2012 Air Quality Updating and Screening Assessment for *Isle of Wight Council*

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

April 2012

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Executive Summary

Isle of Wight Council have kept air quality under review since the Updating and Screening Assessment 2009. Progress Reports were submitted in 2010 and 2011, which indicated that there was unlikely to be any exceedences of statutory air quality standards on the Isle of Wight.

Officers in Environmental Health have a routine of reviewing on a weekly basis all applications for planning consent registered with the Local Planning Authority. In this way, developments with the potential to compromise air quality have been identified and assessed.

This report outlines changes since the 2011 Annual Progress Report was issued. Other changes since the 2009 Updating and Screening Assessment have been reported in the Progress Reports for 2010 and 2011. The author of this report therefore believes that it is not necessary to duplicate effort and waste increasingly scarce public resource by re-visiting the information in those Progress Reports.

It should also be noted that during 2011 there have been 2 major photovoltaic farms installed on the Isle of Wight, with an estimated combined generation capacity of 10 MW of electricity. In addition, an unknown number of private houses on the island now have solar PV panels on their roofs.

The reduced emissions of CO_2, SO_2 and NO_x attributable to this switch from fossil-fuel generation to solar has not been quantified. In addition, as most of the electricity is generated off-island, the air quality benefits may have only a small impact on air quality local to the Isle of Wight. It is, nevertheless, worth mentioning here.

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1 Introduction

1.1 Description of Local Authority Area

Isle of Wight Council is a Unitary Authority which covers the whole of the Isle of Wight. The Isle of Wight is an island off the south coast of England. There are urban areas at Newport, Ryde, and the south-east coastal strip between Sandown and Shanklin. However, the majority of the Island is rural in character.

Tourism is a major contributor to the Island economy. It is estimated that the population is approximately double during the holiday season, with a large influx of visitors. It would be expected that this would result in significant differences between air pollution levels between winter and summer. Diffusion tube monitoring has not borne this out.

There are various industrial installations that are Permitted under the Environmental Permitting (England and Wales) Regulations 2010 (as amended), which are listed elsewhere in this report. However, the main source of air pollution is road traffic.

1.2 Purpose of Report

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

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

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre $\mu g/m^3$ (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 $\mu g/m^3$	Running annual mean	31.12.2003
	5.00 $\mu g/m^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu g/m^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu g/m^3$	Annual mean	31.12.2004
	0.25 $\mu g/m^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu g/m^3$	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu g/m^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu g/m^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

1.4.1 First Round Air Quality Review

The first round of the review in 2000 gave results that indicated that it was not necessary to proceed to a Detailed Assessment, as the specified pollutants were predicted to be below the Air Quality Objectives.

The report of the 2000 review is not available on-line.

1.4.2 Second Round Updating and Screening Assessment 2004

During the second round, the Updating and Screening report 2004 identified that there was a possibility that, for two of the pollutants, concentrations may exceed the Objectives in specific areas.

A Detailed Assessment was carried out in 2004, examining two pollutants. Since the first round of assessment, a new housing estate had been built close to the petrol storage depot at Kingston, East Cowes. Computer modelling was therefore carried out, to predict benzene concentrations in the area. This was supplemented by diffusion tube monitoring for a short period. The results of the monitoring were reported in an Air Quality Progress Report in 2005. The modelling, together with the diffusion tube results, showed that the benzene concentration in air close to the site was very unlikely to exceed the Objective. There was therefore no need to declare an Air Quality Management Area for Benzene.

In addition, the modelling for sulphur dioxide emissions from the three cross-Solent ferry terminals also showed that there would be no exceedences of the short-term Objective for SO2.

1.4.3 Third Round Updating and Screening Assessment 2006

During the third round, in 2006, it was identified that, at two of the sites (Fairlee Road and Lake Hill) there is a possibility that the Air Quality Objective for Nitrogen dioxide may be exceeded.

It was therefore decided to increase the number of diffusion tubes placed at the two sites, to monitor nitrogen oxides. Diffusion tubes are not as exact as they could be, so there was some doubt about the actual concentrations measured. Using three tubes at each site gives a more reliable result.

1.4.4 Detailed Assessment for Nitrogen Dioxide 2007

This was carried out using additional monitoring, using diffusion tubes. The 2007 Detailed Assessment Report concluded that there were unlikely to be exceedences

of the guideline standard for Nitrogen dioxide at either of the two sites referred to above.

1.4.5 Progress report 2008.

Reported on changes, and concluded that the air quality standards were unlikely to be exceeded.

1.4.6 Fourth Round Updating and Screening Assessment 2009

This concluded that the air quality guidelines were unlikely to be exceeded, and that there is therefore no requirement to proceed to a Detailed Review.

1.4.7 Progress Report 2010

This reported the results of additional diffusion tube monitoring of Nox at a second site on Fairlee Road, Newport. The results confirmed the adjusted results from the original monitoring site, that exceedences of NO2 limits are unlikely.

Other changes reported were also assessed as being unlikely to result in exceedences of the air quality standards.

1.4.8 Progress Report 2011

This reported on certain planning developments, and continuing monitoring of NO2 at two sites. It concluded that the changes were assessed as unlikely to result in exceedences of the air quality standards.

1.4.9 Conclusion

As a result of previous assessments and Progress Reports, no Air Quality Management Areas have been declared on the Isle of Wight.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

There are no automatic monitoring sites on the Isle of Wight.

2.1.2 Non-Automatic Monitoring Sites

There are two sites on the Isle of Wight where NO2 is monitored by diffusion tubes. IOW4 has been maintained since the beginning of monitoring in 2000, and therefore provides an estimate of changes year on year.

IOW10 is at Lake, on the main road between Sandown and Shanklin. It has replaced a site (IOW8) which had been identified as having no relevant exposure.

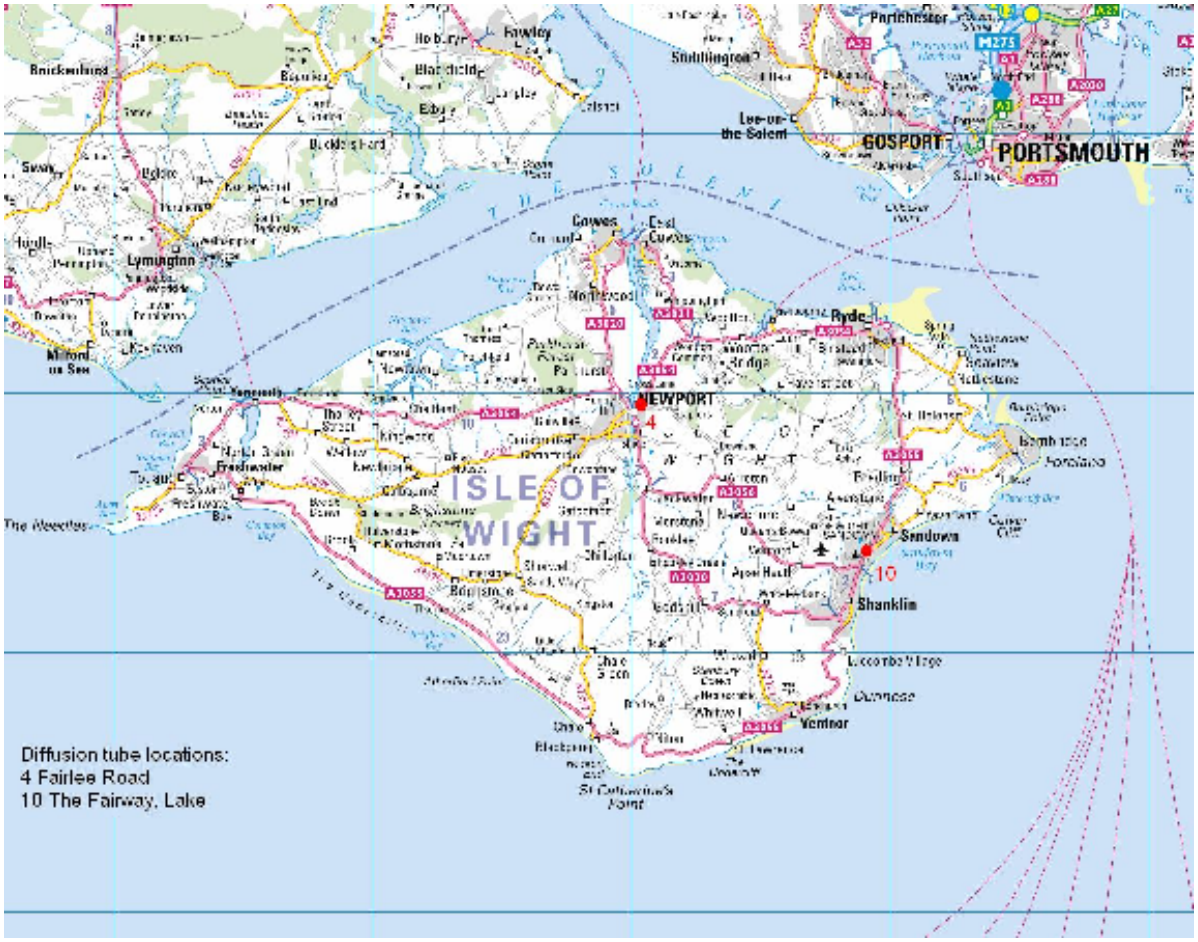
The laboratory used by Isle of Wight Council is the same as in previous years (Bureau Veritas ESGLtd. – Gradco 50% TEA in acetone).

The laboratory in Didcot is listed in the table of the WASP rounds 105 – 113 as having a score of 100%.

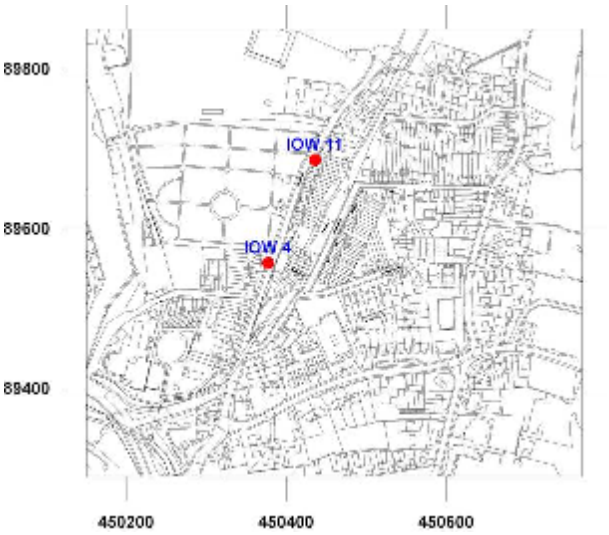
The bias adjustment factor used is the national bias adjustment factor for Gradko 50% TEA in acetone. This is 0.93 (for 2011).

Figure 2.2 Map of Non-Automatic Monitoring Sites

2.1.3 Map 1 General map



2.1.4 Map 2 Fairlee Road, Newport



IOW11 is no longer in use.

2.1.5 Map 3 Lake

IOW8 is no longer in use.

Table 2.2 Details of Non-Automatic Monitoring Sites

Site Name	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 *(N/A if not applicable)*	Does this location represent worst-case exposure?
IOW4	Kerbside	450377	089557	NO_2	N	N	N (11m)	0 m	Y
IOW10	Kerbside	459008	083715	NO_2	N	N	N (23 m)	2 m	Y

2.2 Comparison of Monitoring Results with AQ Objectives

The only monitoring carried out routinely is of Nitrogen dioxide.

2.2.1 Nitrogen Dioxide

Monitoring using diffusion tubes continues at two sites. A short period of monitoring at a site near to IOW4 (IOW11) confirmed that the monitoring at IOW4 gives representative results.

IOW4 is attached to a lamp-post on the kerb. Fairless Road is the main route between Newport and Ryde, and also forms the main route from the vehicle ferry terminal at Fishbourne and destinations to the West and South of Newport.

Three tubes are exposed at this site.

The nearest relevant public exposure is at the façade of the dwelling-house 51 Fairlee Road, set back about 11m from the kerb.

IOW10 is attached to a lamp-post on the triangular green on the junction of Lake Hill, Sandown Road and The Fairway. The nearest relevant public exposure is at The Old Manor House public house, and dwellings at 1 Denness Road and 38 and 40 Sandown Road. It is also likely to be representative of levels at other locations along Sandown Road and Lake Hill, where there is relevant exposure.

One tube is located at this site.

Diffusion Tube Monitoring Data

See the tables below.

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2011

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2011 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.93) 2011 (μg/m^3)
IOW4	Lamppost outside 51 Fairlee Road, Newport	Kerbside	N	Triplicate	12 months	N/A	See column to the right	45.77 (kerbside) 27.80 (corrected for distance)
IOW10	Lamppost on the green at Lake Hill / The Fairway, Lake	Kerbside	N	Single tube	12 months	N/A	N	27.22

Table 2.6 Results of Nitrogen Dioxide Diffusion Tubes (2007 to 2011)

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) μg/m^3				
			2007 (Bias Adjustment Factor = 0.99)	2008 (Bias Adjustment Factor = 0.94)	2009 (Bias Adjustment Factor = 0.97)	2010 (Bias Adjustment Factor = 1.03)	2011 (Bias Adjustment Factor = 0.93
IOW4	Kerbside	N	33.47	41.55	42.96	58.42	45.77
IOW8	Roadside	N	34.57	(not used)	(not used)	(not used)	(not used)
IOW10	Kerbside	N	24.05	24.43	23.23	30.64	24.58
IOW11	Roadside	N	(not used)	31.64	(not used)	(not used)	(not used)

Note: The figures in the table above are the kerbside results. Bias adjustment factors in this table are the national bias adjustment factors for the year in question. Some reports in previous years used bias adjustment factors for the year before, and therefore may not correspond to those used here. This report is submitted in April 2011, using this year's bias adjustment value. The value of 0.93 was therefore used.

Table 2.7 Results for IOW4 corrected for distance (2007 to 2011)

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) µg/m^3				
			2007 (Bias Adjustment Factor = 0.88)	2008 (Bias Adjustment Factor = 1.05)	2009 (Bias Adjustment Factor = 0.99)	2010 (Bias Adjustment Factor = 0.93)	2011 (Bias Adjustment Factor = 0.93)
IOW4	Kerbside	N	22.8	24.4	24.4	29.8	27.8

Distance-corrected values for IOW10 are not given, as the uncorrected values are below the limit.

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)	0.5	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	11	metres
Step 3	What is the local annual mean background NO_2 concentration (in µg/m^3)?	(Note 2)	12.831642	µg/m^3
Step 4	What is your measured annual mean NO_2 concentration (in µg/m^3)?	(Note 2)	45.77	µg/m^3
Result	The predicted annual mean NO_2 concentration (in µg/m^3) at your receptor	(Note 3)	27.8	µg/m^3

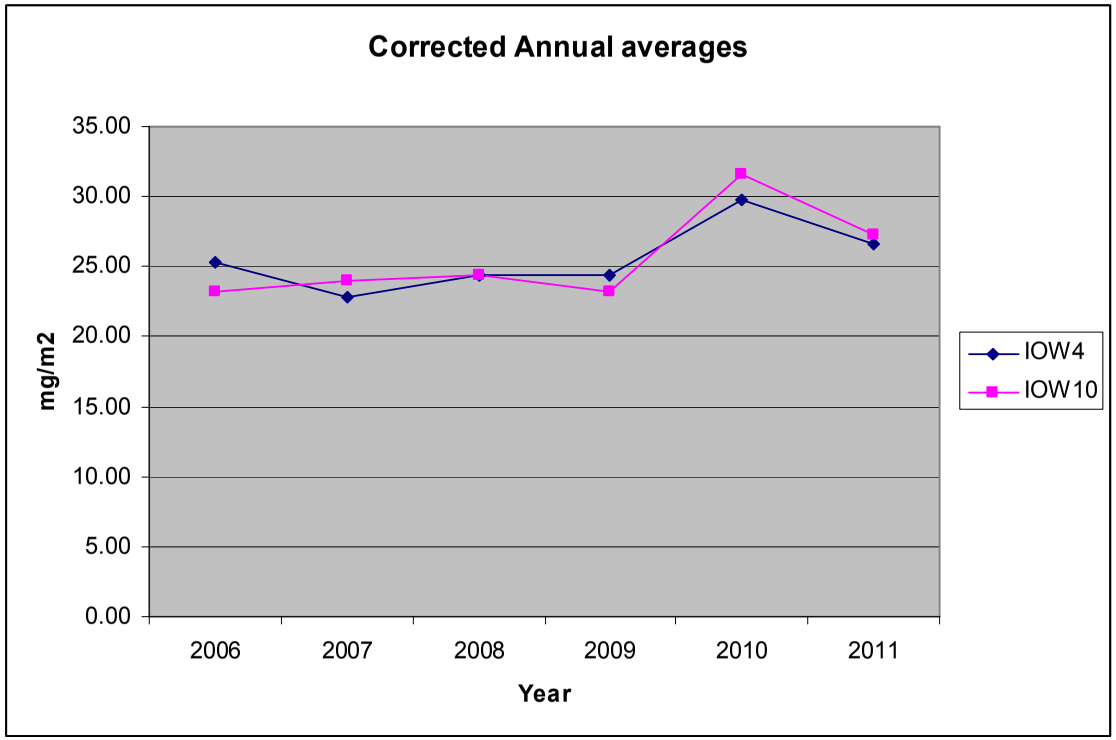
Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. 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

Figure 2.4 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites



2.2.2 PM_{10}

PM_{10} is not monitored on the Isle of Wight.

2.2.3 Sulphur Dioxide

Sulphur Dioxide is not monitored on the Isle of Wight.

2.2.4 Benzene

Benzene is not monitored on the Isle of Wight.

2.2.5 Other pollutants monitored

No other pollutants are monitored.

2.2.6 Summary of Compliance with AQS Objectives

Isle of Wight Council has examined the results from monitoring in the Unitary Authority area. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Isle of Wight Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

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

Isle of Wight Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

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

Isle of Wight Council confirms that there are no new/newly identified roads with high flows of buses/HGVs.

3.4 Junctions

As part of a major development near Newport ("the Pan Extension"), a new roundabout has been built on a main road leading into Newport. This roundabout is considered together with the new road it serves in section 3.5 below.

Isle of Wight Council confirms that there are no new/newly identified busy junctions/busy roads.

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

The Pan Extension is a development of more than 800 houses to the east of Newport.

Isle of Wight Council has assessed new/proposed roads meeting the criteria in Section A.5 of Box 5.3 in TG(09), and concluded that it will not be necessary to proceed to a Detailed Assessment.

3.6 Roads with Significantly Changed Traffic Flows

A new roundabout has been constructed on Staplers Road, Newport, at the junction with a new road serving a major housing development known as The Pan Extension.

Isle of Wight Council has assessed new/newly identified roads with significantly changed traffic flows, and concluded that it will not be necessary to proceed to a Detailed Assessment.

3.7 Bus and Coach Stations

Isle of Wight Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

Two airfields for light aircraft (Bembridge and Sandown) have previously been assessed as having no significant impact on air quality.

Isle of Wight Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

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

4.2.2 Moving Trains

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

4.3 Ports (Shipping)

Sulphur dioxide emissions from the cross-Solent ferries has previously been the subject of a Detailed Assessment. This demonstrated that emissions from the ferries at all three ports (Yarmouth, East Cowes and Fishbourne) are not resulting in exceedences of air quality standards. Since that Detailed Assessment there have been no changes in the ferry fleets, and any alterations to timetables have not affected emission rates.

Isle of Wight Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

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

Planning applications

A planning application was received for a district heating biomass installation as part of the major housing development known as The Pan Extension. Details of this application are on the Isle of Wight Council Planning website at http://www.iwight.com/council/departments/planning/appsdip/AppDetails3.aspx?frmId=23509.

The application was accompanied by an Air Quality Assessment Report at http://www.iwight.com/council/departments/planning/appsDIP/temptifpdf/zhzsir45oitgeafqph22mlam120111040220.pdf.

The report included the results of emissions modelling. The modelling assumed that both proposed biomass boilers would be operating at full capacity 24 hours a day for every day of the year.

In conversation with the consultant who carried out the modelling, it was established that it would be unlikely that these conditions would pertain in practice. The consultant re-ran the model, using an assumption about probable annual load that was more realistic.

A supplementary report was produced of this revised modelling, which demonstrated that, under realistic conditions of use, it would be unlikely that the biomass plant would result in exceedences of the air quality standards.

New Permitted Installations

The Council's officer responsible for Local Authority Permitting reports that there have been no new industrial installations since the Progress Report 2010 was published.

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

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

The Council's officer responsible for Local Authority Permitting reports that there have been no major increases in emissions at any permitted installations.

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

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

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

5.2 Major Fuel (Petrol) Storage Depots

There is a major fuel (petrol) storage depot within the Local Authority area, but this has been considered in previous reports. There have been no changes, and therefore it is not necessary to proceed to a further detailed assessment.

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5.3 Petrol Stations

Isle of Wight Council confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

Isle of Wight Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

A temporary biomass plant serving part of the new Pan Extension development was subjected to a screening assessment by the Council's Air Quality Officer, using supplementary guidance. This concluded that the plant would be unlikely to result in exceedences of the air quality standards.

The new biomass plant at Waitrose, East Cowes, (reported on in a previous Progress Report) is now in operation.

Isle of Wight Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.2 Biomass Combustion – Combined Impacts

Isle of Wight Council is not aware of any large-scale conversion to small domestic or commercial biomass plant. Such plant is excluded from the planning process by Permitted Development rules, making it unlikely that the Local Authority will get to know about any significant areas of cumulative small biomass plant.

Isle of Wight Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.3 Domestic Solid-Fuel Burning

Isle of Wight Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

Fugitive emissions from a quarry at St George's Down, Newport (Bardon Vectis) have previously been considered. A Planning application was received, seeking to extend the area of working.

The proposal was to enable the quarry to work an area that had not previously been worked. It was to replace an area where working has been completed. There will not be an intensification of use, and therefore emissions are likely to remain as previously.

Isle of Wight Council confirms that there are no new potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

Monitoring data for 2011 has demonstrated a reduction in NO2 concentrations in comparison to 2010. The 2010 values were unusually high, for no apparent reason.

NO2 concentration in 2011 were, nevertheless, higher than they were before 2010.

Isle of Wight Council concludes that there is unlikely to be exceedences of the air quality standard for Nitrogen dioxide, and therefore no need to progress to a Detailed Assessment.

However, the situation will be kept under review, and monitoring will continue. Results will be reported annually.

8.2 Conclusions from Assessment of Sources

Having assessed new sources since the 2009 Updating and Screening Assessment, Isle of Wight Council is satisfied that there are unlikely to be exceedences of the Air Quality Standards, and that it is will not be necessary to proceed to a Detailed Review.

8.3 Proposed Actions

Isle of Wight Council Environmental Health will continue to liaise with Isle of Wight Council Planning Services to identify new potentially polluting developments as they arise. Any Air Quality Assessments deemed to be necessary will be asked for at the Planning stage.

Isle of Wight Council will continue to carry out the monitoring programme for Nitrogen dioxide using diffusion tubes.

9 References

Isle of Wight Council, Round 1 Review and Assessment (Stage's I to III)

Isle of Wight Council, Updating and Screening Assessment, 2004.

Isle of Wight Council, Detailed Assessment, 2004.

Isle of Wight Council, Air Quality Progress Report, 2005.

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

UK Air Quality Archive, Nitrogen Dioxide Fall Off With Distance Calculator Issue 4. http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html

UK Air Quality Archive, Estimated Background Air Pollution Maps for 2008 and Projections for Other Years. http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html

National bias adjustment factors, September 2011. http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

Appendix A: QA:QC Data

Diffusion Tube Bias Adjustment Factors

Bias adjustment is effectively a calculated factor which shows whether diffusion tubes are over or under reading ambient concentrations and therefore allows for a correction to be made.

As there is no local automatic monitoring, Isle of Wight Council uses a national factor as given on the review and assessment help desk website[1] for Bureau Veritas (Gradko 50% TEA in acetone).

Factor from Local Co-location Studies (if available)

As the council does not carry out any continuous monitoring on the Island the national bias adjustment factor for Bureau Veritas (Gradko 50% TEA in acetone) has instead been used. The factors used in this assessment are as follows:

2000 - 1.2
2001 - 1.45
2002 - 1.27
2003 - 1.11
2004 - 1.1
2005 - 1.1
2006 - 1.01
2007 - 0.98
2008 - 0.93
2009 - 0.97
2010 - 1.03
2011 – 0.93

Discussion of Choice of Factor to Use

The Council has used the national factor for Bureau Veritas (Gradko 50% TEA acetone) as no local continuous monitoring is carried out.

PM Monitoring Adjustment

The Council does not carry out any local monitoring for PM_{10}.

Short-term to Long-term Data adjustment

This has not been necessary for the three years covered by this report.

QA/QC of automatic monitoring

No automatic monitoring is carried out on the Island.

QA/QC of diffusion tube monitoring

The Workplace Analysis Scheme for Proficiency (WASP) is an independent analytical performance testing scheme, operated by the Health and Safety Laboratory (HSL). WASP formed a key part of the former UK NO_2 Network's QA/QC, and remains an important QA/QC exercise for laboratories supplying diffusion tubes to Local Authorities for use in their Local Air Quality Management work.

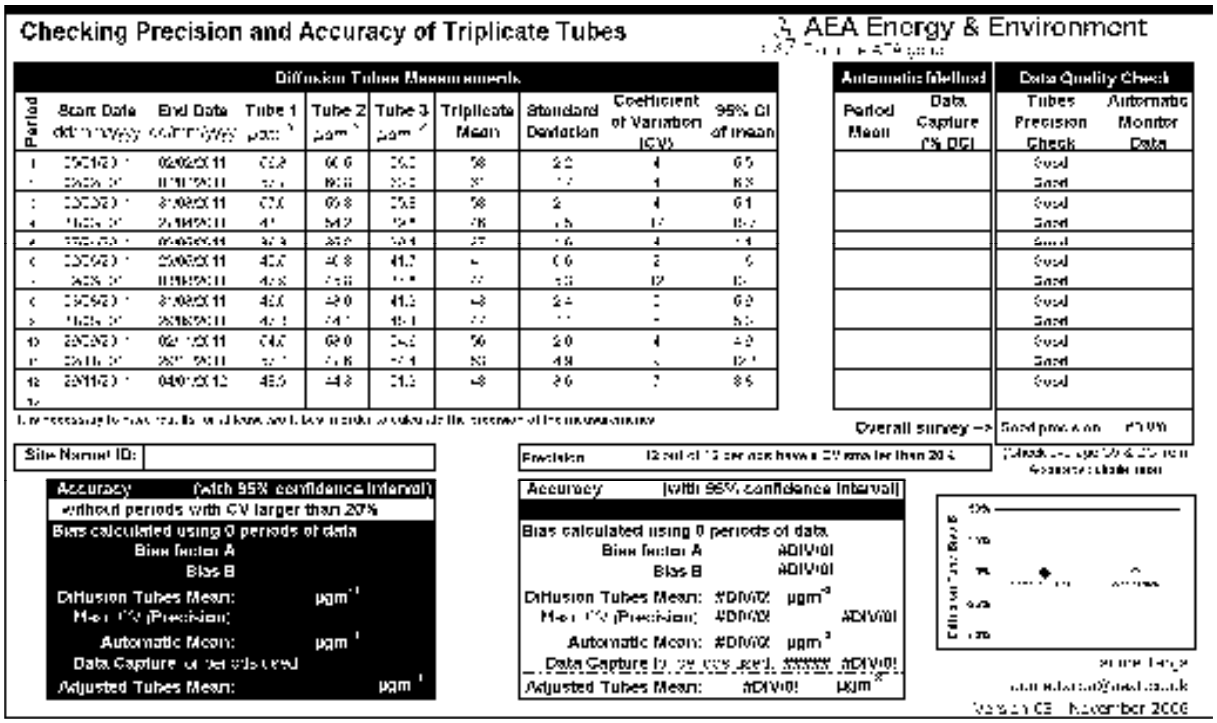
Defra and the Devolved Administrations advise that diffusion tubes used for LAQM should be obtained from laboratories that have demonstrated satisfactory performance in the WASP scheme.

Out of a rating of GOOD, ACCEPETABLE, WARNING AND FAILURE, the results for 2008 show that Bureau Veritas (Gradko) were rated as GOOD. This is classified as follows:

GOOD: Results obtained by the participating laboratory, Bureau Veritas (Gradko 50% TEA in acetone) are on average within 13% of the assigned value. This equates to an RPI of 169 or less.

I attach a copy of a report on methodology and QA / QC from Environmental Scientific Group Ltd., Didcot (Appendix B). This report is copyright Environmental Scientifics Group Ltd., Unit 12, Moorbrook, Southmead Industrial Estate, Didcot, Oxfordshire, OX11 7HP and may not be reproduced without their consent.

Figure A1 Table of precision of diffusion tubes



Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment

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	29/12/10	02/02/2011	52.2	60.6	56.2	56	2.2	4	6.5			Good	
2	02/02/11	01/03/2011	52.1	60.0	55.2	56	2	4	6.1			Good	
3	01/03/11	31/03/2011	47.6	55.8	51.8	52	2	4	6.1			Good	
4	31/03/11	28/04/2011	41.1	48.2	42.8	44	3.5	8	10.2			Good	
5	28/04/11	26/05/2011	42.3	48.6	44.4	45	3.6	8	10.4			Good	
6	26/05/11	30/06/2011	42.2	46.8	41.7	44	2.6	6	7.6			Good	
7	30/06/11	01/08/2011	42.6	47.6	44.4	45	2.6	6	7.6			Good	
8	01/08/11	31/08/2011	42.2	48.0	41.3	44	3.4	8	9.9			Good	
9	31/08/11	28/09/2011	40.1	44.1	40.1	41	2.2	5	6.5			Good	
10	28/09/11	02/11/2011	54.0	59.0	54.2	56	2.9	5	8.3			Good	
11	02/11/11	29/11/2011	50.1	54.6	50.4	52	2.5	5	7.1			Good	
12	29/11/11	04/01/2012	48.5	54.8	51.3	52	3.2	6	8.9			Good	
13													

Low percentage bias values should be viewed with caution as they may be a coincidence of the circumstances

Overall survey => Good precision (CV<20%)

Site Name/ ID:

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

(Check: 2 out of 3 tubes should agree within 20% of their mean)

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: µgm⁻³
Mean CV (Precision):
Automatic Mean: µgm⁻³
Data Capture for periods used:
Adjusted Tubes Mean: µgm⁻³

Accuracy (with 95% confidence interval)			
Bias calculated using 0 periods of data.			
Bias factor A	#DIV/0!		
Bias B	#DIV/0!		
Diffusion Tubes Mean:	#DIV/0!	µgm⁻³	
Mean CV (Precision):	#DIV/0!		#DIV/0!
Automatic Mean:	#DIV/0!	µgm⁻³	
Data Capture for periods used:	######		#DIV/0!
Adjusted Tubes Mean:	#DIV/0!	µgm⁻³	

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Appendix B – Report from the laboratory

NO2 Diffusion Tube Information – 2011/2

Supplier: Environmental Scientifics Group Ltd

Address: Unit 12
Moorbrook
Southmead Industrial Estate
Didcot
Oxfordshire
OX11 7HP

Diffusion Tube Performance:

Tube Type:	50% Acetone : 50% TEA
Uncertainty:	Under European guidelines, diffusion tubes are considered an indicative method, and as such the uncertainty is defined as <20%. (In field intercomparisons ESG's diffusion tubes perform at <10% uncertainty.)
Quality Control:	A quality control sample of known concentration is run every 10 samples. The data generated is compared to acceptable limits as determined statistically using a Shewhart Chart control system.
Analytical Repeatability:	In 2011 several thousand QC samples were analysed, achieving a relative standard deviation of 1.09%
Confidence Intervals:	Assuming a normal distribution, 95.45% of results should fall within 2σ (±2.18%) and 99.73% of results should fall within 3σ (±3.18%) of the expected value.
Limit Of Detection:	0.03µg NO_2 on the tube. Over a 4-week exposure this would equate to 0.6µg/m^3, or 0.3ppb

Quality Assurance: The manufacture and analysis of NO_2 diffusion tubes is covered by our UKAS accreditation

The method meets the requirements laid out in DEFRA's "Diffusion Tubes For Ambient NO2 Monitoring: A Practical Guidance."

The laboratory has taken part in the WASP proficiency scheme since it's inception, and has maintained the highest ranking of 'Satisfactory'

Analytical Information :

Analytical Technique:	Colorimetric
Instrument:	Continuous Flow Auto-analyser
Principle:	Nitrite ions react with Sulphanilamide to form a diazonium compound. In acidic conditions, this couples with N-(1-naphthyl)-ethylenediamine dihydrochloride to form a purple azo dye. Utilising spectrophotometric analysis at 540nm, the NO_2 concentration is calculated by quantification of the colour change in comparison to that produced by known standards.
Calibration:	Standards are made from brought in 1000ppm standard – These standards hold Iso Guide 34 and ISO/IEC 17025 certification The instrument is calibrated every run

	The instrument calibration must achieve a coefficient of linearity >0.999 to be considered acceptable.
System Suitability Checks:	System suitability checks are used to ensure performance within expected criteria. These include baseline, peak height and gain.
Extraction:	To ensure complete, homogeneous extraction, tubes are mixed on a vibrating tray for not less than 30 minutes.