New Forest
DISTRICT COUNCIL

2014 Air Quality Progress Report for New Forest District Council

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

October 2014

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Executive Summary

This is the Progress Report 2014 for air quality for New Forest District Council. The conclusions are based on monitoring data collated and ratified over 2013 and following criteria laid out in Technical Guidance (Defra, 2009).

Diffusion tube monitoring has shown an exceedence of the annual mean objective for nitrogen dioxide at 2 locations within the Lyndhurst Air Quality Management Area, and at a further location outside the Air Quality Management Area in Shrubbs Hill Road, Lyndhurst.

The Progress Report 2014 has concluded that further investigation and monitoring is required (with the assistance of the Air Quality Helpdesk) to determine whether the site in Shrubbs Hill Road is considered relevant exposure. If the site is determined as relevant public exposure the Council will be required to proceed to declare an additional Air Quality Management Area in Lyndhurst or extend the existing Air Quality Management Area.

The automatic monitoring site within the Air Quality Management Area in Lyndhurst has monitored a significant (5µg/m^3) decrease in the annual mean concentration for nitrogen dioxide between 2010 and 2013. In 2013 the site monitored a slight increase on results compared to 2012, resulting in a monitored exceedance of the annual mean objective for nitrogen dioxide of 41µg/m^3. The monitored overall decrease is attributed to the improvements in the traffic light system in Lyndhurst which has improved flow and reduced some congestion within the village centre.

The Progress Report 2014 acknowledges that monitoring results in Totton have not shown an exceedance of the nitrogen dioxide annual mean objective since 2008. However the Progress Report 2014 advises that the Council has been made aware that a planning application for a significant development of a large site 150m outside the Totton Air Quality Management Area will be submitted imminently. Therefore the Progress Report 2014 has recommended that the decision to start the process to revoke the Air Quality Management Area in Totton with respect to nitrogen dioxide

(annual mean objective) should be deferred until Spring 2015 in order to consider the proposed planning application and determine its potential impact on local air quality.

In the meantime the monitoring programme currently in place throughout the district using automatic analysers and diffusion tubes will continue.

New Forest District Council aims to produce an air quality planning guide to assist Local Government officers and developers in due course. This is in light of the publication of the Nation Planning Policy Framework published in 2012.

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1 Introduction

1.1 Description of Local Authority Area

The New Forest District lies to the south-western corner of Hampshire, between the large conurbations of Southampton and Christchurch/Bournemouth and Poole. The District covers 75,100 hectares (290 sq. miles) and has a diverse environment, including the New Forest (and associated New Forest National Park) that covers approximately three quarters of the district comprising of mainly protected heath lands and forests, and a coastline of 64km. Despite the district's largely rural character, it also contains a number of towns and villages. The total population of the District is 176,800 based on 2011 census data (ONS, 2013).

Along Southampton Water much of the shoreline is influenced by urban and industrial development, including 13 (Part A) permitted processes, as listed in Appendix A, under the Pollution Prevention and Control (England and Wales) Regulations 2000. The local landscape is dominated by a refinery, one of the largest in Europe, other processes include an oil fired power station, energy recovery facilities and chemical installations.

1.2 Purpose of Progress Report

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

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the LAQM process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

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 µg/m^3 (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 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 µg/m^3	Running annual mean	31.12.2003
	5.00 µg/m^3	Annual mean	31.12.2010
1,3-Butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m^3	Annual mean	31.12.2004
	0.25 µg/m^3	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10}) (gravimetric)	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m^3	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/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 continuous process of Review and Assessment started in 1998 for New Forest District Council. Table 1.2 outlines reports produced and the outcomes of the report's findings.

Table 1.2 Previous air quality reports

Year	Report	Outcomes
1998	Ist Stage Review & Assessment	Further investigation for CO, benzene, 1,3-butadiene, lead, NO_2, PM_{10} and SO_2 Areas of concern; Marchwood, Hythe, Holbury, Fawley, Totton, Cadnam, Ringwood, New Milton
2000	2nd & 3rd Stages Review & Assessment	No predicted exceedences of the objectives for any pollutant, but installation of automatic monitors to be considered in Fawley, Ringwood and Holbury
2002	Review & Assessment	Automatic monitors installed. No predicted exceedences of the objectives for any pollutant
2003	Updating & Screening Assessment	Detailed Assessment required for benzene (Holbury/Fawley area), NO_2 (Totton and Lyndhurst) and SO_2 (Fawley)
2004	Modelling Report (Faber Maunsell)	For benzene and SO_2 in the Holbury and Fawley area
2004	Detailed Assessment	No likely exceedence of benzene and SO_2 objectives. Likely exceedence of the annual mean objective for NO2 in Totton and Lyndhurst
2005	Progress Report	Exceedence of the annual mean objective for NO_2 in Totton and Lyndhurst Monitoring shows likely exceedence of the 15 minute mean objective for SO_2 in Fawley
2005	Declaration of Air Quality Management Area's (AQMA's)	Totton – NO_2 (annual mean) Lyndhurst – NO_2 (annual mean) Fawley – SO_2 (15 min mean)
2006	Updating & Screening Assessment	No requirement to proceed to a Detailed Assessment
2006	Further Assessment	Totton and Lyndhurst – main source from traffic Fawley – main source from industry Retain AQMA's
2006	Modelling Report (AEA Technology)	For predicted NO_2 concentrations concerning proposed traffic scenarios within Lyndhurst AQMA
2007	Progress Report	Exceedences of NO_2 annual mean objective in Totton and Lyndhurst
2008	Progress Report	Exceedences of NO_2 annual mean objective in Totton and Lyndhurst. Detailed Assessment for NO_2 in Ringwood Rd, Totton (outside current AQMA) for exceedence of annual mean objective.

Year	Report	Outcomes
2008	Formal adoption of Action Plans	Totton – NO_2 Lyndhurst – NO_2 Fawley – SO_2
2008	Modelling Report (AEA Technology)	For proposed traffic scenarios within Lyndhurst Air Quality Action Plan – recommendation to forward 2 options
2008	Monitoring Report (AEA Technology)	6 month survey of PM_{10} in Totton and Lyndhurst. No requirement for further action.
2009	Updating & Screening Assessment	Detailed Assessments required for NO_2 (A31 and Lymington concerning traffic) and for PM_{10} (Sway concerning poultry farms)
2009	Action Plan Progress Report	Updating progression of actions within Action Plans for the declared AQMA's
2010	Progress Report	Detailed Assessments required for NO_2 (Shrubbs Hill Rd and Gosport Lane, Lyndhurst concerning traffic) Updating progression of actions within Action Plans for the declared AQMA's
2011	Detailed Assessment (poultry farm)	Likely exceedence of the 24hr mean objective for PM_{10} in Sway
2011	Modelling Report (AEA Technology)	For proposed traffic scenarios within Lyndhurst Air Quality Action Plan – some reductions in NO_2 predicted but at the expense of vehicle flow.
2011	Progress Report	Detailed Assessment required for NO_2 (Shrubbs Hill Rd and Gosport Lane, Lyndhurst concerning traffic) Updating progression of actions within Action Plans for the declared AQMA's
2012	Detailed Assessment (AEA Technology)	For Shrubbs Hill Road and Gosport Lane, Lyndhurst – likely exceedance of the annual mean objective for NO_2 in Gosport Lane but not for Shrubbs Hill Road (both locations outside current AQMA)
2012	Updating & Screening Assessment	Revocation recommended for Fawley AQMA (SO_2 15 min mean objective) without the requirement to produce a Detailed Assessment. Requirement to declare an AQMA in Sway (PM_{10} 24hr mean objective)
2013	Revocation of AQMA	Fawley AQMA (SO_2 15 min mean objective) revoked in April 2013
2013	Progress Report	Current AQMA's in Lyndhurst and Totton (NO_2 annual mean objective) On advice from air quality helpdesk: • To continue monitoring in Gosport Lane and Shrubbs Hill Road, Lyndhurst before deciding whether to extend current AQMA or declare new AQMA's (NO_2 annual mean objective) • Not to declare AQMA in Sway (PM_{10} 24hr mean objective) due to changes in air quality advice • To consider revoking Totton AQMA (NO_2 annual mean objective) due to no recent exceedances at monitoring sites

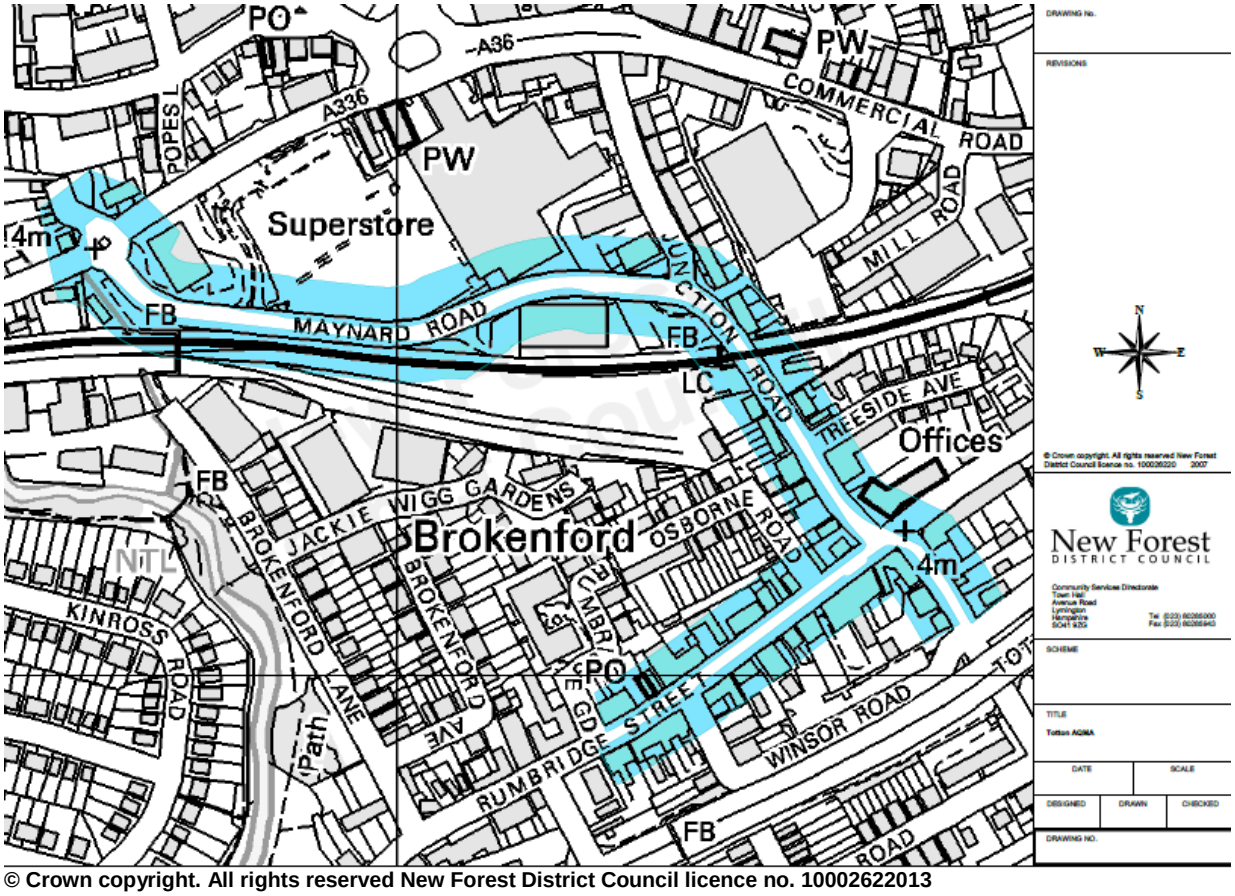
Current Air Quality Management Areas

New Forest District Council has two current Air Quality Management Areas. These are detailed below;

Totton

Air Quality Management Area (Figure 1.1) declared with respect to likely exceedence of the annual mean objective for nitrogen dioxide.

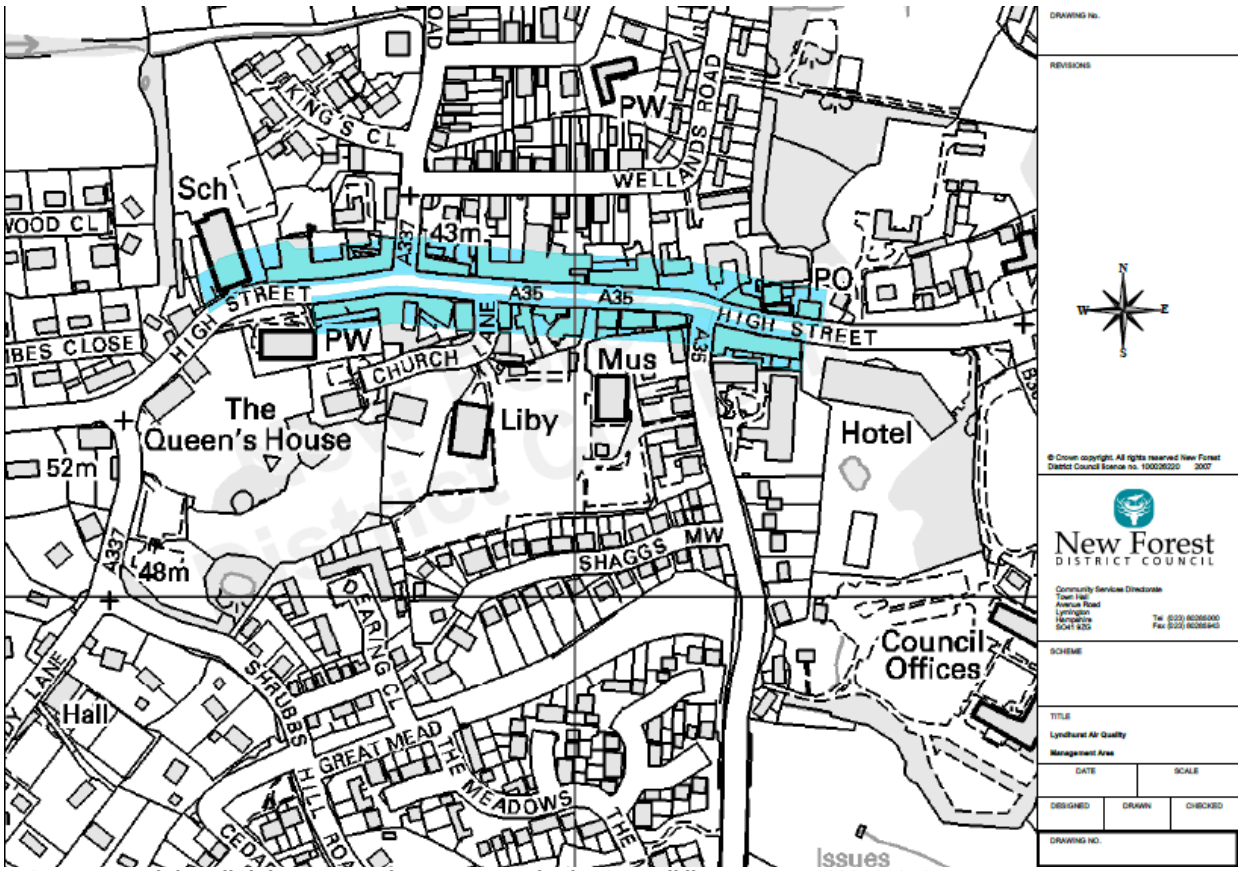
Figure 1.1 Totton Air Quality Management Area



Lyndhurst

Air Quality Management Area (Figure 1.2) declared with respect to likely exceedence of the annual mean objective for nitrogen dioxide.

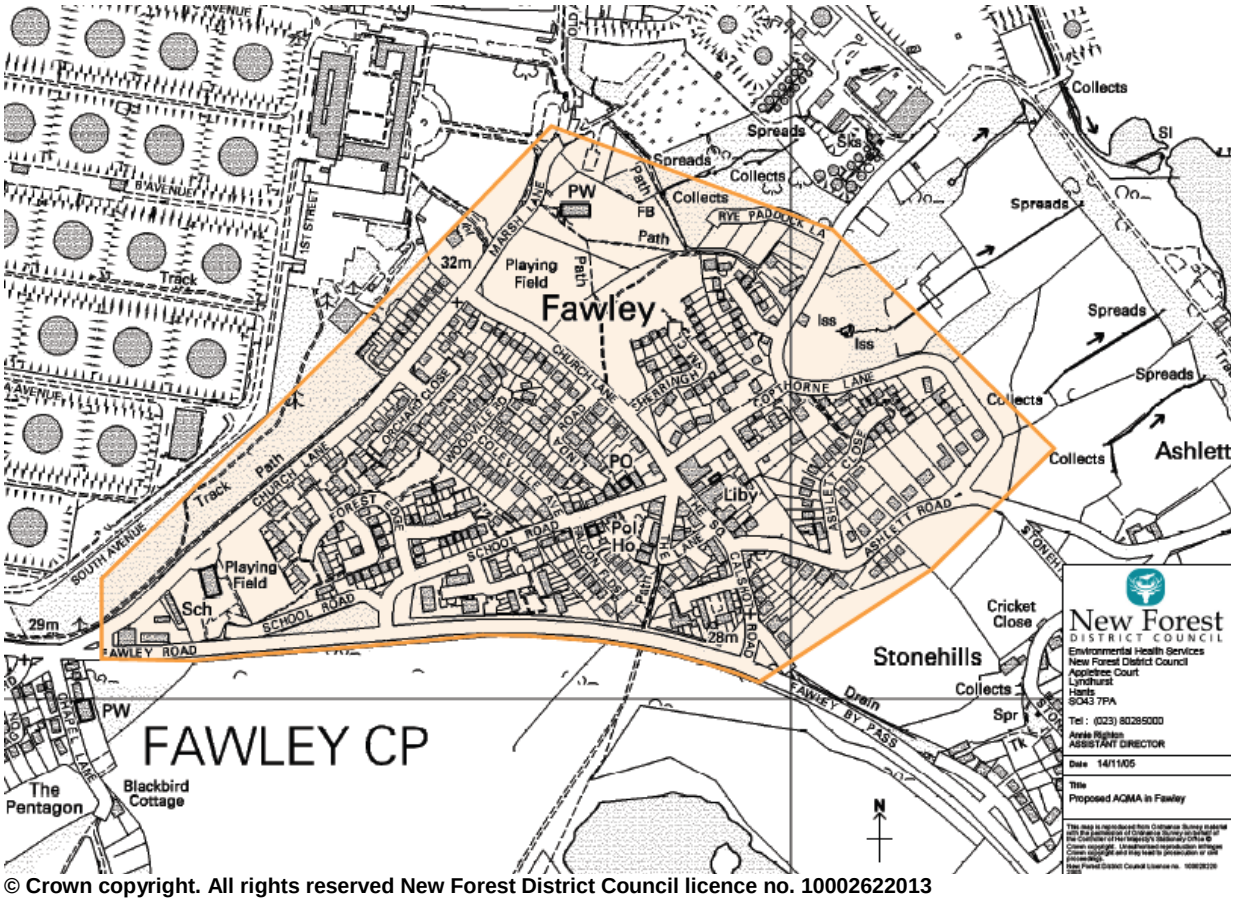
Figure 1.2 Lyndhurst Air Quality Management Area



Revoked Air Quality Management Areas

In April 2013 New Forest District Council formally revoked the Air Quality Management Area in Fawley. The Air Quality Management Area was declared in December 2005 for the likely exceedance of the 15 min mean objective for sulphur dioxide (Figure 1.3 details).

Figure 1.3 Fawley Air Quality Management Area (revoked April 2013)



Current identified locations of Air Quality Objective exceedances

New Forest District Council has identified three locations where either monitoring or modelling has determined a likely exceedance of the Air Quality Objectives, however to date Air Quality Management Areas have not been declared. The details of these locations are shown (Table 1.3).

Table 1.3 Identified locations of Air Quality Objective exceedances

Location	Air Quality Objective Exceeded	Report / Work Identified	Comments
Gosport Lane, Lyndhurst (traffic)	NO_2 annual mean	2010 from monitoring and in 2012 in Detailed Assessment (modelling)	No AQMA declared to date due to a new traffic scheme operating in Lyndhurst which may impact NO_2 results and on advice from air quality helpdesk. Discussed in Section 8.1
Shrubbs Hill Road, Lyndhurst (traffic)	NO_2 annual mean	2010 from monitoring and in 2012 in Detailed Assessment (modelling)	No AQMA declared to date due to a new traffic scheme operating in Lyndhurst which may impact NO_2 results and on advice from air quality helpdesk. Discussed in Section 8.1

Previously identified locations of Air Quality Objective exceedances

Since the beginning of the Local Air Quality Management process there have been a number of locations which have been identified as possibly exceeding air quality objectives. However further work (including monitoring and modelling) has determined there was no requirement to proceed to an Air Quality Management Area. These locations are shown in Table 1.4.

Table 1.4 Areas of previous interest

Location	Pollutant	Year of Investigation
Holbury and Fawley	Benzene	2004
Lyndhurst and Totton	PM_{10}	2008
Totton (outside AQMA)	NO_2	2009
Stoney Cross (A31)	NO_2	2010
Lymington	NO_2	2011
Sway	PM_{10}	2011-12

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

New Forest District Council operated 4 automatic monitoring sites during 2013. The Council also has access to monitoring results from an automatic monitoring site in Marchwood, which was installed as part of a planning condition concerning an industrial premise in the vicinity. Maps showing the locations of the automatic monitoring sites are shown in Figure 2.1, with the site details summarised in Table 2.1.

Details of the QA/QC for the automatic monitoring are shown in Appendix B.

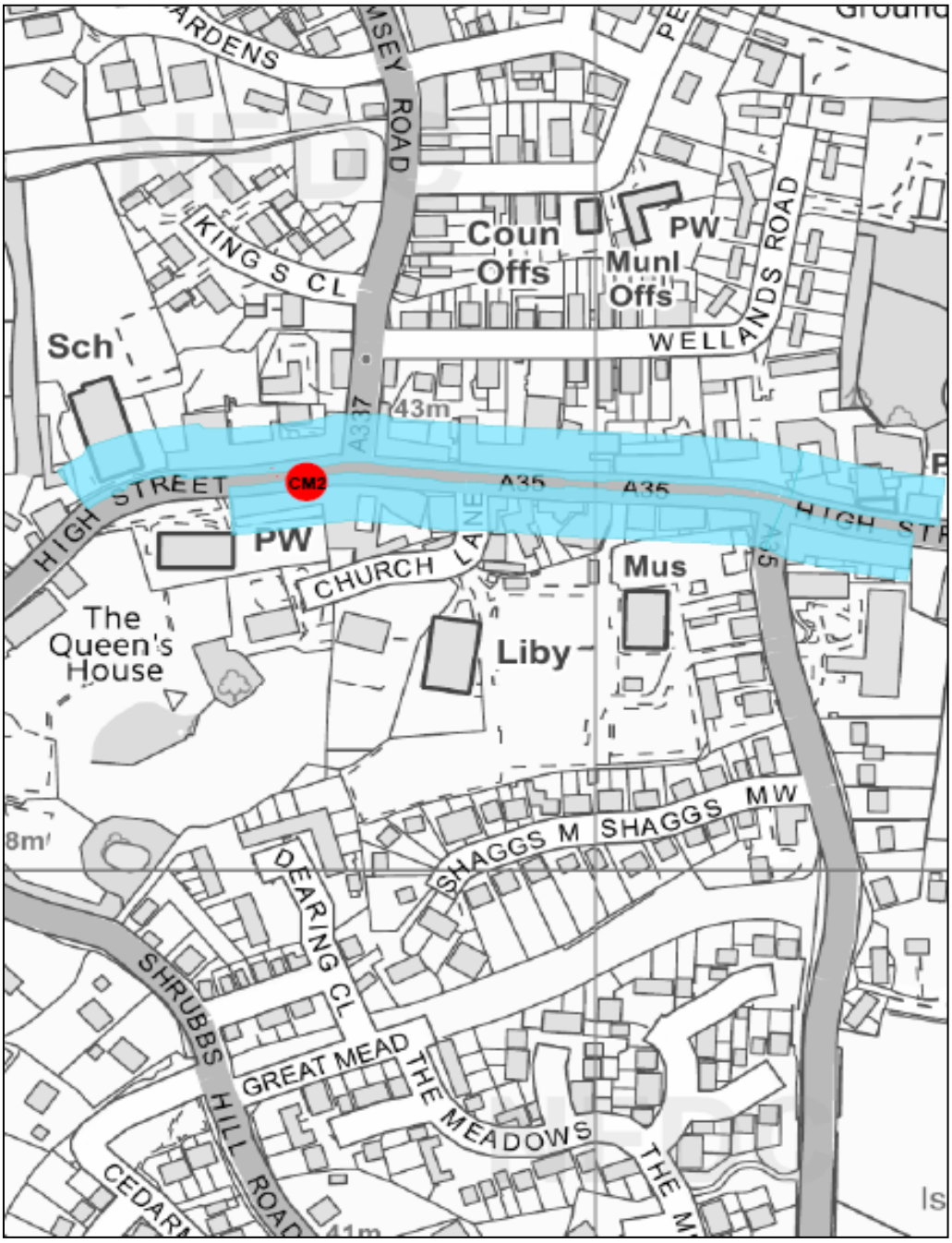
Figure 2.1 Maps of Automatic Monitoring Sites

Totton

The Totton site is located in a roadside location to monitor for emissions from a road. This site is located between the road and residential properties, some 5m from the building façade. Therefore the site is not representative of relevant public exposure.

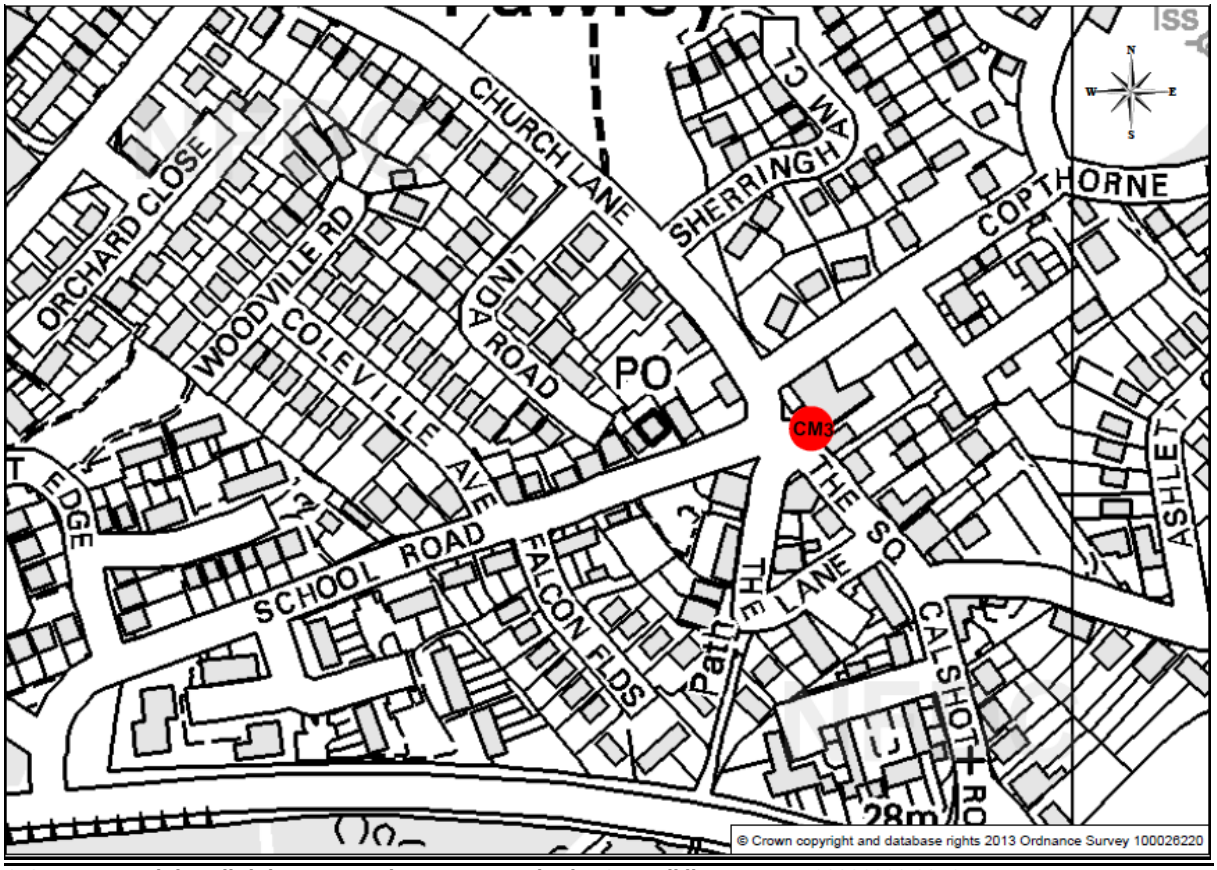
Lyndhurst

The Lyndhurst site is located on the first floor of an office. The office is situated within a street canyon and is representative of relevant public exposure as adjacent properties are residential flats.



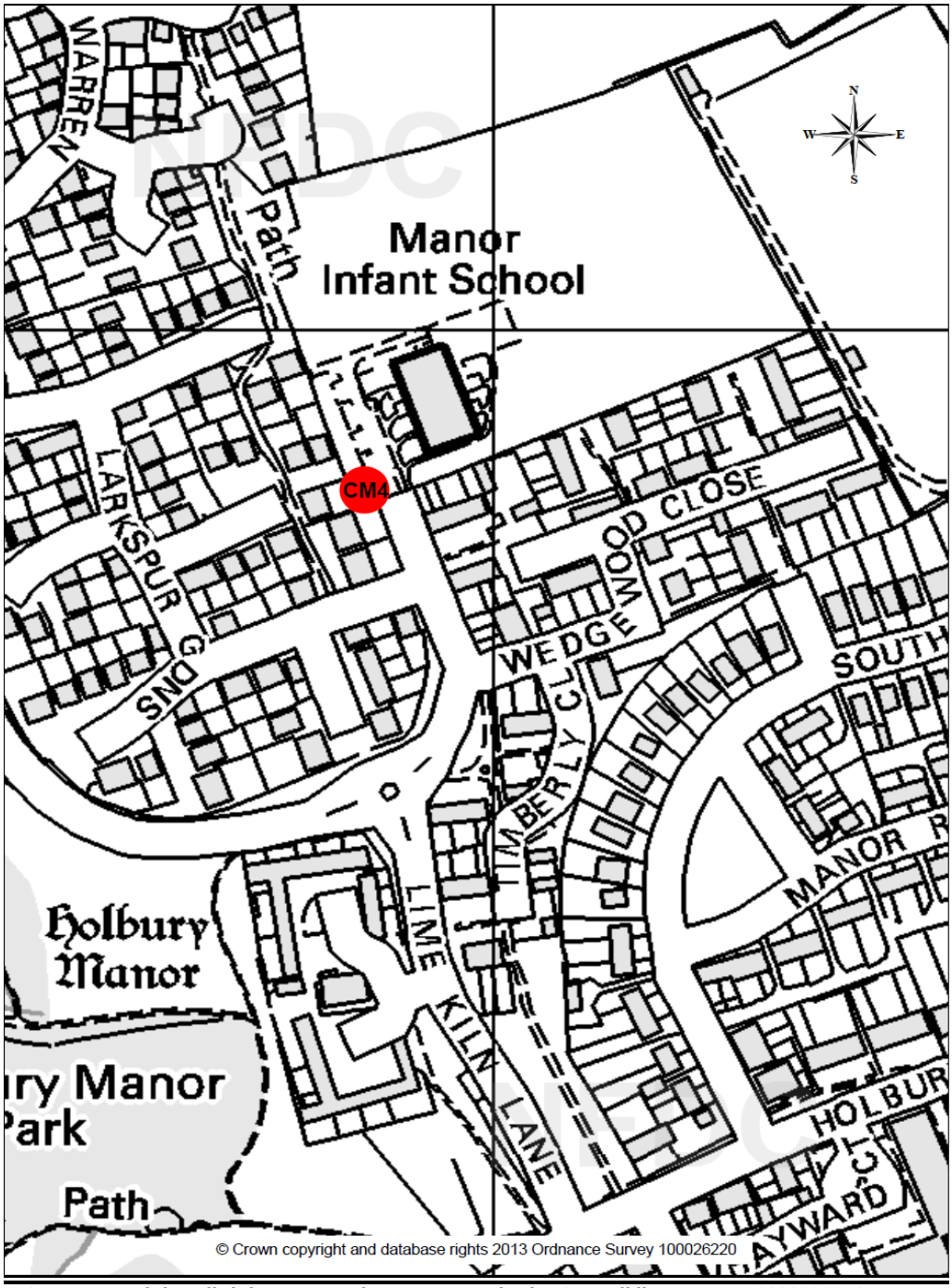
Fawley

The Fawley site is located within a village hall, which includes a children's nursery, at the centre of the village of Fawley. This site is representative of relevant public exposure.



Holbury

The Holbury site is located in a school grounds (Holbury Manor Infants School) within 1km (to the boundary) of a large industrial site, including a refinery, therefore the site is representative of relevant public exposure.



Marchwood

The automatic site at Marchwood came into use in October 2007 and is owned and operated by Marchwood Power. Marchwood Power is an industrial (Part A) premises which became operational in December 2009. As part of their planning and IPPC permit conditions nitrogen dioxide and particulate concentrations prior to and during operation have to be monitored, in addition to a submitted air quality assessment.

The Council assisted Marchwood Power in selecting an appropriate automatic monitoring site for nitrogen oxides and particulates in Marchwood and also maintains a number of nitrogen dioxide diffusion tube sites throughout Marchwood for the benefit of Marchwood Power's planning and permit conditions. The monitoring results from these sites are public therefore the automatic site and diffusion tube results are included in the reported monitoring results.

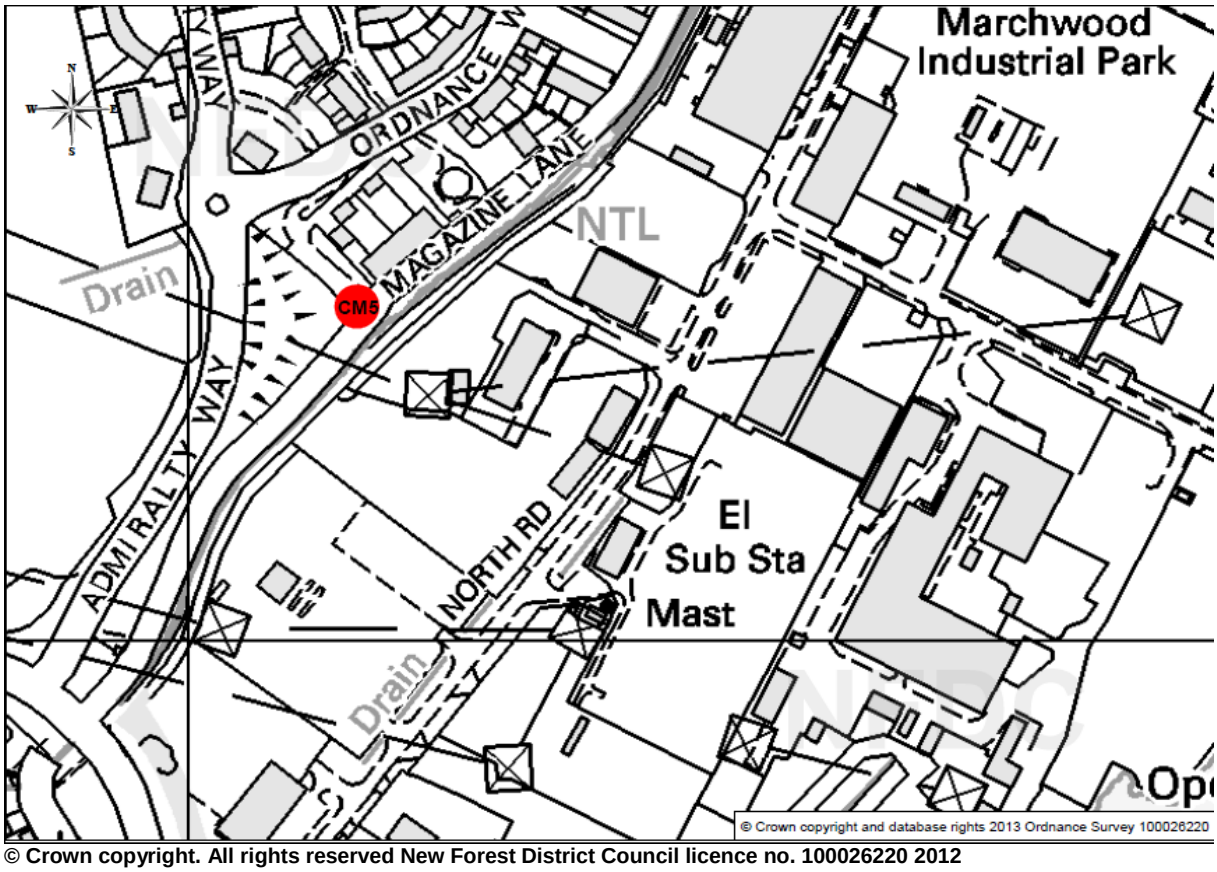


Table 2.1 Details of Automatic Monitoring Sites Operating During 2013

Site Name	Site ID	Site Type	X OS Grid Ref	Y OS Grid Ref	Inlet Height (m)	Pollutants Monitored	In AQMA?	Particulate Monitoring Technique	Relevant Exposure? *(Y/N with distance (m) from monitoring site to relevant exposure)*	Distance to Kerb of Nearest Road (m) *(N/A if not applicable)*	Worst-Case Exposure?
Totton	CM1	Roadside	436188	113237	**1.75**	NO_2 PM_{10}	Y	TEOM	N (5m)	1.5	N
Lyndhurst	CM2	Kerbside	429859	108204	**3.00**	NO_2	Y	-	Y (1m)	0.6	Y
Fawley	CM3	Industrial	445885	103248	**5.00**	SO_2	Y	-	Y (5m)	N/A	Y
Holbury	CM4	Industrial	442948	103932	**3.00**	SO_2 PM_{10}	N	TEOM	Y (8m)	N/A	N
Marchwood	CM5	Industrial	439075	111152	**2.00**	NO_2 PM_{10}	N	Partisol and BAM	N (15m)	N/A	N

2.1.2 Non-Automatic Monitoring Sites

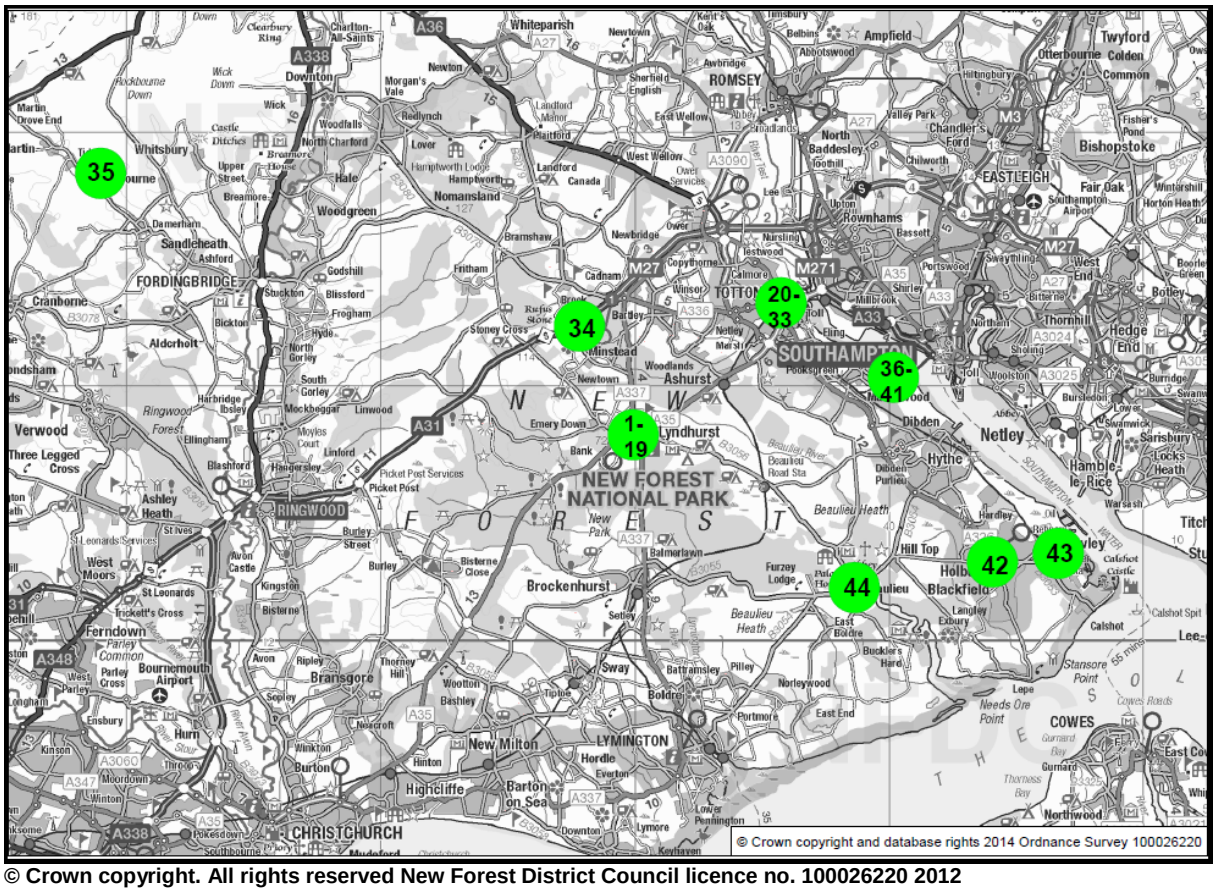
Diffusion tubes are used throughout the New Forest district to monitor nitrogen dioxide concentrations. During 2013 the Council exposed 55 diffusion tubes over 44 sites, which included 3 triplicate and 4 duplicate co-located sites.

Maps showing the nitrogen dioxide diffusion tube locations in the New Forest district are shown in Figure 2.2. The numbers stated on the maps correlate to the diffusion tube site numbers listed in Table 2.2.

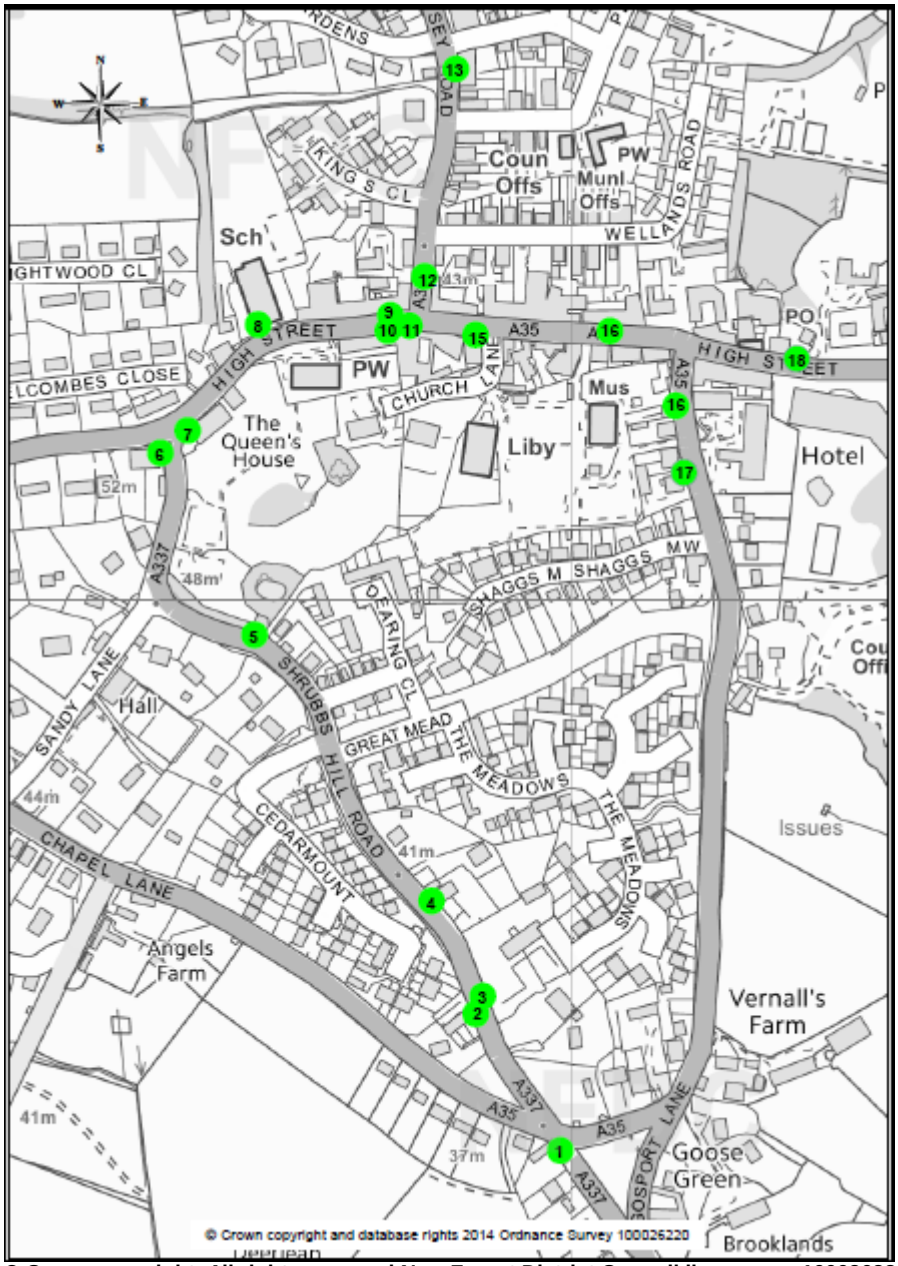
Details of the diffusion tube sites are shown in Table 2.2. Details of the QA/QC for the non-automatic monitoring are shown in Appendix B

Figure 2.2 Map of Non-Automatic Monitoring Sites

Nitrogen dioxide diffusion tube sites in New Forest district



Nitrogen dioxide diffusion tube sites in Lyndhurst



Nitrogen dioxide diffusion tube sites in Totton

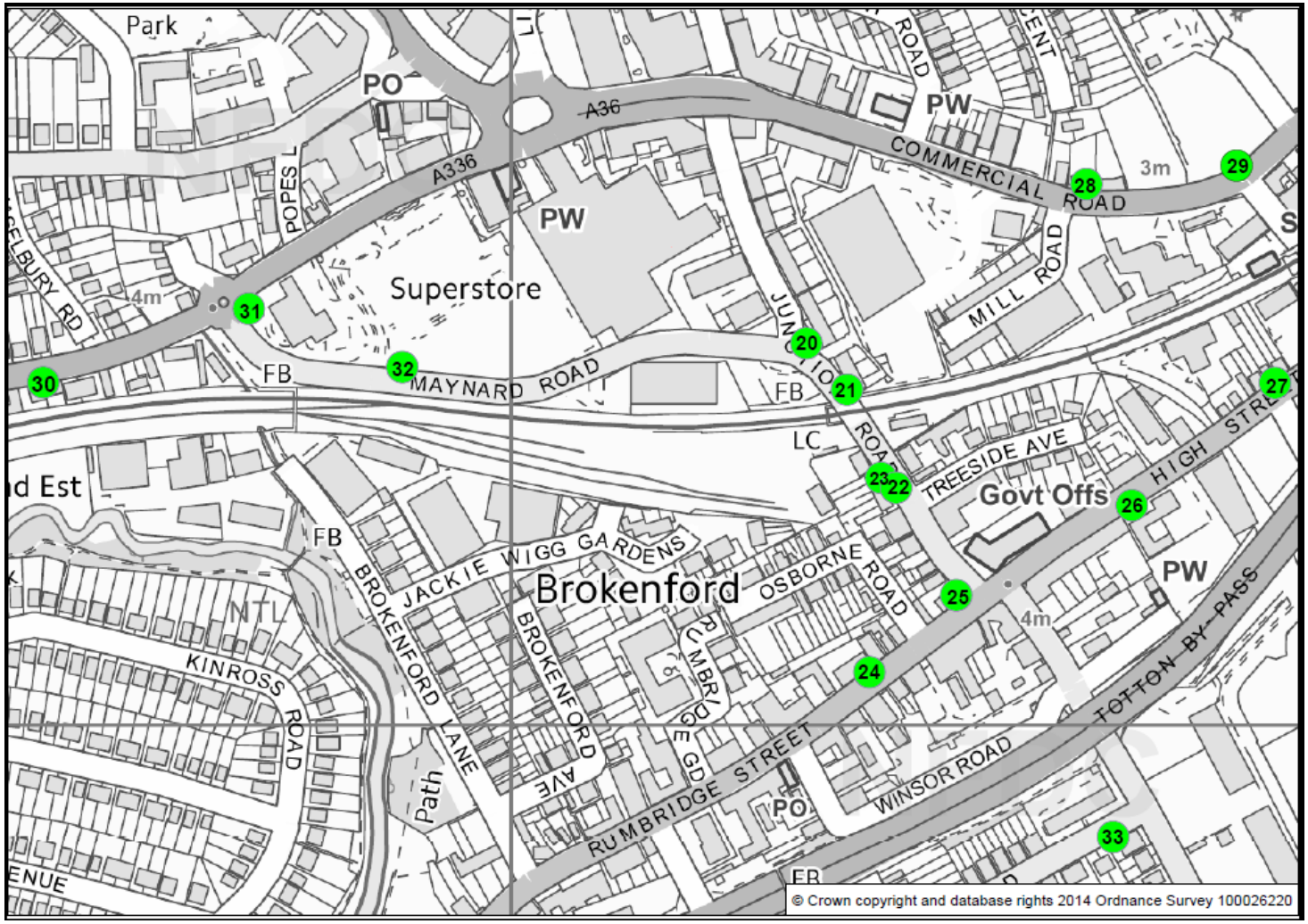


Table 2.2 Details of Non- Automatic Monitoring Sites

Site Name	Site ID	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a continuous analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road (m) *(N/A if not applicable)*	Worst-case Location?
Lyndhurst										
Lyndhurst Rd, Goose Green	1	Kerbside	429991	107583	NO_2	N	N	N (4m)	0.4	Y
1, Foxlease Terrace, Shrubbs Hill Rd	2	Roadside	429928	107687	NO_2	N	N	Y(1m)	1.5	Y
Shrubbs Hill Rd	3	Roadside	429934	107698	NO_2	N	N	N*	2.2	Y
The Orchards, Shrubbs Hill Rd	4a	Roadside	429895	107770	NO_2	N	N	**Y (1m)**	3	Y
The Orchards, Shrubbs Hill Rd	4b	Roadside	429895	107770	NO_2	N	N	**Y (1m)**	5	Y
Shrubbs Hill Rd	5	Roadside	429758	107972	NO_2	N	N	N (13m)	2	Y
Little Queens, Shrubbs Hill Rd	6	Roadside	429689	108111	NO_2	N	N	Y (1m)	6	Y
Queens House	7	Roadside	429710	108128	NO_2	N	N	N*	5	Y
School, High St.	8	Roadside	429767	108205	NO_2	Y	N	Y (1m)	6	Y
15, High St.	9	Kerbside	429864	108213	NO_2	Y	N	Y (1m)	1.25	Y
14, High St. (analyser)	10	Kerbside	429858	108205	NO_2	Y	**Y**	Y (1m)	0.9	Y

Site Name	Site ID	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a continuous analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road (m) *(N/A if not applicable)*	Worst-case Location?
Lyndhurst										
16, High St.	11	Kerbside	429875	108207	NO_2	Y	N	Y (1m)	1.55	Y
2a, Romsey Rd	12	Roadside	429891	108245	NO_2	Y	N	N (3m)	2	Y
22, Romsey Rd	13	Roadside	429911	108402	NO_2	N	N	N*	2.3	Y
28, High St.	14	Roadside	429933	108200	NO_2	Y	N	N (5m)	4	Y
65, High St.	15	Roadside	430026	108206	NO_2	Y	N	Y (1m)	1.8	Y
2, Gosport Lane	16	Roadside	430079	108147	NO_2	N	N	Y (1m)	2.2	Y
South View, Gosport Lane	17	Roadside	430092	108077	NO_2	N	N	N (5m)	2	Y
Lyndhurst Park Hotel	18	Roadside	430162	108173	NO_2	N	N	N (5m)	1.88	Y
Baytree Cottage, Bournem'th Rd	19	Roadside	429169	108129	NO_2	N	N	N (1m)	2	N

Site Name	Site ID	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Is monitoring collocated with a continuous analyser (Y/N	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road (m) *(N/A if not applicable)*	Worst-case Location?
Totton										
Junction Rd (analyser)	20	Roadside	436189	113235	NO_2	Y	Y	N (7m)	2	Y
30, Junction Rd	21	Kerbside	436210	113210	NO_2	Y	N	N (3m)	1	Y
23, Junction Rd	22	Kerbside	436236	113153	NO_2	Y	N	N (3m)	1	Y
25, Junction Rd	23	Roadside	436232	113156	NO_2	Y	N	Y (1m)	4	Y
26, Rumbridge St.	24	Roadside	436205	113019	NO_2	Y	N	N (2m)	1.5	Y
2, Eling Lane	25	Roadside	436307	113077	NO_2	Y	N	Y (1m)	2	Y
Elingfield Court, High St.	26	Roadside	436383	113135	NO_2	N	N	N (12m)	2	Y
55, High St.	27	Roadside	436476	113214	NO_2	N	N	Y (1m)	4	Y
114, Commercial Rd	28	Kerbside	436364	113322	NO_2	N	N	Y (1m)	1	Y
Commercial Rd	29	Roadside	436457	113354	NO_2	N	N	N*	1	N
83, Ringwood Rd	30	Roadside	435706	113215	NO_2	N	N	Y (1m)	4	Y
Ringwood Rd / Maynard Rd roundab't	31	Roadside	435834	113260	NO_2	Y	N	N*	2	Y

Site Name	Site ID	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA ?	Is monitoring collocated with a continuous analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road (m) *(N/A if not applicable)*	Worst-case Location?
Totton										
Asda roundab't	32	Roadside	435927	113226	NO_2	Y	N	N*	2	Y
1, Rose Rd	33	Roadside	436374	112929	NO_2	N	N	N (5m)	2	N
Other locations										
A31, Stoney Cross	34	Roadside	425877	111778	NO_2	N	N	Y (14m)	20	N
Rockbourne School	35	Rural	411569	118098	NO_2	N	N	Y (1m)	N/A	N
11, Bilberry Drive, Marchwood	36	Industrial	438500	110629	NO_2	N	N	Y (5m)	N/A	N
Shorefield Rd, Marchwood	37	Industrial	438765	111006	NO_2	N	N	Y (6m)	N/A	N
3 Magazine Lane, Marchwood (adj to)	38	Industrial	439075	111152	NO_2	N	Y	Y (15m)	N/A	Y
9, Boardwalk Way, Marchwood	39	Industrial	439106	111409	NO_2	N	N	Y (4m)	N/A	Y
Autumn Road, Marchwood	40	Industrial	439174	110367	NO_2	N	N	Y (5m)	N/A	N

Site Name	Site ID	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a continuous analyser (Y/N)	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road (m) *(N/A if not applicable)*	Worst-case Location?
Other locations										
Marchwood School, Twiggs Lane	41	Suburban	438363	109694	NO_2	N	N	Y (1m)	25	N
Teachers Way, Holbury	42	Industrial	442947	103931	NO_2	N	N	Y(1m)	N/A	Y
Jubilee Hall, The Square, Fawley	43	Industrial	445881	103247	NO_2	Y (for SO2)	N	Y(1m)	N/A	Y
School field, Beaulieu	44	Rural	438836	102115	NO_2	N	N	Y (1m)	N/A	N

Note:

All diffusion tubes are located at a height between 2.5m and 3m
****indicates sites which have no local relevant exposure relating to the site, for example at places of work, hotels, isolated lamp-posts. These sites may have been selected for planning or general air quality modelling purposes to obtain general air quality information on an area of interest.***

2.2 Comparison of Monitoring Results with Air Quality Objectives

In order to determine whether the air quality objectives are being met throughout the district, monitoring results are compared with the objectives set by Government as shown in Table 1.1. As previously discussed, during 2013 the pollutants monitored in the New Forest were nitrogen dioxide, particulates (PM_{10}) and sulphur dioxide. The results are summarised below.

2.2.1 Nitrogen Dioxide (NO_2)

As stated in Table 1.1 there are two objectives for nitrogen dioxide, an annual mean and an hourly mean. The annual mean is 40μg/m^3 and the hourly objective is 200μg/m^3 not to be exceeded more than 18 times a year.

During 2013 the automatic monitoring site at Totton did not monitor an exceedance of the annual mean objective. However the automatic monitoring site at Lyndhurst and 4 diffusion tube sites in Lyndhurst exceeded the annual mean objective.

2 of the exceeding sites at Lyndhurst are within an Air Quality Management Area and represent relevant public exposure. The other exceeding sites in Lyndhurst; Shrubbs Hill Road and Gosport Lane are not within the current Air Quality Management Area for Lyndhurst and are discussed further in Section 8.

No site recorded an exceedence of the 1-hour mean objective for nitrogen dioxide.

The monitoring results are detailed below.

Automatic Monitoring Data

New Forest District Council monitors nitrogen dioxide automatically at two sites; Totton and Lyndhurst. A further site at Marchwood is operated by Marchwood Power however these results are publically available and therefore included.

The results from the automatic nitrogen dioxide monitoring sites for the years 2008 – 2013 are shown in Tables 2.3 and 2.4, and Figures 2.3 and 2.4 for the monitored trends. A graphical data set for the full year (2013) is shown in Appendix C for each site as an hourly mean.

Table 2.3 Results of Automatic Monitoring for NO_2: Comparison with Annual Mean Objective

Site ID	Site Name	Site Type	Within AQMA?	Valid Data Capture 2013 % [a]	Annual mean objective ($\mu g/m^3$)	Annual Mean Concentration ($\mu g/m^3$)					
						2008[b]	2009[b]	2010[b]	2011[b]	2012[b]	2013[b]
CM1	Totton	Roadside	Y	91	40	30	28	29	28	28	28
CM2	Lyndhurst	Kerbside	Y	96	40	**46**	**46**	**46**	**43**	40	**41**
CM5	Marchwood	Industrial	N	99	40	23	19	21	17	19	20

Notes:

1. *[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%)*
2. *[b] means should be "annualised" as in Box 3.2 of TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), if valid data capture is less than 75%*

Figure 2.3 Trends in Annual Mean Objective for NO_2 (automatic monitoring sites)

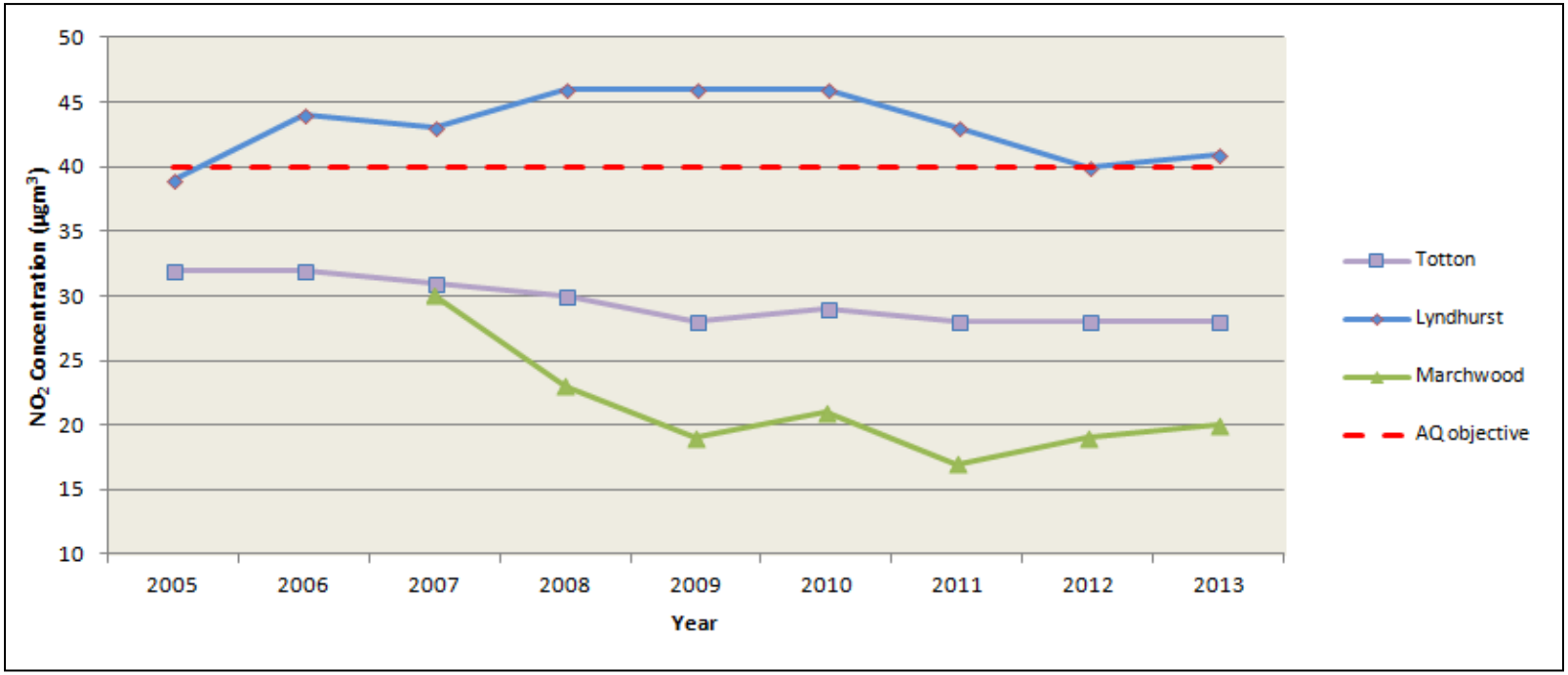


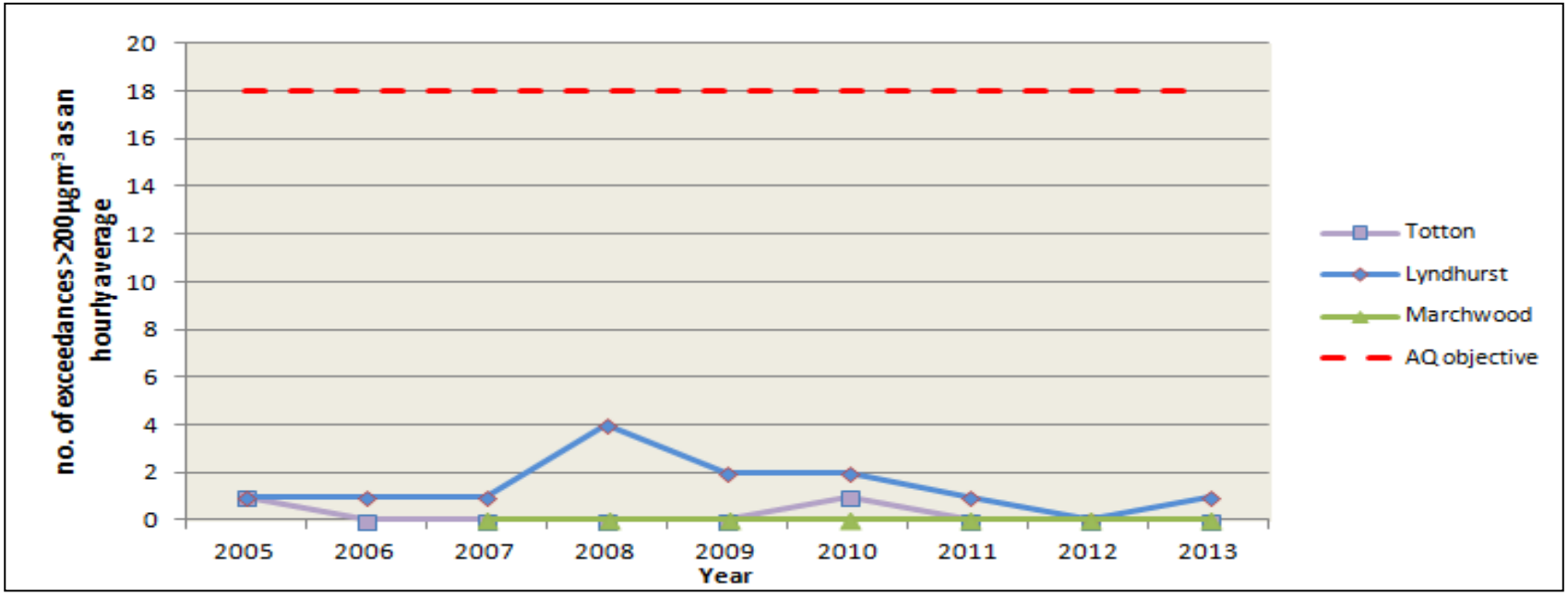
Table 2.4 Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective

Site ID	Site Name	Site Type	Within AQMA?	Valid Data Capture 2013 % [a]	Hourly objective (number of exceedences > 200 µg/m^3)	Number of Hourly Means > 200µg/m^3					
						2008[b]	2009[b]	2010[b]	2011[b]	2012[b]	2013[b]
CM1	Totton	Roadside	Y	91	18	0	0	1	0	0	0
CM2	Lyndhurst	Kerbside	Y	96	18	4	2	2	1	0	1
CM5	Marchwood	Industrial	N	99	18	0	0	0	0	0	0

Notes:

1. *[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%)*
2. *[b] If the data capture for full calendar year is less than 90%, include the 99.8th percentile of hourly means in brackets*

Figure 2.4 Trends in Hourly Mean Objective for NO_2 (automatic monitoring sites)



The monitoring results from the automatic sites show a slight increase in nitrogen dioxide concentrations. Lyndhurst monitored an increase in both nitrogen dioxide objectives (annual mean and the hourly mean) resulting in a reported exceedance in the annual mean objective of 41µg/m^3.

It is noted that the trend data for the automatic monitoring site at Lyndhurst shows an overall decrease in nitrogen dioxide concentrations. In 2011 following 3 years (2008-2010) of a consistent exceedance of 46µg/m^3, a decrease in the nitrogen dioxide annual mean was monitored at 43µg/m^3 with a further decrease monitored in 2012 of 3µg/m^3 to an annual mean concentration of 40µg/m^3, followed by a reported 1µg/m^3 increase in 2013.

It is noted that the automatic monitoring sites at Totton and Marchwood are well below the annual mean and hourly mean objectives for nitrogen dioxide, with neither site monitoring any significant variations in concentrations over recent years.

Lyndhurst and Totton sites are within current Air Quality Management Areas, and the Lyndhurst site represents relevant public exposure. It should be noted that the declaration of the Air Quality Management Area for Totton was based on diffusion tube data (2004 and 2005) and not the data collated from the automatic monitoring site.

Neither Lyndhurst, Totton nor Marchwood monitored an exceedence of the hourly objective for nitrogen dioxide (18 exceedances greater than 200µg/m^3 over the year). There has been 1 exceedance greater than 200µg/m^3 over an hourly average at Lyndhurst and 0 exceedances at Totton and Marchwood during 2013.

Diffusion Tube Monitoring Data

The results from the nitrogen dioxide diffusion tube monitoring sites for 2013 are shown in Table 2.5, while Table 2.6 shows the results from 2008 - 2013. Figure 2.5 show the trends from the diffusion tubes for sites in Lyndhurst which have regularly shown exceedances of the annual mean objective for nitrogen dioxide.

Calculations regarding the annualisation of data are provided in Appendix D, adjustment for relevant exposure in Appendix E and the data set for the full year (2013) is given in Appendix F for each diffusion tube site.

The tables report the annual mean results which have been bias adjusted using either locally or nationally derived factors. Details of the use and selection of bias correction factors are given in Appendix B.

Table 2.5 Results of NO_2 Diffusion Tubes 2013

Site ID	Location	Site Type	Within AQMA?	Triplicate (T) or Co-located (C) Tube	Full Calendar Year Data Capture 2012 *(%)* [a]	2013 Annual Mean Concentration (µg/m^3) *(Bias Adjusted)* [b]
Lyndhurst						
1	Lyndhurst Rd, Goose Green	Kerbside	N	-	83	28.62
2	1, Foxlease Tr, Shrubbs Hill Rd	Roadside	N	-	100	34.24
3	Shrubbs Hill Rd	Roadside	N	-	75	28.75
4a	The Orchards, Shrubbs Hill Rd	Roadside	N	-	100	**44.73**
4b	The Orchards, Shrubbs Hill Rd	Roadside	N	-	42	32.98[a]
5	Shrubbs Hill Rd	Roadside	N	-	75	32.13
6	Little Queens, Shrubbs Hill Rd	Roadside	N	-	100	20.76
7	Queens House	Roadside	N	-	58	20.74[a]
8	School, High St.	Roadside	Y	-	100	27.08
9	15, High St.	Kerbside	Y	-	100	**46.77***
10	14, High St. (analyser)	Kerbside	Y	T	100	39.80*
11	16, High St.	Kerbside	Y	-	100	**43.21***
12	2a, Romsey Rd	Roadside	Y	-	92	37.79*
13	22, Romsey Rd	Roadside	N	-	100	29.55
14	28, High St.	Roadside	Y	C	100	29.24
15	65, High St.	Roadside	Y	-	92	34.63*

Site ID	Location	Site Type	Within AQMA?	Triplicate (T) or Co-located (C) Tube	Full Calendar Year Data Capture 2012 *(%)* [a]	2013 Annual Mean Concentration (µg/m^3) *(Bias Adjusted)* [b]
16	2, Gosport Lane	Roadside	N	-	92	37.48
17	South View, Gosport Lane	Roadside	N	-	83	**42.77 (36.50)**[c]
18	Lyndhurst Park Hotel	Roadside	N	-	100	25.89
19	Bournem'th Rd	Roadside	N	-	83	28.78
Totton						
20	Junction Rd (analyser)	Roadside	Y	T	100	27.98
21	30, Junction Rd	Kerbside	Y	-	92	30.76
22	23, Junction Rd	Kerbside	Y	-	67	33.00[a]
23	25, Junction Rd	Roadside	Y	-	100	25.87
24	26, Rumbridge St.	Roadside	Y	-	100	30.92
25	2, Eling Lane	Roadside	Y	-	83	32.42
26	Elingfield Court, High St.	Roadside	N	-	100	28.12
27	55, High St.	Roadside	N	-	100	26.43
28	114, Commercial Rd	Kerbside	N	-	75	31.52
29	Commercial Road	Roadside	N	-	58	26.31[a]
30	83 Ringwood Rd	Roadside	N	-	100	27.60
31	Maynard Rd roundab't	Roadside	Y	-	100	30.83

Site ID	Location	Site Type	Within AQMA?	Triplicate (T) or Co-located (C) Tube	Full Calendar Year Data Capture 2012 *(%)* [a]	2013 Annual Mean Concentration (µg/m^3) *(Bias Adjusted)* [b]
32	Asda roundab't	Roadside	Y	-	92	27.95
33	1, Rose Rd	Roadside	N	-	58	27.28[a]
Other Locations						
34	A31, Stoney Cross	Roadside	N	C	100	33.78
35	Rockbourne School	Rural	N	-	100	10.67
36	11, Bilberry Drive, Marchw'd	Industrial	N	-	92	16.31
37	Shorefield Rd, Marchwood	Industrial	N	-	83	22.83
38	3 Magazine Lane, Marchw'd	Industrial	N	T	92	20.52
39	9, Boardwalk Way, Marchw'd	Industrial	N	-	100	20.86
40	Autumn Road, Marchwood	Industrial	N	-	83	21.10
41	School, Twiggs Lane	Suburban	N	-	100	20.64
42	Teachers Way, Holbury	Industrial	N	C	100	14.18
43	Jubilee Hall, The Square, Fawley	Industrial	N	-	92	16.45
44	School field, Beaulieu	Rural	N	-	75	11.85

Notes:

1. ***Results in red and bold = exceedence of the NO_2 annual mean AQS objective of 40µg/m^3***
2. ***Results underlined are close to the NO_2 annual mean objective***
3. ***Results in red, bold and underlined = annual mean > 60µg/m^3, indicating a potential exceedence of the NO_2 hourly mean AQS objective***
4. ***The air quality helpdesk advised the data for July 2012 throughout the whole district should not be included in any assessment due to the diffusion tubes for July 2012 being suspect. This was dependant on the supplier of the diffusion tubes and analyser method used***
5. ****denotes sites in Lyndhurst which were locally bias adjusted due to locations (including analyser) being within a street canyon***
6. ***[a] Means results should be "annualised" as in Box 3.2 of TG(09) if full calendar year data capture is less than 75%***
7. ***[b] Diffusion tube sites have been locally or nationally bias adjusted depending on the location as shown below :***

   (further explanation given in Appendix B)

Year	*Lyndhurst local bias adjustment factor (street canyon)*	*Totton local bias adjustment factor*	*Marchwood local bias adjustment factor*	*National bias adjustment factor*
2013	*0.88*	*0.84*	*0.98*	*0.95*

8. ***[c] Diffusion tube results which have been adjusted to account for relevant exposure using adjustment calculator http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html***

Table 2.6 Results of NO_2 Diffusion Tubes (2008 to 2013)

Site ID	Location	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias[a]					
				2008 Bias Adjusted (see note)	2009 Bias Adjusted (see note)	2010 Bias Adjusted (see note)	2011 Bias Adjusted (see note)	2012 Bias Adjusted (see note)	2013 Bias Adjusted (see note)
Lyndhurst									
1	Lyndhurst Rd, Goose Green	Kerbside	N	23.97	22.56	24.83	25.59	27.78	28.62
2	1, Foxlease Tr, Shrubbs Hill Rd	Roadside	N	31.56	32.79	33.07	30.93	33.05	34.24
3	Shrubbs Hill Rd	Roadside	N	33.78	35.26	33.80	28.49	30.53	28.75
4a	The Orchards, Shrubbs Hill Rd	Roadside	N	38.92	**40.33**	**42.62**	37.92	**43.58**	**44.73**
4b	The Orchards, Shrubbs Hill Rd	Roadside	N	-	-	-	-	-	32.98
5	Shrubbs Hill Rd	Roadside	N	32.95	34.21	34.29	32.47	33.01	32.13
6	Little Queens, Shrubbs Hill Rd	Roadside	N	19.63	22.56	23.26	21.38	21.76	20.76
7	Queens House	Roadside	N	21.52	22.98	23.76	20.88	21.88	20.74[a]
8	School, High St.	Roadside	Y	28.05	27.67	26.90	26.10	29.12	27.08
9	15, High St.	Kerbside	Y	**52.34***	**48.92***	**53.67***	**45.03***	**48.55***	**46.77***
10	14, High St. (analyser)	Kerbside	Y	**47.02***	**46.42***	**46.36***	**43.89***	39.67*	39.80*
11	16, High St.	Kerbside	Y	**45.12***	**46.83***	**44.55***	**44.23***	**43.30***	**43.21***
12	2a, Romsey Rd	Roadside	Y	**41.96***	**42.34***	**43.63***	39.83*	36.94*	37.79*
13	22, Romsey Rd	Roadside	N	28.09	29.06	25.98	27.64	29.51	29.55
14	28, High St.	Roadside	Y	30.62	30.95	29.83	28.47	29.46	29.24
15	65, High St.	Roadside	Y	35.46*	34.00*	36.54*	34.26*	35.13*	34.63*

Site ID	Location	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias[a]					
				2008 Bias Adjusted (see note)	2009 Bias Adjusted (see note)	2010 Bias Adjusted (see note)	2011 Bias Adjusted (see note)	2012 Bias Adjusted (see note)	2013 Bias Adjusted (see note)
16	2, Gosport Lane	Roadside	N	36.46	**42.12**	39.14	**43.81**	39.58	37.48
17	South View, Gosport Lane	Roadside	N	-	-	-	29.49	33.64	**42.77 (36.50)**[c]
18	Lyndhurst Park Hotel	Roadside	N	-	25.00	27.20	25.30	28.11	25.89
19	Bournem'th Rd	Roadside	N	27.46	29.41	31.33	27.98	30.49	28.78
Totton									
20	Junction Rd (analyser)	Roadside	Y	30.51	27.00	27.38	27.85	29.27	27.98
21	30, Junction Rd	Kerbside	Y	32.64	27.16	27.13	26.01	30.55	30.76
22	23, Junction Rd	Kerbside	Y	**42.23**	33.23	32.72	34.47	38.59	33.00[a]
23	25, Junction Rd	Roadside	Y	-	24.54	26.83	26.73	27.63	25.87
24	26, Rumbridge St.	Roadside	Y	35.20	26.43	29.82	29.02	33.51	30.92
25	2, Eling Lane	Roadside	Y	36.31	28.62	29.18	30.94	33.49	32.42
26	Elingfield Court, High St.	Roadside	N	35.29	26.67	27.63	29.41	31.25	28.12
27	55, High St.	Roadside	N	-	26.46	29.27	27.94	29.46	26.43
28	114, Commercial Rd	Kerbside	N	37.35	28.51	27.71	27.39	29.74	31.52
29	Commercial Rd	Roadside	N	-	-	-	-	-	26.31[a]
30	83 Ringwood Rd	Roadside	N	36.85	25.68	27.90	26.74	31.27	27.60
31	Maynard Rd roundab't	Roadside	Y	35.09	28.85	28.56	32.65	34.73	30.83
32	Asda roundab't	Roadside	Y	36.63	29.18	28.86	32.22	32.83	27.95

Site ID	Location	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [b]					
				2008 Bias Adjusted (see note)	2009 Bias Adjusted (see note)	2010 Bias Adjusted (see note)	2011 Bias Adjusted (see note)	2012 Bias Adjusted (see note)	2013 Bias Adjusted (see note)
33	1, Rose Rd	Roadside	N	31.19	23.55	25.45	22.50	21.00	27.28[a]
Other									
34	A31, Stoney Cross	Roadside	N	**42.82**	33.62	33.97	34.71	36.24	33.78
35	Rockbourne School	Rural	N	9.51	8.41	10.55	8.15	9.08	10.67
36	11, Bilberry Drive, Marchw'd	Industrial	N	19.10	15.92	17.99	15.09	16.74	16.31
37	Shorefield Rd, Marchwood	Industrial	N	26.12	21.60	25.41	19.38	22.15	22.83
38	3 Magazine Lane, Marchw'd	Industrial	N	22.84	17.46	20.92	16.58	20.72	20.52
39	9, Boardwalk Way, Marchw'd	Industrial	N	24.46	17.71	22.75	17.66	21.28	20.86
40	Autumn Road, Marchwood	Industrial	N	20.96	18.33	19.43	18.07	19.85	21.10
41	School, Twiggs Lane	Suburban	N	23.21	20.71	20.95	18.81	21.38	20.64
42	Teachers Way, Holbury	Industrial	N	15.99	12.68	14.96	12.31	13.31	14.18
43	Jubilee Hall,, Fawley	Industrial	N	20.45	16.68	17.71	15.50	16.42	16.45
44	School field, Beaulieu	Rural	N	11.81	9.58	12.88	12.01	12.24	11.85

Notes:

1 **** denotes sites in Lyndhurst which were locally bias adjusted due to locations (including analyser) being within a street canyon***

2 ***In red and bold, exceedence of the NO_2 annual mean AQS objective of 40µg/m^3***

3 ***Results underlined are close to the NO2 annual mean objective***

4 ***Results in red, bold and underlined = annual mean > 60µg/m3, indicating a potential exceedence of the NO2 hourly mean AQS objective***

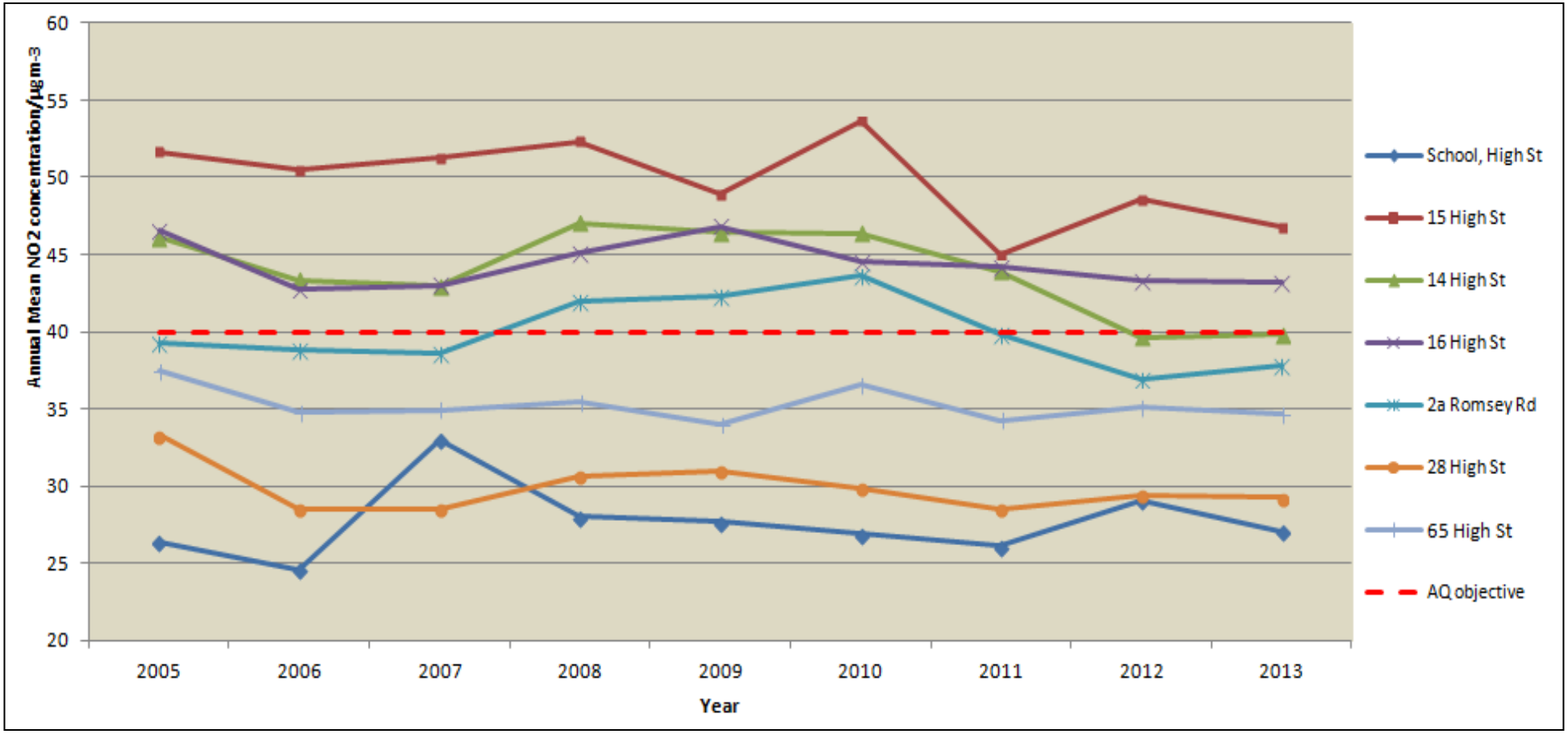
5 [a] ***Means should be "annualised" as in Box 3.2 of TG(09) (http://laqm.defra.gov.uk/technical-guidance/index.html?d=page=38), if full calendar year data capture is less than 75%***

5 [b] ***Diffusion tube sites have been locally or nationally bias adjusted depending on the location as shown below (further explanation given in Appendix B):***

Year	**National** bias adjustment factor	**Lyndhurst** local bias adjustment factor (locations within street canyon)	**Totton** local bias adjustment factor	**Marchwood** local bias adjustment factor
2008	1.05	0.84	0.90	0.98
2009	0.90	0.86	0.73	0.87
2010	0.92	0.92	0.76	0.89
2011	0.89	0.90	0.81	0.91
2012	0.97	0.88	0.89	1.03
2013	0.95	0.88	0.84	0.98

6 [c] ***Diffusion tube results which have been adjusted to account for relevant exposure using adjustment calculator http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html (as shown in Appendix E)***

Figure 2.5 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites



The diffusion tube monitoring show 3 sites have exceeded the nitrogen dioxide annual mean objective in 2013. All these sites are located in Lyndhurst and are the same 3 exceeding sites which were reported in 2012 (with 4 reported in 2011 and 5 in 2010).

The exceeding sites at 15 and 16 High Street are within the current Lyndhurst Air Quality Management Area and are sites of relevant public exposure. It is noted that 15 High Street, which historically monitors the highest nitrogen dioxide concentrations compared to all the diffusion tube monitoring sites in the New Forest district, monitored a decrease in the annual mean concentration of ~2µg/m^3.

The site exceeding in Shrubbs Hill Road is not currently within the Lyndhurst Air Quality Management Area but is a site being considered as relevant public exposure (see Section 8). This site also monitored an exceedance in 2009, 2010 and 2012 and has been considered in a Detailed Assessment (2012).

The site at South View, Gosport Lane monitored an exceedance of the nitrogen dioxide annual mean objective (42.77µg/m^3). This site is located on a lamp-post and not representative of relevant exposure. In accordance with guidance (Defra, 2009) the result was adjusted to determine the relevant exposure nitrogen dioxide annual mean concentration (as shown in Appendix E), and this was determined to be below the objective at 36.50µg/m^3.

It is noted that there are a number of sites which have monitored an annual mean concentration for nitrogen dioxide below the objective, but above 36µgm^{-3}. In Lyndhurst these sites are: 14 High Street (analyser), 2a Romsey Road, 2 Gosport Lane and South View, Gosport Lane.

The sites at 14 High Street and 2a Romsey Road are within the current Air Quality Management Area for Lyndhurst, but only 14 High Street is regarded as a relevant public exposure site. 2 Gosport Lane is a site which has exceeded the nitrogen dioxide annual mean objective in previous years (2009 and 2011) and regularly reports concentrations close to the annual mean objective. This site has been considered within a Detailed Assessment in 2012. As noted above, South View, Gosport Lane was adjusted for relevant

public exposure, and although the result was below the objective level, it was still close to the objective. It was noted that the monitoring site at South View, Gosport Lane was adjacent to a small residential development which was undertaken during 2013.

It is noted that other sites which monitored an annual mean concentration greater than 36µgm^{-3} in 2012 monitored lower concentrations in 2013. These sites are noted as 23 Junction Road, Totton and the A31 Stoney Cross.

The overall trends for the Lyndhurst sites presented in Figure 2.5 show general increases and decreases between 2005 – 2013. However it is my opinion that overall the sites are starting to show a general trend in decreasing concentrations with regards to the annual mean nitrogen dioxide objective over the monitoring period.

2.2.2 Particulate Matter (PM_{10})

New Forest District Council monitored for particulate matter (PM_{10}) automatically at two sites; Holbury and Totton during 2013. A further site at Marchwood is operated by Marchwood Power however the results are publically available and therefore the results are also included.

There are two objectives for PM_{10} (as stated in Table 1.1), an annual mean and a 24-hour mean. The annual mean is set at 40$\mu g/m^3$ and the 24-hour objective is set at 50$\mu g/m^3$ not to be exceeded more than 35 times a year.

There were no exceedences of the PM_{10} objectives at Holbury, Totton or Marchwood during 2013.

The monitoring results are detailed below. The results from the automatic PM_{10} monitoring sites for the years 2007 - 2013 are shown in Tables 2.7 and 2.8 for the annual and 24-hour means with the trends shown in Figures 2.6 and 2.7.

Details of the QA/QC for the automatic monitoring and the data correction method are shown in Appendix B.

Table 2.7 Results of Automatic Monitoring for PM_{10}: Comparison with Annual Mean Objective

Site ID	Site Name	Site Type	Within AQMA?	Valid Data Capture 2013 % [a]	Confirm Gravimetric Equivalent (Y or N/A)	Annual mean objective ($\mu g/m^3$)	Annual Mean Concentration ($\mu g/m^3$)					
							2008	2009	2010	2011	2012	2013
CM1	Totton	Roadside	Y (for NO_2)	89	N/A	40	23	22	23	26	23	24
CM4	Holbury	Industrial	N	98	N/A	40	17	16	18	20	17	19
CM5	Marchwood	Industrial	N	66	Y	40	25	24	30	28	20	20

Notes:

1. *[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%)*

2. *All PM_{10} data has been adjusted to gravimetric equivalent using the volatile correction method (VCM) as described in Appendix B.*

Figure 2.6 Trends in Annual Mean PM_{10} Concentrations

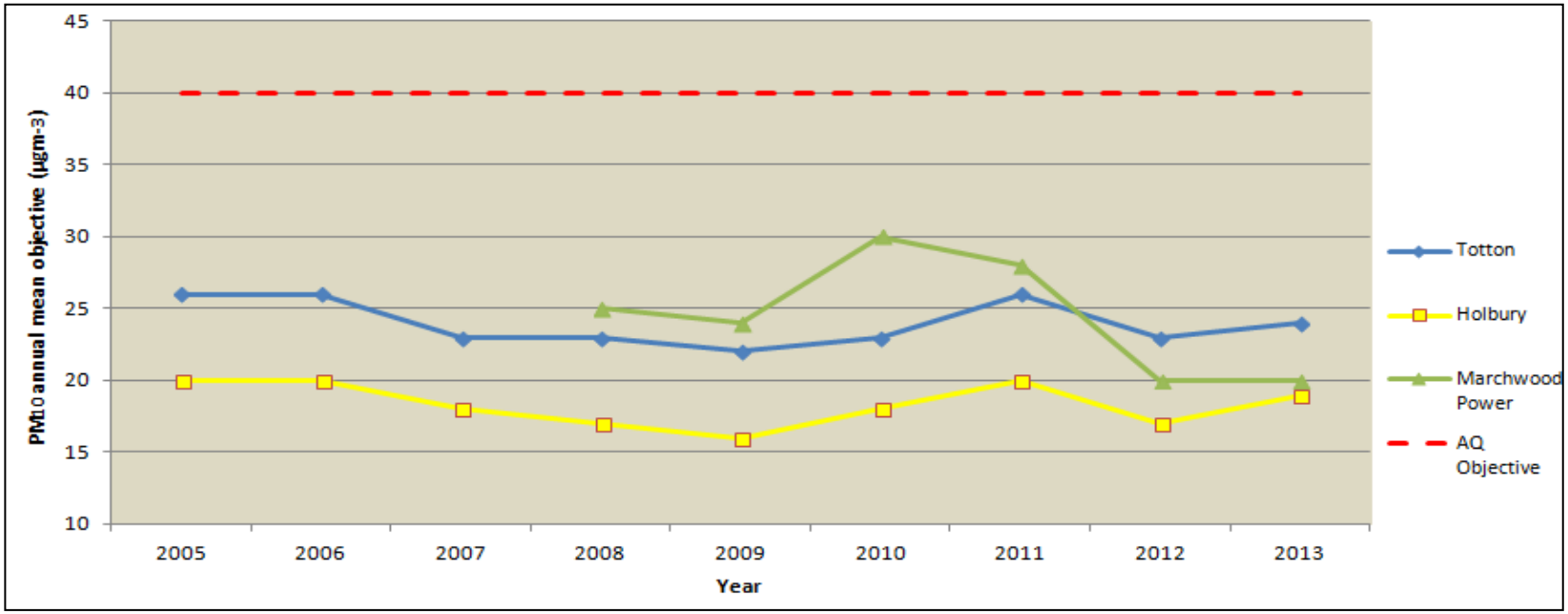


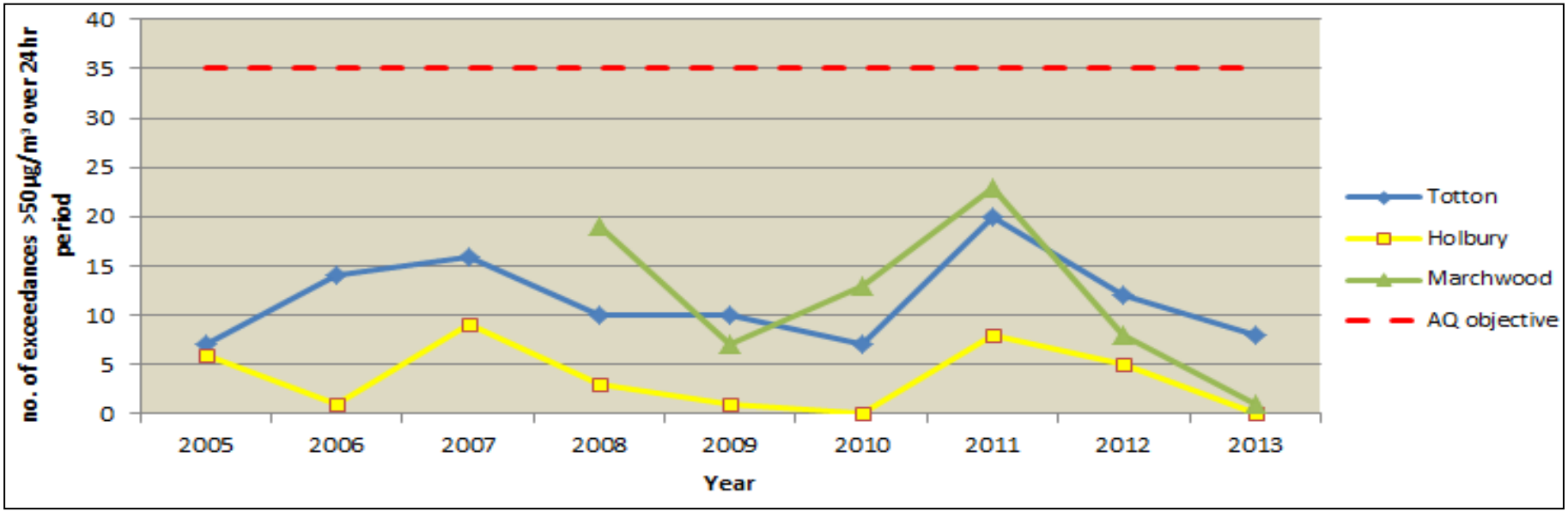
Table 2.8 Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour Mean Objective

Site ID	Site Name	Site Type	Within AQMA?	Valid Data Capture 2013 % [a]	Confirm Gravimetric Equivalent (Y or N/A)	24 hour objective number of exceedences > 50 µg/m³	Annual Mean Concentration (µg/m³)					
							2008[b]	2009[b]	2010[b]	2011[b]	2012[b]	2013[b]
CM1	Totton	Roadside	Y (for NO_2)	89	N/A	35	10	10	7	20	12	8(38)
CM4	Holbury	Industrial	N	98	N/A	35	3	1	0	8	5	0
CM5	Marchwood	Industrial	N	66	Y	35	19	7 (38)	13	23	8	1(38)

Notes:

1. *[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%)*
2. *[b] if data capture for full calendar year is less than 90%, include the 90.4th percentile of 24-hour means in brackets*
3. *All PM_{10} data has been adjusted to gravimetric equivalent using the volatile correction method (VCM) as described in Appendix B.*

Figure 2.7 Trends in 24hr Mean PM_{10} Concentrations



None of the automatic monitoring sites exceeded the objectives set for PM_{10} during 2013. The monitoring site at Holbury represents relevant public exposure, and whilst the sites at Totton and Marchwood are close to residential housing they do not represent relevant public exposure.

The automatic monitoring results show the PM_{10} concentrations at Totton, Holbury and Marchwood are well below the annual and daily mean objectives during 2013, and over the period 2005-2013. Overall there has been a slight decrease in monitored concentrations over the period 2005 – 2013 for both PM_{10} objectives at all the monitoring sites, although it is noted that there is a greater degree of variation over time in the daily concentrations at the automatic monitoring sites compared to the annual mean concentrations.

2.2.3 Sulphur Dioxide (SO_2)

New Forest District Council monitored sulphur dioxide automatically at two sites during 2013; Holbury and Fawley.

As stated in Table 1.1 there are three objectives for sulphur dioxide, a 24-hour mean, an hourly mean and a 15-minute mean. The 24-hour objective is set at 125μg/m^3 not to be exceeded more than 3 times in a year, the hourly objective is set at 350μg/m^3 not to be exceeded more than 24-times a year and the 15-minute objective is set at 266μg/m^3 not to be exceeded more than 35 times in a year.

The results from the two automatic monitoring sites for 2013 against the 3 sulphur dioxide objectives are shown in Table 2.9. Figure 2.8 shows the trends in the 15-min mean objective for sulphur dioxide between 2005 and 2012.

There were no exceedences of the sulphur dioxide objectives at the monitoring sites during 2013.

Details of the QA/QC for the automatic monitoring are shown in Appendix B.

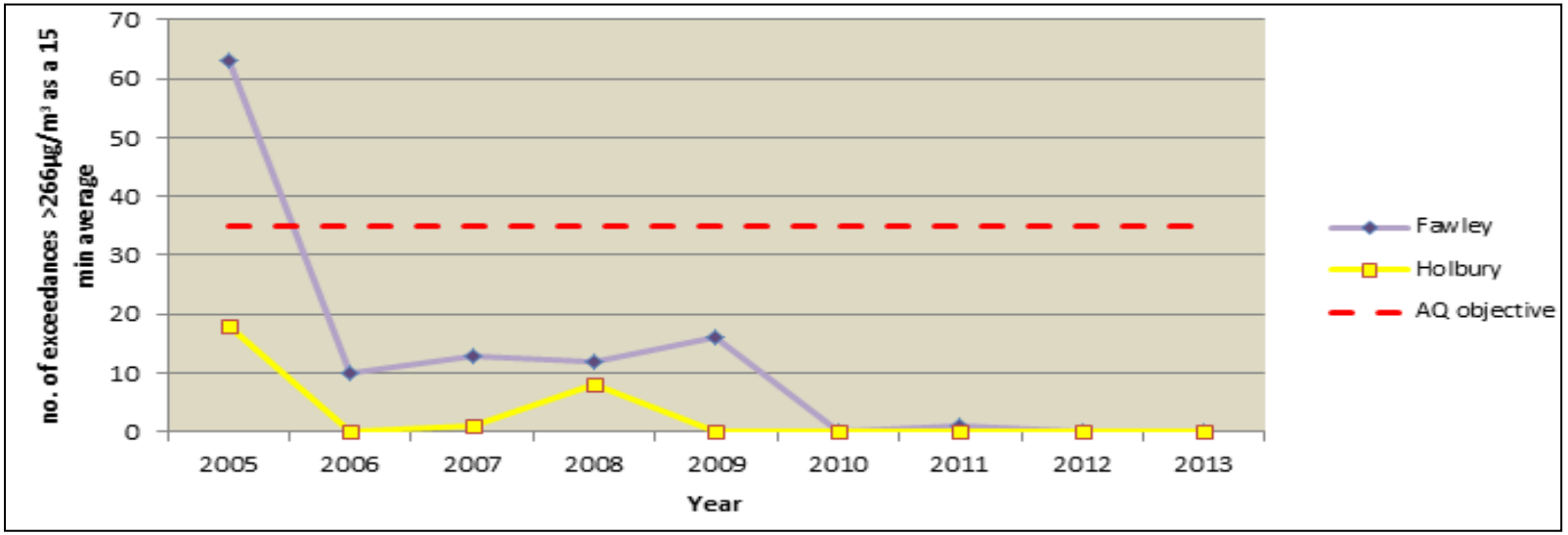
Table 2.9 Results of Automatic Monitoring for SO_2: Comparison with Objectives

Site ID	Site Name	Site Type	Within AQMA?	Valid Data Capture 2013 % [a]	Number of: [b]		
					15-minute Means > 266µg/m^3	1-hour Means > 350µg/m^3	24-hour Means > 125µg/m^3
CM3	Fawley	Industrial	N*	86	0(81.125)	0(42)	0(19)
CM4	Holbury	Industrial	N	96	0	0	0

Notes:

1. ***In bold, exceedence of the relevant AQS objective (15-min mean = 35 allowed/year; 1-hour mean = 24 allowed/year; 24-hour mean = 3 allowed/year)***
2. ****The Fawley AQMA (with regards to the 15 min mean objective for sulphur dioxide) was revoked in April 2013.***
3. ***[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%)***
4. ***[b] if data capture for full calendar year is less than 90%, include the relevant percentile in bracket (in µg/m^3): 15-min mean = 99.9th ; 1-hour mean = 99.7th ; 24-hour mean = 99.2th percentile***

Figure 2.8 Trends in SO_2 Concentrations



None of the monitoring sites exceeded the objectives set for sulphur dioxide during 2013. The monitoring sites both represent relevant public exposure.

The trend data clearly shows the exceedance of the 15minute mean objective for sulphur dioxide at Fawley in 2005 which resulted in the declaration of the Air Quality Management Area. However the graph also shows how the number of exceedances of the 15 minute mean objective has significantly decreased since 2005, with all subsequent results being well below the objective of 35 exceedances per year.

There are no trend graphs presented for the 1-hour and 24-hour sulphur dioxide objectives. The monitoring results for Fawley and Holbury recorded zero for each objective since the sites became operational in 2005, with one exception at Fawley in 2005 when 4 exceedances of the hourly objective were monitored. The hourly objective is set at 350µg/m^3, not to be exceeded more than 24 times a year therefore this objective was not exceeded in 2005.

2.2.4 Benzene

New Forest District Council has not monitored benzene within its district during 2013.

2.2.5 Other Pollutants Monitored

New Forest District Council has not monitored any other pollutants within its district during 2013.

2.2.6 Summary of Compliance with AQS Objectives

New Forest District Council has measured concentrations of nitrogen dioxide above the annual mean objective at locations outside of an AQMA for Shrubbs Hill Road, Lyndhurst.

A Detailed Assessment was completed in 2012 by AEA Technology and determined no exceedance of the annual mean objective for nitrogen dioxide at Shrubbs Hill Road, Lyndhurst. On advice of the Air Quality Helpdesk further monitoring has continued and an additional site erected since the 2012 Detailed Assessment. Please refer to Section 8 (Conclusions and Proposed Actions)

3 New Local Developments

3.1 Road Traffic Sources

New Forest District Council confirms there have been no newly identified road traffic sources which require consideration in terms of air quality within its District.

3.2 Other Transport Sources

New Forest District Council confirms there have been no newly identified transport sources which require consideration in terms of air quality within its District.

3.3 Industrial Sources

New Forest District Council confirms there have been no newly identified industrial sources which require consideration in terms of air quality within its District.

3.4 Commercial and Domestic Sources

A 4.7MW biomass boiler (burning recycled wood to heat greenhouses) has been granted planning permission at Double H Nurseries, Gore Road, New Milton. The applicant has subsequently reduced the size of the unit and stack resulting in further consideration of the planning permission and the potential impact on local air quality.

An air quality assessment has been formally submitted as a result of the changes in stack height and diameter, and it has been concluded that the biomass boiler will have a negligible to small impact on local air quality. The biomass boiler will require a

Part B Permit to operate under the Environmental Permitting Regulations 2010 as amended (issued by New Forest District Council) and the Local Authority is currently in the process of determining the permit application. There are no further biomass plants or areas where solid fuel burning is considered relevant since the previous Updating and Screening Assessment within the District.

3.5 New Developments with Fugitive or Uncontrolled Sources

New Forest District Council confirms there have been no new developments with fugitive or uncontrolled sources which require consideration in terms of air quality within its District.

New Forest District Council has identified the following new or previously unidentified local developments which may impact on air quality in the Local Authority area.

- **Double H Nurseries, Gore Road, New Milton** (4.7MW Biomass Boiler)

These will be taken into consideration in the next Updating and Screening Assessment

4 Planning Applications

Eling Wharf, Totton

Eling Wharf is a 150,000m^2 brown field site adjacent to Totton and Southampton Water, 150m southeast of the Totton Air Quality Management Area. It is currently used for variety of industrial processes, but there is a likelihood that the site will be re-developed introducing a significant number of housing units to the local area (subject to the relevant planning permission), in addition to retail (possibly a supermarket) and industrial units.

The Totton Air Quality Management Area includes the roads between the development site and Totton town centre. Therefore if the development proceeds the roads within the Air Quality Management Area may be subject to noted increases in traffic (post development) by occupiers of the development accessing the town centre and the public accessing the retail and industrial units on the development site. Furthermore the railway barriers which operate within the Air Quality Management Area would only add to localised traffic congestion and additional pollution from idling vehicle engines. Therefore the development has the potential to increase local traffic movements which may impact on air quality (nitrogen dioxide and particulate concentrations) inside and outside the Totton Air Quality Management Area.

To date a planning application has not been submitted for the site. However the developers have been discussing their plans with New Forest District Council and the local Town Council and the submission of a formal planning application is believed to be imminent.

Navitus Bay off-shore wind farm

An off-shore wind farm has been proposed in the Solent. There is a potential impact on local air quality from construction traffic accessing the site via Lyndhurst and therefore through the Lyndhurst AQMA. The construction traffic has been advised to be approximately 150AADT over a 2 year period.

As a result New Forest District Council has requested the applicant undertake an air quality assessment of the potential impact of the construction traffic on the local air quality in Lyndhurst. The Council is currently waiting for the report before comments can be made.

In addition to the potential impact from construction traffic, the on-shore cable route has the potential to produce fugitive dust emissions from exposing the ground during the cable laying process. This issue has been raised with the applicant, and a dust management plan will be agreed prior to works commencing.

Fawley Power Station, Fawley and Polimeri Chemicals, Hythe

Two Part A permitted processes have ceased operating within the District since the last Updating and Screening Assessment. These sites are:

- Fawley Power Station, Fawley
- Polimeri Chemicals, Hythe

Both sites are currently in the process of obtaining planning permission for demolition however the future use of these sites is unknown at this time.

5 Air Quality Planning Policies

It should be noted that Environmental Protection, the department within New Forest District Council charged with the review and assessment of local air quality, has to work with two different planning authorities; New Forest District Council and New Forest National Park Authority. Both planning authorities will receive applications depending on the location of the site of concern.

As a result planning procedures and policies, whilst similar, are different and involve working with different planning authorities and officers. Both planning authorities have adopted planning policy documents which note the relationship between planning and air quality;

<u>New Forest District Council planning authority</u>

- Covers the area outside the National Park, 29% of the New Forest district – including the towns and industrial areas on the New Forest boundary.

- Includes the Totton AQMA.

- Under the Local Development Framework the authority adopted its Core Strategy in October 2009 replacing the Local Plan (although some policies within the Local Plan were retained).

- CS5 refers to air quality;
  "Development should not result in pollution or hazards which prejudice the health and safety of communities and their environments . . . . Appropriate mitigation measures may be required to enable development.

  Development in the vicinity of hazardous sites and uses, known to present risks to public health and safety, will be restricted to ensure that there are no unacceptable risks to people . . . .

When the opportunity arises, particularly through development proposals, remedial measures will be taken to address existing problems of . . . air quality "

- Some planning policies are retained from the Local Plan affecting specific area and developments, for example TE-23 development of a railway station at Bartley Park, Totton which may impact on the Air Quality Action Plan for Totton.

New Forest National Park planning authority

- Covers the area of the National Park, 71% of the New Forest district– some towns but essentially the more rural areas of the New Forest

- Includes the Lyndhurst AQMA

- Adopted its Core Strategy and Management Development Policies within the Local Development Framework in February 2010

- CP6 relates to pollution (air quality);

"Opportunities** should be taken to control and reduce the impacts of noise, visual intrusion, nuisance and other unacceptable environmental impacts on the National Park and its special qualities. . . . **"

Following the publication of the National Planning Policy Framework in 2012, the framework for air quality in planning has changed (EMAQ, 2013). The aim is to simplify planning policy but to also protect the environment, and promote sustainable growth and development (EMAQ, 2013).

It is acknowledged that existing guidance concerning air quality and planning is considered out of date however there is a continuing need for guidance to assist Local Government officers in determining whether there is a requirement for an air quality assessment in relation to a proposed developed, and whether a submitted air quality assessment is fit for purpose. Therefore it is considered appropriate for Councils to produce their own local air quality planning guidance to provide clarity to Local Government officers and developers to help them fulfil their individual roles with regards developments and the impacts on air quality.

It is the aim of Environmental Protection to work towards producing such a guide that will work both for the District Council and National Park planning departments by 2016.

6 Local Transport Plans and Strategies

Hampshire County Council's most recent Local Transport Plan (LTP) 2011 – 2031 (HCC, 2013(a)) was formally approved by the County Council in February 2011. The LTP (HCC, 2013(a)) is comprised of two parts:

- 20 year Strategy, which sets out a long-term vision for how the transport network of Hampshire will be developed over the next 20 years, and
- 3 year Implementation Plan which has recently been revised covering the period 2013 – 2016. The Plan sets out local strategies through Approved Transport Statements for each district and borough in Hampshire, the New Forest Transport Statement (HCC, 2013(b)) was finalised in September 2012.

The Hampshire LTP (HCC, 2013(a)) does not refer to specific air quality issues in the New Forest however the Plan does aim to:

- 'Promote . . . the installation of transport technologies . . . including electric vehicle charging points' (policy objective 3)
- Improve public transport (policy objectives 3 and 4)
- Contribute to achieving local targets for improving air quality through transport measures and implementation of smarter choices (policy objectives 10 and 11)
- 'Invest in sustainable transport measures . . . to provide a healthy alternative to the car' (policy objective 12)

The New Forest Transport Statement (HCC, 2013(b)) was developed by Hampshire County Council with the District Council and National Park and covers the period 2012 – 2026. The Statement includes the aims:

- 'to maintain and improve the area's distinctive character whilst improving opportunities for sustainable travel . . . . through appropriate transport investment and greater integration . . . '
- Reduce congestion
- Improve accessibility by non-car modes
- Encourage use of public transport and cycling

- Encourage travel plans with schools and employers (currently 83% of schools within the New Forest have a travel plan)
- Implement measures to support Air Quality Action Plan objectives

Some of the plans and schemes noted in the New Forest Transport Statement (HCC, 2013(b)) are listed within the Implementation of Action Plans (section 7) within this document due to their possible link with air quality.

It is noted that large scale funding initially allocated to the Totton and Lyndhurst Air Quality Action Plans through a previous LTP (2003-2006) was not ring fenced and any funding for schemes is unlikely to be available due to cost savings.

New Forest District Council continues to work well with Hampshire County Council at a local level, looking specifically at the Air Quality Management Areas in Totton and Lyndhurst and other local transport issues, and at a regional level through membership of steering groups and committees. The work with Hampshire County Council includes traffic counts, feasibility studies and small scale funding of projects.

7 Implementation of Action Plans

A summary of the two current Air Quality Management Areas within the New Forest district are given in Section 1.4. The Action Plans were formally adopted by the Council in 2008 following the declaration of the Air Quality Management Areas.

Since 2008 the Council has been working with stakeholders to progress the options listed within each Action Plan. The options are dependent on the pollutant of interest and objective being exceeded, as well as the location of the area of concern. A summary of the progress of the Action Plans for Totton and Lyndhurst is shown in Table 7.1.

Table 7.1 Update on Air Quality Action Plans

Totton *NO_2 annual mean objective*

No.	Option	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments
1	Pedestrianisation	Removes vehicles from part of AQMA	County Council	n/a	n/a	Closure of road. Monitoring NO_2.	> 5 µgm-3	Option originally discounted by local members and through Urban Design Framework. Option included in feasibility study by HCC.	n/a	**Option discounted** (social exclusion)	Feasibility study indicated the option was potentially favourable within the AQMA but would have a negative impact on NO_2 outside the AQMA (High St.) and results in social exclusion.
2	Road bridge over railway crossing	Reduces idling and slow moving traffic	County Council	n/a	n/a	n/a	< 1 μgm^{-3}	n/a	n/a	**Option discounted** (cost)	Option too costly, intrusive and socially exclusive

No.	Option	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments
3	Installation of variable messaging system (VMS)	Reduce traffic through AQMA. Encourage motorists to turn off engines	County Council	n/a	n/a	n/a	2–4µgm^{-3}	Feasibility study indicated the option was potentially favourable but would require detailed transport and AQ modelling.	n/a	**Option discounted** (cost)	Feasibility study advised that the use of static signs were favoured over VMS due to costs to achieve the resulting reduction in NO_2
4	Review static signs	Encourage motorists to turn off engines	County Council / District Council	Signs in use, annual review	n/a	Traffic surveys to assess no. of switched off engines. Monitoring NO_2.	2µgm^{-3}	Feasibility study indicated the option was potentially favourable compare with VMS.	Continuous surveys (~22%) of drivers switching off engines	**Completed** Further survey required and replacement of signs – 2 removed following works to highways	Feasibility study advised static signs were favoured over VMS due to costs for the resulting reduction in NO_2. Impact on NO_2 would be a slight improvement.

No.	Option	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments
5	Enforcement of HGV restrictions	Reduce number of unauthorised HGV's travelling through AQMA	Police	2010	2011	Traffic surveys to assess number of unauthorised HGV's	< 1 μgm^{-3}	Restrictions in place	LA traffic surveys have not indicated unauthorised HGV movements	**Continuous**	
6	Consultation on Urban Design Framework (UDF) for Totton	Improved working between departments	District Council	Immediate effect	Phased implementation	n/a	< 1 µgm-3	Works undertaken outside AQMA UDF replaced by different schemes to improve transport	None	**Continuous**	Schemes of interest – (i) Local Development Scheme (ii) New Forest Transport Statement

No.	Option	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments
7	Improvements to pedestrian routes	Encourage walking and reduce number of trips in cars	County Council	Completed	Completed	Travel surveys	< 1 μgm^{-3}	Works completed in Rumbridge Street. Feasibility study indicates no further improvements could be made within AQMA but outside AQMA: (i) World Stores roundabout (outside AQMA) - will improve pedestrian access and pedestrian routes (ii) Upgrading existing routes – eg railway footbridge at Brokenford Ln	None	**>10years**	Schemes identified through New Forest Transport Statement

No.	Option	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments
8	Improvements to cycle routes	Encourage cycling and reduce number of trips in cars	County Council	Completed	Continuing	Travel surveys	< 1 μgm^{-3}	Initially no further cycle routes agreed thr' AQMA New cycle route through AQMA agreed by district council	None	**>10 years**	Identified in New Forest Transport Statement. Prefeasibility stage
9	Increase use and awareness of public transport	Reduce number of cars in Totton	County Council	2010	2011-2012	Travel surveys to assess use of public transport	< 1 μgm^{-3}	Waterside bus quality partnership completed Production of New Forest Transport Statement	None	**>10 years**	Many schemes identified to improve bus use and community transport

No.	Option	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments
10	Review car parking in Totton	Reduce journeys through AQMA	County Council / District Council	Completed	Completed	Car parking surveys	< 1 μgm^{-3}	Feasibility study advised the use of new static signs directing to lesser used car parks should be considered, however local residents are unlikely to change their current parking preferences	None	**2015**	District Council to work with Asda to discuss the use of their free car park situated in the centre of Totton and just outside AQMA.

No.	Option	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments
11	Reducing congestion in Totton (AQMA)	Reduce journeys through AQMA	County Council	n/a	n/a	Travel surveys to assess travel movement through Totton	< 1 μgm^{-3}	Feasibility study advised the BATs corner junction is not suitable for alterations in layout and any changes would not improve NO_2 $conc^{ns}$ in AQMA. The current signposted routes are the shortest plus residents are unlikely to change their current behaviour. New Forest Transport Statement advises of schemes to install CCTV and number plate recognition around Totton to assist in overall traffic management	None	**Option to improve BATs corner discounted corner** (no reduction in NO_2 $conc^{ns}$) **>10years for traffic managemen t scheme**	Traffic management scheme will depend on funding from developers contributions. The scheme is not proposed as a 'vehicle charging' scheme.

No.	Option	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments
12	Areas for planned developments	Assess impact of developments on air quality	District Council	Continuous	Continuous	None	< 1 μgm^{-3}	Planning assessed for air quality impacts, including provision of air quality GIS maps to planning	To continually assess method of working is appropriate	**Continuous**	
13	Development of Asda travel plan	Reduce journeys through AQMA	Asda / District Council	2009 - 2011	2012	Travel surveys	< 1 μgm^{-3}	Updating of travel plan. Planning approval given to extend store and car park by 32 spaces and produce a staff travel plan to reduce the need to drive to work.	Re-development of car park completed	**2015**	To discuss the use of the free Asda car park (in Totton centre) with the store and the Asda travel plan for staff and customers

No.	Option	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments
14	New Forest District Council fleet management	Reduce emissions from Council vehicles	District Council	Completed	2008 - 2012	n/a	< 1 μgm^{-3}	Assessment of council fleet. Staff using Council vehicles trained in ecodriving. Tracker equipment installed into vehicles Assessment of remaining Council fleet. Review methods of working of council workers.	Continuous: (i) new vehicles purchased have latest spec / fuel efficient engines (ii) optimisation of vehicle routes and council officer driving. (iii) link created between air quality and 'eCO_2' group	**Continuous**	'eCO2 champions' group set up to manage climate change and sustainability responsibilities for the Council.
15	Vehicle emission testing	Emission test vehicles travelling through AQMA	District Council	2011	2012	n/a	< 1 μgm^{-3}	None	No procedure for VOSA testing outside low emission zones specifically within AQMA's	**Option discounted**	
16	Investigate use of absorbing paving surface	Reduce NO_2 concentrations	District Council	n/a	n/a	Monitoring using diffusion tubes and continuous analyser	Unknown	Option discounted due to lack of positive outcomes from trials with other LA's		**Option discounted** (technology not viable)	

No.	Option	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments
17	Increase public awareness of air quality	Publicise air quality throughout district	District Council	Continuous	Continuous	n/a	< 1 μgm^{-3}		Updated website	**Continuous**	
18	Review air quality monitoring	Ensure correct locations are being monitored	District Council	Continuous	Continuous	n/a	n/a	Additional monitoring completed	Continuous assessment of monitoring locations.	**Continuous** Review every January	

Lyndhurst *NO_2 annual mean objective*

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments
1	Bypass	Reduce number of stationary vehicles in High St.	County Council	n/a	n/a	n/a	Unknown	Scrutiny review at County Council in 2008	None	**Option discounted** (cost and environment-tal impacts)	Option not feasible after scrutiny review
2	Improvements to A337 and High St. junction	Improve flow of traffic through junction	County Council	n/a	n/a	Traffic surveys to assess traffic movements and monitoring NO_2	3-4 μgm^{-3}	No physical junction alterations. Installation of long vehicle detection technology in High Street on approach to junction with Romsey Road. 'MOVA' system installed to work in conjunction with long vehicle detection.	'MOVA' system operating 24/7 but green filter stops when long vehicles detected or pedestrians use crossings	**Option to alter junction layout discounted** (cost) **Option to install long vehicle detection completed** **Option to install 'MOVA' completed**	Monitoring at the automatic site has noted a decrease of 5 μgm^{-3} since 2010. Observations have determined reduced congestion in terms of queue lengths and frequency of occurrence

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments
3	Additional road traffic management scheme	Improve flow of traffic through street canyon	County Council	n/a	n/a	Traffic surveys to assess traffic movements and monitoring NO_2	1-5 μgm^{-3}	Air quality and traffic modelling work completed. Additional traffic gating systems discounted due to impacts on vehicle flows. New Forest Transport Statement advises of schemes to install CCTV and number plate recognition around Lyndhurst to assist in overall traffic management	None	**Traffic gating option discounted** (impact on traffic flows) **>10years for traffic managem-ent scheme**	Traffic management scheme will depend on funding from developers contributions. The scheme is not proposed as a 'vehicle charging' scheme.

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments
4	Enforcement of heavy goods vehicle restriction	Reduce number of HGV's travelling illegally down High St.	Police	2011	Continuous	Traffic surveys to assess no's. of illegal HGV's and monitoring NO_2	1–2 μgm^{-3}	County Council traffic survey	Some police enforcement work completed	**Continuous**	HCC traffic survey showed a low percentage of illegal HGV's (~7% of all HGV's) travelling down High St.
5	Installation of variable messaging system	Reduce traffic from travelling through Lyndhurst	County Council	Completed	Completed	Traffic surveys to assess traffic flows and monitoring NO_2	1–2 μgm^{-3}	System installed	n/a	**Completed**	System is only used when traffic is congested on A337 and the traffic signs are available for use.
6	Enforcing current parking restrictions	Improve flow of traffic through Lyndhurst	District Council	Continuous	Continuous	Enforcem-ent figures and monitoring NO_2	< 1μgm^{-3}	None	Meeting with traffic enforcement, agreed parking enforcement signs in High St require updating for clarity	**Continuous**	Requirement to regularly meet (~ every 6 months) with traffic wardens to discuss issues / progress

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments
7	Review signage around Lyndhurst	Ensure vehicles reach their destination quickly	County Council	2011	2012	Visitor surveys	< 1µgm^{-3}	7.5t restriction signage reviewed	None	**2016**	Further work required
8	Review and support New Forest District Council's travel plan	Reduce traffic from travelling through Lyndhurst	District Council	Continuous	Continuous	Travel surveys of Council staff and monitoring NO_2	< 1µgm^{-3}	Incentives to car share, use alternative transport. Pool cars and bikes available at work	Continue involvement in travel plan. Link between air quality and 'eCO_2' group	**Continuous**	'eCO2 champions' group set up to manage climate change and sustainability responsibilities for the Council.
9	Development of school travel plan	Reduce traffic from travelling through Lyndhurst	County Council	Continuous	Continuous	Travel surveys of school travel and monitoring NO_2	< 1µgm^{-3}	School travel plan approved 2006 Travel plan reviewed, improved pathway to school via church avoiding High Street completed	None	**Continuous**	

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments
10	Areas of planned developments	Assess impact of developments on air quality	District Council	Continuous	Continuous	None	< 1 μgm^{-3}	Planning assessed for air quality impacts, including provision of air quality GIS maps to planning	To continually assess method of working is appropriate	**Continuous**	
11	Review bus routes (incl. green transport)	Reduce congestion	County Council	Continuous	Continuous	Travel surveys to assess use of public transport and monitoring NO_2	< 1 μgm^{-3}	Bus priority lane installed in Shrubbs Hill Road. Free bus for tourists travelling into New Forest on train during summer season.	Continued operation of bus lane and bus schemes Continued use of fleet of electric cars for visitors throughout New Forest (18 charge points – free to charge) Operation of 3 New Forest Tour buses	**Bus priority lane** (Shrubbs Hill Road) **completed** **Electric fleet completed**	Option unlikely to reduce NO_2 emissions greatly, but encourages use of public and green transport into and through Lyndhurst

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments
12	Review cycle routes	Encourage cycling and reduce number of trips in cars	County Council	Completed	Completed	Travel surveys to assess use of cycle routes and monitoring NO_2	< 1 µgm^{-3}	Installation of additional cycle parking in Lyndhurst Additional cycle schemes identified in New Forest Transport Statement including cycle routes to rear of primary school	None	**Cycle parking completed** **>10yrs for additional schemes**	Additional schemes currently at prefeasibility stage
13	Review car parking	Assess parking requirements	District Council	6 months	1 year	Travel surveys and monitoring NO_2	< 1 µgm^{-3}	Car parking reviewed by County Council	None	**2016 to review car park usage**	County Council review determined no agreeable alterations to current car parking arrangement. Car park usage should be reviewed for air quality purposes.

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments
14	New Forest District Council vehicle fleet management	Reduce emissions from Council vehicles	District Council	Completed		n/a	< 1 µgm^{-3}	Assessment of council fleet. Staff using Council vehicles trained in ecodriving. Tracker equipment installed into vehicles Assessment of remaining Council fleet. Review methods of working of council workers.	Continuous: (i) new vehicles purchased have latest spec / fuel efficient engines (ii) optimisation of vehicle routes and council officer driving. (iii) link created between air quality and 'eCO_2' group	**Continuous**	'eCO2 champions' group set up to manage climate change and sustainability responsibilities for the Council.
15	Vehicle emission testing	Emission test vehicles travelling through AQMA	District Council	2012	2013	n/a	< 1 µgm^{-3}	None	No procedure for VOSA testing outside low emission zones specifically within AQMA's	**Option discounted**	

No.	Measure	Focus	Lead authority	Planning phase	Implementation phase	Indicator	Target annual emission reduction in the AQMA	Progress to date	Progress in last 12 months	Estimated completion date	Comments
16	Investigate use of absorbing paving surface	Reduce NO_2 concentrations	District Council	n/a	n/a	n/a		Option discounted due to lack of positive outcomes from trials with other LA's	n/a	**Option discounted** (technology not viable)	
17	Increase public awareness of air quality	Publicise air quality throughout district	District Council	Continuous	Continuous	n/a	< 1 μgm^{-3}	Update website	Improved website	**Continuous**	
18	Review air quality monitoring	Ensure correct locations are being monitored	District Council	Continuous	Continuous	n/a	n/a	Additional monitoring completed	Continuous assessment of monitoring locations.	**Continuous** Review every January	

The Totton and Lyndhurst Actions Plans are transport related and therefore rely heavily on the involvement of the highway authority; Hampshire County Council.

The Air Quality Action Plan update acknowledges the New Forest Transport Statement which was produced in September 2012 by Hampshire County Council. This transport statement identifies a number of schemes and aspirations with regards to transport in the region, and those relevant to the Air Quality Action Plans have been incorporated into the update. It is noted that the time scales for many of the transport schemes are very long, with no identified funding currently available. However such schemes should be noted as a transport need has been identified and the air quality issues may influence such schemes progressing in the future.

It is noted that throughout the review and assessment of air quality within the New Forest district Hampshire County Council has worked well with New Forest District Council, providing support, technical advice and funding for a number of schemes and studies.

Totton Action Plan

In Totton the transport related options have either been completed or discounted. A feasibility study commissioned by Hampshire County Council was accepted however it was acknowledged that the study lacked detail with regards to the option assessments. The feasibility study recommendations are noted in Table 7.1.

As noted in previous sections, monitoring results for Totton have been significantly below the annual mean objective for nitrogen dioxide at locations of relevant public exposure over the past 8 years. The reductions in monitored nitrogen dioxide concentrations within the Air Quality Monitoring Area have been to a large extent unexplained considering there has been limited progression of implementing the transport related options (with the exception of the installation of static signs at the railway crossing). However it is unlikely that transport related schemes which only aim to reduce nitrogen dioxide concentrations will be undertaken by Hampshire County Council, although future transport schemes in Totton will take into account the potential impact (positive or negative) on local air quality.

The possibility of revoking the Totton Air Quality Management Area (due to the monitoring data continuing to show the annual mean objective for nitrogen dioxide has not been exceeded for a number of years) is discussed further in Section 8. In the meantime the Totton Air Quality Management Area will remain and options within the Air Quality Action Plan will be progressed, in particular:

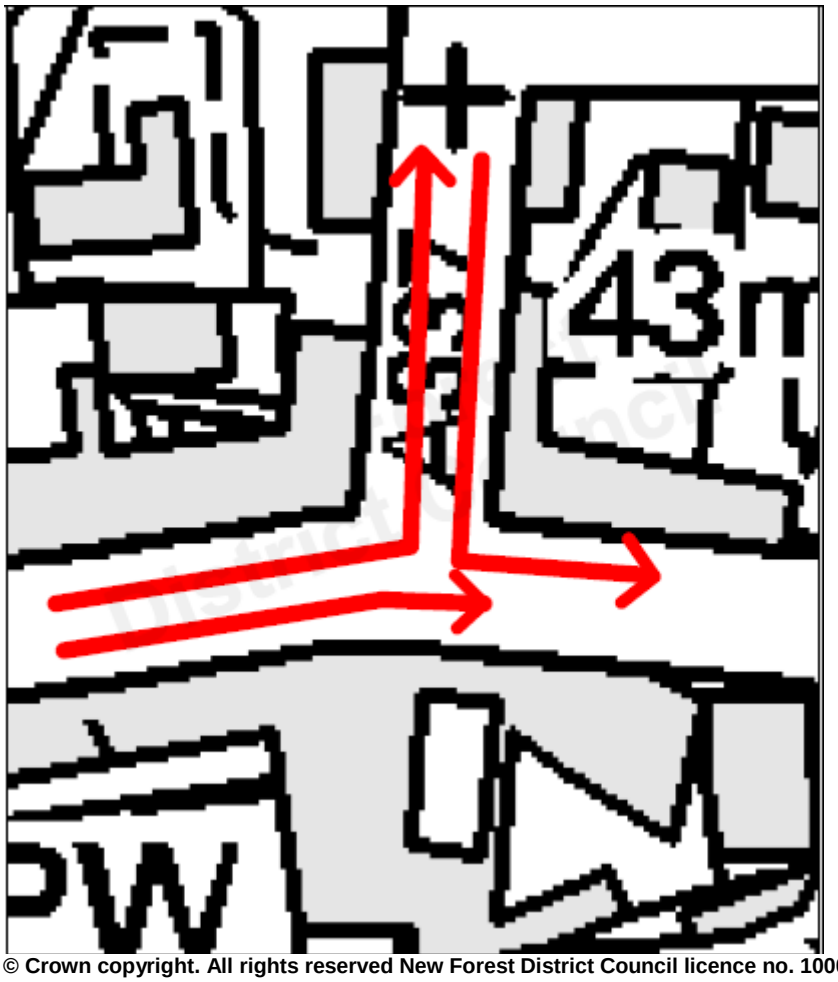
- ensuring the static signs are maintained
- working with Asda and feeding into their travel plan
- working with transport planners with regards to forwarding transport schemes in Totton
- commenting on future planning applications in Totton which may potentially impact on local air quality.

Lyndhurst Action Plan

The Lyndhurst Action Plan has been progressing slowly. The major transport related options have all been exhausted and concluded as not feasible for Lyndhurst due to a variety of factors including potential increases in traffic congestion, unacceptable environmental impacts, cost and negligible air quality benefits.

The remaining transport option which is progressing well concerns the long vehicle detection system and the green traffic light filter. The long vehicle detection system is located at the top of the High Street before the street canyon and the junction with the A337 (Romsey Road). This system enables the left hand green filter on the traffic lights to be utilised more therefore allowing traffic to flow through the canyon and turn left (north) into the A337 as shown in Figure 7.1.

Figure 7.1 Details of traffic flow through junction of High Street and A337 (Lyndhurst)



This system reduces the time traffic in the left hand lane queues in the street canyon part of the High Street. However when a long vehicle (heavy goods vehicles are permitted on this route) is detected approaching the junction the green filter is turned off and the traffic lights revert to their normal sequencing. This ensures the long vehicle (which has to cross both carriageways on the A337 in order to turn the corner) does not collide with traffic travelling southbound on the A337 (and then eastbound onto the High Street).

The ‘MOVA’ (Microprocessor Optimised Vehicle Actuation) system installed in 2012 at the traffic lights has been operating 24/7. This system optimises the signal timings using data from all the approaches to the junction. MOVA is able to vary the maximum cycle time in response to actual traffic flows, rather than the flows assumed for that time of day (HCC, 2013(c)). It can also adjust the individual timings for one approach in response to conditions all round the junction (HCC, 2013(c)). Therefore the system is more intelligent than other traffic light sequencing systems.

As a result the flow of traffic along the High Street has improved which has been noted by residents and commuters accessing Lyndhurst. It is acknowledged that during periods of very high vehicle numbers there still may be significant queuing on the approach routes into Lyndhurst, although it is hoped these instances are reduced in number. Indeed monitoring has shown a reduction of 5μg/m^3 at the automatic analyser in the street canyon since 2010.

It is acknowledged that the few smaller transport options (VMS routing and a bus lane in Shrubbs Hill Road) and improvements in green transport (tour bus and availability of electric vehicles) which have been implemented are unlikely to reduce nitrogen dioxide concentrations significantly and certainly not below the annual mean objective in the Lyndhurst Air Quality Management Area. However the current aim for Lyndhurst is to put into place all feasible transport and smarter options with the assistance of the transport planners, enforcement officers and the local community in order to pursue the nitrogen dioxide annual mean objective.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

Throughout 2013 monitoring for nitrogen dioxide, particulate matter (PM_{10}) and sulphur dioxide has been undertaken throughout the New Forest district. The only pollutant monitored as exceeding air quality objectives was nitrogen dioxide for the annual mean objective.

The majority of monitoring for nitrogen dioxide concentrations was undertaken using diffusion tubes located throughout the District. The annual mean results for each diffusion tube site was biased corrected either using a locally determined bias correction factor as detailed in Appendix B or using the national bias correction factor (Defra, 2013).

It is noted that the local bias correction factors for Lyndhurst and Totton were similar for 2013; Lyndhurst 0.88 and Totton 0.84 (national bias correction factor 0.95). The local bias correction factors were used for diffusion tube sites in similar monitoring locations and conditions to the automatic analysers.

The exceedances for the nitrogen dioxide annual mean objective were monitored using diffusion tubes at locations in Lyndhurst. Within the Air Quality Management Area in Lyndhurst 2 diffusion tube locations monitored exceedances at 15 and 16 High Street. These sites have consistently exceeded the annual mean objective since 2006, although a decrease in the annual mean for nitrogen dioxide was monitored at both sites between 2012 and 2013 - 16 High Street (of 0.09µg/m^3) and 15 High Street (of 1.78µg/m^3). 15 High Street, Lyndhurst has historically been the site which monitors the highest annual mean concentration of nitrogen dioxide therefore it was good to note a significant decrease in concentration at this site.

A previously exceeding monitoring site (14 High Street) monitored a slight increase compared to the 2012 results in nitrogen dioxide concentrations using the automatic analyser (and diffusion tubes). This resulted in the automatic site monitoring an exceedance of the annual mean objective for nitrogen dioxide from 40µg/m^3 to 41µg/m^3.

This increase in nitrogen dioxide concentration is disappointing particularly considering the annual mean objective for nitrogen dioxide was met in 2012 following 6 years of continuing exceedance. However it should be noted that the actual monitored increase in the annual mean nitrogen dioxide concentration at Lyndhurst was 0.2µg/m^3.

Annual mean monitoring results are reported as a whole figure, therefore on the advice of the Air Quality Helpdesk the monitored annual mean concentration for nitrogen dioxide in Lyndhurst in 2012 was rounded down from the monitored 40.4µ/gm^3 to a reported 40µg/m^3 and therefore no reported exceedance. The monitored annual mean concentration for nitrogen dioxide in Lyndhurst in 2013 was rounded up from the monitored 40.6µg/m^3 to a reported 41µg/m^3.

Therefore whilst there had been a slight increase in the monitored annual mean concentration of nitrogen dioxide at the automatic site in Lyndhurst, this had resulted in an exceedance of the annual mean objective for nitrogen dioxide at 41µg/m^3. However despite this slight monitored increase in the annual mean nitrogen dioxide concentrations, the reductions monitored at the automatic site in Lyndhurst have been encouraging with an overall reduction of 5µg/m^3 since 2010.

Colleagues in Hampshire County Council have advised that vehicle numbers using the routes into Lyndhurst have not decreased in 2013. Therefore the reduction in nitrogen dioxide monitored at 14 High Street has not been as a result of a reduction in vehicle numbers entering Lyndhurst.

Therefore it is presumed that the increase use of a green filter (since 2011) and subsequent installation of a MOVA system (end of 2012) at the traffic lights of Romsey Road and the High Street may have resulted in this monitored reduction in nitrogen dioxide

concentrations. This is because the traffic within the street canyon part of the High Street is less congested with the improved traffic flow.

It is noted that the nitrogen dioxide concentrations at 15 High Street would have also shown a more significant decrease in nitrogen dioxide concentrations over a number of years, and not just in the previous year, particularly because this site is adjacent to the vehicle lane with the improved flow. Continued monitoring within this area will help determine whether the new traffic light system has resulted in a more widespread decrease in nitrogen dioxide concentrations, although it is acknowledged that the monitored reduction at the automatic monitoring site has been significant.

It is noted that the diffusion tube site located at 14 High Street (a triplicate site alongside the automatic analyser) monitored a lower result for the annual mean nitrogen dioxide concentration (39.80µg/m^3) when compared to the automatic analyser (monitored as 40.6µg/m^3, reported as 41µg/m^3). This difference has resulted in the automatic analyser showing an exceedance of the air quality objective for the annual mean nitrogen dioxide concentration but the diffusion tube site not showing an exceedance.

This difference in results is due to the local bias correction figure applied to the diffusion tubes in Lyndhurst located within the street canyon. The local bias correction factor was determined without the use of the automatic analyser results between 04.12.13 – 06.01.14 due to poor data capture for this period (41%) at the automatic analyser. However the results for the automatic analyser takes into account the data collated for the full year because the data capture for the year was greater than 90%.

On discussion with the Air Quality Helpdesk, it was concluded that both methods of determining an annual mean concentration at 14 High Street were correct and show a slight variation which has unfortunately occurred over the air quality objective concentration highlighting the difference. However it would be concluded that the automatic result is the more accurate method of monitoring and therefore is the more accurate nitrogen dioxide concentration at that particular location.

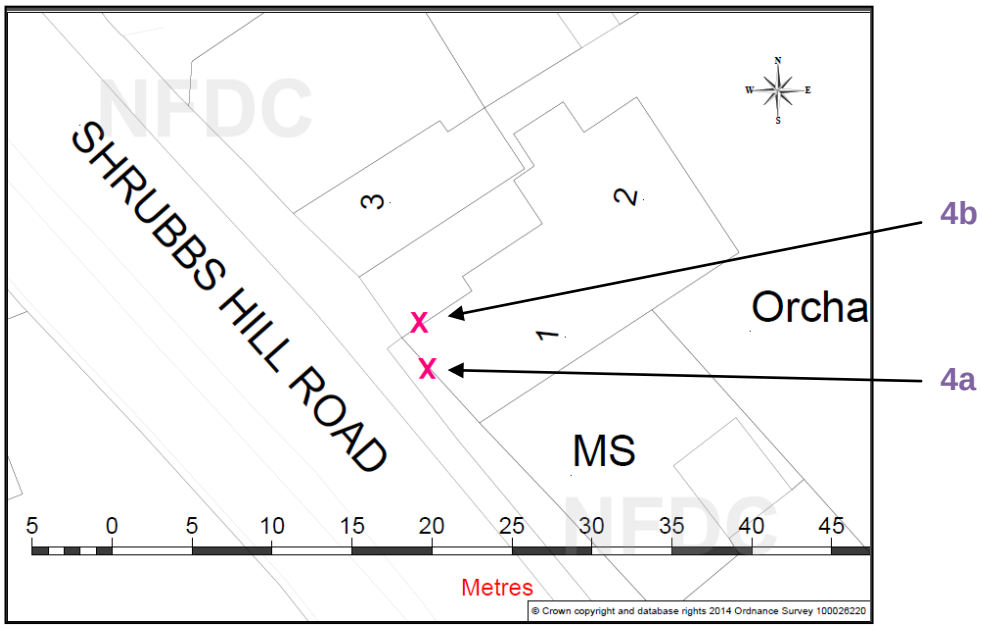
A further location (Shrubbs Hill Road(a)) outside the current Lyndhurst Air Quality Management Area also monitored an exceedance of the nitrogen dioxide annual mean objective. This site had monitored previous exceedances in 2009 and 2010. It is unclear why this site has exceeded the annual mean objective for nitrogen dioxide because:

- whilst on a one way system approaching the more congested parts of Lyndhurst, this road system is free flowing for the majority of the time
- the traffic is only heavy during peak hours and is only slow at this location on occasions
- diffusion tube monitoring sites either side of the site have not monitored an exceedance
- the site is relatively open

As a result of the monitoring results at Shrubbs Hill Road, this site (and a further site at Gosport Lane) formed the basis of a Detailed Assessment undertaken by AEA in 2012 and accepted by Defra. The report concluded that Shrubbs Hill Road should not monitor an exceedance of the annual mean objective for nitrogen dioxide. This did not concur with the monitoring results for 2013, however the Detailed Assessment did acknowledge the uncertainty in the model, particularly highlighting the issues at Shrubbs Hill Road, that theoretically the site should not be monitoring an exceedance based on road layout and vehicle figures.

The site at Shrubbs Hill Road (4a) is located at the façade of a residential building. Following advice from the Air Quality Helpdesk this site was turned into a duplicate site to check on the monitoring performance of the diffusion tubes, and an additional diffusion tube site was erected by the residential property's front door (Shrubbs Hill Road (4b)) still on the façade of the building, as shown in Figure 8.1.

Figure 8.1 Location of diffusion tube monitoring sites 4a and 4b



The monitoring results have determined that Shrubbs Hill Road (4a) is exceeding the nitrogen dioxide annual mean objective and is ~12µg/m^3 higher than at Shrubbs Hill Road (4b). Further investigations by the Council have determined that there is a domestic boiler outlet ~3m from site 4a, and the two windows on the building façade where 4a is located are the kitchen and bathroom.

It is the opinion of the Council that Shrubbs Hill Road (4a) is a site which has monitored a hot spot in nitrogen dioxide concentrations over a number of years. Monitoring at adjacent sites in Shrubbs Hill Road have not monitored an exceedance and the Detailed Assessment has determined that there should not be an exceedance of the nitrogen dioxide annual mean concentration at this location.

Whilst the Council is aware of the requirement to declare an Air Quality Management Area for locations likely to exceed the Air Quality objectives, the Council is questioning whether site 4a would be considered a site of relevant exposure. Therefore the information gathered and queries raised have been discussed with the Air Quality Helpdesk. The Council was advised . .

Technically, you only have [an] exceedence where there is relevant exposure. Therefore, to be absolutely correct you can identify all the living areas in the house/block (also on higher floor levels) and try to estimate concentrations in those rooms using the data from existing monitoring (e.g. using the fall-off with distance calculator). A more accurate method to do the above would be to use a dispersion model.

I would also recommend you to continue monitoring for another year - as concentration may vary from year to year - before you reach any decision.

Therefore the Council has decided to monitor the location using diffusion tubes during 2014 and to attempt to determine the concentrations of nitrogen dioxide at the relevant exposures points at the site. A continuing question to the Air Quality Helpdesk is whether the building façade has to lead onto a living space and whether that living space needs to have an opening (door / window) on the building façade being monitored. It is noted that a residential garden is not considered relevant exposure (for an annual mean objective), whereas a living space on the building façade with no opening windows / doors onto the monitored façade could be determined as relevant exposure. These issues require resolving before this situation can be resolved.

It should be noted that a determination to declare an Air Quality Management Area in Shrubbs Hill Road is unlikely to result in additional work to address local air quality. This is because Shrubbs Hill Road forms part of the Lyndhurst one-way system which already contains the current Air Quality Management Area, and any options considered to reduce nitrogen dioxide concentrations within the Lyndhurst Air Quality Management Area are already assessed around the one-way system including Shrubbs Hill Road.

The two monitoring locations in Gosport Lane, Lyndhurst have produced results close to the nitrogen dioxide annual mean objective. The site at South View, Gosport Lane was located adjacent to a small housing development site during 2013 which is likely to account for the increase in monitoring results. This site will remain with monitoring continuing during 2014 to determine whether the monitored increase in 2013 was attributed to the housing development.

The site at 2 Gosport Lane is 23m outside the current Lyndhurst Air Quality Management Area. The site is adjacent to a two lane one-way system leading out of Lyndhurst. At the monitoring site two single lane roads enter Gosport Lane, both after 90^0 corners, before vehicles can change lanes or enter the Lyndhurst village car park.

It is believed the road layout of tight turns and the entrance into the car park results in variable vehicle speeds over short distances. This may be the reason the site often monitors an exceedance of the nitrogen dioxide annual mean objective, although it is noted that the monitoring in 2013 did not result in an exceedance of the objective. Indeed there was a noted decrease in monitoring results (the lowest since 2009) however the result at 37.48µg/m^3 is still close to the objective.

Therefore the Council has concluded that monitoring in 2014 using diffusion tubes will continue in Gosport Lane. This is to obtain a further year of monitoring results and to take into account whether these sites may be affected by the newly operating MOVA system in the High Street. Should monitoring results still determine exceedances of the annual mean objective for nitrogen dioxide or results close to the objective, the Council will either declare further Air Quality Management Areas or amend the current Air Quality Management Area in Lyndhurst to take into account these sites after full consultation.

Nitrogen dioxide monitoring using the automatic analyser and diffusion tubes will continue in Lyndhurst during 2014.

Monitoring in Totton has not shown an exceedance of the annual mean objective for nitrogen dioxide either inside or outside the Air Quality Management Area at any site since 2008. Whilst it is noted that the Council should be revoking the Air Quality Management Area in Totton based on the monitoring results, the Progress Report 2014 is recommending the decision to start the revocation process is deferred until Spring 2015.

The recommendation is based on the recent update concerning the re-development of Eling Wharf (as discussed in Section 4) and the potential for the development to include a significant number of housing units in addition to a large retail development. It is likely that such a development would increase traffic and congestion through the current Air Quality Management Area in Totton resulting in increases in localised pollutant concentrations. If a planning application is not submitted by Spring 2015, the Council will have to consider starting the process to revoke the Totton Air Quality Management Area.

It should be noted that if the Eling Wharf re-development proceeds, the Air Quality Management Area could still be revoked if the impact of the development on local air quality is sufficiently addressed and shown not to result in the exceedance of any of the air quality objectives. However in the interim the Progress Report 2014 recommends a deferred decision with regards to revoking the Air Quality Management Area in order to have confidence that such a large re-development in Totton would not have a significant impact on local air quality.

Nitrogen dioxide monitoring using the automatic analyser and diffusion tubes will continue in Totton during 2014.

A couple of diffusion tubes sites have also been noted as reporting interesting results for the nitrogen dioxide annual mean. One site was 2a Romsey Road which has shown an increase from 36.94µg/m^3 in 2012 to 37.79µg/m^3 in 2013, which would be considered a borderline result, ie close to the objective. This site is within the Lyndhurst Air Quality Management Area and will continue to be monitored.

A further site on the A31 at Stoney Cross was being reported as borderline in 2012, with a monitored result of 36.24µg/m^3 however in 2013 the results decreased significantly to 33.78µg/m^3. This site is considered relevant exposure, is adjacent to a main route through the district (A31) and has frequently been considered a borderline site, therefore monitoring will continue at this location.

The trend data shown for nitrogen dioxide monitoring using diffusion tubes at sites within the Lyndhurst Air Quality Management Area has shown a general slight decrease in nitrogen dioxide concentrations over time (2005 – 2014). It is hoped this decreasing trend will continue.

It is also noted that throughout all the diffusion tube sites, the majority of sites have monitored slight decreases in nitrogen dioxide concentrations between 2012 and 2013 with 29 sites (out of 44) monitoring a decrease. This gives an overall District wide picture of the monitoring in 2013 compared to 2012, although the changes across the district are difficult to explain - it may be the influence of weather conditions or subtle changes in fleet configurations. Whilst it is worth keeping a note of such patterns, overall it is monitored exceedances of the air quality objectives which would result in action being taken to reduce pollution concentrations.

Following monitoring in 2013, it is recommended that some diffusion tube sites are removed. The sites being considered are located in Marchwood where the majority of sites were erected to obtain monitoring data prior and post commissioning of Marchwood Power station. Monitoring has not determined exceedances of the Air Quality objectives either using automatic monitoring or diffusion tubes, therefore it is likely the monitoring will be scaled back, with only a few diffusion tubes remaining to obtain local monitoring data for the area which includes an industrial park and trunk road (A326).

The Council will continue to review its monitoring sites throughout the District and locate or remove sites as required. **In the meantime monitoring of nitrogen dioxide using diffusion tubes will continue throughout the District during 2014.**

It is noted that there are no monitored exceedances of the particulate matter (PM_{10}) objectives at any of the monitoring sites during 2013. The sites monitoring PM_{10} at Holbury and Totton are still relevant and will continue to monitor for particulate matter. It is noted that the Council uses TEOM monitors which do not meet the equivalence criteria, however the annual results are corrected using the Defra accepted volatile correction method (VCM) as detailed in Appendix B. Should the Council determine the PM_{10} concentrations are likely to exceed the objectives or that the particulate monitoring

equipment requires replacement, then equipment that meets the equivalence criteria will be installed to replace the existing TEOM's.

Monitoring of PM_{10} at Totton and Holbury will continue in 2014.

Monitoring results for sulphur dioxide from Fawley and Holbury have not shown an exceedance of the any of the sulphur dioxide objectives. Indeed there have been no monitored exceedances of the sulphur dioxide objective since the monitored exceedance of the 15 minute mean objective at Fawley in 2005. As a result the Air Quality Management Area for Fawley for the likely exceedance of the 15 minute mean objective was revoked in April 2013.

Monitoring of sulphur dioxide at Fawley and Holbury will continue in 2014 in order to obtain local monitoring data for the area.

8.2 Conclusions relating to New Local Developments

The assessment of new local developments within the New Forest district has concluded that to the best of our knowledge there will be no impacts on air quality from local developments: road transport, other transport, industrial installations or domestic sources and fugitive emissions.

A commercial biomass boiler has been granted planning permission in Gore Road, New Milton. Part of the planning application included an air quality impact assessment which concluded that the impact on local air quality from the biomass boiler was negligible to small. The assessment was considered and accepted by New Forest District Council.

Furthermore, the biomass boiler will require a Part B Permit (under the Environmental Permitting Regulations 2010 as amended) to operate issued by New Forest District Council. The Council is currently determining the application for the Permit which will

include conditions to control and assess emissions from the plant. The Operators Permit will be required before the plant can operate.

Therefore due to the submission of an air quality impact assessment as part of the planning permission and Operators Permit application there is no need to proceed to a Detailed Assessment for this new development.

8.3 Other Conclusions

The Air Quality Action Plans for Totton and Lyndhurst are transport related. It has been concluded that all the transport options have been assessed for feasibility by the transport authority (Hampshire County Council), and a number of transport schemes progressed. It is unlikely at this time, that further transport schemes will be implemented in Lyndhurst and Totton, and therefore the focus of the Air Quality Action Plans is to progress the smarter options.

In Totton it has been concluded that the feasibility of all transport schemes has been exhausted and the major transport related schemes cannot be progressed due to issues relating to costs and social exclusion. The decision to start the revocation of the Air Quality Management Area has been deferred until Spring 2015 and is dependent on the submission of a planning application for the significant re-development at Eling Wharf. In the meantime a number of smarter options within the Air Quality Action Plan will be progressed, for example working with Asda to develop their travel plan and ensuring the static signs are in place.

In Lyndhurst it has been concluded that the feasibility of all transport schemes has been exhausted and the major transport related schemes cannot be progressed due to issues relating to costs, increased congestion and environmental impacts. However the implementation of the MOVA system at the traffic lights of the High Street and Romsey Road has been a success showing improvements traffic flow and a reduction in monitored nitrogen dioxide concentrations at the automatic analyser.

Some smaller transport related schemes (including smarter options) have either been implemented or are progressing. It has been concluded that these schemes will not significantly reduce nitrogen dioxide concentrations to below the annual mean objective, however all options should be forwarded to obtain even a slight improvement in nitrogen dioxide concentrations. It is acknowledged that the smarter (and non-transport related) options in Lyndhurst requires further work to forward their progression.

It is noted that the Air Quality Management Area for Fawley was revoked in April 2013.

There are no current approved planning applications which may impact upon air quality in the District except the commercial biomass boiler noted above (section 8.2). However it is anticipated that a planning application will be submitted in due course for a mixed development on a brown field site in Totton (Eling Wharf). This development will require a detailed air quality assessment as part of the planning application.

It is acknowledged that officers undertaking air quality work within New Forest District Council have to work within two different planning authorities due to the New Forest National Park. Both planning authorities have adopted planning policies which identify the requirements to assess planning applications for likely impacts concerning air quality, and it is the aim of Environmental Protection to work with both planning authorities to produce a relevant local guide concerning air quality and planning in the near future.

New Forest District Council will continue to work with Hampshire County Council with regards to transport issues, air quality and the production of Local Transport Plans within its District. A New Forest Transport Statement produced by Hampshire County Council pulls together an extensive list of transport schemes and aspirations. Whilst it is acknowledged that many of these schemes are in the prefeasibility stages, with no available funding and long term timescales, such schemes may have a positive impact on air quality. Therefore those schemes of air quality significance have been

noted within the Air Quality Action Plan update with the hope that air quality may assist in developing some of these transport schemes in the future.

8.4 Proposed Actions

The Progress Report 2014 has not identified the requirement for additional monitoring however some diffusion tube sites will be removed. There are no further changes to the existing monitoring programme which will continue during 2014.

The Progress Report 2014 has identified a monitored exceedance of the annual mean objective for nitrogen dioxide outside the current Air Quality Management Area in Lyndhurst in a small area of Shrubbs Hill Road. A recently submitted Detailed Assessment did not identify this location as an exceeding site, therefore monitoring at this site will continue during 2014 along with discussions concerning the relevant exposure at the site with the Air Quality Helpdesk in order for the Council to determine the most appropriate course of action. The Council has also deferred the decision to start the revocation of the Totton Air Quality Management Area until May 2015 depending on the submission of a planning application for the re-development of Eling Wharf.

Therefore in conclusion, further work to be completed or progressed by New Forest District Council is as follows:

- **Continue the current air quality monitoring programme in New Forest district**

- **Start consultation process to revoke the Totton Air Quality Management Area in 2015 subject to submission of Eling Wharf planning application**

- **Produce an air quality planning guide for the New Forest District Council and New Forest National Park Authority by January 2016**

- **Produce a district wide Updating and Screening Assessment by end of April 2015**

9 References

Defra (2009). *Part IV of the Environment Act 1995. Local Air Quality Management. Technical Guidance LAQM.TG(09). February 2009*. Defra.

Defra (2013). *Diffusion Tubes.* [Online]. Available from: http://laqm.defra.gov.uk/diffusion-tubes/diffusion-tubes.html [Accessed 22 May 2013].

EMAQ (2013). *AQ Advanced (II): Development Control and Air Quality Impact Assessment.* Training Course CIEH, Ricardo-AEA, IAQM. January 2013

Erg (2013). *Air Quality in the New Forest.* [Online]. Available from: http://www.hantsair.org.uk/hampshire/asp/home.asp?la=NFDC [Accessed 22 May 2013].

Environment Agency (2014). *Public Registers* [Online]. Available from: http://epr.environment-agency.gov.uk/ePRInternet/searchregisters.aspx [Accessed 3 June 2014].

Hampshire County Council (2013(a)). *Local Transport Plan.* [Online]. Available from: http://www3.hants.gov.uk/transport/local-transport-plan.htm [Accessed 19 June 2013].

Hampshire County Council (2013(b)). *Transport Statements for Hampshire.* [Online]. Available from: http://www3.hants.gov.uk/transport-planning/transport-statements.htm [Accessed 19 June 2013].

Hampshire County Council (2013(c)). *Traffic Signal Control (MOVA system)* [Online]. Available from: http://www3.hants.gov.uk/search?cx=009988739743092233991%3A4hx6rzq-jqg&cof=FORID%3A11&q=MOVA&sa=Search [Accessed 19 June 2013].

Office for National Statistics (2013).*Neighbourhood Statistics.* [Online]. Available from: http://www.neighbourhood.statistics.gov.uk/dissemination/ [Accessed 22 May 2013].

Appendices

Appendix A:	Part A permitted processes within New Forest district
Appendix B:	QA/QC Local bias correction factor spreadsheets
Appendix C:	Full data set – nitrogen dioxide automatic monitoring hourly means
Appendix D:	Annualised calculations for short term data sets
Appendix E:	Adjustment for relevant exposure
Appendix F:	Full data set – diffusion tube monitoring results

Appendix A: Part A Permitted Processes within New Forest district (2013) (EA, 2014)

Operator/Site Name	Current Environmental Permit Number
Esso Petroleum Co. Ltd	JP3631KW
Esso Petroleum Company Ltd	BR6996IC
ExxonMobil Chemical Limited	ZP3839MG
Tradebe	FP3435KW FP3935KL
Nalco Manufacturing Ltd	PP3432HA
Versalis UK Ltd	BR8263IE
Veolia ES (UK) Ltd	NP3833UE
Veolia ES Hampshire Ltd	BJ7093IY
Marchwood Power Ltd	BL6217IM
RWE npower plc	WP3535ZZ
Npower Cogen (Hythe) Ltd	BK1732IQ
GEO Speciality Chemicals UK Ltd	SP3038FQ

Appendix B: QA/QC

QA/QC of automatic monitoring

All of the automatic monitoring sites undertake a daily internal calibration using either on site gases or permeation tubes and scrubbers. The sites are also manually calibrated using a reference span gas once a fortnight. The gas is obtained from Air Liquide and BOC, and each cylinder is certified.

In addition, the sites are serviced and calibrated every 6 months by engineers from EnviroTech who hold the service contract for the Council. The engineer is also available for call outs if the site appears to be malfunctioning.

Erg, at Kings College, London, validates and ratifies the data from the sites, which is downloaded twice a day and hourly from the Fawley site. During the validation process any potential problems are identified and if necessary reported back to the Council and EnviroTech. The data is ratified every 1-3 months during which the manual calibrations and servicing are taken into account. Full ratification of the data occurs annually when all servicing and auditing reports, calibrations and breakdown information can be applied to the data.

The Council contracts AEA to externally audit the automatic monitoring sites biannually. This process ensures quality assurance and control of the sites.

The data given in the Progress Report 2014 has been fully ratified.

QA/QC of diffusion tube monitoring

The determination of nitrogen dioxide diffusion tube precision is obtained from duplicate and triplicate co-located sites. The results from triplicate diffusion tube sites operated by New Forest District Council at Totton, Lyndhurst and Marchwood can be seen in the spreadsheet calculation used to determine local bias correction and shown in Appendix F. All the triplicate diffusion tube sites throughout 2013 showed good precision.

Gradko International Ltd. is a UKAS accredited laboratory and has been rated ‘good’ through the Workplace Analysis Scheme for Proficiency (WASP) as determined by the health and safety laboratory. Gradko International Ltd. also follows procedures set out in the Technical Guidance LAQM.TG(09) (Defra, 2009).

Diffusion Tube Bias Adjustment Factors

The nitrogen dioxide diffusion tubes were supplied and analysed by Gradko International Ltd. The preparation method used for the diffusion tubes was 20% TEA (triethanolamine) in water.

The national bias adjustment factor for Gradko using the preparation method of 20% TEA in water (2013) was 0.95. This was obtained from the Local Air Quality Management website (Defra, 2013) from database version 03/13.

Factor from Local Co-location Studies

Three different local bias correction factors were determined for the data for 2013. These were as follows;

Details of Bias Correction Factors

Location	Bias Correction Factor
Totton	**0.84**
Lyndhurst (street canyon)	**0.88**
Marchwood	**0.98**

The local bias correction factors have been determined using calculations supplied by the Local Air Quality Management website (Defra, 2013) and are shown below for Totton and Lyndhurst.

Totton – Local Bias Correction Factor Spreadsheet

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	03.01.2013	31.01.2013	43	36.65	38.33	39	3.3	8	8.2
2	31.01.2013	28.02.2013	37.61	41.45	39.25	39	1.9	5	4.8
3	28.02.2013	28.03.2013	42.8	40.91	45.88	43	2.5	6	6.2
4	28.03.2013	23.04.2013	25.24	29.67	30.32	28	2.8	10	6.9
5	23.04.2013	30.05.2013	25.9	27.61	24.98	26	1.3	5	3.3
6	30.05.2013	27.06.2013	27.49	27.88	26.37	27	0.8	3	1.9
7	27.06.2013	02.08.2013	32.83	29.47	29.65	31	1.9	6	4.7
8	02.08.2013	13.09.2013	27.91	28.6	30.82	29	1.5	5	3.8
9	13.09.2013	25.09.2013	36.33	34.85	34.34	35	1.0	3	2.6
10	25.09.2013	29.10.2013	32.76	33.7	34.2	34	0.7	2	1.8
11	29.10.2013	06.12.2013	31.17	37.21	33.38	34	3.1	9	7.6
12	06.12.2013	08.01.2014	29.84	33.96	36.65	33	3.4	10	8.5
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
32.6	78	Good	Good
33.4	99	Good	Good
38.4	100	Good	Good
25.5	99	Good	Good
20	100	Good	Good
21	85	Good	Good
24	64	Good	r Data Capture
23	83	Good	Good
21	97	Good	Good
28	97	Good	Good
35.7	100	Good	Good
30.6	100	Good	Good
Overall survey -->		Good precision	Good Overall

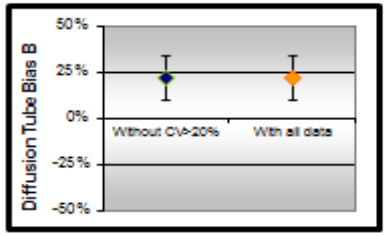
(Check average CV & DC from Accuracy calculations)

Site Name/ ID: Totton

Precision 12 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 11 periods of data
Bias factor A 0.84 (0.76 - 0.93)
Bias B 19% (8% - 31%)
Diffusion Tubes Mean: 34 μgm^{-3}
Mean CV (Precision): 6
Automatic Mean: 28 μgm^{-3}
Data Capture for periods used: 94%
Adjusted Tubes Mean: 28 (25 - 31) μgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 11 periods of data
Bias factor A 0.84 (0.76 - 0.93)
Bias B 19% (8% - 31%)
Diffusion Tubes Mean: 34 μgm^{-3}
Mean CV (Precision): 6
Automatic Mean: 28 μgm^{-3}
Data Capture for periods used: 94%
Adjusted Tubes Mean: 28 (25 - 31) μgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

If you have any enquiries about this spreadsheet please contact the LAQM Helpdesk at: LAQMHelpdesk@uk.bureauveritas.com

Lyndhurst - Local Bias Correction Factor Spreadsheet

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	02.01.2013	30.01.2013	52.32	47.57	41.51	47	5.4	11	13.5	39.9	99	Good	Good
2	30.01.2013	27.02.2013	51.6	44.51	51.09	49	4.0	8	9.8	39.9	100	Good	Good
3	27.02.2013	26.03.2013	50.29	54.97	50.34	52	2.7	5	6.7	47.4	100	Good	Good
4	26.03.2013	22.04.2013	40.38	40.96	38.65	40	1.2	3	3.0	38.5	100	Good	Good
5	22.04.2013	30.05.2013	41.54	39.31	41.15	41	1.2	3	3.0	35	100	Good	Good
6	30.05.2013	27.06.2013	44.38	41.86	41.43	43	1.6	4	4.0	39	100	Good	Good
7	27.06.2013	01.08.2013	46.21	41.93	49.06	46	3.6	8	8.9	44	100	Good	Good
8	01.08.2013	11.09.2013	53.93	46.96	51.24	51	3.5	7	8.7	41	100	Good	Good
9	11.09.2013	24.09.2013	41.95	40.54	42.21	42	0.9	2	2.2	36	100	Good	Good
10	24.09.2013	31.10.2013	54.75	43.06	38.73	46	8.3	18	20.6	38	100	Good	Good
11	31.10.2013	04.12.2013	47.25	45.72	48.52	47	1.4	3	3.5	43.7	100	Good	Good
12	04.12.2013	06.01.2014	40.77	41.03	40.13	41	0.5	1	1.2	47	41	Good	or Data Capture
13													
										Overall survey -->		Good precision	Good Overall

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

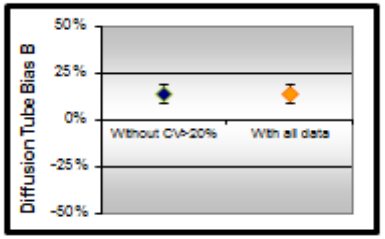
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	Lyndhurst

Precision 12 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 11 periods of data	
Bias factor A	0.88 (0.84 - 0.92)
Bias B	13% (8% - 18%)
Diffusion Tubes Mean:	46 μgm^{-3}
Mean CV (Precision):	7
Automatic Mean:	40 μgm^{-3}
Data Capture for periods used:	100%
Adjusted Tubes Mean:	40 (38 - 42) μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 11 periods of data	
Bias factor A	0.88 (0.84 - 0.92)
Bias B	13% (8% - 18%)
Diffusion Tubes Mean:	46 μgm^{-3}
Mean CV (Precision):	7
Automatic Mean:	40 μgm^{-3}
Data Capture for periods used:	100%
Adjusted Tubes Mean:	40 (38 - 42) μgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

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Marchwood - Local Bias Correction Factor Spreadsheet

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	02.01.2013	30.01.2013	25.95	26.72	25.94	26	0.4	2	1.1	25.4	99	Good	Good
2	30.01.2013	27.02.2013	26.88	26.62	28.47	27	1.0	4	2.5	22.1	100	Good	Good
3	27.02.2013	27.03.2013	32.8	32.49	32.95	33	0.2	1	0.6	30.4	97	Good	Good
4	27.03.2013	23.04.2013	18.72	18.5	18.66	19	0.1	1	0.3	21.4	98	Good	Good
5	23.04.2013	28.05.2013	16.4	12.47	17.71	16	2.7	18	6.8	17	100	Good	Good
6	28.05.2013	28.06.2013	16.42	15.98	15.77	16	0.3	2	0.8	17	100	Good	Good
7	28.06.2013	31.07.2013								16	97		Good
8	31.07.2013	11.09.2013	13.7	16.74	15.56	15	1.5	10	3.8	16	100	Good	Good
9	11.09.2013	27.09.2013	19.77	19.09	20.05	20	0.5	3	1.2	17	100	Good	Good
10	27.09.2013	29.10.2013	14.74	16.88	17.62	16	1.5	9	3.7	18	97	Good	Good
11	29.10.2013	05.12.2013	24.92	25.52	25.31	25	0.3	1	0.8	27.1	100	Good	Good
12	05.12.2013	10.01.2014	16.42	17.42	17.9	17	0.8	4	1.9	17.4	100	Good	Good
13													
											Overall survey -->	Good precision	Good

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

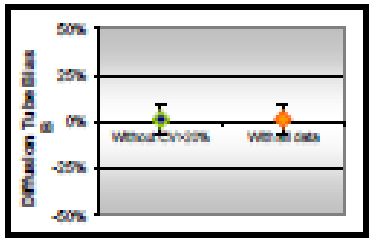
Site Name/ ID:	MARCHWOOD

Precision: 11 out of 11 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval)	
without periods with CV larger than 20%	
Bias calculated using 11 periods of data	
Bias factor A	0.98 (0.92 - 1.06)
Bias B	2% (-6% - 9%)
Diffusion Tubes Mean:	21 μgm^{-3}
Mean CV (Precision):	5
Automatic Mean:	21 μgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	21 (19 - 22) μgm^{-3}

Accuracy (with 95% confidence interval)	
WITH ALL DATA	
Bias calculated using 11 periods of data	
Bias factor A	0.98 (0.92 - 1.06)
Bias B	2% (-6% - 9%)
Diffusion Tubes Mean:	21 μgm^{-3}
Mean CV (Precision):	5
Automatic Mean:	21 μgm^{-3}
Data Capture for periods used:	99%
Adjusted Tubes Mean:	21 (19 - 22) μgm^{-3}



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Version 04 - February 2011

Discussion of Choice of Factor to Use

The diffusion tube results have been bias corrected to allow for laboratory bias. Bias correction factors can either be determined from local or national data sets, and factors influencing the decision on which bias correction factors to use include local conditions and the location of automatic nitrogen oxides analysers. 4 different bias correction factors have been applied to the 2013 diffusion tube data for New Forest.

Local bias correction factors were determined and used for diffusion tube sites located in Totton and Marchwood. These locations contain an automatic monitoring site with a co-located triplicate diffusion tube site, therefore enabling a local correction factor to be applied.

In Lyndhurst 5 diffusion tube sites have been locally biased corrected. These 5 diffusion tube sites and the automatic monitoring site are located within the street canyon of the High Street. The remaining 14 diffusion tube sites in Lyndhurst have been bias corrected using the national bias correction factor, as these sites are located outside the effects of the street canyon in the High Street, Lyndhurst.

The bias correction factors used on the 2013 diffusion tube data are shown below;

Details of Bias Correction Factors

Location	Bias Correction Factor	Local / National
Totton	**0.84**	Local
Lyndhurst (street canyon)	**0.88**	Local
Lyndhurst	**0.95**	National
Marchwood	**0.98**	Local
Remaining sites	**0.95**	National

It is noted that bias correction factors less than 1 will reduce the raw annual mean result for each diffusion tube, whilst factors greater than 1 will increase the raw annual mean result. The degree of adjustment will depend on the bias correction factor, with larger adjustments noted the further the correction factor is from 1. Therefore the choice of bias correction factor is important.

In conclusion, I am confident in the determination and selection of the bias correction factors used to adjust raw diffusion tube data. The correct methods have been followed using the data available, although it is clear how influential the correction factors can be to the overall conclusion made.

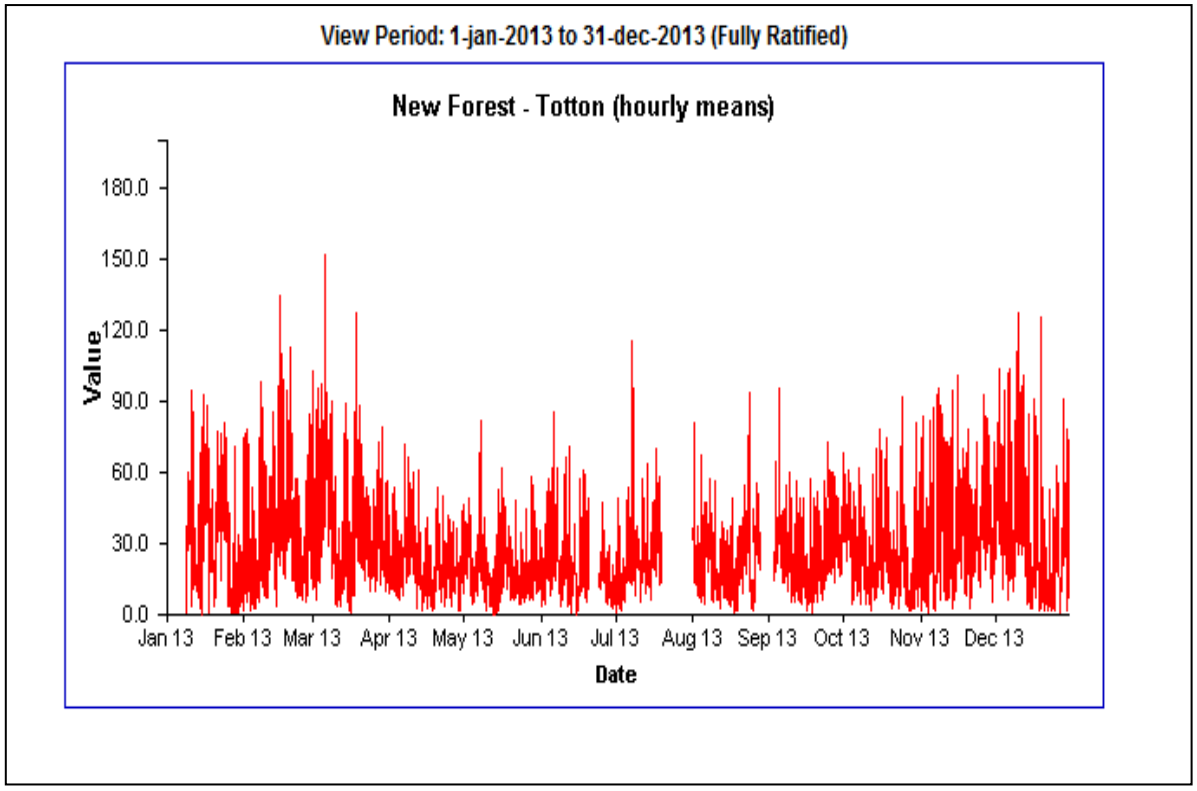
PM Monitoring Adjustment

New Forest District Council uses TEOM analysers to monitor PM_{10}. It is noted that this monitoring equipment does not meet the equivalence criteria, however guidance states that it is not necessary to immediately replace the monitoring equipment particularly considering the monitored PM_{10} concentrations are below the objectives. When the equipment is due for replacement the Council will consider other equipment which meets the equivalence criteria.

PM_{10} data has been adjusted using the Volatile Correction Model (VCM) to correct for the use of a TEOM particulate monitor.

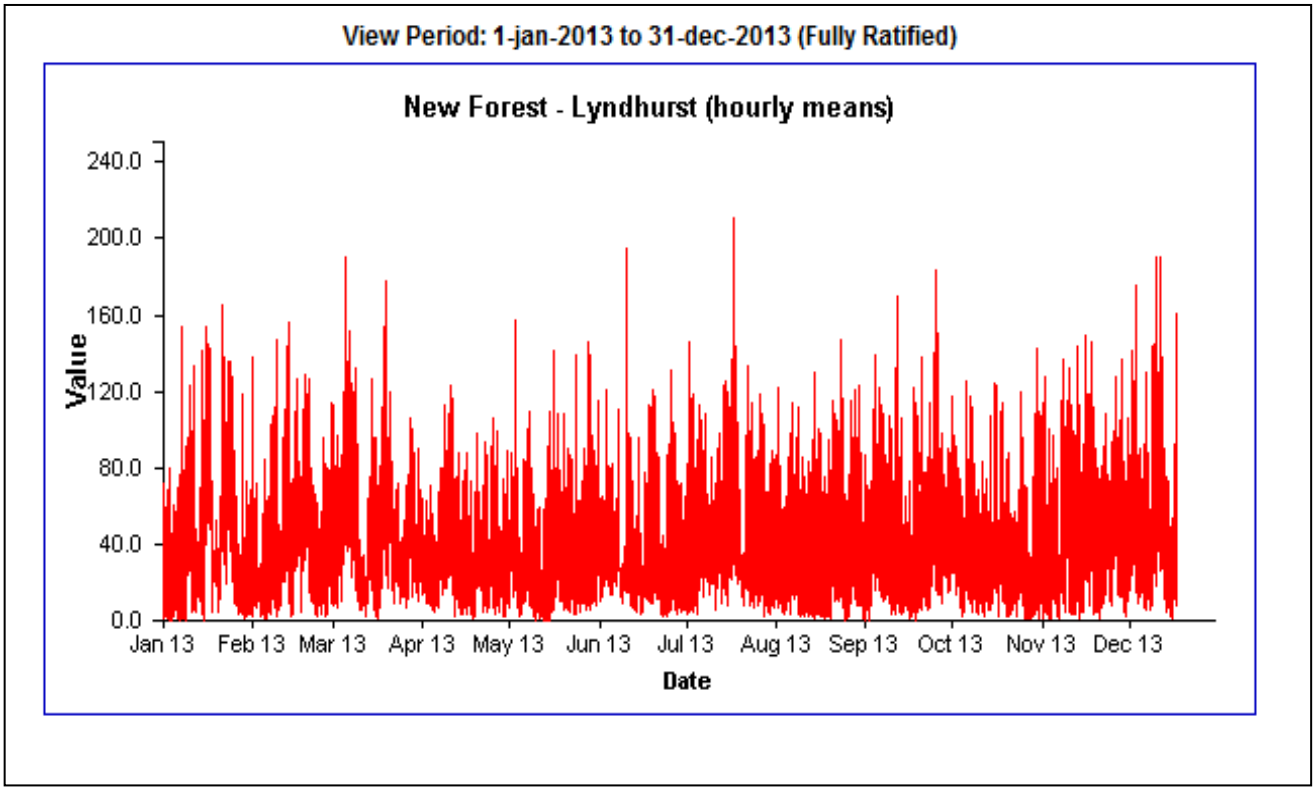
Appendix C: Full data set of nitrogen dioxide automatic monitoring 2013 (hourly mean)

Totton



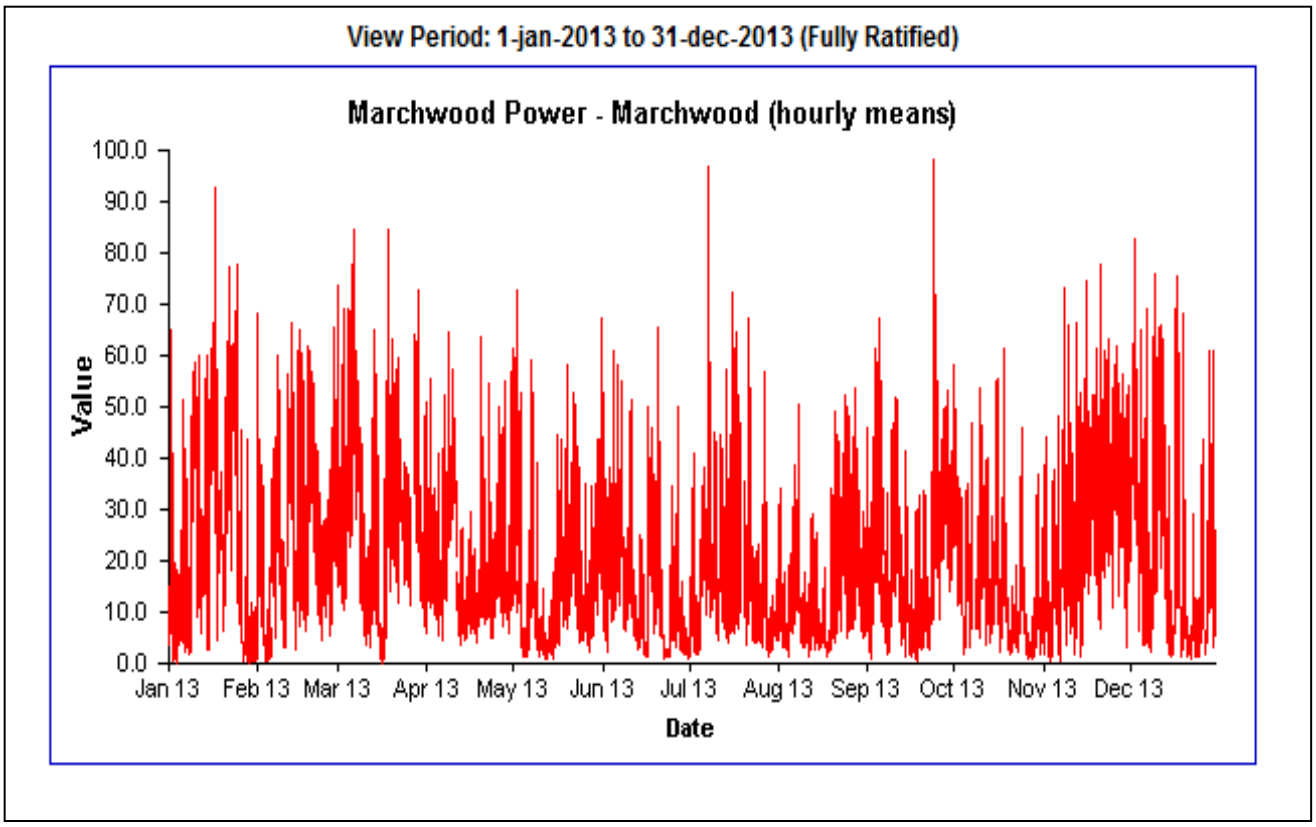
Note: Results shown in µgm^{-3}. Hourly exceedance objective = 200µgm^{-3} over 18 times per year.

Lyndhurst



Note: Results shown in µgm^{-3}. Hourly exceedance objective = 200µgm^{-3} over 18 times per year.

Marchwood



Note: Results shown in µgm^{-3}. Hourly exceedance objective = 200µgm^{-3} over 18 times per year.

Appendix D: Annualised calculations for short term data

Short-term to Long-term Data adjustment

During 2013 5 diffusion tube sites reported data over the calendar year of less than 75%. Therefore in accordance with Technical Guidance (TG(09) Box 3.2, the data collated from these sites was annualised, as detailed below.

It should be noted that each site was determined individually and was dependent on which periods during the calendar year had produced actual data and which periods had no data. Typically data was not available due to diffusion tubes being taken from sites or highly unusual results (often very low) which were determined as abnormal and therefore removed from the data set for the site.

The long term sites utilised in the calculations were Portsmouth AURN and Southampton AURN. For the monitoring period, the annual mean (Am) results for these sites were reported as:

A Portsmouth (Am) 2013 = 21.9
B Southampton (Am) 2013 = 30.2

Shrubbs Hill Road (site 4b)

Long term site	Annual mean (Am)	Period mean (Pm)	Ratio (Am/Pm)
A	21.9	19.7	1.11
B	30.2	32.9	0.92
		Average Ratio	1.015

Data from site over monitoring period = 34.20µgm^{-3}

Annualised result = (34.20µgm^{-3} x 1.015) x 0.95 (bias correction factor)

= 32.98µgm^{-3}

Queens House (site 7)

This diffusion tube site had 3 periods of collated data during the monitoring period (2013) resulting in multiple period means in order to determine the overall period mean average for each long term site.

Long term site	Annual mean (Am)	Period mean (Pm)	Period mean (Pm)	Period mean (Pm)	Period mean average	Ratio (Am/Pm)
A	21.9	28.7	16.1	21.1	21.97	0.997
B	30.2	29.5	23.7	35.3	29.5	1.024
					Average Ratio	1.010

Data from site over monitoring period = 21.61µgm^{-3}

Annualised result = (21.61µgm^{-3} x 1.010) x 0.95 (bias correction factor)

= 20.73µgm^{-3}

Rose Road (site 33)

This diffusion tube site had 3 periods of collated data during the monitoring period (2013) resulting in multiple period means in order to determine the overall period mean average for each long term site.

Long term site	Annual mean (Am)	Period mean (Pm)	Period mean (Pm)	Period mean (Pm)	Period mean average	Ratio (Am/Pm)
A	21.9	29.0	15.8	17.2	20.67	1.06
B	30.1	31.7	22.7	29.0	27.80	1.08
					Average Ratio	1.07

Data from site over monitoring period = 30.34µgm^{-3}

Annualised result = (30.34µgm^{-3} x 1.07 x 0.84 (bias correction factor)

= 27.28µgm^{-3}

Junction Road (site 22)

This diffusion tube site had 2 periods of collated data during the monitoring period (2013) resulting in multiple period means in order to determine the overall period mean average for each long term site.

Long term site	Annual mean (Am)	Period mean (Pm)	Period mean (Pm)	Period mean average	Ratio (Am/Pm)
A	21.9	26.8	20.3	23.55	0.93
B	30.1	30.2	33.3	31.70	0.95
				Average Ratio	0.94

Data from site over monitoring period = 41.80µgm^{-3}

Annualised result = (41.80µgm^{-3} x 0.94) x 0.84 (bias correction factor)

= 33.00µgm^{-3}

Commercial Road (site 29)

This diffusion tube site had 2 periods of collated data during the monitoring period (2013) resulting in multiple period means in order to determine the overall period mean average for each long term site.

Long term site	Annual mean (Am)	Period mean (Pm)	Period mean (Pm)	Period mean average	Ratio (Am/Pm)
A	21.9	26.0	28.9	23.15	0.95
B	30.1	28.9	33.3	31.10	0.97
				Average Ratio	0.96

Data from site over monitoring period = 32.63µgm^{-3}

Annualised result = (32.63µgm^{-3} x 0.96) x 0.84 (bias correction factor)

= 26.31µgm^{-3}

Appendix E: Adjustment for relevant exposure

In accordance with guidance (REF) adjustments are made to bias corrected diffusion tube results when monitoring is undertaken at an exceeding site which is not determined to be relevant public exposure.

With regards to the monitoring undertaken within the New Forest district only one site monitored an exceedance of the nitrogen dioxide annual mean at a location determined not to be relevant public exposure: **South View, Gosport Lane, Lyndhurst.**

South View monitored an annual mean for nitrogen dioxide of 42.77µgm^{-3}, however after using the adjustment calculator *http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html* this concentration decreased to 36.50µgm^{-3} at the point of relevant exposure, as shown below:

This calculator allows you to predict the annual mean NO_2 concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph.

Air Quality CONSULTANTS

Enter data into the yellow cells

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	4	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	8	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	(Note 2)	10.31	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	(Note 2)	42.77	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	(Note 3)	36.5	µg/m^3

Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

Note 3: The calculator follows the procedure set out in Box 2.3 of LAQM TG(09). The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

Issue 4: 25/01/11. Created by Dr Ben Marner; Approved by Prof Duncan Laxen. Contact: benmarner@aqconsultants.co.uk

Appendix E: Full data set of diffusion tube monitoring results

Lyndhurst

Exposure dates		Site						
		Goose Green, Lyndhurst Rd	Foxlease Ter, Shrubbs Hill Rd	Opp Foxlease Terr	The Orchards, Shrubbs Hill Rd (a)	The Orchards, Shrubbs Hill Rd (a)	The Orchards, Shrubbs Hill Rd (a) average	The Orchards, Shrubbs Hill Rd (b)
02.01.2013	30.01.2013	35.08	40.88	34.24	53.14		53.14	
30.01.2013	27.02.2013	33.88	40.22	6.97*	53.13		53.13	
27.02.2013	26.03.2013	39.28	49.63	37.98	66.5		66.5	
26.03.2013	22.04.2013	28.56	37.81	25.45	42.66		42.66	
22.04.2013	30.05.2013	26.45	27.17		41.66		41.66	
30.05.2013	27.06.2013	26.96	34.67		45.87		45.87	
27.06.2013	01.08.2013		35.6	32.57	50.4		50.5	
01.08.2013	11.09.2013		37.09	30.96	45.08	58.88	51.98	38.94
11.09.2013	24.09.2013	24.19	30.24	27.47	35.91	36.55	36.26	29.84
24.09.2013	31.10.2013	28.42	31.09	30.77	33.5	40.86	37.18	34.56
31.10.2013	04.12.2013	30.95	38.86	36.59	67.5	50.07	poor precision	35.52
04.12.2013	06.01.2014	27.49	29.17	16.27	38.81	39.46	39.13	32.14
Uncorrected average		30.13	36.04	30.26			47.09	34.20

Note:
****Unusual result not included in calculation***

Exposure dates		Site					
		Hillmead Lodge, Shrubbs Hill Rd	Little Queens	Queens House	Lyndhurst School	15 High Street	16 High Street
02.01.2013	30.01.2013	33.86	20.01	6.13*	33.17	57.09	46.33
30.01.2013	27.02.2013	0.69*	26.51	2.55*	30.28	61.13	45.3
27.02.2013	26.03.2013	17.09*	32.3	21.87	36.73	76.01	51.25
26.03.2013	22.04.2013		24.89	25.13	25.69	45.67	36.62
22.04.2013	30.05.2013	33.78	16.93		23.73	53.67	53.3
30.05.2013	27.06.2013	31.28	19.36	13.02	23.55	47.47	46.89
27.06.2013	01.08.2013	30.79	22.15	21.51	25.78	55.28	56.82
01.08.2013	11.09.2013	34.66	20.95		26.93	46.84	59.31
11.09.2013	24.09.2013	34.76	15.71		25.64	49.48	44.66
24.09.2013	31.10.2013	32.93	21.66	21.3	30.58	44.88	42.76
31.10.2013	04.12.2013	38.79	23.52	27.81	31.9	55.37	55.06
04.12.2013	06.01.2014	33.52	18.2	20.64	28.16	44.9	50.95
Uncorrected average		33.82	21.85	21.61	28.51	53.15	49.10

Note;
****Unusual result - not included in calculations***

Exposure dates		Site								
		14 High Street (Analyser)	(Analyser)	(Analyser)	Analyser average	2a, Romsey Rd	22 Romsey Rd	28 High St.	28 High St.	28 High St. average
02.01.2013	30.01.2013	52.32	47.57	41.51	47.13	45.05	32.45	37.01	37.33	37.17
30.01.2013	27.02.2013	51.6	44.51	51.09	49.07	43.7	35.62	37.99	34.58	36.29
27.02.2013	26.03.2013	50.29	54.97	50.34	51.87	55.57	45.4	35.75	33.69	34.72
26.03.2013	22.04.2013	40.38	40.96	38.65	40	42.42	32.14	28.51	29.09	28.80
22.04.2013	30.05.2013	41.54	39.31	41.15	40.67	39.74	15.31	25.53	27.04	26.29
30.05.2013	27.06.2013	44.38	41.86	41.43	42.56	38.79	28.89	25.35	26.84	26.10
27.06.2013	01.08.2013	46.21	41.93	49.06	45.73	40.08	33.76	25.7	25.62	25.66
01.08.2013	11.09.2013	53.93	46.96	51.24	50.71	45.81	29.62	29.06	28.06	28.56
11.09.2013	24.09.2013	41.95	40.54	42.21	41.57	39.01	27	27.28	27.49	27.39
24.09.2013	31.10.2013	54.75	43.06	38.73	45.51	37.51	32	29.66	30.55	30.11
31.10.2013	04.12.2013	47.25	45.72	48.52	47.16	44.66	33.32	31.48	37.22	34.35
04.12.2013	06.01.2014	40.77	41.03	40.13	40.64		27.75	32.85	35.11	33.98
Uncorrected average					45.22	42.94	31.11			30.78

Note;
****Unusual result - not included in calculations***

Exposure dates		Site				
		65, High St	2 Gosport Lane	South View Gosport Lane	Park Hotel	A35 Baytree Cottage
02.01.2013	30.01.2013	43.06	44.49	44.42	31.55	29.58
30.01.2013	27.02.2013	44.56	36.77	55.98	29.44	34.44
27.02.2013	26.03.2013	51.43	53.01	58.41	33.15	34.16
26.03.2013	22.04.2013	35.43	33.92	42.43	22.68	25.83
22.04.2013	30.05.2013	41.3	32.8	41.32	23.81	28.97
30.05.2013	27.06.2013	33.27	40.36	41.62	25.05	29.74
27.06.2013	01.08.2013			42.18	22.21	27.63
01.08.2013	11.09.2013	35.77	39.86	40.64	25.73	
11.09.2013	24.09.2013	36.08	36.69	41.33	23.8	28.57
24.09.2013	31.10.2013	37	39.8	41.89	25.9	25.19
31.10.2013	04.12.2013	41.45	36.93		33.75	38.87
04.12.2013	06.01.2014	33.53	39.34		29.98	
Uncorrected average		39.35	39.45	45.02	27.25	30.30

Totton

Exposure dates		Site					
		Junction Rd (Analyser)	(Analyser)	(Analyser)	Analyser average	30, Junction Rd	23, Junction Rd
03.01.2013	31.01.2013	43	36.65	38.33	39.33	41.76	44.99
31.01.2013	28.02.2013	37.61	41.45	39.25	39.44	48.12	44.72
28.02.2013	28.03.2013	42.8	40.91	45.88	43.20	51.62	46.92
28.03.2013	23.04.2013	25.24	29.67	30.32	28.41	29.52	37.81
23.04.2013	30.05.2013	25.9	27.61	24.98	26.16	30.04	38.17
30.05.2013	27.06.2013	27.49	27.88	26.37	27.25	31.59	
27.06.2013	02.08.2013	32.83	29.47	29.65	30.65	34.55	
02.08.2013	13.09.2013	27.91	28.6	30.82	29.11	30.48	
13.09.2013	25.09.2013	36.33	34.85	34.34	35.17	35.1	41.18
25.09.2013	29.10.2013	32.76	33.7	34.2	33.55	33.68	41.24
29.10.2013	06.12.2013	31.17	37.21	33.38	33.92	36.27	39.34
06.12.2013	08.01.2014	29.84	33.96	36.65	33.48		
Uncorrected average					33.31	36.62	41.80

Exposure dates		Site						
		25, Junction Road	26, Rumbridge St.	2, Eling Lane	Elingfield Court, High St.	55, High St.	Commercial Rd	114, Commercial Rd
03.01.2013	31.01.2013	35.58	45.51	45.6	41.26	39.18		42.47
31.01.2013	28.02.2013	37.31	45.89	45.01	37.86	35.5	35	45.67
28.02.2013	28.03.2013	41.39	46.42	47.8	45.48	42.8	43.61	52.38
28.03.2013	23.04.2013	28.83	35.73	33.2	33.38	29.22	27.9	37.49
23.04.2013	30.05.2013	26.46	29.09		25.95	23.95	24.68	30.71
30.05.2013	27.06.2013	23.03	29.74		28.39	29.42		29.4
27.06.2013	02.08.2013	28.06	33.57	29.46	30.9	26.37		33.97
02.08.2013	13.09.2013	26.48	31.66	30.81	28.5	24.64		31.16
13.09.2013	25.09.2013	31.29	35.66	36.62	31.57	29.97	31.45	34.42
25.09.2013	29.10.2013	30.69	32.85	38.05	35.41	31.93	36.76	
29.10.2013	06.12.2013	30.16	35.26	40.96	31.81	30.46	29.02	
06.12.2013	08.01.2014	30.31	40.37	38.4	31.27	34.08		
Uncorrected average		30.80	36.81	38.59	33.48	31.46	32.63	37.52

Exposure dates		Sites			
		83, Ringwood Rd	Ringwood Rd / Maynard Rd	Asda roundab't	1, Rose Rd
03.01.2013	31.01.2013	36.95	37.91	37.52	34.52
31.01.2013	28.02.2013	35.6	41.41	37.59	39.59
28.02.2013	28.03.2013	37.05	42.34	44.2	33.66
28.03.2013	23.04.2013	30.23	33.16	29.3	24.41
23.04.2013	30.05.2013	27.67	30.31	30.5	
30.05.2013	27.06.2013	27.89	33.42	26.14	24.99
27.06.2013	02.08.2013	28.12	37.66	28.79	
02.08.2013	13.09.2013	31.39	34.25	34.94	
13.09.2013	25.09.2013	33.9	40.46	35.06	27.66
25.09.2013	29.10.2013	31.1	38.73	29.25	27.65
29.10.2013	06.12.2013	37.81	32.7	32.86	
06.12.2013	08.01.2014	36.61	38.01		
Uncorrected average		32.86	36.70	33.28	30.35

Other Sites

Exposure dates		Site					
		Bilberry Drive	Shorefield Road	Magazine Lane (Analyser)	(Analyser)	(Analyser)	Analyser average
02.01.2013	30.01.2013	24.09	27.84	25.95	26.72	25.94	26.20
30.01.2013	27.02.2013	26.49	31	26.86	26.62	28.47	27.32
27.02.2013	27.03.2013	28.24	31.02	32.8	32.49	32.95	32.75
27.03.2013	23.04.2013	15.07	20.59	18.72	18.5	18.66	18.63
23.04.2013	28.05.2013	14.67	21.38	16.4	12.47	17.71	15.53
28.05.2013	28.06.2013	15.91	19.98	16.42	15.98	15.77	16.06
28.06.2013	31.07.2013	15.56	21.29				
31.07.2013	11.09.2013	12.86	18.58	13.7	16.74	15.56	15.33
11.09.2013	27.09.2013	15.4	22.88	19.77	19.09	20.05	19.64
27.09.2013	29.10.2013	14.58	18.44	14.74	16.88	17.62	16.41
29.10.2013	05.12.2013	0.17		24.92	25.52	25.31	25.25
05.12.2013	10.01.2014			16.42	17.42	17.9	17.25
Uncorrected average		16.64	23.30				20.94

Exposure dates		Sites								
		Broadwalk Way	Autumn Road	Marchwood School	Holbury School	Holbury School	Holbury School average	Jubilee Hall, Fawley	Beaulieu	Rockbourne
02.01.2013	30.01.2013	25.44	24.55	27	19.9	20.61	20.255	19.36	20	13.82
30.01.2013	27.02.2013	23.32	27.28	25.38	20.42	19.9	20.16	20.9	17.84	12.89
27.02.2013	27.03.2013	32.72	31.75	28.82	22.69	24.94	23.815	24.67		40.55
27.03.2013	23.04.2013	16.86	18.13	18.59	12.28	14.27	13.275	13.53		7.79
23.04.2013	28.05.2013	15.37	14.17	14.99	9.35	9.95	9.65	13.69	9.94	6.11
28.05.2013	28.06.2013	18.41	16.97	17.37	11.38	11.97	11.675	15.37	10.28	6.73
28.06.2013	31.07.2013	17.08	17.42	18.64	12.05	12.15	12.1	14.13	10.8	5.84
31.07.2013	11.09.2013	18.22		16.24	7.85	8.91	8.38	14.41	7.88	5.57
11.09.2013	27.09.2013	22.69	20.85	22.36	15.41	15.93	15.67	17.98		7.61
27.09.2013	29.10.2013	18.51	18.31	17.82	13.29	14.25	13.77	15	10.68	8.7
29.10.2013	05.12.2013	28.34	25.89	22.31	17.74	19.82	18.78	21.5	15.37	11.05
05.12.2013	10.01.2014	18.54		23.18	11.55	11.63	11.59		9.49	8.14
Uncorrected average		21.29	21.53		21.06		14.93	17.32	12.47	11.23

Exposure dates		Sites		
		Stoney Cross	Stoney Cross	Stoney cross average
	01.02.2013	39.43	40.25	39.84
01.02.2013	01.03.2013	36.45	40.74	38.60
01.03.2013	28.03.2013	36.93	34.42	35.68
28.03.2013	26.04.2013	35.49	36.51	36.00
26.04.2013	30.05.2013	39.61	26.08	32.85
30.05.2013	27.06.2013	33.89	32.6	33.25
27.06.2013	02.08.2013	35.27	35.76	35.52
02.08.2013	13.09.2013	38.12	36.48	37.30
13.09.2013	24.09.2013	38.17	40.57	39.37
24.09.2013	01.11.2013	29.9	32.7	31.30
01.11.2013	06.12.2013	39.77	41.41	40.59
06.12.2013	08.01.2013	26.46		26.46
Uncorrected average				35.56