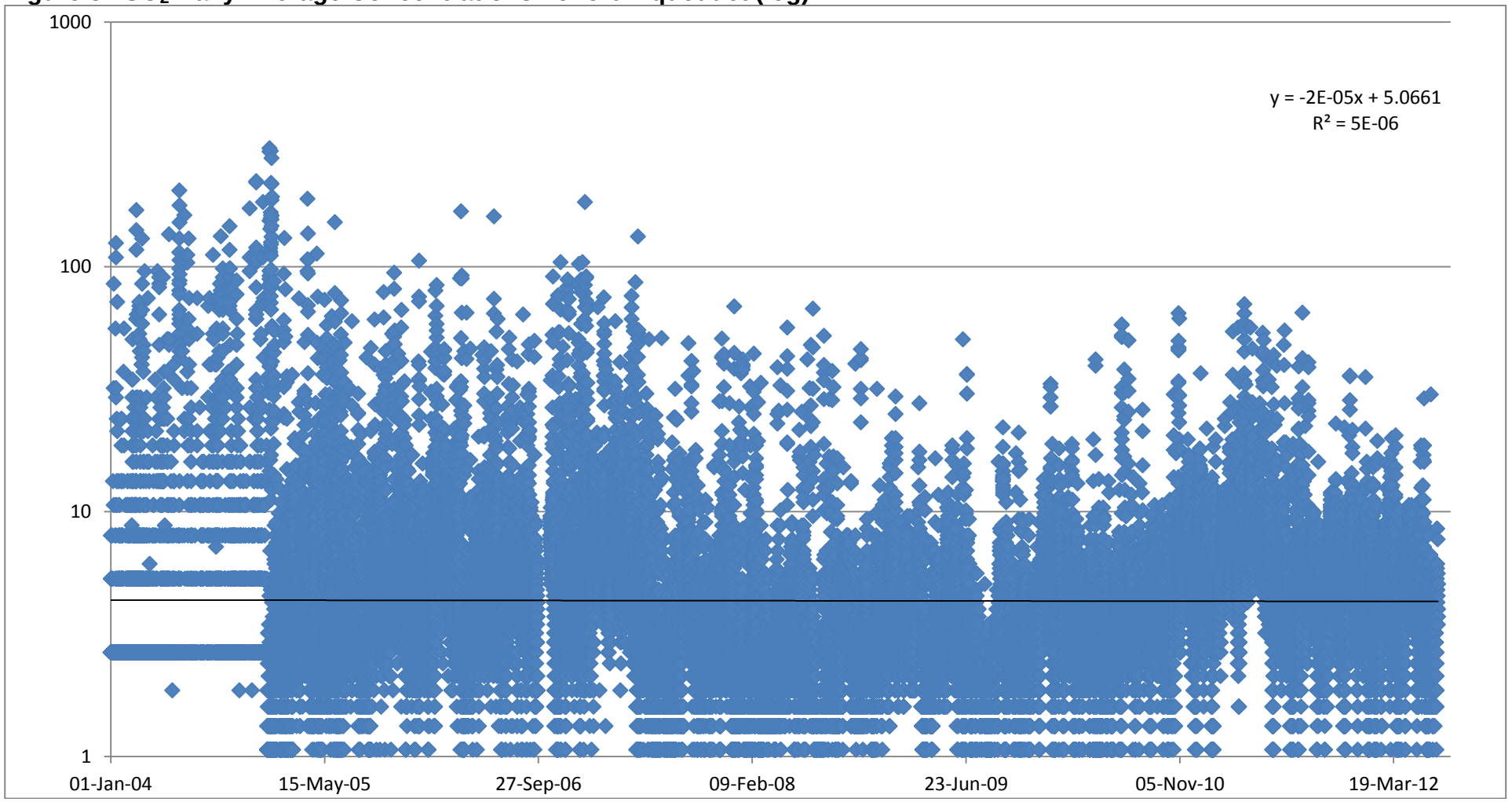
What is most evident from this chart is that there has been a significant improvement in air quality over time; specifically from the beginning of the assessment period in 2004. There was an increase towards the end of 2010 and beginning of 2011, then, the levels decreased towards the end of the assessment period. The last exceedance was in August 2011.

Figure 36 SO_2 Daily Average Concentrations Telford School



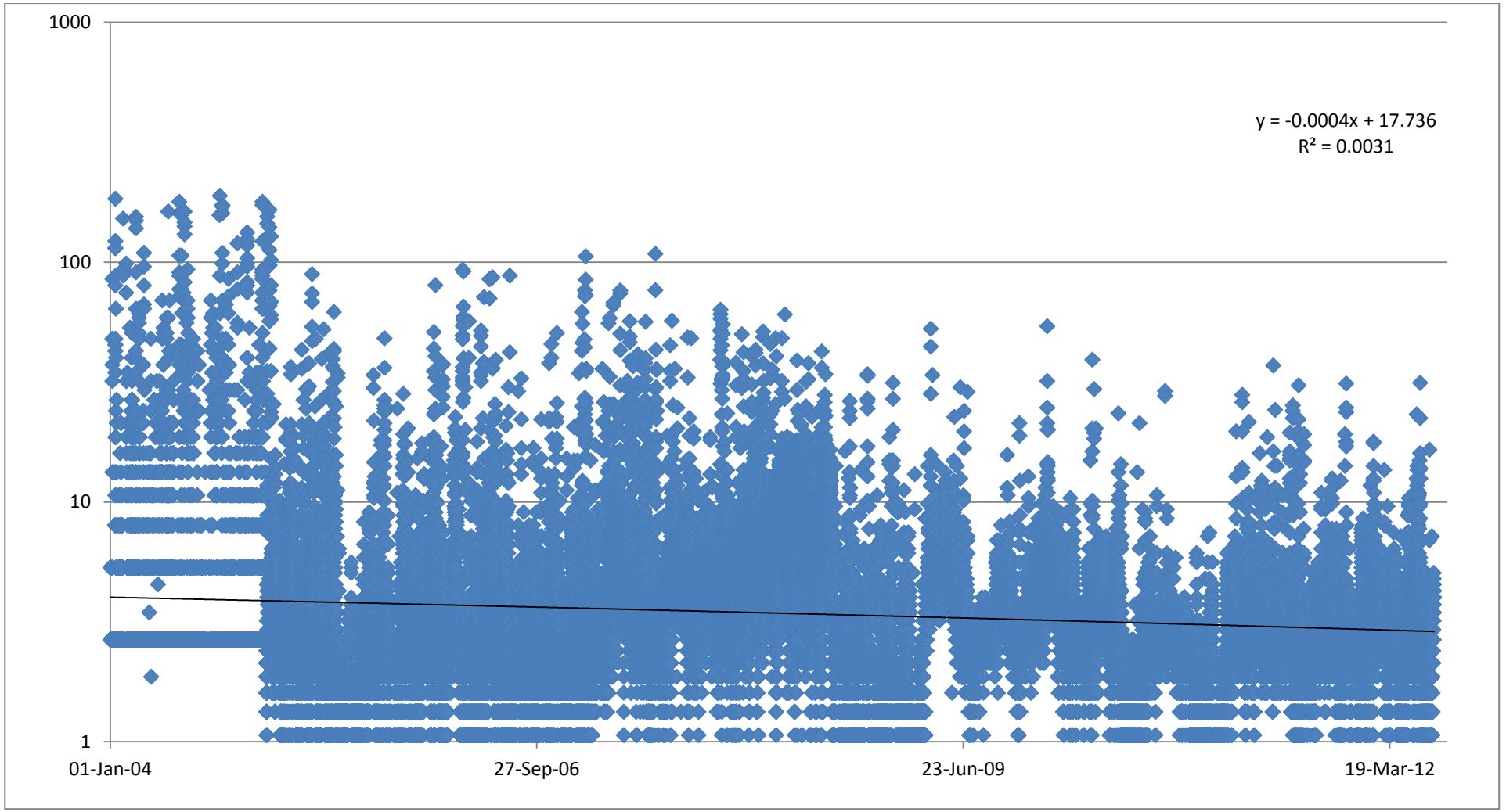
This chart shows a similar distribution to that from Telford Aqueduct; with high initial readings, and a decrease in levels. The last exceedance was in January 2010.

Figure 37 SO_2 Daily Average Concentrations Telford Aqueduct (log)



The log chart for Telford Aqueduct demonstrates a steady decrease in SO_2 levels at the monitoring station, followed by an increase at the end of 2010, which was followed by a subsequent decrease.

Figure 38 SO_2 Daily Average Concentrations Telford School (log)



The log chart for Telford School demonstrates a steady decrease in SO_2 levels at the monitoring station throughout the entire monitoring period.

Table 16 Percentile data for SO_2 monitoring, 2007-2011; Telford Aqueduct

Year	SO_2 90th Percentile	SO_2 95th Percentile	SO_2 98th Percentile	SO_2 99th Percentile	SO_2 99.9th Percentile	SO_2 Maximum Hourly Value
2004	5.6	10.6	34.6	77.1	242.8	396.3
2005	9.6	13.3	25.5	41.7	116.8	288.8
2006	8.8	11.4	23.7	42.2	114.4	232.2
2007	6.4	8.8	14.6	23.1	67.2	230.4
2008	4.8	5.9	7.7	11.7	49.2	101.6
2009	5.3	6.7	8.8	11.4	27.9	83.3
2010	8	9.3	12	15.7	55	110.1
2011	8.2	9.6	13.8	19.7	60.3	110.9

Table 17 Percentile data for SO_2 monitoring, 2007-2011; Telford School

Year	SO_2 90th Percentile	SO_2 95th Percentile	SO_2 98th Percentile	SO_2 99th Percentile	SO_2 99.9th Percentile	SO_2 Maximum Hourly Value
2004	5.3	10.6	29.3	58.5	186.2	396.3
2005	4	6.2	11.9	19.2	56.1	167.3
2006	4.8	6.9	12.5	22.9	90.9	162.5
2007	7.7	9.3	16.2	26.6	68.3	159.1
2008	12.2	14.6	16.8	17.8	41	97.9
2009	5.3	6.1	7.7	9.3	25.2	93.4
2010	3.5	4	5.1	6.1	18.3	66.8
2011	4	4.8	6.4	9.3	27	55.1

Table 18 Results of Automatic Monitoring of SO_2 for 2004: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %	Valid Data Capture %	Number of Exceedances (percentile in bracket μg/m³)		
					15-minute Objective (266 μg/m³)	1-hour Objective (350 μg/m³)	24-hour Objective (125 μg/m³)
1	Telford Aqueduct	N		97	0	0	0
2	Telford School	N		99	0	0	0

Table 19 Results of Automatic Monitoring of SO_2 for 2005: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %	Valid Data Capture %	Number of Exceedances (percentile in bracket μg/m³)		
					15-minute Objective (266 μg/m³)	1-hour Objective (350 μg/m³)	24-hour Objective (125 μg/m³)
1	Telford Aqueduct	N		93	0	0	0
2	Telford School	N		99	0	0	0

Table 20 Results of Automatic Monitoring of SO_2 for 2006: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %	Valid Data Capture %	Number of Exceedances (percentile in bracket μg/m³)		
					15-minute Objective (266 μg/m³)	1-hour Objective (350 μg/m³)	24-hour Objective (125 μg/m³)
1	Telford Aqueduct	N		91	0	0	0
2	Telford School	N		100	0	0	0

Table 21 Results of Automatic Monitoring of SO_2 for 2007: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %	Valid Data Capture %	Number of Exceedances (percentile in bracket μg/m³)		
					15-minute Objective (266 μg/m³)	1-hour Objective (350 μg/m³)	24-hour Objective (125 μg/m³)
1	Telford Aqueduct	N		97	0	0	0
2	Telford School	N		99	0	0	0

Table 20 Results of Automatic Monitoring of SO_2 for 2008: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %	Valid Data Capture %	Number of Exceedances (percentile in bracket μg/m³)		
					15-minute Objective (266 μg/m³)	1-hour Objective (350 μg/m³)	24-hour Objective (125 μg/m³)
1	Telford Aqueduct	N		99	0	0	0
2	Telford School	N		100	0	0	0

Table 22 Results of Automatic Monitoring of SO_2 for 2009: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %	Valid Data Capture %	Number of Exceedances (percentile in bracket μg/m³)		
					15-minute Objective (266 μg/m³)	1-hour Objective (350 μg/m³)	24-hour Objective (125 μg/m³)
1	Telford Aqueduct	N		96	0	0	0
2	Telford School	N		100	0	0	0

Table 23 Results of Automatic Monitoring of SO_2 for 2010: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %	Valid Data Capture %	Number of Exceedances (percentile in bracket μg/m³)		
					15-minute Objective (266 μg/m³)	1-hour Objective (350 μg/m³)	24-hour Objective (125 μg/m³)
1	Telford Aqueduct	N		97	0	0	0
2	Telford School	N		100	0	0	0

Table 24 Results of Automatic Monitoring of SO_2 for 2011: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %	Valid Data Capture %	Number of Exceedances (percentile in bracket μg/m³)		
					15-minute Objective (266 μg/m³)	1-hour Objective (350 μg/m³)	24-hour Objective (125 μg/m³)
1	Telford Aqueduct	N		98	0	0	0
2	Telford School	N		98	0	0	0

2.2.4 Benzene

Telford and Wrekin Council do not monitor for Benzene.

2.2.5 Other pollutants monitored

$PM_{2.5}$

$PM_{2.5}$ is monitored within the area of Telford and Wrekin Council. The information below is a detailed assessment of the data available since 2007, reported in the same way as the PM_{10} report, for $PM_{2.5}$. For completeness, it should be noted that the value used to assess $PM_{2.5}$ is that value as used in the LAQM.TG09 document (DEFRA 2009). This is an annual mean of 25$\mu g/m^3$, a value that is to be achieved by 2020. To assess the twenty four hour mean value, it was decided to halve the value of the PM_{10} air quality objective, which would place this at 25$\mu g/m^3$.

$PM_{2.5}$ is monitored at a dedicated facility located at the Huntingdon Open Cast Colliery, in fulfilment of a condition on their environmental permit. This is to monitor particulate emissions from the permitted process.

Monitoring at this location began in 2007 to determine the background levels of particulates; prior to this there was no monitoring point within the Borough. Monitoring began in 2007 and is currently still being undertaken.

Table 25 Results of Automatic Monitoring of $PM_{2.5}$: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration			
					2008	2009	2010	2011
1	Background/Industrial	N	93	NA	5 (99%)	5 (92%)	5 (92%)	5 (87%)

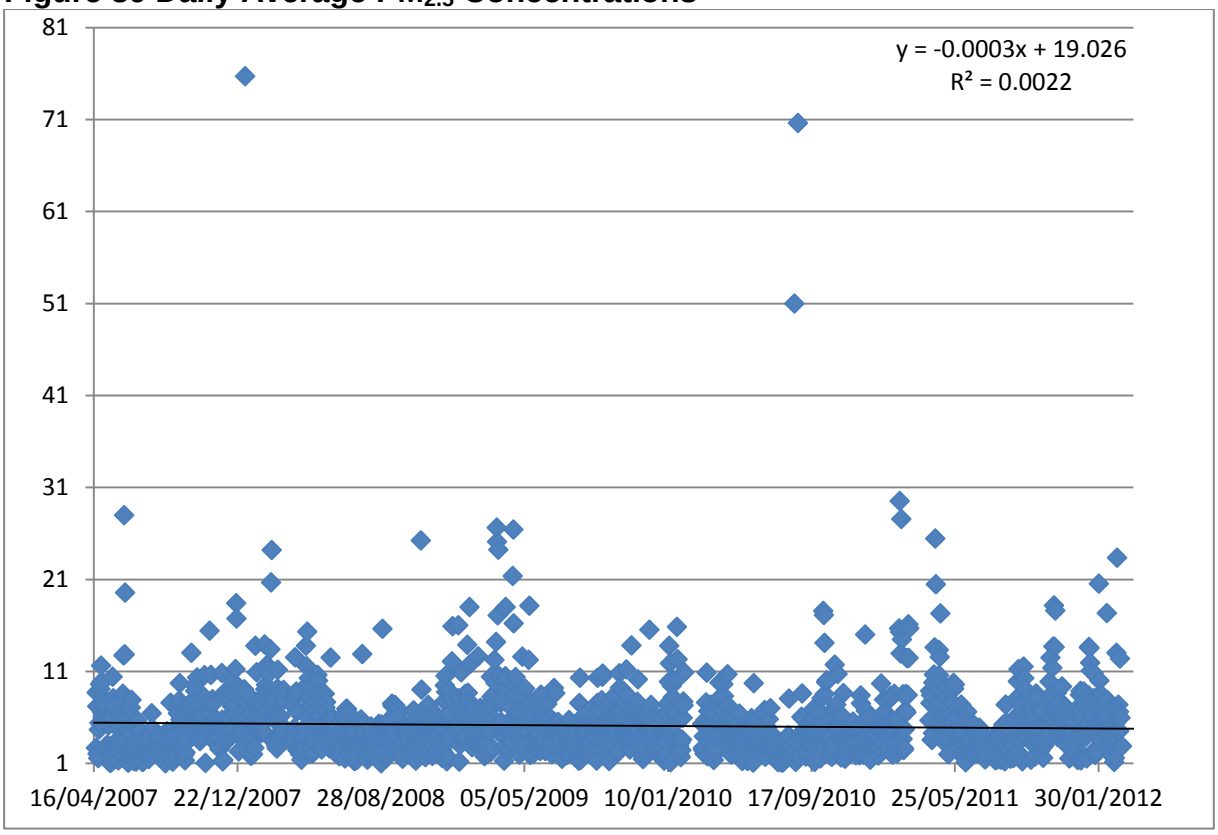
Table 26 Results of Automatic Monitoring for $PM_{2.5}$: Comparison with 24-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Confirm Gravimetric Equivalent	Number of Exceedances of 24-Hour Mean (25 $\mu g/m^3$)			
					2008*	2009*	2010*	2011
1	Background/Industrial	N	93	NA	2 (99%)	3 (92%)	1 (92%)	4 (87%)

This data shows that the annual average concentration of $PM_{2.5}$ is well below the proposed air quality objective. Halving the PM_{10} value for the twenty four hour mean objective, shows that 25mg/m3 has been exceeded only ten times since monitoring began. As such, this again backs up the conclusions regarding the cleanliness of the air in the Borough.

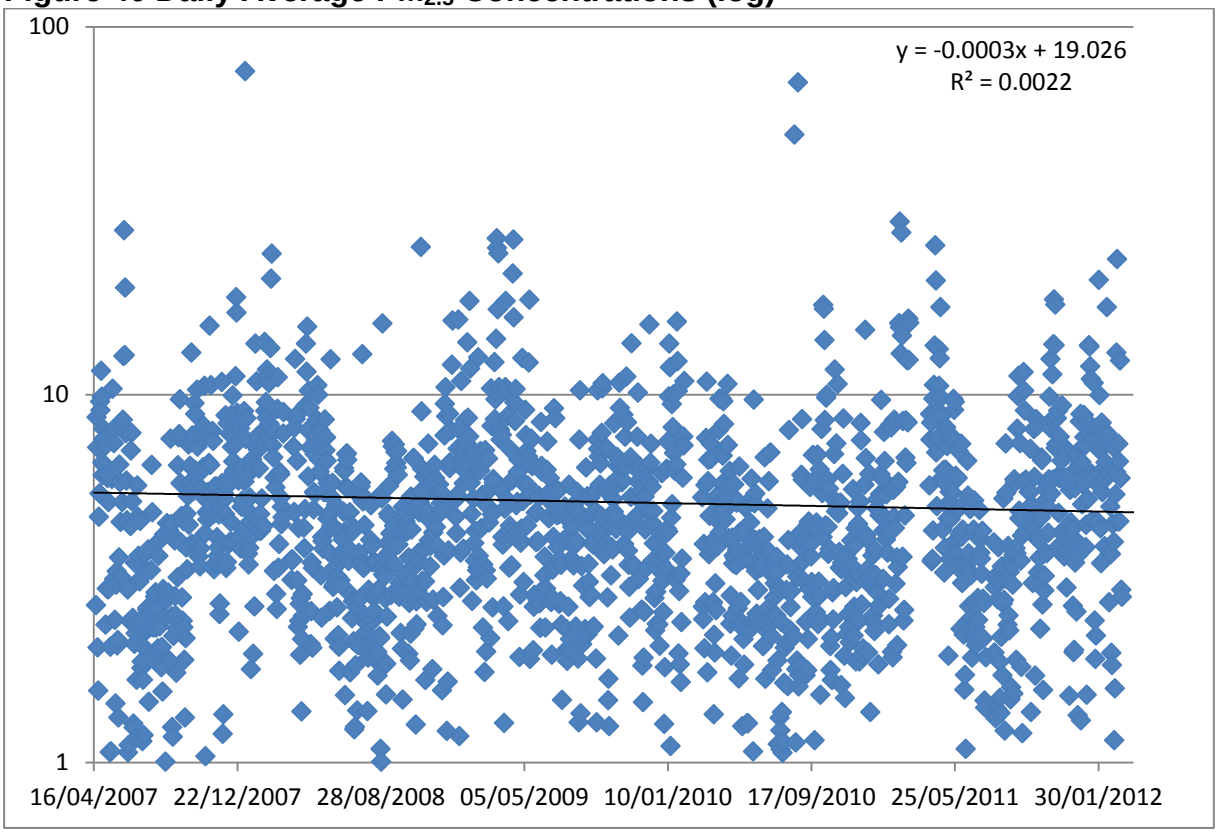
Two trend charts are inserted here to enable an adequate interpretation of the underlying data; a normal and a log graph.

Figure 39 Daily Average $PM_{2.5}$ Concentrations



The data from the colliery is shown in the graph above. As can be seen, the overwhelming vast majority of the data is well under the 25μg/m^3 level. Those that are well above 30 μg/m^3 can be considered outliers, and not representative of the population as a whole. It is also apparent from a study of the data at these points that the exceedances are related to events of fog, mist or dew. Given that the analyser is a laser nephelometer that is susceptible to this kind of interference, it is felt that taking account of this as a $PM_{2.5}$ event would not give an adequate representation of the air quality within the Borough.

Figure 40 Daily Average $PM_{2.5}$ Concentrations (log)



The logged version of the data helps to show the distribution of the clustered data more effectively. It confirms that there are relatively few exceedances of the 25 μg/m^3 level, and that in general most of the recordings are under 10 μg/m^3. This can be confirmed by looking at the percentiles of the data set on an annual basis, as shown in Table 26 below, where the level is either at, or above, the 99th Percentile.

Table 27 Percentile data for $PM_{2.5}$ monitoring, 2007-2011

Year	PM_{10} 90th Percentile	PM_{10} 95th Percentile	PM_{10} 98th Percentile	PM_{10} 99th Percentile	PM_{10} 99.9th Percentile	PM Maximum Hourly Value
2008	10	13	17	20	38	44
2009	11	14	19	25	39	41
2010	8	11	14	17	117	336
2011	10	13	20	25	45	51

Comparison with other Regulatory Regimes

The WHO hasn't produced air quality guidelines for $PM_{2.5}$ because the body of information on long term effects is small and insufficient with which to produce a guideline value. They go onto state that, for $PM_{2.5}$, effects have been seen below annual average values of 20μg/m^3, and refer risk managers to the risk estimates produced within the Guidelines. The data produced shows that values above this level for $PM_{2.5}$ are in the 98th percentile and above region, and only for one year (2011). Otherwise they are in the 99th percentile, or above.

The United States Environmental Protection Agency produced three guideline concentrations with regards to $PM_{2.5}$. These are:

- Primary – Annual mean of 12mg/m^3 averaged over three years
- Primary and Secondary – a twenty four hour of 35 mg/m^3 averaged over three years
- Secondary – an Annual mean of 15mg/m^3 averaged over three years.

(Further information at USEPA NAAQS (http://www.epa.gov/air/criteria.html).

For those years where an appropriate calculation exists, the air quality annual mean for both the primary and secondary values of 12 and 15μg/m^3, respectively, aren't breached.

Table 28 Comparison of PM2.5 with USEPA NAAQS

Year	Average (annual)	Average (24hr)	USEPA Primary	USEPA Primary and Secondary.	USEPA Secondary
2008	5[1]	18	12 (annual)	35 (24hr)	15 (annual)
2009	5[2]	21	12 (annual)	35 (24hr)	15 (annual)
2010	5	16	12 (annual)	35 (24hr)	15 (annual)
2011	5	20	12 (annual)	35 (24hr)	15 (annual)

[1] mean for one year only.
[2] mean for two years only.

PM_1

PM_1 is monitored within the area of Telford and Wrekin Council. The information below is a detailed assessment of the data available since 2007, reported in the same way as the PM_{10} report. The World Health Organisation's Air Quality Guidelines for Europe (WHO, 2000), and the USEPA in evaluating their Air Quality Standards, did not assess PM_1.

As there is no level available for PM_1; however, given that the value for $PM_{2.5}$ is half the value of PM_{10}, it was decided to use a value for PM_1 that was half the value for $PM_{2.5}$. For completeness, it should be noted that the value used to assess PM_1 has been rounded up for convenience, from 12.5μg/m^3 to 13μg/m^3. This was done for no other reason than to have a limit to compare due to the fact that, as a particle size, there is limited regulatory risk assessment relating to it.

PM_1 is monitored at a dedicated facility located at the Huntingdon Open Cast Colliery, in fulfilment of a condition on their environmental permit. This is to monitor particulate emissions from the permitted process.

Monitoring at this location began in 2007 to determine the background levels of particulates; prior to this there was no monitoring point within the Borough. Monitoring began in 2007 and is currently still being undertaken.

Table 29 Results of Automatic Monitoring of PM_1: Comparison with Annual Mean Target

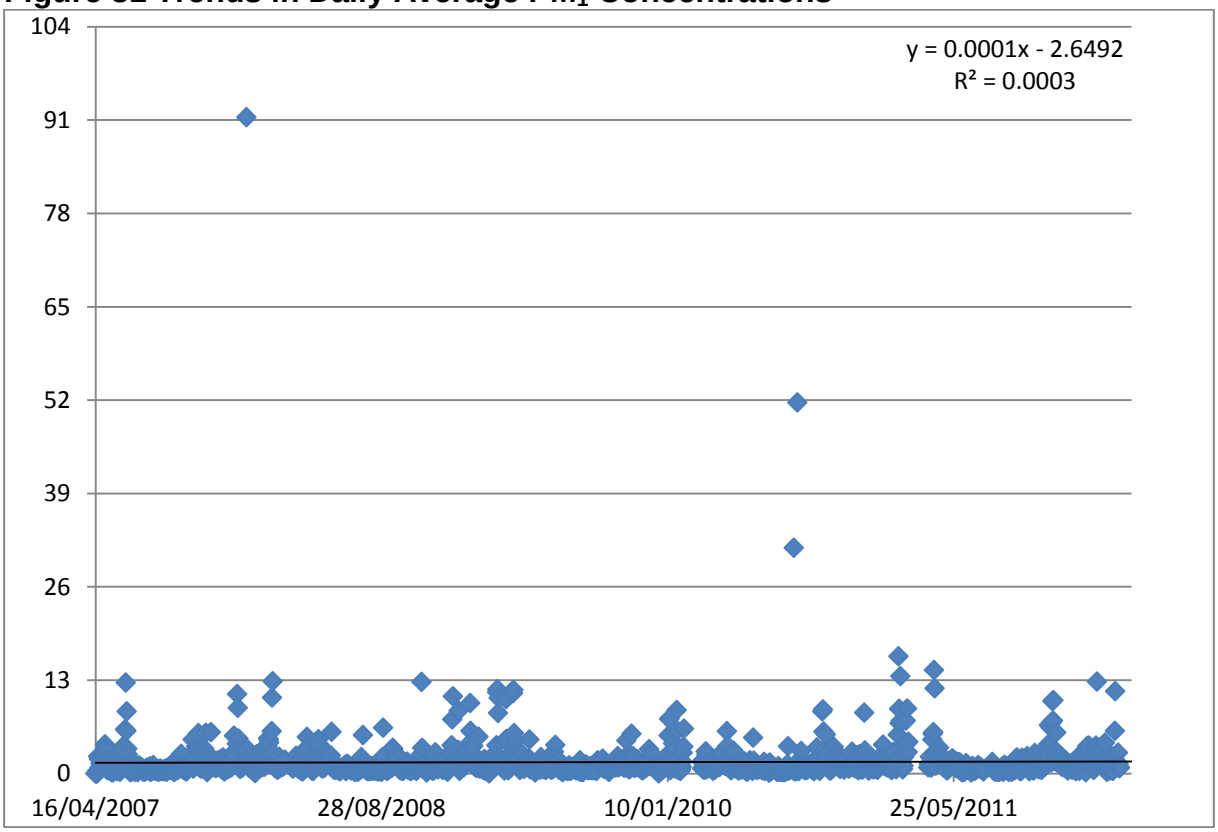
Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration			
					2008	2009	2010	2011
1	Background/Industrial	N	93	NA	2 (99%)	2 (92%)	2 (92%)	2 (87%)

Table 30 Results of Automatic Monitoring of PM_1: Comparison with 24-hour Mean Target

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Confirm Gravimetric Equivalent	Number of Exceedances of 24-Hour Mean (13 $\mu g/m^3$)			
					2008*	2009*	2010*	2011
1	Background/Industrial	N	93	NA	1 (99%)	0 (92%)	0 (92%)	4 (87%)

Two trend charts are inserted here to enable an adequate interpretation of the underlying data; a normal and a log graph.

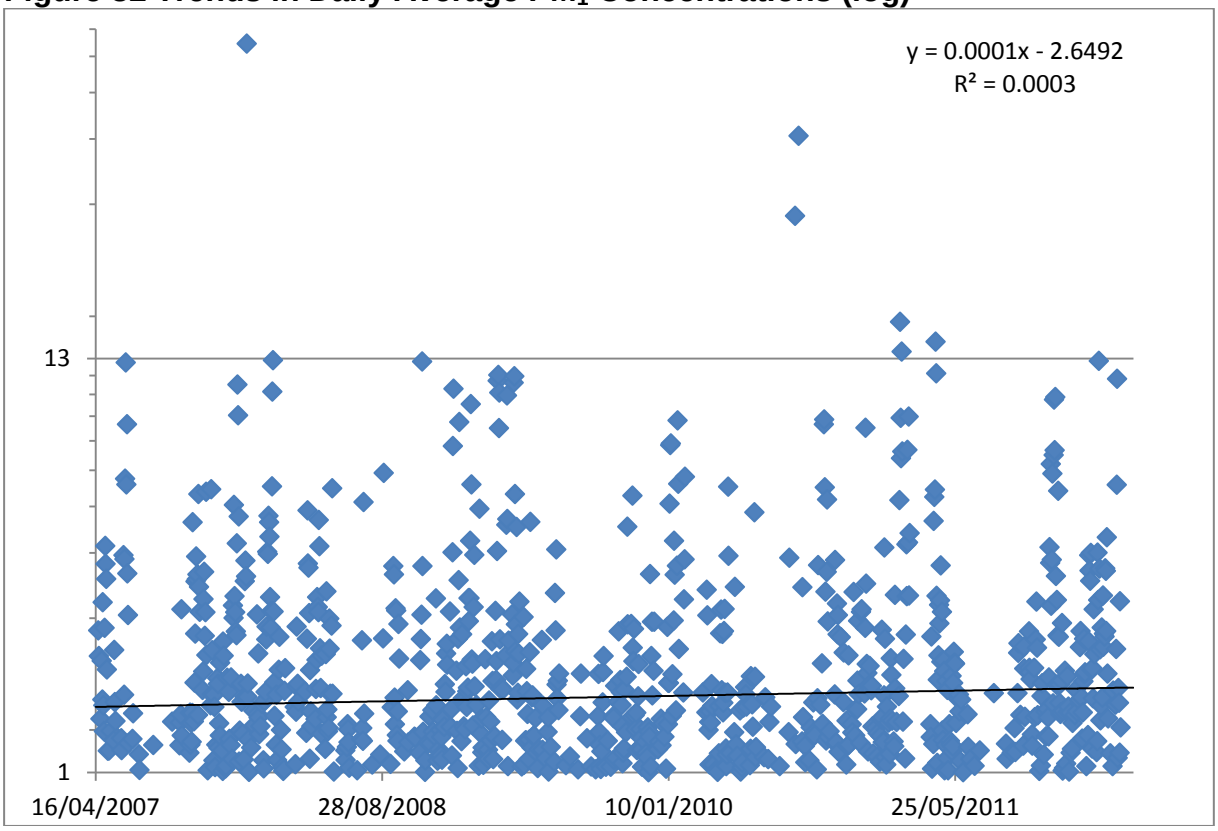
Figure 31 Trends in Daily Average PM_1 Concentrations



The data from the colliery is shown in the graph above. As can be seen, all bar three of the sample population data is well under 13µg/m^3. Those that are well above 13µg/m^3 can be considered outliers, and not representative of the population as a whole. Given the very low levels of PM_1, it is difficult to determine the trend orientation in this chart.

The above data in log format shows this distinction very clearly. This is in Figure 71 below.

Figure 32 Trends in Daily Average PM_1 Concentrations (log)



The logged version of the data helps to show the distribution of the clustered data more effectively. It confirms that there are relatively few exceedances of 13µg/m^3, and that in general most the recordings are under 6µg/m^3. This can be confirmed by looking at the percentiles of the data set on an annual basis, as shown in Table 27 below. What this graph does do, however, is show that there has been a very slight increase of PM_1 over time; as demonstrated by the trend line.

Table 33 Percentile data for PM_1 monitoring, 2007-2011

Year	PM_{10} 90th Percentile	PM_{10} 95th Percentile	PM_{10} 98th Percentile	PM_{10} 99th Percentile	PM_{10} 99.9th Percentile	PM Maximum Daily Value
2007	17	22	30	37	58	64
2008	20	25	34	44	1,137	1,584
2009	17	21	28	31	383	546
2010	13	19	25	32	407	491
2011	19	23	30	35	446	526

The WHO and the USEPA haven't produced air quality guidelines for PM_1 because the body of information on long term effects is small and insufficient with which to produce a guideline value. As stated above, a value for PM_1 of half the $PM_{2.5}$ level (13µg/m^3) was used solely for comparative purposes. The data shows that values above this level for PM_1 are in the 90th percentile plus region. As such, the levels for PM_1 within the Borough are below the selected levels.

Summary of Compliance with AQS Objectives

Telford and Wrekin Council has examined the results from monitoring in the borough. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

An assessment was made using comprehensive traffic count data, GIS maps, as well as local knowledge, and looking at all those streets that either were not assessed earlier, have experienced a change in traffic flows, are a new development, or where a new exposure has been introduced.

Telford & Wrekin 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

An assessment was made using comprehensive traffic count data, GIS maps, as well as local knowledge, and looking at all those streets that either were not assessed earlier, have experienced a change in traffic flows, are a new development, or where a new exposure has been introduced.

Telford & Wrekin 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.

An assessment was made using comprehensive traffic count data, GIS maps, as well as local knowledge, and looking at all those streets that either were not assessed earlier, have experienced a change in traffic flows, are a new development, or where a new exposure has been introduced.

Telford & Wrekin Council confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.4 Junctions

An assessment was made using comprehensive traffic count data, GIS maps, as well as local knowledge, and looking at all those streets that either were not assessed earlier, have experienced a change in traffic flows, are a new development, or where a new exposure has been introduced.

Telford & Wrekin 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

An assessment was made, and using traffic count data from 2004 onwards and previous USA data, there are no new, or proposed, roads.

Telford & Wrekin Council confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

An assessment was made, and using traffic count data from 2004 onwards and previous USA data, it was determined that there are no roads with significantly changed traffic flows.

Telford & Wrekin Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

Bus and coach stations have been considered under previous rounds, and there have been no changes between then and now. As such, it was not considered necessary to further assess these.

Telford & Wrekin Council has assessed new/newly identified bus stations, and concluded that it will not be necessary to proceed to a Detailed Assessment.

4 Other Transport Sources

4.1 Airports

There are no airports within the Borough of Telford and Wrekin Council.

Telford and Wrekin Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

There are no issues with stationary trains within the Borough. The main areas of exposure within the Borough are at the stations. 182 trains a week pass through the Borough.

4.2.1 Stationary Trains

The stations within the Borough are: Telford Central, Oakengates, and Wellington. Whereas all trains travelling along the line stop at Telford Central and Wellington, only every other train stops at Oakengates. Within 15 metres of the following train stations are:

Telford Central: train station, railway land, A442 slip road, M54 motorway, car park.
Oakengates: train station, railway land, roads, garden at rear of one domestic property, car parks
Wellington: train station, railway land, Victoria Road (B Road), bus station, rear yards of bank and shop, war memorial and car park.

There is also a freight terminal within the Borough, however the use of this is exceedingly limited, and as such there is no need to assess this.

There are no occasions when the criteria in the Technical Guidance are exceeded to warrant further assessment.

Telford and Wrekin Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving Trains

The railway line that runs through Telford is not identified as one of those lines that have a large number of diesel locomotives running through. As such, there are no occasions when the criteria in the Technical Guidance are exceeded to warrant further assessment.

Telford and Wrekin 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)

There are no shipping ports within the Borough of Telford and Wrekin Council.

Telford and Wrekin Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

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

Telford and Wrekin Council currently have one hundred and eleven permitted processes within the area of the Council, as well as outstanding applications for five new permits. These permitted processes are a mixture of both A2 and Part B permits. There are currently a total of 14 A1 permitted processes within the area of the Authority. All of these applications have been assessed upon application.

Table 34 Active Permitted Processes

Type	Business	Date Permit Granted
PPCB	Besblock Limited Site 1	01-Mar-03
PPCB	Besblock Limited Site 2	15-Apr-03
PPCB	Ce Do	21-Jul-08
PPCB	Cemex UK Materials Ltd	05-Aug-03
PPCB	Cropac	01-Apr-06
PPCB	Defence Support Group	11-Dec-07
PPCB	Denso Manufacturing UK Ltd	06-Jun-06
PPCB	Elite Precast Concrete Ltd	
PPCB	Ennstone Johnston Limited	25-May-05
PPCB	Ennstone Johnston Ltd	01-Jun-06
PPCB	Ennstone Johnston Ltd	28-Apr-06
PPCB	F.P. McCann Limited	31-Mar-09
PPCB	GKN Aluminium Structures Ltd	01-Apr-05
PPCB	Grange Fencing Ltd	05-Aug-03
PPCB	Grange Fencing Ltd	15-Apr-03
PPCB	John G Russell (Transport) Ltd	
PPCB	Specialist Car Products Ltd	01-Apr-05
PPCB	Lafarge Aggregates Ltd	05-Aug-03
PPCB	Link 51	25-Mar-05
PPCB	Link Lockers	01-Apr-06
PPCB	Madeley Brass Castings	07-Apr-05
PPCB	Supreme Concrete Ltd.	12-Apr-04
PPCB	TAFS (Salop) Ltd	31-Mar-04
PPCB	Tarmac Central Ltd.	01-Apr-03
PPCB	TCL Packaging Limited	01-Apr-05
PPCB	Telford Copper Cylinders Ltd	07-Mar-05
PPCB	Telford Crematorium Limited	26-Mar-04
PPCB	TTI Nitriding Services Ltd	15-Jul-09
PPCB	UK Coal Ltd	17-Nov-10
PPCB	Weber	25-Mar-10
PPCB	Webster Wilkinson Limited	26-Feb-04
PPCB	Wrekin Shell Mouldings Limited	18-Aug-04
PPCB	24/7 Concrete	
PPCB	Ricoh UK Products Ltd.	11-Apr-08
PPCB	Besblock Limited Site 1	01-Mar-03
PPCB	Besblock Limited Site 2	15-Apr-03
PPCB	Ce Do	21-Jul-08
PPCB	Cemex UK Materials Ltd	05-Aug-03
PPCB	Cropac	01-Apr-06
PPCB	Defence Support Group	11-Dec-07
PPCB	Denso Manufacturing UK Ltd	06-Jun-06
PPCB	Elite Precast Concrete Ltd	

PPCB	Ennstone Johnston Limited	25-May-05
PPCB	Ennstone Johnston Ltd	01-Jun-06
PPCB	Ennstone Johnston Ltd	28-Apr-06
PPCB	F.P. McCann Limited	31-Mar-09
PPCB	GKN Aluminium Structures Ltd	01-Apr-05
PPCB	Grange Fencing Ltd	05-Aug-03
PPCB	Grange Fencing Ltd	15-Apr-03
PPCB	John G Russell (Transport) Ltd	
PPCB	Specialist Car Products Ltd	01-Apr-05
PPCB	Lafarge Aggregates Ltd	05-Aug-03
PPCB	Link 51	25-Mar-05
PPCB	Link Lockers	01-Apr-06
PPCB	Madeley Brass Castings	07-Apr-05
PPCB	Supreme Concrete Ltd.	12-Apr-04
PPCB	TAFS (Salop) Ltd	31-Mar-04
PPCB	Tarmac Central Ltd.	01-Apr-03
PPCB	TCL Packaging Limited	01-Apr-05
PPCB	Telford Copper Cylinders Ltd	07-Mar-05
PPCB	Telford Crematorium Limited	26-Mar-04
PPCB	TTI Nitriding Services Ltd	15-Jul-09
PPCB	UK Coal Ltd	17-Nov-10
PPCB	Weber	25-Mar-10
PPCB	Webster Wilkinson Limited	26-Feb-04
PPCB	Wrekin Shell Mouldings Limited	18-Aug-04
PPCB	24/7 Concrete	
PPCB	Ricoh UK Products Ltd.	11-Apr-08
PPCA2	Aga Consumer Products Limited	07-Feb-05
PPCA2	Bischof And Klein (UK) Ltd	
PPCA2	Blockleys Brick Ltd	10-Oct-05
PPCA2	GKN Autostructures	31-Mar-06
PPCA2	GKN Off Highway Systems Ltd	16-Aug-05
PPCA2	Joseph Ash Galvanizing Telford	13-Aug-04
PPCA2	Mahle Filter Systems UK Ltd	12-Jun-07
PPCA2	Metokote UK Ltd	03-Mar-06
PPCA2	Saint Gobain	15-Nov-04
PPCA2	W. Corbett & Company (Galvanizing) Limited	31-Mar-05
PPCA2	Precision Colour Printing Limited	01-Apr-05
VREF	Autocraft Telford	12-Apr-05
VREF	Doseley Motors Ltd	08-Apr-04
VREF	Furrows (Telford) Ltd.	07-Mar-05
VREF	SIM Vehicle Consultancy Ltd	07-Mar-05
PFS	ASDA Stores Ltd	04-Aug-05
PFS	ASDA Stores Ltd	14-Apr-05
PFS	Furrows Limited	14-Apr-05
PFS	Furrows Limited	14-Apr-05
PFS	J Sainsbury PLC	14-Apr-05
PFS	Arina Ltd	14-Apr-05
PFS	Morrisons	04-Aug-05
PFS	Mound Way Service Station	04-Aug-05
PFS	Murco Petroleum Ltd	14-Apr-05
PFS	NIX Service Station	14-Apr-05
PFS	Red Lion Service Station	14-Apr-05
PFS	Shell UK Limited	14-Apr-05
PFS	Shell UK Ltd	14-Apr-05
PFS	Shell UK Ltd	01-Jan-04
PFS	Shell UK Ltd	14-Apr-05
PFS	Tesco Stores Limited	14-Apr-05
PFS	Trench Lock 24/7	14-Apr-05
DC	Creases Dry Cleaners	10-Apr-08

DC	Madeley Laundry & Dry Cleaning	17-Oct-06
DC	Peter Posh Ltd	15-Nov-06
DC	Pritchards Of Shropshire Ltd	18-Oct-06
DC	Pritchards Of Shropshire Ltd	17-Oct-06
DC	Timpson Ltd	05-Sep-06
SWOB	Dynorod	31-Aug-06
SWOB	Hadley Test & Repair	09-Mar-10
SWOB	Marks Motor Mechanics	17-Dec-07
SWOB	McPhillips (Wellington) Limited	30-Sep-09
SWOB	Peter Morris Cars	01-Mar-04

These applications were either assessed when the applications were submitted via the processes as laid out in the Environmental Permitting Regulations, or they were of limited significance due to low emissions and so were not considered worthy of further assessment.

There are currently five new applications for new permitted processes; these are:

TCL Packaging (Part A2 Activity, process type)
Wellings Ltd (Part B Activity, process type)
Borgers Ltd (Part B Activity, process type)
Precision Colour Printing Ltd (Part A2 Activity, process type)
John G Russell (Transport) Ltd (Part B Activity, process type).

Of all the assessments that have been undertaken, or are currently being evaluated, relating to industrial emissions, none have shown that these installations have either substantially increased, or introduced, relevant or new exposures.

Telford & Wrekin 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

An assessment has shown that there are no installations where emissions have increased substantially, or new, relevant exposure, has been introduced.

Telford & Wrekin 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

There are no new, or significantly changed, installations with no previous air quality assessment.

Telford & Wrekin Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major Fuel (Petrol) Storage Depots

There are no major fuel (petrol) storage depots within the Borough.

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

5.3 Petrol Stations

An assessment of quantities, and nearby road traffic flows for petrol stations, show that none of the petrol stations meet the relevant criteria for assessment.

Telford & Wrekin Council confirms that there are no petrol stations meeting the specified criteria**.**

5.4 Poultry Farms

There are a number of poultry farms within the borough, although these are all situated in the rural north of the borough away from most of the major population centres.

There are currently seven poultry farms within the borough. These are:

1. TH Udale & Sons, AP3030UM, Eyton House Farm
2. GH & V Davies Ltd, MP3234KA, Chicken Unit, Walton
3. Oaklands Farm Eggs Ltd., GP3731HZ, Harper Adams University
4. James Heath & Sons Ltd., JP3931HD, Bola House Poultry Unit
5. D.J. Gwyne & Sons, Charlton Farm, Poultry Unit
6. Outlands Ltd., NP3930UF, Hoo Hall Farm
7. Peter Watson Jones Ltd., Howle Manor Poultry Unit

However, none of these farms meet the initial criteria as set out within the technical guidance document; these are farms housing more than 400,000 birds if mechanically ventilated, 200,000 birds if naturally ventilated, or 100,000 birds of any turkey unit. Therefore, it is not necessary to proceed to a further detailed assessment.

Telford & Wrekin Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

A number of pre-application assessments have been conducted where biomass combustion was posited as a fuel source. However, when the applications were submitted most of the fuel sources had changes. For those that did progress to biomass combustion as a fuel source, assessment via planning showed that there will be no deleterious effect to the air quality.

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

6.2 Biomass Combustion – Combined Impacts

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

6.3 Domestic Solid-Fuel Burning

The assessment of domestic solid fuel burning considers SO_2 emissions from those areas which have a significantly large number of houses that use solid fuel for heating purposes.

Telford & Wrekin Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

The assessment of fugitive and uncontrolled sources considers the PM10 objectives. This included consideration to quarries, landfill sites, opencast coal mining, waste transfer sites, and materials handling (i.e. ports, major construction sites). Only locations not covered by previous rounds of review and assessment, or where there is new relevant exposure, require consideration. In the case of proposed new sources, these are only required to be considered if planning approval has been granted.

Telford & Wrekin 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

There have been no relevant exceedances of air quality objectives. For those attributed to PM_{10}, it is considered that these are more attributable to fog, mist or dew than to any specific pollution events, and as such do not give an indication of any actual, relevant exceedances of PM_{10} objectives. The same is also thought to be occurring for those relevant objectives and targets exceeded for $PM_{2.5}$ and PM_1.

Telford & Wrekin Council has no AQMAs. Therefore, there is no need to progress to a Detailed Assessment.

8.2 Conclusions from Assessment of Sources

This USA has assessed all sources of pollution within Telford & Wrekin Council's area. With regards to road sources, no roads of junctions were identified that required assessment using the DMRB model.

There have been a number of Part A2 and B processes within the Borough in the time period of this assessment. These processes have been considered via the environmental permitting regime with regards to their impact on likely breaches of air quality objectives, and it is considered that a Detailed Assessment isn't necessary.

8.3 Overall Conclusions

It is considered that the majority of the pollution within the borough comes from vehicles, largely personal motor vehicles, and to a lesser extent commercial and passenger vehicles. Implementation of the stricter Euro 6 emissions schemes should see an actual reduction in the levels of NO_x within the Borough, particularly as non-compliant older vehicles are withdrawn from service to be replaced with compliant vehicles.

Emissions from industry (including the open cast colliery and the power station at Ironbridge (which is outside the Borough) are relatively minor, and in the case of the power station, have seen dramatic improvement in their emissions over the past decade.

With regard to the Air Quality Strategy, Telford and Wrekin Council intend to produce one. This strategy will set out how the Council intends to maintain its current air quality levels with actions being implemented via the Development Control regime. This will likely adopt a zero change approach to air quality within the Borough.

As such, it can be concluded that, currently, the air in Telford and Wrekin Councils area is excellent.

8.4 Proposed Actions

Proposed actions arising from the USA are:

- Progress to the 2013 progress report.

9 References

DEFRA 2009 Local Air Quality Management: Policy Guidance (PG09)
DEFRA 2009 Local Air Quality Management: Technical Guidance LAQM.TG(09)
Great Britain. Environment Act 1995: Elizabeth II Chapter 25, (1995). London. The Stationery Office
Great Britain. Air Quality (England) Regulations 2000. Statutory Instrument 928. London. The Stationery Office
Great Britain. Air Quality (England) (Amendment) Regulations 2002. Statutory Instrument 3043. London. The Stationery Office
Telford and Wrekin Council (2009), Joint Strategic Needs Assessment. Telford, 2009
USEPA. United States Environmental Protection Agency National Ambient Air Quality Standards (http://www.epa.gov/air/criteria.htm Accessed 2nd July 2013)
WHO. World Health Organisation Air Quality Guidelines for Europe (http://www.euro.who.int/__data/assets/pdf_file/0005/74732/E71922.pdf Accessed 2nd July 2013)

Appendices

10 Appendix A: Diffusion Tube QA/QC Data

Diffusion Tube Bias Adjustment Factors

The nitrogen dioxide diffusion tubes used were 50% TEA in acetone preparation method and were supplied and analysed by Gradko Laboratories, Winchester. Gradko Laboratories are UKAS accredited. Maps and descriptions of the diffusion tube monitoring locations can be found in Appendix 1. The tubes at all locations throughout the Telford and Wrekin area have a monthly exposure period. All operating staff are fully trained and follow the monitoring procedures provided in the UK Nitrogen Dioxide Diffusion Tube Network Instruction Manual. The following diffusion tube bias adjustment factors were derived from the Review and Assessment Website national bias adjustment factor database (v.03/10) (http://www.uwe.ac.uk/aqm/review/index.html). 2011's bias adjustment factor would have been derived from the National Diffusion Tube Bias Adjustment Factor Spreadsheet v07/12, which was available from http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html. However, as no monitoring data was ready, this was not undertaken.

Factor from Local Co-location Studies (if available)

As the national bias adjustment factors are based on so few studies, consideration has been given to also using local bias adjustment factors. Telford and Wrekin Council has triplicate diffusion tubes situated within the Borough. As there were no collocated automatic monitoring stations within the Borough, then a decision was used to utilise the national values calculated from the national diffusion tube bias adjustment factor, which was 1.03.

Diffusion Tube Short-term Monitoring Adjustment Factors

Values only needed to be calculated for two sites; 11 Elephant & Castle, and 19 Adeney. These were calculated using data from the following automatic monitoring sites; Aston Hill, Birmingham Tyburn, Stoke-on-Trent Centre and Wrexham. Ratios were calculated for each period, and the average of these ratios was used to determine the adjustment factor. These were 1.14 for 11 Elephant & Castle, and 1.08 for 19 Adeney.

Table A2.1 Percentage data capture for NO_2 Diffusion Tubes 2007-2011

Site Name	2004 %	2005 %	2006 %	2007 %	2008 %	2009 %	2010 %	2011 %	Overall %
1 Holmer Lake	100%	100%	100%	92%	100%	100%	92%	No Data	98%
2 Cygnet Drive	100%	100%	100%	100%	100%	100%	100%	No Data	100%
3 Cygnet Drive	100%	100%	100%	100%	100%	100%	100%	No Data	100%
4 Cygnet Drive	100%	100%	100%	100%	100%	100%	100%	No Data	100%
5 Aqueduct	67%	83%	58%	75%	83%	67%	92%	No Data	75%
6 Aqueduct	67%	83%	58%	75%	83%	67%	92%	No Data	75%
7 Ironbridge	83%	83%	100%	100%	92%	100%	100%	No Data	94%
8 Bush House	100%	100%	100%	92%	100%	100%	100%	No Data	99%
9 Bush House	100%	100%	100%	92%	100%	100%	100%	No	99%

								Data	
10 Bush House	100%	100%	100%	92%	100%	100%	100%	No Data	99%
11 Elephant & Castle	25%	33%	92%	92%	92%	83%	67%	No Data	69%
12 The Russetts	100%	83%	92%	100%	100%	100%	100%	No Data	96%
13 The Russetts	100%	83%	92%	100%	100%	100%	100%	No Data	96%
14 The Russetts	100%	83%	92%	100%	100%	100%	100%	No Data	96%
15 Wellington Solicitors	100%	100%	100%	100%	100%	100%	100%	No Data	100%
16 17, Castle Street	100%	100%	100%	100%	100%	100%	100%	No Data	100%
17 17, Castle Street	100%	100%	100%	100%	100%	100%	100%	No Data	100%
18 17, Castle Street	100%	100%	100%	100%	100%	100%	100%	No Data	100%
19 Adeney	92%	75%	100%	100%	75%	100%	83%	No Data	89%
20 Priorslee	75%	100%	83%	83%	83%	92%	92%	No Data	87%

11 Appendix B: Diffusion Tube Monitoring Data Analysis

As noted in the main body of the text, forecasts have been made, using diffusion tubes, of when air quality objectives may be breached. This was done using the trendline function in Microsoft Office Excel 2010. Please note that due to the differing time scales shown in the graphs, the horizontal axes showing time periods differs for each graph. It should also be noted that these graphs are only meant to be indicative, and not necessarily to be used as formal Council policy regarding air quality. It should also be noted that the data used is the annual averages. Again, it should be noted that the analysis in this chart is full of uncertainties relating to the diffusion tube as well as the subsequent analysis of the data.

Table 35 1 Holmer Lake Forward Extrapolation

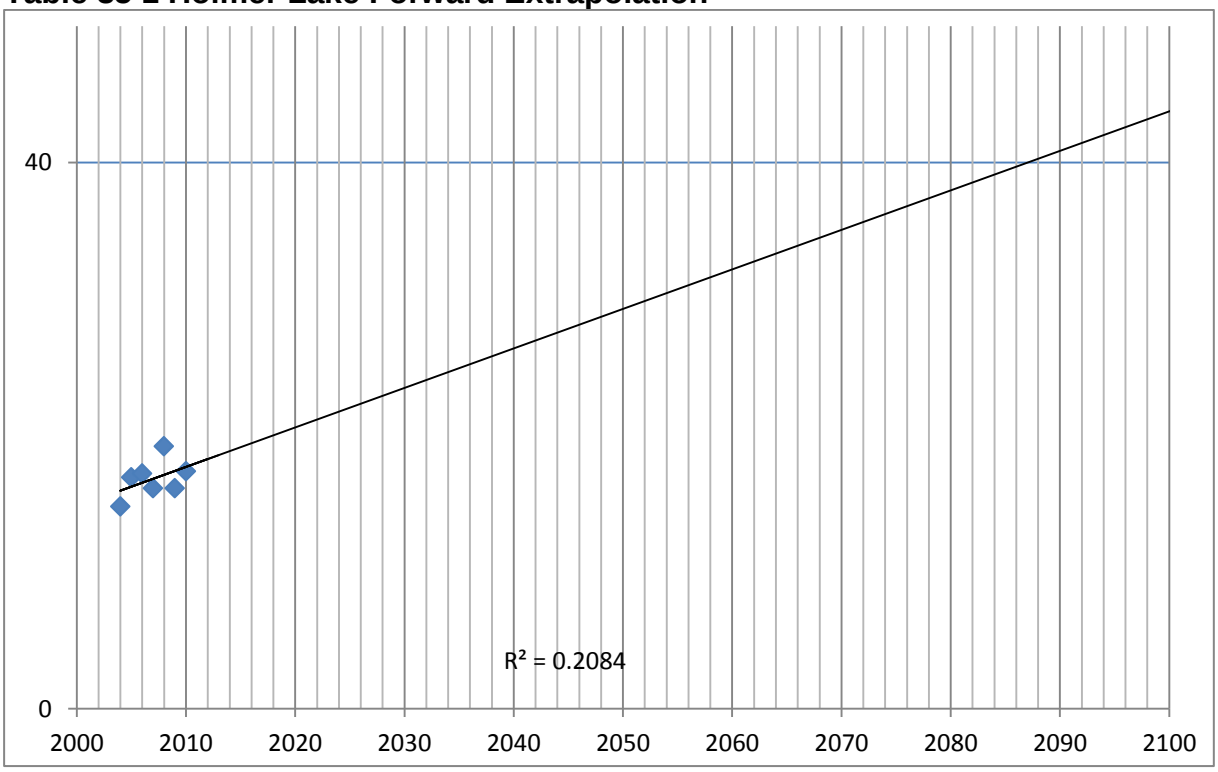


Table 36 2 Cygnet Drive Forward Extrapolation

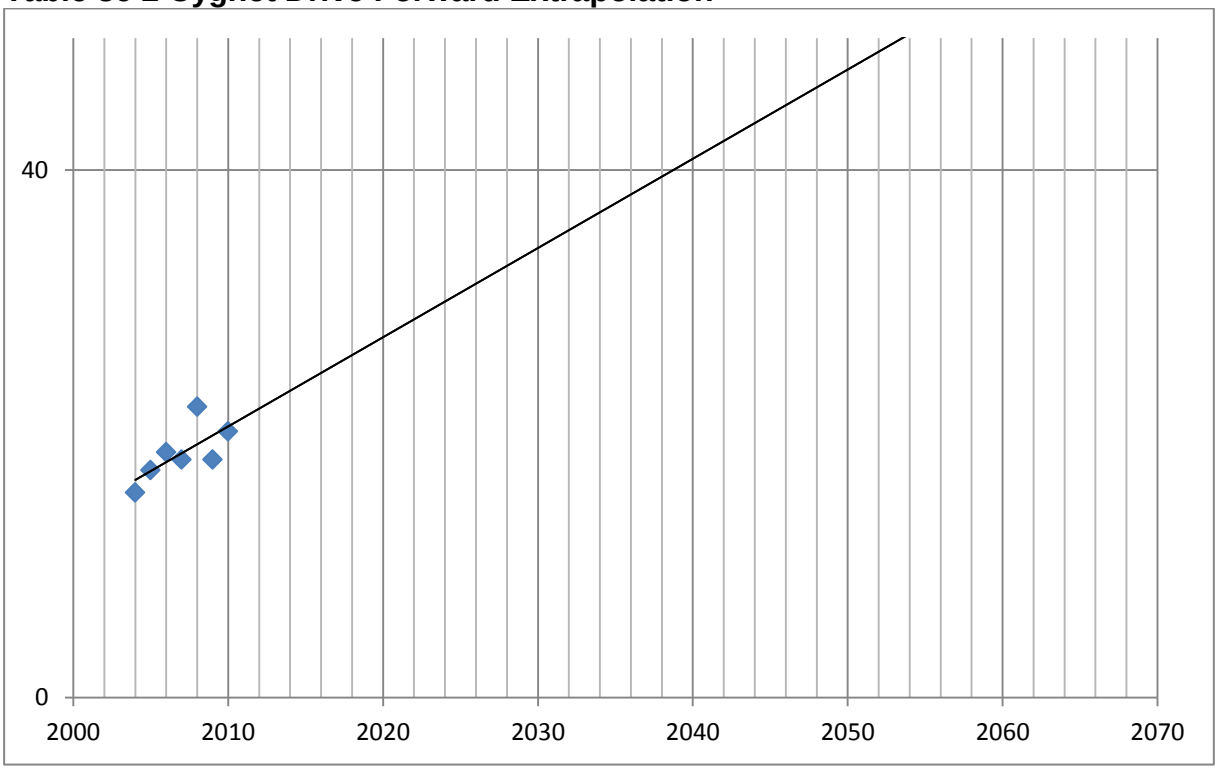


Table 37 3 Cygnet Drive Forward Extrapolation

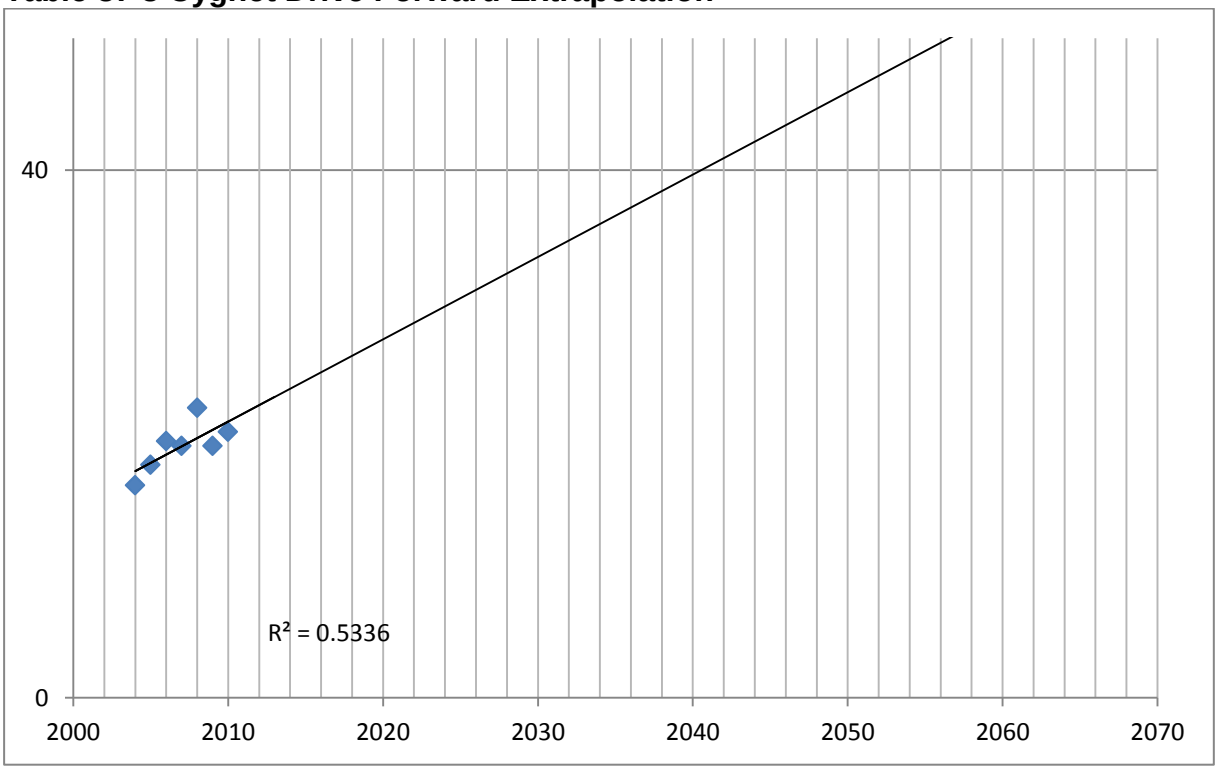


Table 38 4 Cygnet Drive Forward Extrapolation

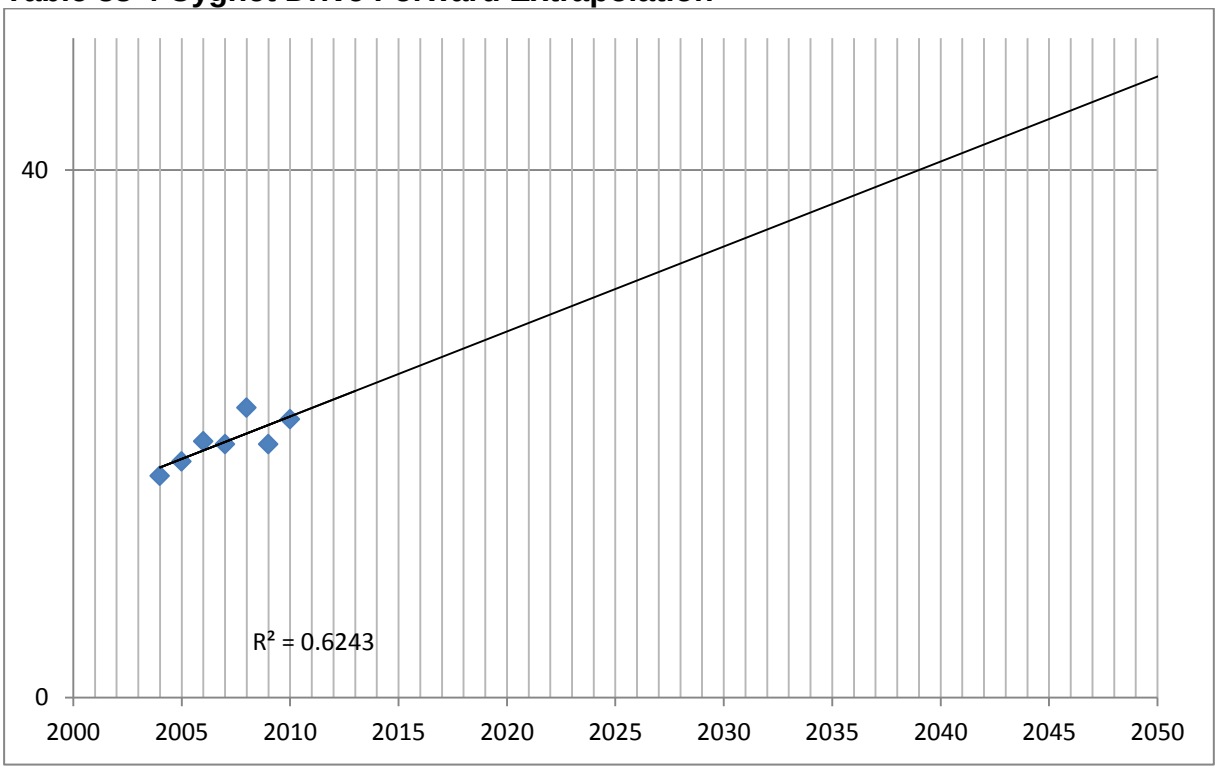


Table 39 5 Aqueduct Forward Extrapolation

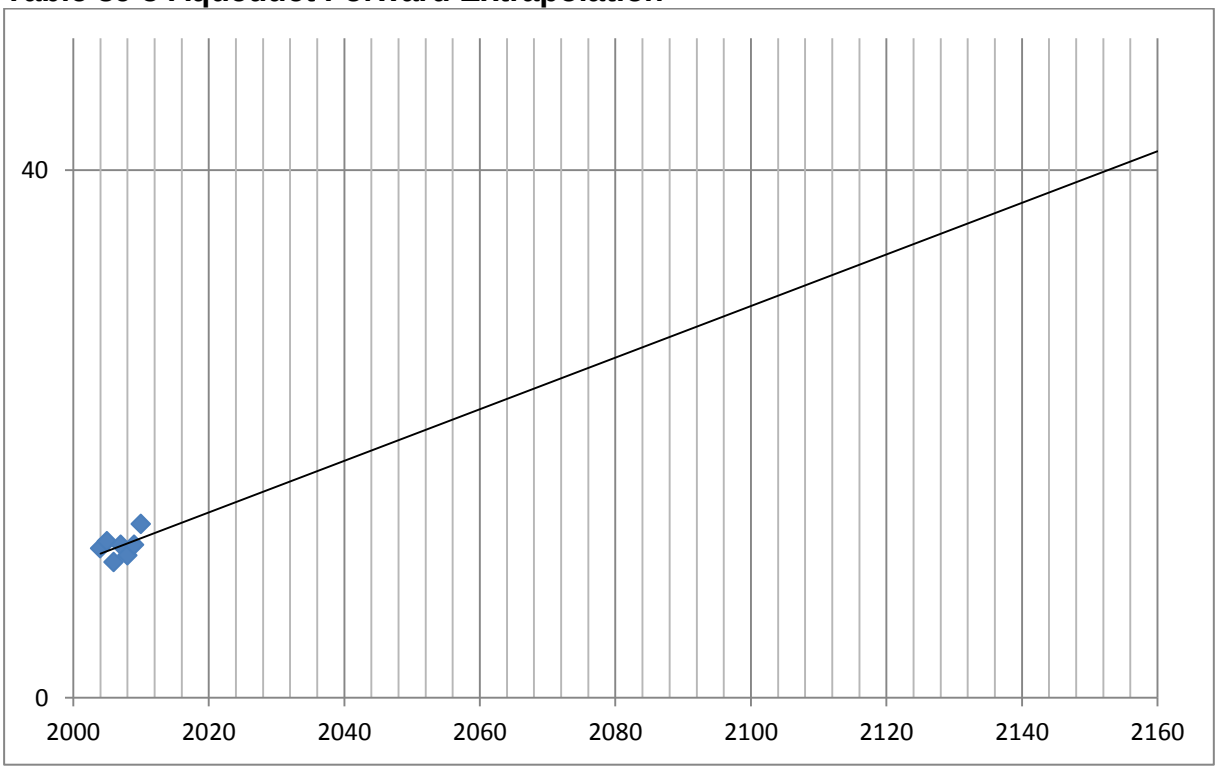


Table 40 6 Aqueduct Forward Extrapolation

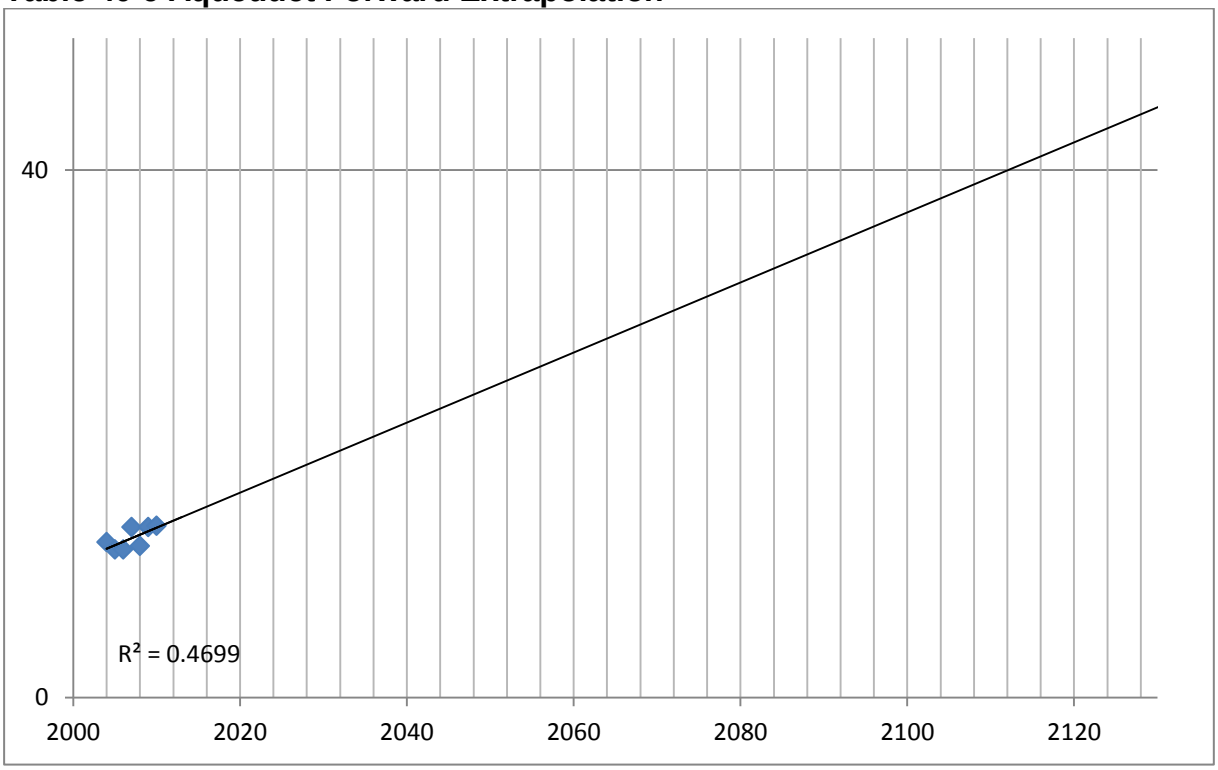


Table 41 7 Ironbridge Forward Extrapolation

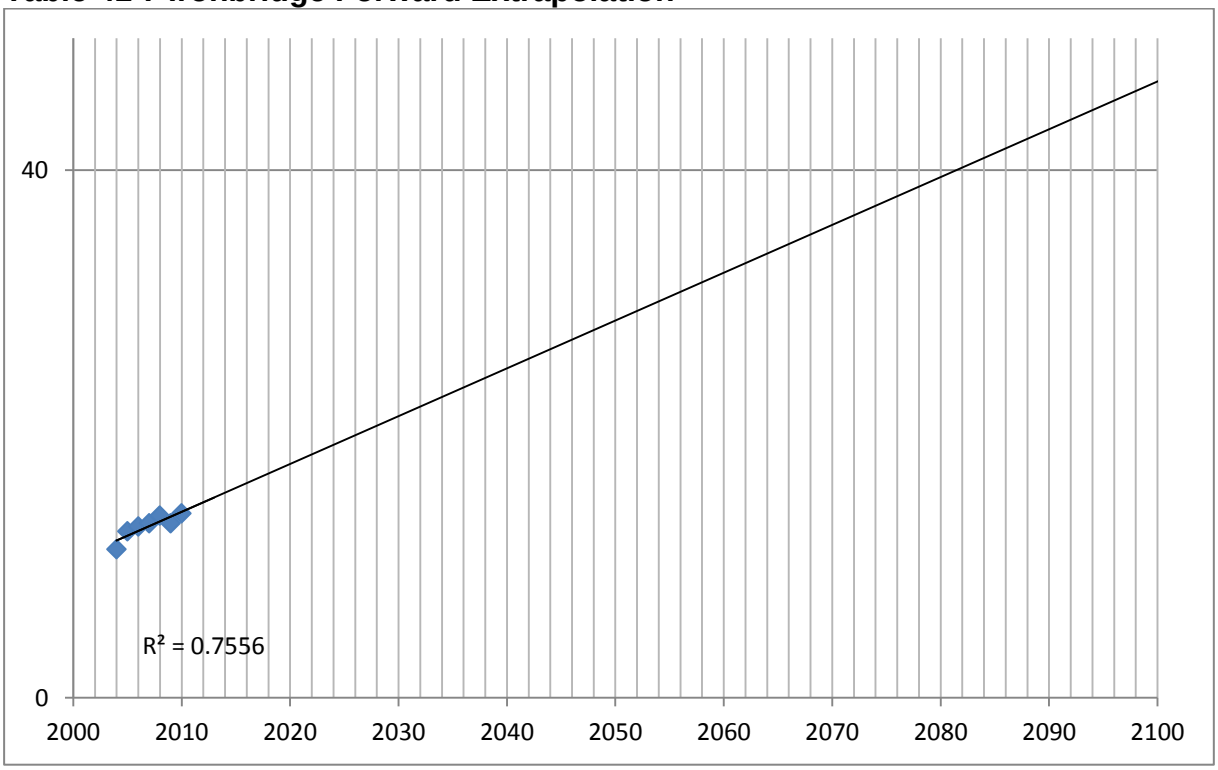


Table 42 8 Bush House Forward Extrapolation

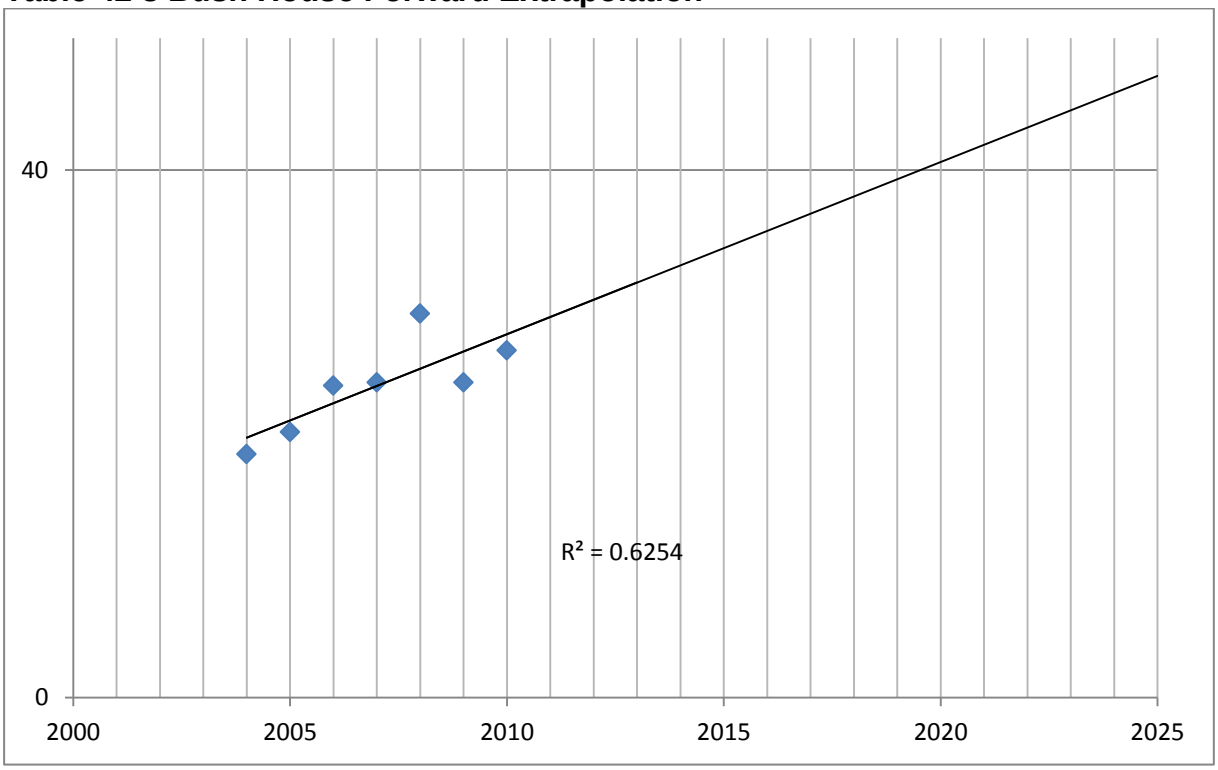


Table 43 9 Bush House Forward Extrapolation

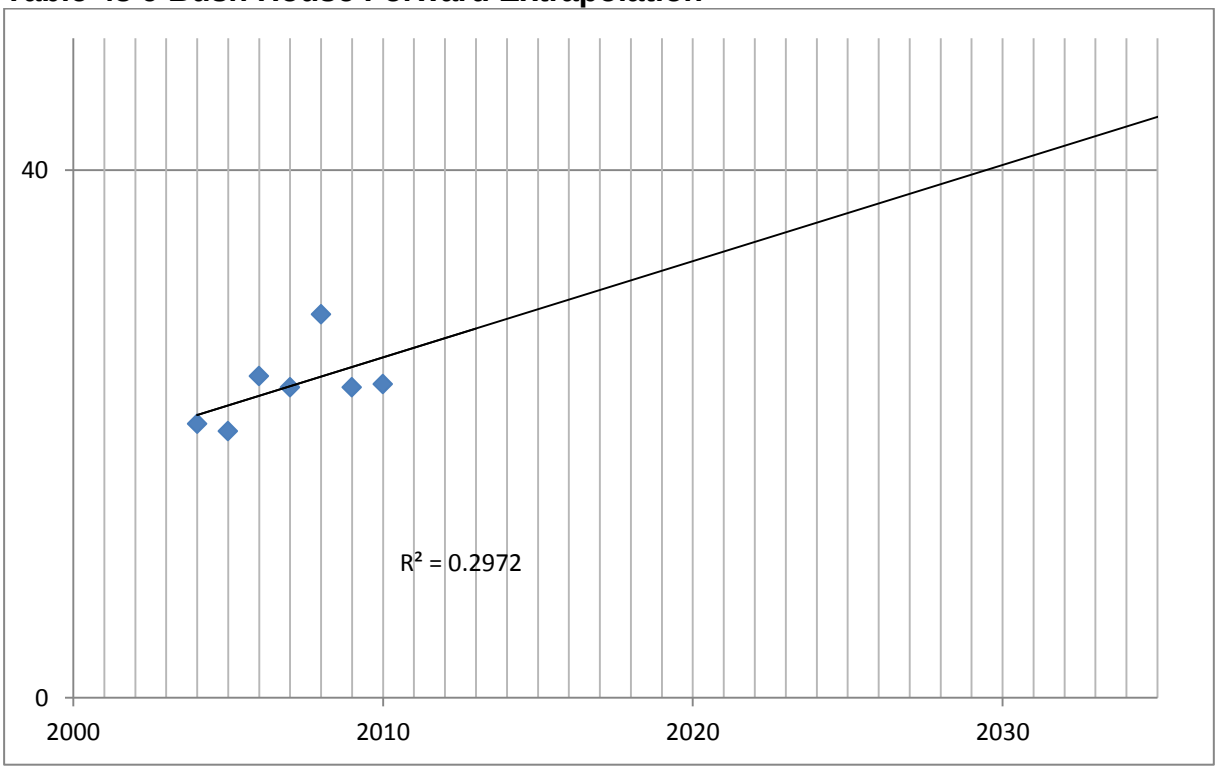


Table 44 10 Bush House Forward Extrapolation

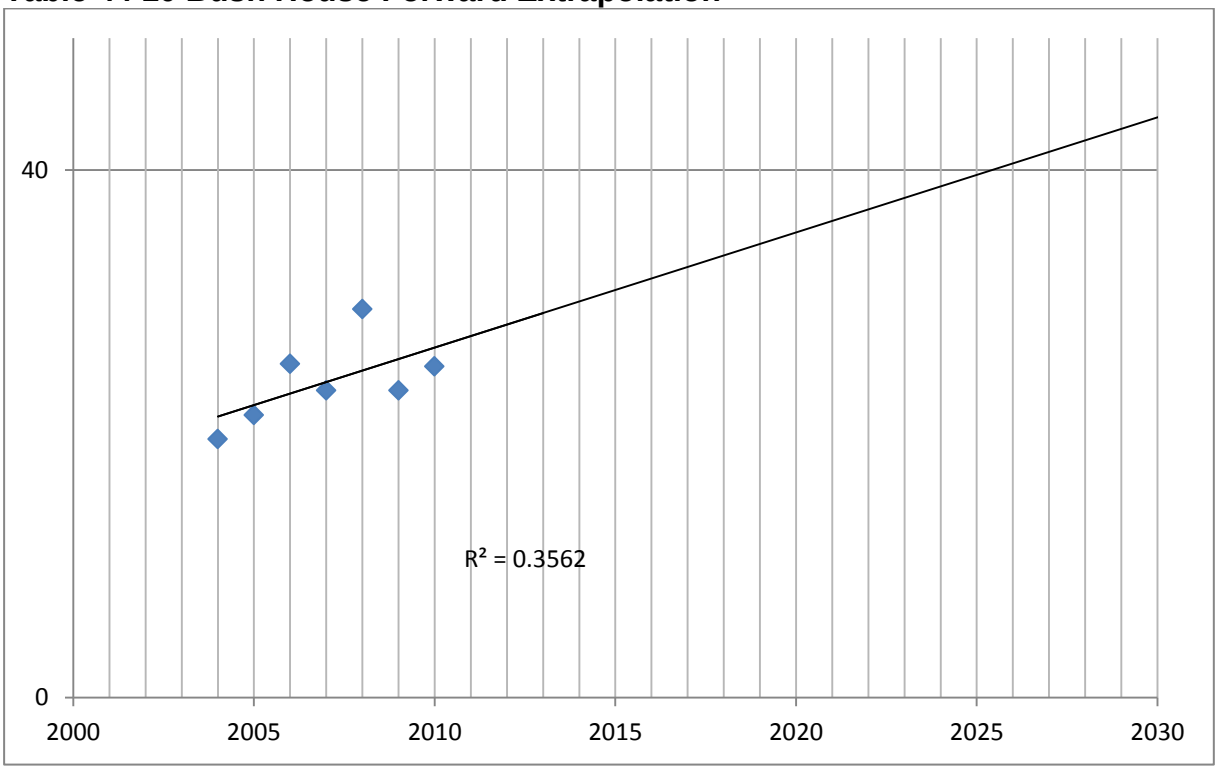


Table 45 11 Elephant & Castle Forward Extrapolation

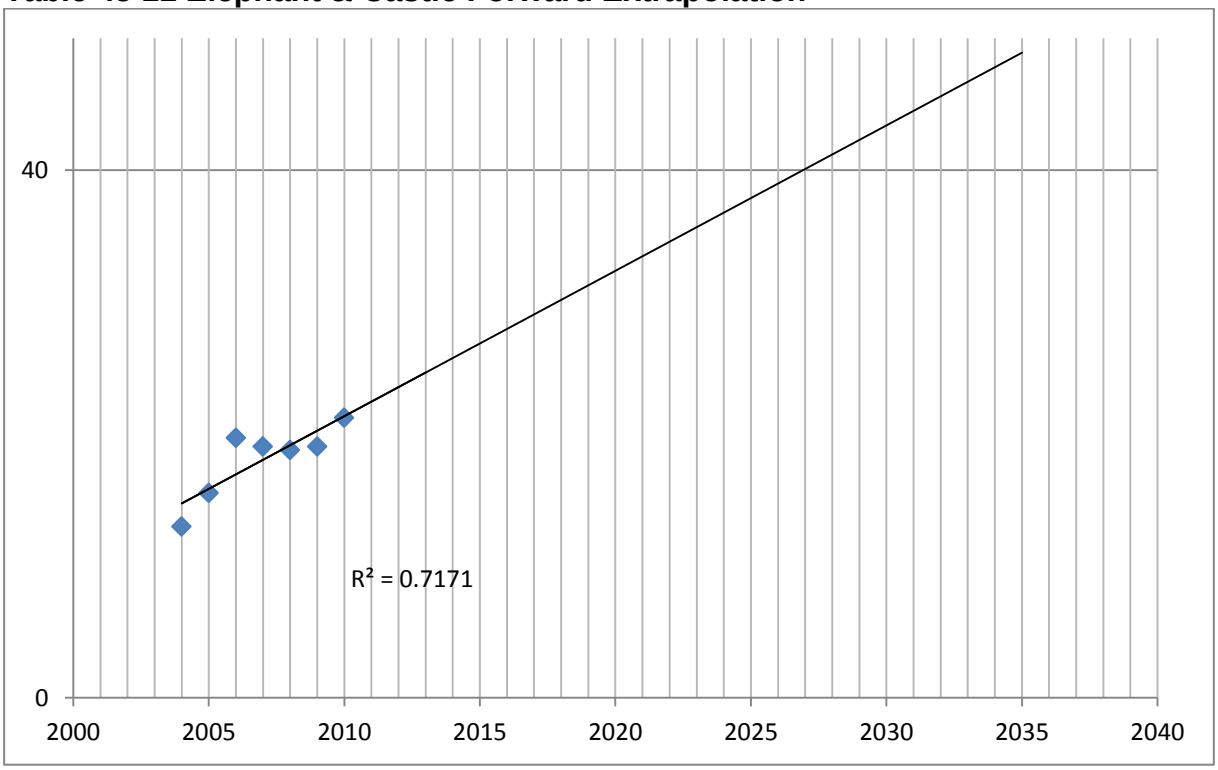


Table 46 12 The Russetts Forward Extrapolation

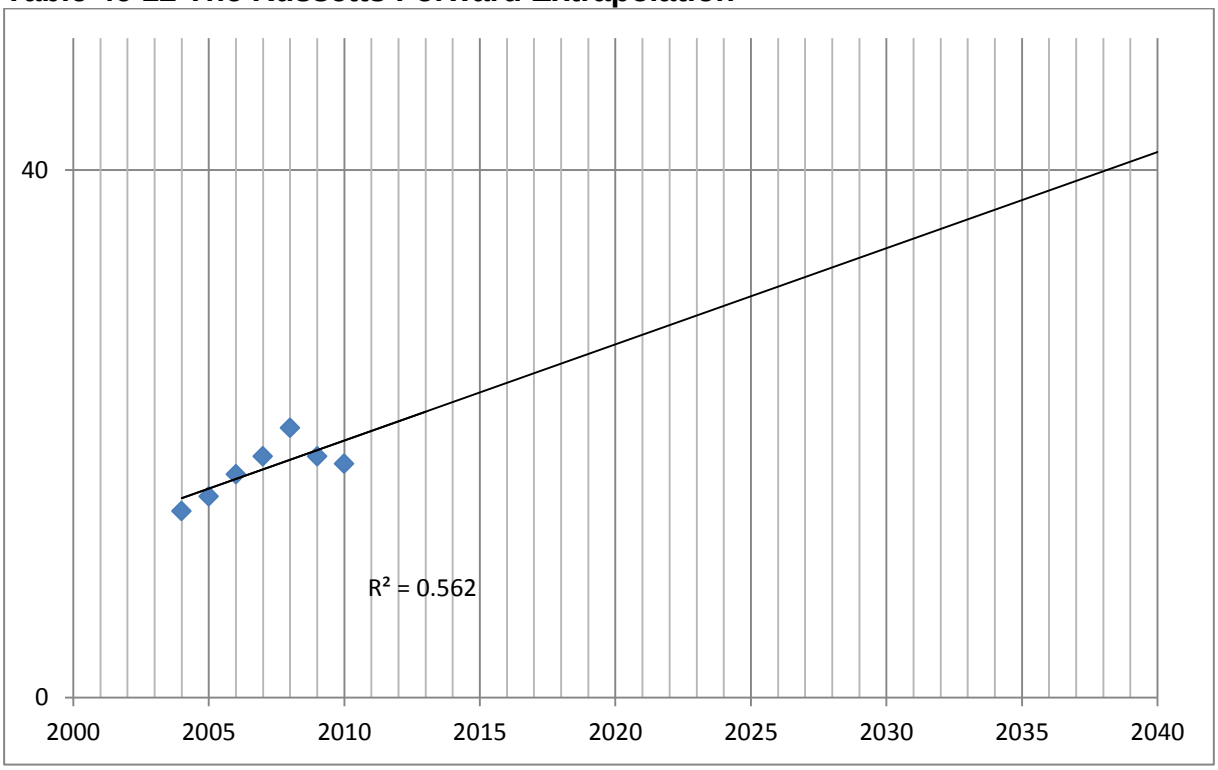


Table 47 13 The Russetts Forward Extrapolation

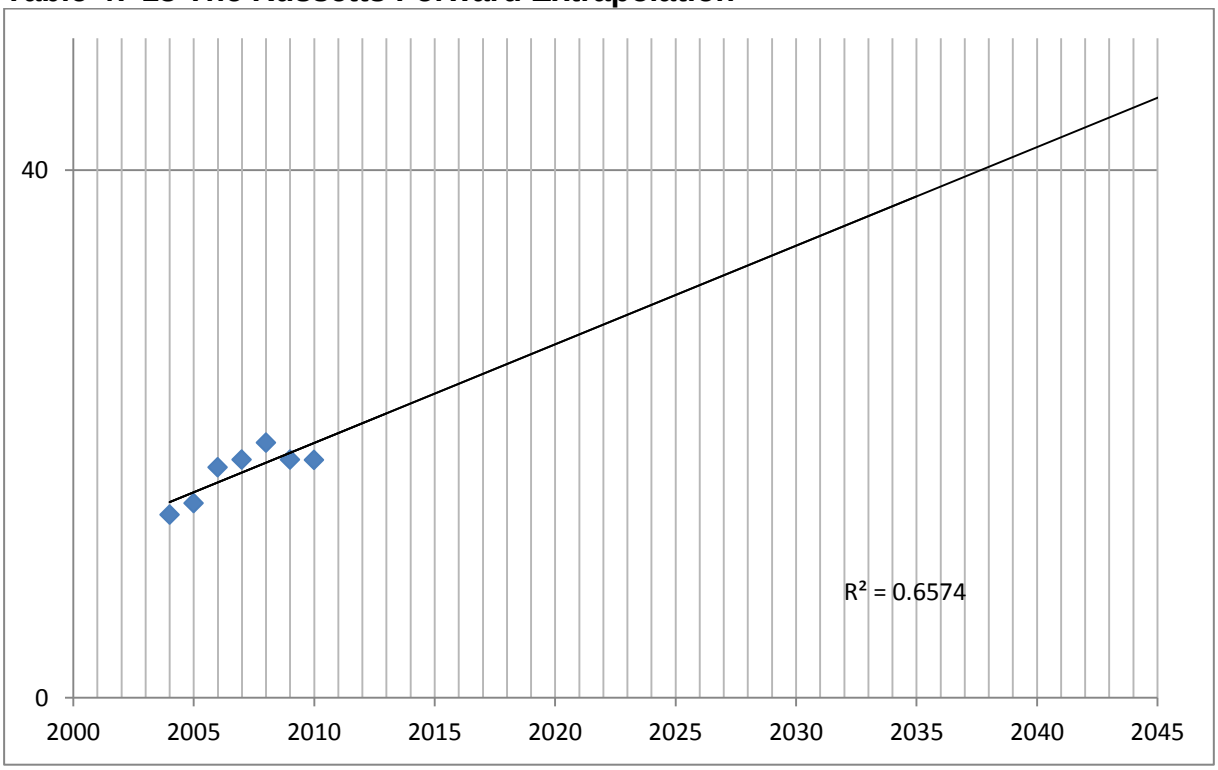


Table 48 14 The Russetts Forward Extrapolation

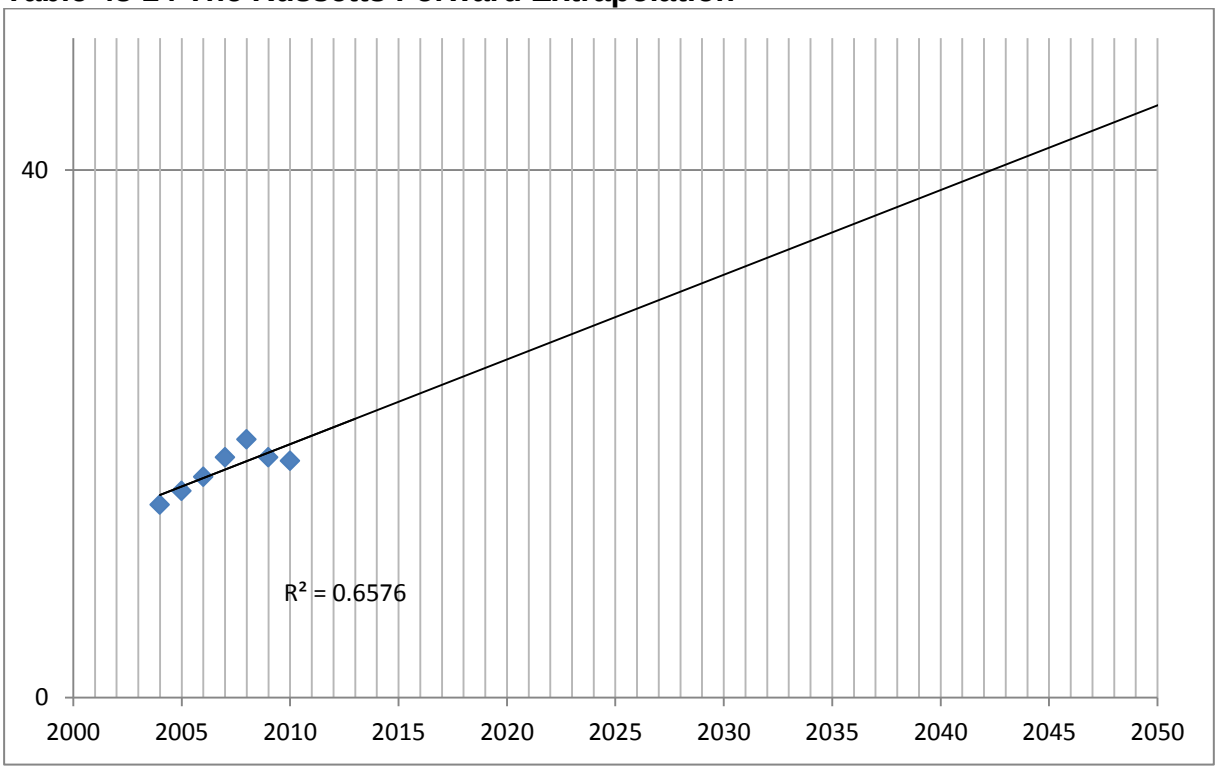


Table 49 15 Wellington Solicitors Forward Extrapolation

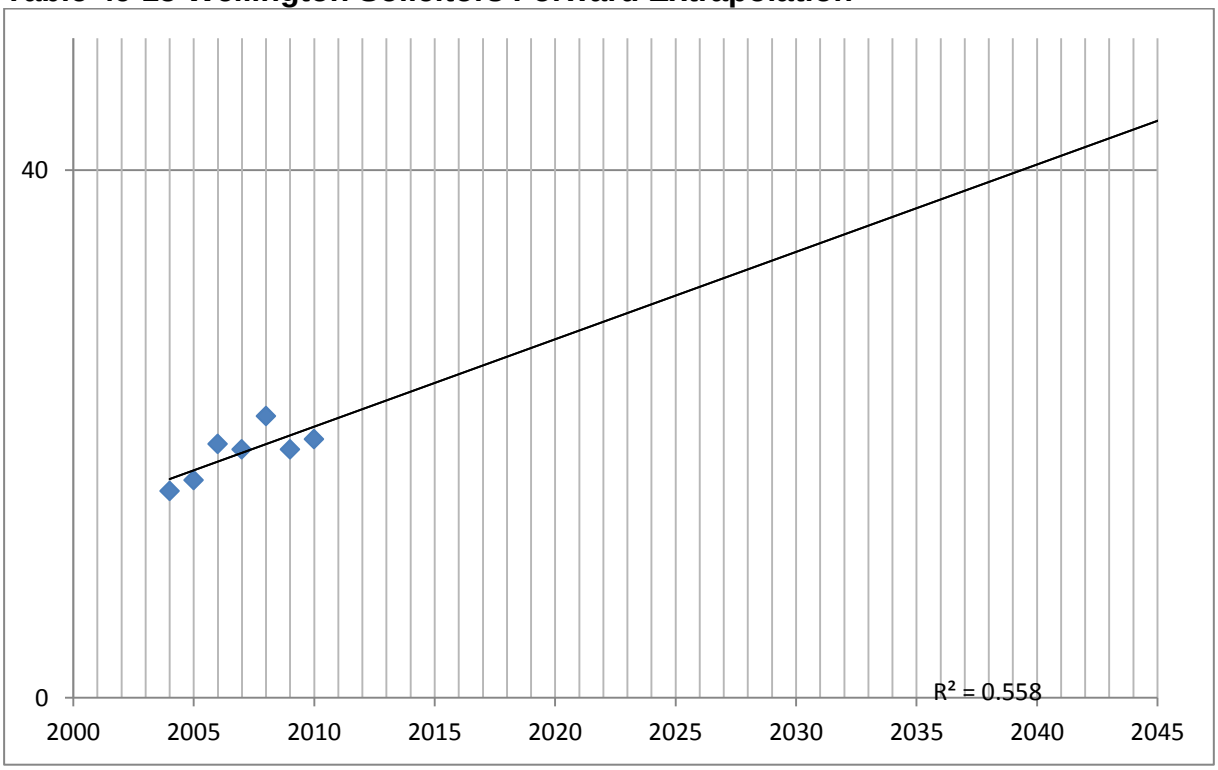


Table 50 16, 17 Castle Street Forward Extrapolation

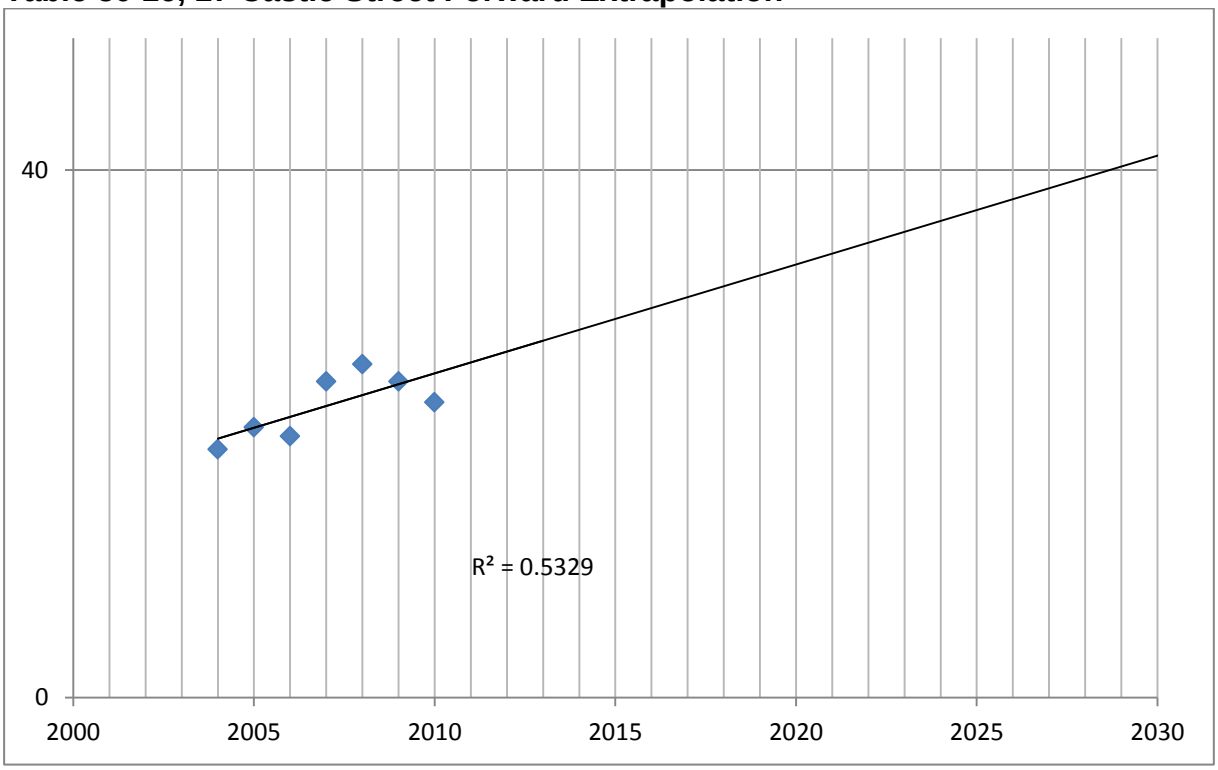


Table 51 17, 17 Castle Street Forward Extrapolation

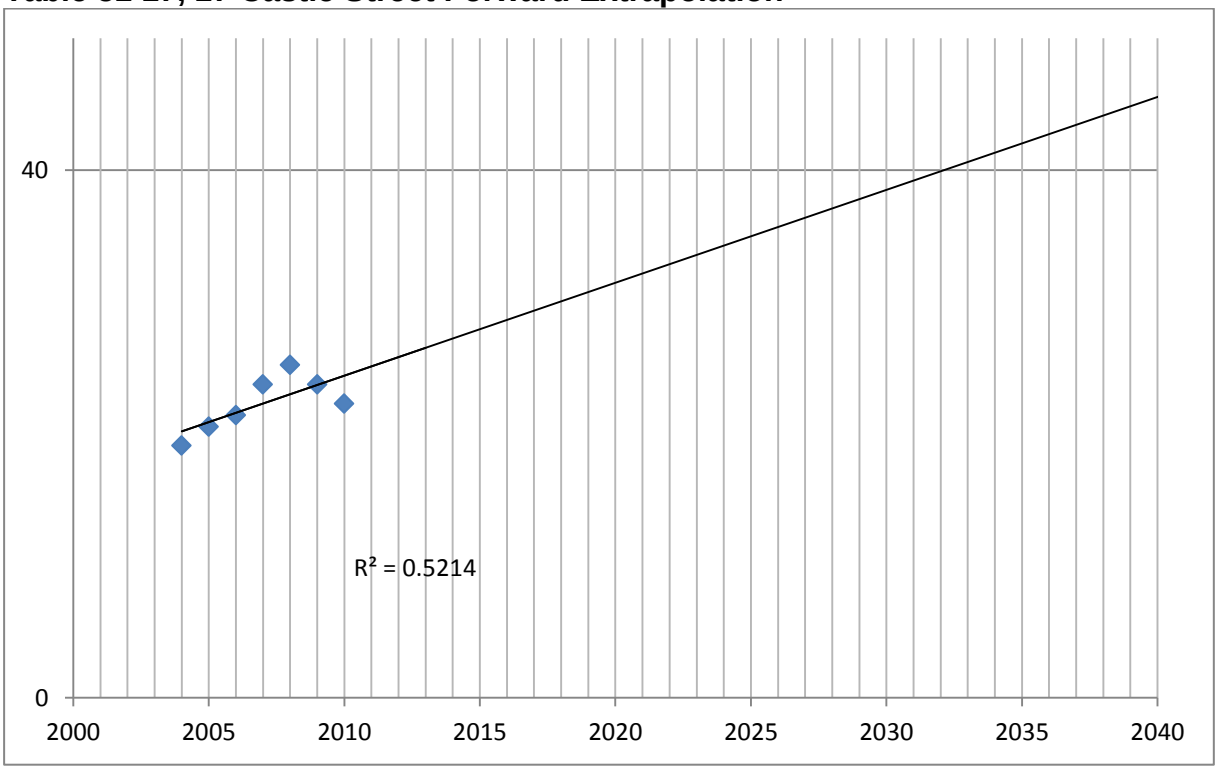


Table 52 18, 17 Castle Street Forward Extrapolation

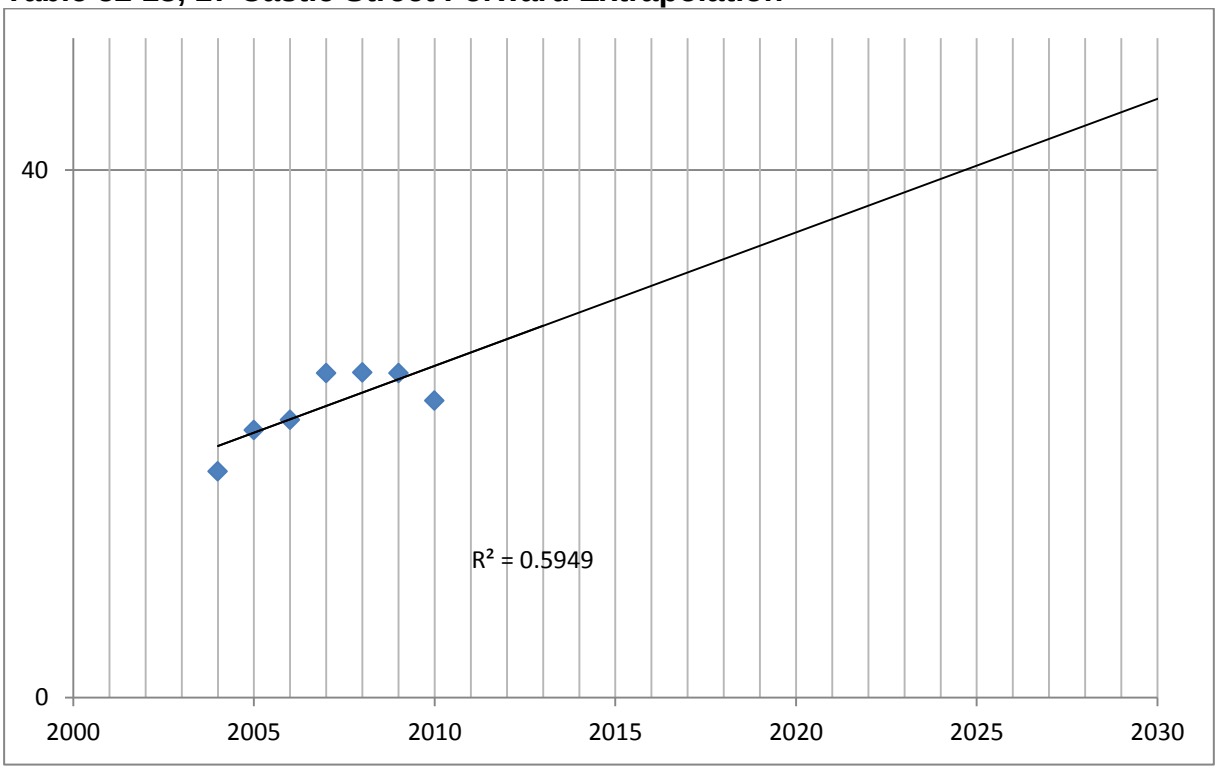


Table 53 19 Adeney Forward Extrapolation

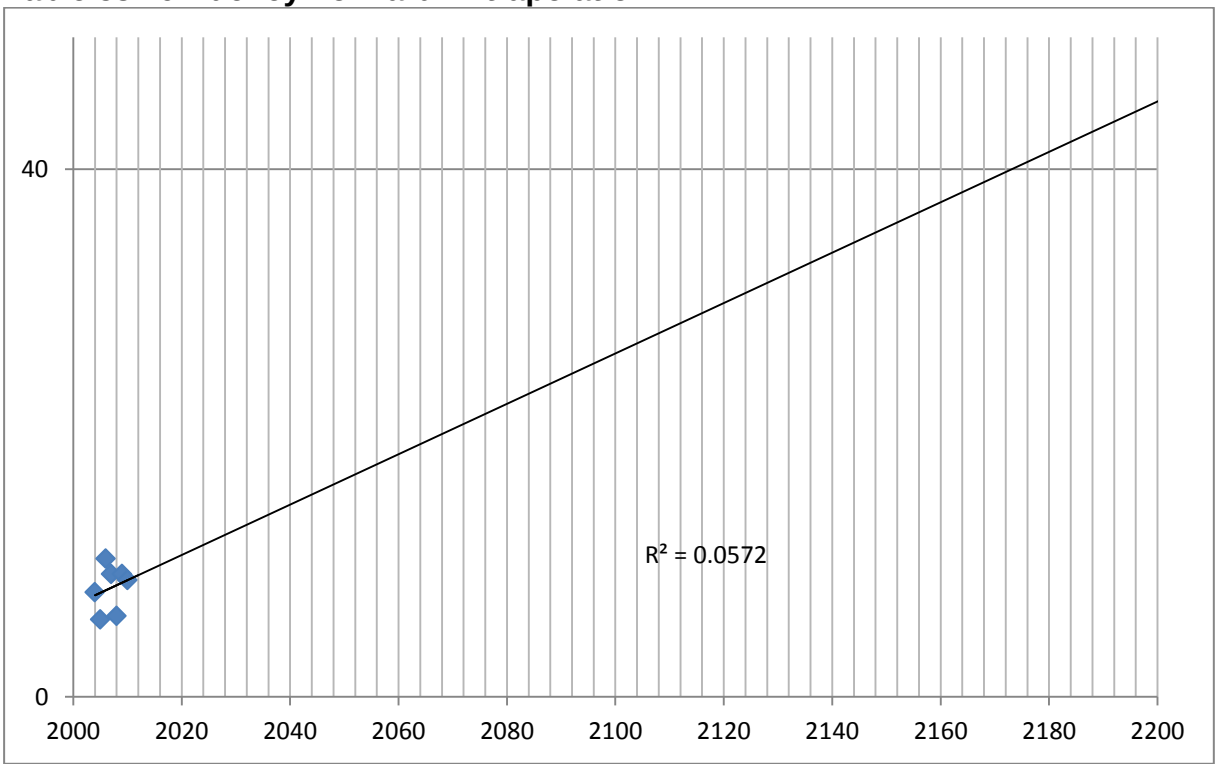


Table 54 20, Priorslee Forward Extrapolation