



2009 Air Quality Updating and Screening Assessment for Inverclyde Council

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

August 2009



Executive Summary

In order to fulfil its statutory obligation under Part IV of the Environment Act 1995, Inverclyde Council has undertaken an Update and Screening Assessment of air quality throughout Inverclyde. The findings are detailed in this report.

Previous rounds of Review and Assessment concluded that there was no requirement to proceed to a Detailed Assessment for any pollutants contained in the Air Quality Scotland Regulations 2000 and there has never been an Air Quality Management Area declared within Invercelyde.

At present monitoring of NO₂ and benzene is undertaken throughout the area and Inverclyde Council has one Mobile Automatic Air Quality Monitor which also records the levels of NO₂, CO and PM₁₀. Data from these monitoring sites have consistently shown that Air Quality Objectives are being met for all measured pollutants.

There have been no significant changes to the existing road network or the introduction of new domestic or industrial sources since the previous round of Review and Assessment and it is anticipated that the Air Quality Objectives for all seven pollutants will continue to be met. There is therefore no requirement to proceed with a Detailed Assessment of any pollutant.

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1 Introduction

1.1 Description of Local Authority Area

Inverclyde is situated on the south bank of the Clyde Estuary at the mouth of the River Clyde where it opens into the Firth of Clyde. It is bounded by North Ayrshire to the south, Renfrewshire to the east and Argyll and Bute to the west and north. It is one of the smallest local authorities in Scotland extending 61 square miles and has a mixture of both urban and rural areas.

Map of Inverciyde



The 2008 population was estimated to be approximately 80,500 and is projected to fall to 77, 500 by 2015 and 69, 500 by 2030.

To stabilise one of the fastest declining populations in Scotland, a local regeneration company Riverside Inverclyde has been established. They will lead a £400 million initiative with the mission to revive Inverclyde into an attractive area for housing, businesses and leisure.

One of the targeted areas, shown below is the coastal strip between Greenock and Port Glasgow. Historically Inverclyde had significant associations with maritime trade and the associated industries of shipbuilding, rope making and sugar refining, the majority being confined to this area. Seven developments will now transform redundant dockland into residential and commercial areas, marina, leisure and public spaces.



Currently the majority of the population in Inverclyde is concentrated in Port Glasgow, Greenock and Gourock. Typical industries throughout the area consist of high technology firms and service sector industries.

Gourock contains little manufacturing industry and is recognised as a residential town and popular destination with ferry terminals connecting Inverclyde with Argyll and Bute.

The smaller settlements consisting of the rural villages Kilmacolm and Quarriers Village and the coastal villages of Inverkip and Wemyss Bay are also growing residential areas.

Road Network

Inverclyde is served by three main roads, the A8 (M8) from Glasgow and the Central Belt, the A78 which leads to Ayrshire and the West Coast and A761 from the rural areas of Kilmacolm and Bridge of Weir.

The busiest areas of road are along the A8 corridor which runs through Port Glasgow and Greenock. These stretches of road can become fairly congested during rush hour.

1.2 Purpose of Report

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

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in Scotland are set out in the Air Quality (Scotland) Regulations 2000 (Scottish SI 2000 No 97), the Air Quality (Scotland) (Amendment) Regulations 2002 (Scottish SI 2002 No 297), and are shown in Table 1.1.

This table shows the objectives in units of microgrammes 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).

Pollutant	Air Quality Objective	Date to be	
	Concentration	Measured as	achieved by
Benzene			
	16.25 <i>µ</i> g/m³	Running annual mean	31.12.2003
	3.25 <i>µ</i> g/m ³	Running annual mean	31.12.2010
1,3-Butadiene	2.25 <i>µ</i> 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 μg/m ³	Annual mean	31.12.2004
	0.25 <i>μ</i> g/m ³	Annual mean	31.12.2008
Nitrogen dioxide	200 μ g/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 <i>µ</i> g/m ³	Annual mean	31.12.2005
Particles (PM ₁₀) (gravimetric)	50 μ g/m ³ , not to be exceeded more than 35 times a year 40 μ g/m ³	24-hour mean Annual mean	31.12.2004 31.12.2004
	50 μ g/m ³ , not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18 <i>µ</i> g/m³	Annual mean	31.12.2010
Sulphur dioxide	350 μ g/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 μ g/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 μ g/m ³ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

Table 1.1Air Quality Objectives included in Regulations for the purpose of Local AirQuality Management in Scotland.

1.4 Summary of Previous Review and Assessments

The first round of Review and Assessment began in 1998 with a first stage review. This was a screening process to eliminate any pollutants which would not be of concern. The outcome of this stage was that a second stage review was required for PM_{10} and Nitrogen Dioxide, the two principal pollutants related to road traffic.

The second stage review was conducted in March 2000 and used extended monitoring and some simple modelling to predict current and future pollutant levels.

The results of these assessments concluded that the National Objectives would be met in Inverclyde.

Since then the Air Quality (Scotland) Amendment Regulations 2002 have tightened the Air Quality Objectives, and a new phased approach to Review and Assessment has been introduced.

An Updating and Screening Assessment was produced in April 2003. This concluded that the National Air Quality Objective would be met for Carbon Monoxide, 1,3-Butadiene, Lead, Sulphur Dioxide, Nitrogen Dioxide and PM_{10} . It also concluded that the National Air Quality Objective for Benzene should be met.

As a result of these conclusions, Inverclyde was not required to carry out a detailed assessment for any pollutant and therefore produced a Progress Report in April 2004.

The 2004 Progress Report concluded that the Objectives would be met for 5 of the 7 pollutants. After identifying high levels of Benzene in 2002, the 2003 results were reduced to a level more realistic for an authority of this size, and we were confident that the Objective would be met.

We also concluded that the Nitrogen Dioxide levels were marginally above the Objective level and therefore decided to monitor the sites closely over 2004.

The 2005 Progress Report and the 2006 Updating and Screening Assessment both showed that the Objectives would be met for all 7 pollutants, and that no detailed assessment would be required.

The subsequent 2007 and 2008 Progress Reports again concluded that the National Objectives would be met for all 7 pollutants.

Report Date	Outcome
Update and Screening Assessment: May 2003	Concluded that all air quality objectives would be
	met. No Detailed Assessment required.
Progress Report: April 2004	Concluded that all air quality objectives would be
	met.
Progress Report: June 2005	Concluded that all air quality objectives would be
	met.
Update and Screening Assessment: July 2006	Concluded that all air quality objectives would be
	met. No Detailed Assessment required.
Progress Report: July 2007	Concluded that all air quality objectives would be
	met.
Progress Report: July 2008	Concluded that all air quality objectives would be
	met.

Summary of Reports

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites



Inverclyde Council currently shares a Mobile Automatic Air Quality Monitor with North Ayrshire Council, details are contained in Table 2.1 below. The monitoring station was returned to Inverclyde in August 2008 and placed at Kilblain Street, Greenock as shown in the above map.

The monitoring station is located beside the main bus terminal in Greenock and shopping precinct. High rise flats are approximately 25m away.

Casella Monitor continuously collate and analyse the data from this station and also maintains, repairs and calibrates the equipment as part of the Service Level Agreement with Inverclyde Council. Details of the QA/QC procedures are contained in Appendix A.

Site Name	Site Type	OS Grid Ref	Pollutant s Monitore d	In AQM A?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst- case Locatio n?
Kilblain Street, Greenock	Urban Centre	227581 676282	NO _{2,} CO, PM10	N	25m	1.5m	Y

Table 2.1Automatic Air Quality Monitor Details.

2.1.2 Non-Automatic Monitoring

Inverclyde Council currently monitors NO₂ and benzene throughout its area.

 NO_2 diffusion tubes have been placed at 16 sites (11 in Greenock, 2 in Gourock and one each of the towns of Port Glasgow, Kilmacolm and Wemyss Bay). Benzene diffusion tubes have also been placed at 4 of these sites, all located within Greenock.

A summary of the monitoring sites is shown in the table below and a map showing the location of these points is contained in Appendix C.

Over the forthcoming year the NO₂ monitoring sites will be reviewed and new sites introduced into the current monitoring regime.

Glasgow Scientific Services analyse the diffusion tubes on a monthly basis. Details of the preparation method used and the bias adjustment factor applied are contained in Appendix A. Details of the QA/QC procedures are also contained here.

Inverkip St,

Greenock

Nelson St,

Greenock

Roadside

				U		
Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)
Carwood	Urban	229503	NO ₂	Ν	Y(13.5m)	5m
Court, Greenock	Background	675400				
East Hamilton St, Greenock	Roadside	229365 675700	NO _{2,} Benzene	Ν	Y(10m)	2.25m
Dellingburn St, Greenock	Roadside	228422 675735	NO _{2,} Benzene	N	Y(3.5m)	5m
Dalrymple St, Greenock	Roadside	228311 675993	NO ₂	N	Y(15m)	3m

 NO_2

Ν

Y(1m)

227563

676246

Table 2.2 **Details of Non- Automatic Monitoring Sites**

Nelson St, Greenock	Roadside	227092 676134	NO _{2,} Benzene	N	Y(1m)	5m	Y	
Broomhill St	Roadside	227263 675558	NO ₂	N	Y(48m)	1.5m	Y	
Inverkip Rd, Greenock	Roadside	224441 675224	NO _{2,} Benzene	Ν	Y(15m)	4m	Y	
Mercury Lane, Greenock	Roadside	223940 675018	NO ₂	N	Y(31m)	2.5m	Y	
Newark St, Greenock	Urban Background	225460 677501	NO ₂	Ν	Y(1m)	5m	Y	
Brougham St, Greenock	Roadside	227242 677032	NO ₂	N	Y(7m)	5.5m	Y	
Scarlow St, Port Glasgow	Roadside	231992 674633	NO ₂	N	Y (28m)	2m	Y	
Bridge of Weir Rd, Kilmacolm	Kerbside	235824 669909	NO ₂	N	Y(1m)	1m	Y	
Kempock St, Gourock	Kerbside	224097 677910	NO ₂	Ν	Y(1m)	1m	Y	
Cardwell Road, Gourock	Roadside	224664 677168	NO ₂	N	Y(3m)	4m	Y	
Greenock Road, Wemyss Bay	Kerbside	219407 669162	NO ₂	N	Y(18m)	1m	Y	

Worst-

case

Location?

Υ

Y

Υ

Y

Υ

2.5m

2.2 Comparison of Monitoring Results with AQ Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

Nitrogen Dioxide is monitored using the Mobile Automatic Air Quality Monitor located in Kilblain Street, Greenock.

The following data shown in table 2.3a below has been provided by Casella Monitor for the period 01 August 2008 – 31 July 2009. This data is shown in graphical format in Appendix D.

The annual mean concentration is recorded as being below the Air Quality Objective of 40 μ g/m³. No exceedences of the hourly mean of 200 μ g/m³ were reported throughout the monitoring period.

Table 2.3a Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective and Comparison with 1 hourly mean (200 μ g/m³)

Location	Within AQMA?	Proportion of year with valid data/ 2008Data Capture %	Annual mean concentrations (μg/m³)	Number of Exceedences of hourly mean (200 μg/m ³)
Kilblain Street, Greenock	N	99.8	21.2	0

Diffusion Tube Monitoring Data

The monthly passive diffusion tube results for NO₂ in Inverciyde in 2008 are contained in Appendix E.

Based on the available data, the annual mean at each monitoring site was below the annual mean Air Quality Objective of 40 μ g/m³. This is summarised in Table 2.4a below.

Table 2.4b also contains the annual mean concentration for each site for 2006 and 2007 for the purposes of comparison.

In summary with the exception of one site namely East Hamilton Street, the NO₂ annual mean concentrations have remained fairly constant or shown a decline.

			Annual mean
			concentrations 2008
			(µg/m³)
Location	Within AQMA?	Data Capture 2008 %	Adjusted for blas
Carwood Court, Greenock			
	N	91.7%	10.6
Scarlow St, Port Glasgow			13.1
	N	91.7%	10.1
Bridge of Weir Rd, Kilmacolm		0.4 70/	10.1
Fast Hamilton St. Crospook	N	91.7%	16.1
East Hamilton St, Greenock	N	91 7%	38.0
Dellingburn St, Greenock		01.170	00.0
	N	91.7%	36.9
Dalrymple St, Greenock			
	N	91.7%	21.2
Inverkip St, Greenock	N	01 79/	22.4
Broomhill St. Greenock	IN	91.170	55.4
Broomin St, Greenoek	N	91.7%	11.0
Nelson St, Greenock			
	N	75%	27.5
Inverkip Road, Greenock		750/	05.4
Marauny Lana, Graanaak	N	/5%	25.1
Mercury Lane, Greenock	N	91 7%	18.2
Greenock Rd. Wemvss Bav		011170	10.2
	N	83.3%	12.9
Kempock St, Gourock			
	N	91.7%	18.4
Cardwell Road, Gourock	N	02.20/	24.0
Newark St. Greenock	IN	03.3%	24.0
	N	91.7%	18.7
Brougham Street, Greenock			
	Ν	91.7%	25.1

Table 2.4a Results of Nitrogen Dioxide Diffusion Tubes

Location	Within AQMA?	n Annual mean concentrations (μg/m3 λ? Adjusted for bias			
		<u>2006</u>	<u>2007</u>	2008	
Carwood Court	N	13.58	9.74	10.6	
Scarlow St, Port Glasgow	N	20.3	15.5	13.1	
Bridge of Weir Rd, Kilmacolm	N	19.7	16.9	16.1	
East Hamilton St, Greenock	N	24.4	35.4	38.0	
Dellingburn St, Greenock	N	41.4	35.4	36.9	
Dalrymple St, Greenock	N	28.4	22.3	21.2	
Inverkip St, Greenock	N	32.7	31.5	33.4	
Broomhill St, Greenock	N	17.5	11.2	11.0	
Nelson St, Greenock	N	26.3	25.2	27.5	
Inverkip Road, Greenock	N	21	31.5	25.1	
Mercury Lane, Greenock	N	21.8	17.9	18.2	
Greenock Rd, Wemyss Bay	N	16.3	14.4	12.9	
Kempock St, Gourock	N	25.3	21.4	18.4	
Cardwell Road, Gourock	N	32.3	27.4	24.0	
Newark St, Greenock	N	19.9	17.7	18.7	
Brougham Street, Greenock	N	27.4	27.4	25.1	

Table 2.4b Results of Nitrogen Dioxide Diffusion Tubes

2.2.2 PM₁₀

PM₁₀ is monitored using the TEOM analyser within the Mobile Automatic Air Quality Station. The following results contained in table 2.5a below are based on data captured between 01 August 2008 and 31 July 2009. The results have also been presented in graphical format in Appendix D.

The data recorded showed that the current Air Quality Objective of 40 μ g/m³ annual mean concentration has not been exceeded and no exceedences of the daily mean objective of 50 μ g/m³ were reported.

Using the methodology in Box 2.2 and Paragraph 2.36 of LAQM TG (09), the 2010 PM_{10} annual mean concentration and number of daily exceedences has been predicted and detailed in tables 2.5a and 2.5b below.

Table 2.5a Results of PM₁₀ Automatic Monitoring: Comparison with Annual Mean Objective

		Data Capture 2008 %	Annual mean concentrations (μg/m ³)				
Location	Within AQMA?		2006	2007	2008	2010	
Kilblain Street, Greenock	Ν	100	N/A	N/A	14.8	14.26	

Table 2.5b Results of PM₁₀ Automatic Monitoring: Comparison with 24-hour Mean Objective

Location	Within AQMA?	Data Capture 2008	Number of Exceedences of daily mean objective (50 μg/m³)			
		%	2006	2007	2008	2010
Kilblain Street, Greenock	N	100	N/A	N/A	0	0

An Osiris Particulates Monitor has also recently been introduced into the current monitoring regime to measure PM_{10} and $PM_{2.5}$. This is currently positioned at Dellingburn Street, Greenock. Data from this site will be available for the forthcoming year.

2.2.3 Sulphur Dioxide

No monitoring for sulphur dioxide is undertaken in Inverclyde.

2.2.4 Benzene

The following benzene diffusion tube data has been provided by Glasgow Scientific Services. Data is only available from May 2008 onwards due to an instrumentation problem at the laboratory. There is also no monitoring data available for Inverkip Road in October and November due to damaged or missing diffusion tubes.

Benzene (ppb)										
	May June July Aug Sept Oct Nov Dec									2008 Mean (μg/m ³)
Nelson Street	xxx	0.1	0.25	0.15	0.2	0.22	0.36	0.41	0.24	0.79
Dellingburn Street	0.26	0.3	0.86	0.41	0.35	0.44	0.47	0.45	0.44	1.51
Inverkip Road	0.21	0.05	0.42	0.15	0.21	xxx	xxx	0.37	0.24	0.78
East Hamilton Street	0.18	0.1	0.08	0.13	0.2	0.17	0.26	0.34	0.18	0.60

Table 2.6a Results of Benzene Diffusion Tube Monitoring

Table 2.6b Results of Benzene Diffusion Tube Monitoring 2006-2008

Location	Within AQMA?	Annual mea	an concentrations (μg/m³)			
		<u>2006</u>	<u>2007</u>	<u>2008</u>		
Nelson Street, Greenock	Ν	1.17	0.98	0.79		
Dellingburn Street, Greenock	Ν	1.50	1.56	1.51		
Inverkip Road, Greenock	N	0.85	0.94	0.78		
East Hamilton Street, Greenock	N	ххх	0.78	0.60		

On the basis of the available data for 2008 and from assessment of historical monitoring data, the annual mean concentration for all sites is likely to be below the Air Quality Objective of $3.35 \ \mu g/m^3$.

2.2.5 Carbon Monoxide

Carbon Monoxide is monitored using the Mobile Air Quality Monitor at Kilblain Street, Greenock.

The following data contained in table 2.7a has been provided by Casella Monitor for the period 01 August 2008 – 31 July 2009. The results are also shown in graphical format in Appendix D.

The results show that the maximum daily running 8 hour mean concentration of 10mg/m³ was not exceeded throughout the monitoring period.

Table 2.7a Results of Automatic Monitoring for Carbon Monoxide: Comparison with 8 hourly mean (10mg/m^3)

Location	Within AQMA? %		mean concentration (mg/m ³)	Number of Exceedences of Max Daily Running 8 Hour Mean mean (10 mg/m ³)		
Kilblain Street, Greenock	N	96.7	0.132	0		

Inverclyde Council has examined the results from monitoring in the district. 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

Inverclyde Council confirms that there are no new or 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

Inverclyde 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.

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

3.4 Junctions and Busy Roads

Inverclyde 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

Inverclyde Council confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

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

3.7 Bus and Coach Stations

Inverclyde Council currently has one main bus terminal, located at Kilblain Street, Greenock. There have been new bus stations introduced since the previous round of Review and Assessment.

The Automatic Air Quality Monitor is also positioned beside this terminal and has recorded no exceedences of NO_2 , CO or PM_{10} Air Quality Objectives.

Inverclyde Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

Inverclyde Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

Inverclyde 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

Inverclyde 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)**

Inverclyde Council has one main port operated by Clydeport. This is located at Greenock Ocean Terminal, Patrick Street, Greenock and is visited by various sizes of container ships and cruise liners throughout the year.

Information obtained from Clydeport confirmed that there are less than 5,000 shipping movements per year with only 346 ships visited the port in 2008.

Three Roll On Roll Off passenger ferries also serve Inverclyde. The operators have confirmed that the fuel used in by the ferries is marine gas oil which has a sulphur content of less than 0.1%.

Inverclyde Council confirms that there are no ports or shipping that meets 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

Inverclyde 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.

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

Inverclyde 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

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

5.2 Major Fuel (Petrol) Storage Depots

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

5.3 Petrol Stations

Since the previous round of Review and Assessment a new petrol station has opened in Greenock Road, Port Glasgow however there is no relevant exposure within 10m of the pumps.

Inverclyde Council confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

Inverclyde Council confirms that there are no poultry farms meeting the specified criteria.

6 **Commercial and Domestic Sources**

6.1 **Biomass Combustion – Individual Installations**

Inverclyde Council is not aware of any commercial or domestic biomass combustion plants in the Local Authority area or any proposals for the introduction of these plants.

6.2 Biomass Combustion – Combined Impacts

Inverclyde Council is not aware of any existing biomass combustion plants in the Local Authority area or any proposals for the introduction of any plants.

6.3 Domestic Solid-Fuel Burning

There are currently 9 smoke control areas in Inverclyde; one in Greenock and the remaining eight in Port Glasgow. A map detailing these areas can be found in Appendix B.

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

7 Fugitive or Uncontrolled Sources

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

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

In summary the 2008 monitoring data for Inverclyde has identified no exceedances of the Air Quality Objectives for any of the monitored pollutants.

The NO_2 diffusion tube monitoring data recorded no exceedances of the annual or the hourly mean concentration. This is also consistent with historical data showing NO_2 concentrations to have remained fairly constant at the monitoring sites.

The benzene diffusion tube monitoring data also showed no exceedances of the annual mean with recorded concentrations being well below the Air Quality Objective.

The levels of NO₂, CO and PM_{10} which are currently monitored through the Mobile Air Quality Monitor have recorded no exceedences of the Air Quality Objectives. The PM_{10} annual mean Objective for 2010 is also expected to be achieved.

Based on the 2008 monitoring data and historical data it is unlikely that the Air Quality Objectives for any pollutants will be exceeded.

8.2 Conclusions from Assessment of Sources

Inverclyde Council has not identified any changes to the existing road infrastructure or changes to existing sources of transport in the area since the previous round of Review and Assessment.

There have also been no new industrial installations or biomass combustion plants introduced or any uncontrolled or fugitive sources identified.

There is therefore no requirement to proceed with a Detailed Assessment in relation to any sources considered in Technical Guidance LAQM.TG (09).

8.3 **Proposed Actions**

The outcome of the Update and Screening Assessment has not identified any areas of concern in terms of sources of pollutants or in relation to monitoring data. Inverclyde Council will therefore not be proceeding with a Detailed Assessment of any pollutant.

Monitoring of NO_2 and benzene will continue to be undertaken throughout the area using diffusion tubes. The existing sites will however be reviewed and new sites introduced. Inverclyde Council is also considering purchasing new monitoring equipment to replace our existing Mobile Automatic Air Quality Monitor.

An Osiris PM_{10} monitor has recently been installed at Dellingburn Street, Greenock and data for this site will be available to be included in the 2010 Progress Report.

9 References

- 1. The Air Quality (Scotland) Regulations 2000
- 2. The Air Quality (Scotland) Amendment Regulations 2002
- 3. Part IV of the Environment Act 1995 Local Air Quality Management Technical Guidance LAQM.TG(09), DEFRA, February 2009
- 4. Inverclyde Council Update and Screening Assessment 2003
- 5. Inverclyde Council Update and Screening Assessment 2006
- 6. Inverclyde Council Progress Report 2007
- 7. Inverclyde Council Progress Report 2008
- 8. UK Air Quality Archive website www.airquality.co.uk/archive/laqm/tools.php
- 9. Air Quality Review and Assessment Helpdesk ww.uwe.ac.uk/aqm/review/
- 10. Design Manual for Roads and Bridges Screening Method, Highways Agency
- 11. WASP Annual Performance Criteria for NO₂ Diffusion Tubes used in Air Quality Management, 2008 onwards, prepared by AEA

10 Appendices

Appendix A: QA/QC Data

Diffusion Tube Bias Adjustment Factors

Glasgow Scientific Services supply and analyse both NO₂ and benzene diffusion tubes on a monthly basis. The preparation method used is 20% TEA in Water.

The bias adjustment factor used for the NO₂ diffusion tube data was obtained from the Review and Assessment Helpdesk Database and is reported as 0.97. No local co-location studies were available to produce bias adjustment factors.

PM Monitoring Adjustment

As per TG09 the Tapered Element Oscillating Microbalance (TEOM) fails the equivalence criteria for PM_{10} monitoring and the data collected should be adjusted using the Volatile Correction Model (VCM).

Casella Monitor have confirmed that data provided in all reports for the TEOM contained in the Mobile Air Quality Monitor Station has been adjusted using the VCM Portal and can therefore be compared to the Air Quality Objectives.

QA/QC of automatic monitoring

The Mobile Air Quality Monitor currently located in Kilblain Street, Greenock is fitted with the following 3 analysers:-

Monitor labs – Nitrogen Oxides as Analyser (ML 984 1B) Monitor labs – Carbon Monoxide Gas Analyser (ML 9830B) Rupprecht and Patashnick Co. – TEOM – Series 14004A Ambient Particulate Monitor.

Readings from these analysers are collected on site by an Odessa Data Logger. The information held by the Odessa is accessed by a modem link to a Personal Computer (PC) situated in our offices in Greenock. The data is collected and processed on the PC by "Enview Software".

Both the gas analysers are calibrated shortly after midnight each day. This is achieved by the use of calibration gases for both the measurement gas and the zero gas (i.e. air with no NOx or CO present). All of the calibration gases used are to a certified content.

The Council has a service level agreement with the Casella Monitor, the station's supplier. All the analysers including the TEOM are serviced on a 6 monthly basis.

Programmed routine maintenance is carried out for filter replacement on the gas analysers on a 4 weekly cycle.

The Station's output information e.g. monitor readings, calibrations etc are checked daily (working days only).

Sample filters for the TEOM are also replaced before it reaches 90% completion. This information is collected by the analyser and is displayed by the Enview Software. Any readings from the TEOM when the sample filter is over 90% complete is automatically recorded as invalid.

Any bogus readings which can result from the servicing of the analysers are marked invalid.

QA/QC of diffusion tube monitoring

Inverclyde Council NO₂ diffusion tubes are supplied and analysed by Glasgow Scientific Services. This Laboratory has adopted the procedures for preparation and analysis of the diffusion tubes contained in the document 'Diffusion Tubes for Ambient NO₂ Monitoring: Practical Guidance'

Glasgow Scientific Services also participate in the WASP scheme, managed by the Health and Safety Laboratory. The report WASP Annual Performance Criteria for NO₂ Diffusion Tubes used in Air Quality Management, 2008 onwards, prepared by AEA confirms Glasgow Scientific Services as having demonstrated satisfactory performance in the WASP Scheme of Analysis for NO₂ tubes January 2008 – January 2009.

Appendix B: DMRB Calculations

The map shown below details the locations of road traffic counts which were undertaken in 2008 by both Inverclyde Council's Roads Department and Transport Scotland



The following table presents the AADT and traffic composition data for 8 roads within Inverclyde.

None of these roads meet the criteria contained in Section 3 of this Report ('Road Traffic Sources') and there is no requirement to carry out modelling or a Detailed Assessment of these roads.

Calculations were however carried out using the Design Manual for Roads and Bridges Screening Method published by the Highways Agency however the data was unable to be verified.

Location/ Receptor		Distance	Traffic flow	& speed	Traffic composition			
		centre to receptor (m)	AADT (combined, veh/day)	Annual average speed (km/h)	Road type (A,B,C,D)	Total % LDV (<3.5t GVW)	Total % HDV (>3.5t GVW)	
1	Cloch Rd, Gourock	18	5390 48.2		Α	93.5	6.5	
2	Albert Road, Gourock	10	9677	677 48.2		93	7	
3	Clune Brae, Port Glasgow	20	11839	48.2	Α	91	9	
4	Port Glasgow Road, Kilmacolm	15	4540	48.2	Α	89	11	
5	Larkfield Road, Greenock	12	7974	48.2	В	92.5	7.5	
6	Dunlop Street, Greenock	15	16829	48.2	В	99	1	
7	A761 Kilmacolm Road, Port Glasgow	30	4472	48.2	Α	88	12	
8	A78 Greenock	10	16339	48.2	Α	90	10	

Appendix C: Maps of Smoke Control Areas and Monitoring Sites

Inverclyde Smoke Control Areas



Updating and Screening Assessment



Diffusion Tube Monitoring Sites: Inverclyde

Updating and Screening Assessment



NO₂ and Benzene Diffusion Tubes: Greenock Central







NO₂ and Benzene Diffusion Tubes: Port Glasgow

NO₂ and Benzene Diffusion Tubes: Kilmacolm





NO2 and Benzene Diffusion Tubes: Gourock/Greenock

NO₂ and Benzene Diffusion Tubes: Wemyss Bay



Appendix D: Automatic Air Quality Monitoring Data

Nitrogen Dioxide:



Carbon Monoxide:



PM₁₀:



Appendix E: NO₂ Monthly Diffusion Tube Monitoring Data (ug/m³)

	Jan	March	April	May	June	July	August	Sept	Oct	Nov	Dec	2008 average (ug/m ³)
Carwood Court	19.4	5.8	7.8	10.7	11.6	5.8	8.7	11.6	3.9	17.5	13.6	10.6
Scarlow St	11.6	6.8	6.8	15.5	12.6	17.5	13.6	16.5	3.9	21.3	17.5	13.1
Kilmacolm	13.6	10.7	14.6	23.3	14.6	11.6	21.3	21.3	9.7	12.6	24.3	16.1
East Hamilton St	30.1	32.0	39.8	42.7	38.8	36.9	39.8	53.4	29.1	38.8	36.9	38.0
Dellingburn St	34.0	26.2	36.9	39.8	40.7	27.2	39.8	42.7	34.0	37.8	46.6	36.9
Dalrymple Street	22.3	15.5	25.2	11.6	26.2	11.6	21.3	30.1	13.6	21.3	34.0	21.2
Inverkip Street	28.1	30.1	30.1	31.0	29.1	21.3	34.9	47.5	36.9	30.1	48.5	33.4
Broomhill Street	11.6	3.9	8.7	13.6	4.9	10.7	17.5	16.5	4.9	9.7	19.4	11.0
Nelson Street	24.3	XXX	28.1	xxx	25.2	26.2	30.1	32.0	20.4	28.1	33.0	27.5
A78	21.3	21.3	21.3	24.3	20.4	19.4	24.3	29.1	xxx	xxx	44.6	25.1
Mercury Lane	20.4	6.8	11.6	14.6	11.6	19.4	20.4	23.3	19.4	19.4	33.0	18.2
Wemyss Bay	12.6	6.8	15.5	18.4	13.6	12.6	9.7	16.5	8.7	14.6	xxx	12.9
Kempock St	17.5	12.6	20.4	21.3	22.3	19.4	14.6	23.3	6.8	19.4	25.2	18.4
Cardwell Road	26.2	ххх	19.4	28.1	2.0	23.3	34.9	34.0	8.7	32.0	31.0	24.0
Newark St	18.4	13.6	16.5	15.5	27.2	12.6	13.6	20.4	25.2	13.6	29.1	18.7
Brougham Street	25.2	14.6	23.3	19.4	29.1	22.3	31.0	30.1	6.8	33.0	41.7	25.1

N.B NO₂ data for February has not been included due to an instrument failure at Glasgow Scientific Services.

The report produced for February showed the diffusion tubes to have a dramatic decrease when compared with historical data and it was noted that the internal quality control was marginally outwith the limits specified by the laboratory.