

## 2014 Air Quality Progress Report for South Lanarkshire Council

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

**September, 2014**

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## Executive Summary

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

A review of monitoring data from 2013 has concluded that:

- South Lanarkshire Council has measured concentrations of NO<sub>2</sub> above the annual mean objective in Lanark. A Detailed Assessment of NO<sub>2</sub> in Lanark was completed in February 2014 which concluded that annual mean NO<sub>2</sub> concentrations in excess of the 40 µg.m<sup>-3</sup> objective were occurring at locations of relevant exposure. South Lanarkshire Council is currently in the process of declaring an AQMA for NO<sub>2</sub> in Lanark.
- Annual mean NO<sub>2</sub> concentrations in excess of the 40 µg.m<sup>-3</sup> objective were measured at two diffusion tube locations in Hamilton, Low Patrick Street and Almada Street:
  - No further action is required at Low Patrick Street at this time as a Detailed Assessment of NO<sub>2</sub> and PM<sub>10</sub> for the area around the Duke Street/Quarry Street junction in Hamilton, has been completed and is being submitted to Scottish Government for appraisal.
  - South Lanarkshire Council are required **to proceed to a detailed assessment** at Almada Street, Hamilton and will consider expanding their NO<sub>2</sub> diffusion tube network in this area to provide additional measurements for the Detailed Assessment.
- An annual mean PM<sub>10</sub> concentration in excess of the 18 µg.m<sup>-3</sup> objective was measured at the Rutherglen automatic monitoring site (19 µg.m<sup>-3</sup>) this site is however at a roadside location 10m from the nearest relevant exposure. South Lanarkshire Council is currently in the process of declaring Rutherglen as an AQMA for PM<sub>10</sub>, the AQMA boundaries have been drafted and are awaiting formal public consultation which will commence in August 2014. Nine daily mean concentrations in excess of the 50 µg.m<sup>-3</sup> daily mean objective were measured during 2013 which is out with the seven exceedances permitted in the Scottish short-term PM<sub>10</sub> objectives.

The review of local developments has not identified any locations where there may be a risk of the air quality objectives being exceeded; no additional air quality assessment is recommended at this time.

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# 1 Introduction

## 1.1 Description of Local Authority Area

South Lanarkshire is a diverse area containing both densely populated industrial towns and large expanses of rural landscapes. It stretches from the Glasgow suburbs south to the open moorlands of the Leadhills via the Clyde Valley. The South Lanarkshire district shares its borders with a number of authorities from Dumfries and Galloway and Scottish Borders in the south, to East Ayrshire, East Renfrewshire, City of Glasgow, North Lanarkshire and West Lothian to its North, East and West boundaries.

The Council District can be described in four distinct areas:

- Cambuslang and Rutherglen area;
- Clydesdale.
- East Kilbride area; and
- Hamilton area;

The Cambuslang and Rutherglen areas are situated at the north-western tip of South Lanarkshire, bordering Glasgow City. The towns are commonly considered part of greater-Glasgow which is made up of a mix of both densely populated area suburbs and areas of large scale former industrial land use. The Hamilton area includes Blantyre, Bothwell, Larkhall and Stonehouse as well as the county town of Hamilton and many surrounding villages.

The East Kilbride area takes in the new town of East Kilbride and its surrounding villages as well as the small town of Strathaven. East Kilbride is a large new-town with high-technology industrial and extensive commercial activity, whilst Strathaven and the surrounding area is largely rural and agricultural.

The Clydesdale area forms the largest region in South Lanarkshire, and incorporates the southern and eastern areas of the district. The areas are largely rural and agricultural, dotted with several market towns, including Carluke, Lanark, Lesmahagow and Biggar as well as numerous villages.

There are a number of industrial sites located within South Lanarkshire, however most manufacture higher technology products and do not generate significant emissions to the air. The South Lanarkshire Council area is well served by an extensive road and rail network, including the M74 motorway, passing north to south through the council area.

## 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 **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  $\mu\text{g}/\text{m}^3$  (milligrammes per cubic metre,  $\text{mg}/\text{m}^3$  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 Scotland**

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m <sup>3</sup>	Running annual mean	31.12.2003
	3.25 µg/m <sup>3</sup>	Running annual mean	31.12.2011
1,3-Butadiene	2.25 µg/m <sup>3</sup>	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m <sup>3</sup>	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m <sup>3</sup>	Annual mean	31.12.2004
	0.25 µg/m <sup>3</sup>	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m <sup>3</sup>	Annual mean	31.12.2005
Particulate Matter (PM <sub>10</sub> ) (gravimetric)	50 µg/m <sup>3</sup> , not to be exceeded more than 7 times a year	24-hour mean	31.12.2011
	18 µg/m <sup>3</sup>	Annual mean	31.12.2011
Sulphur dioxide	350 µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

## 1.4 Summary of Previous Review and Assessments

South Lanarkshire Council has completed a number of LAQM Review and Assessment reports. A brief summary of all previous reviews and assessments of local air quality in South Lanarkshire is presented in Table 1.1. A map showing the location and boundary of the existing air quality management area (AQMA) at Whirlies Roundabout in East Kilbride is presented in Figure 1.1.

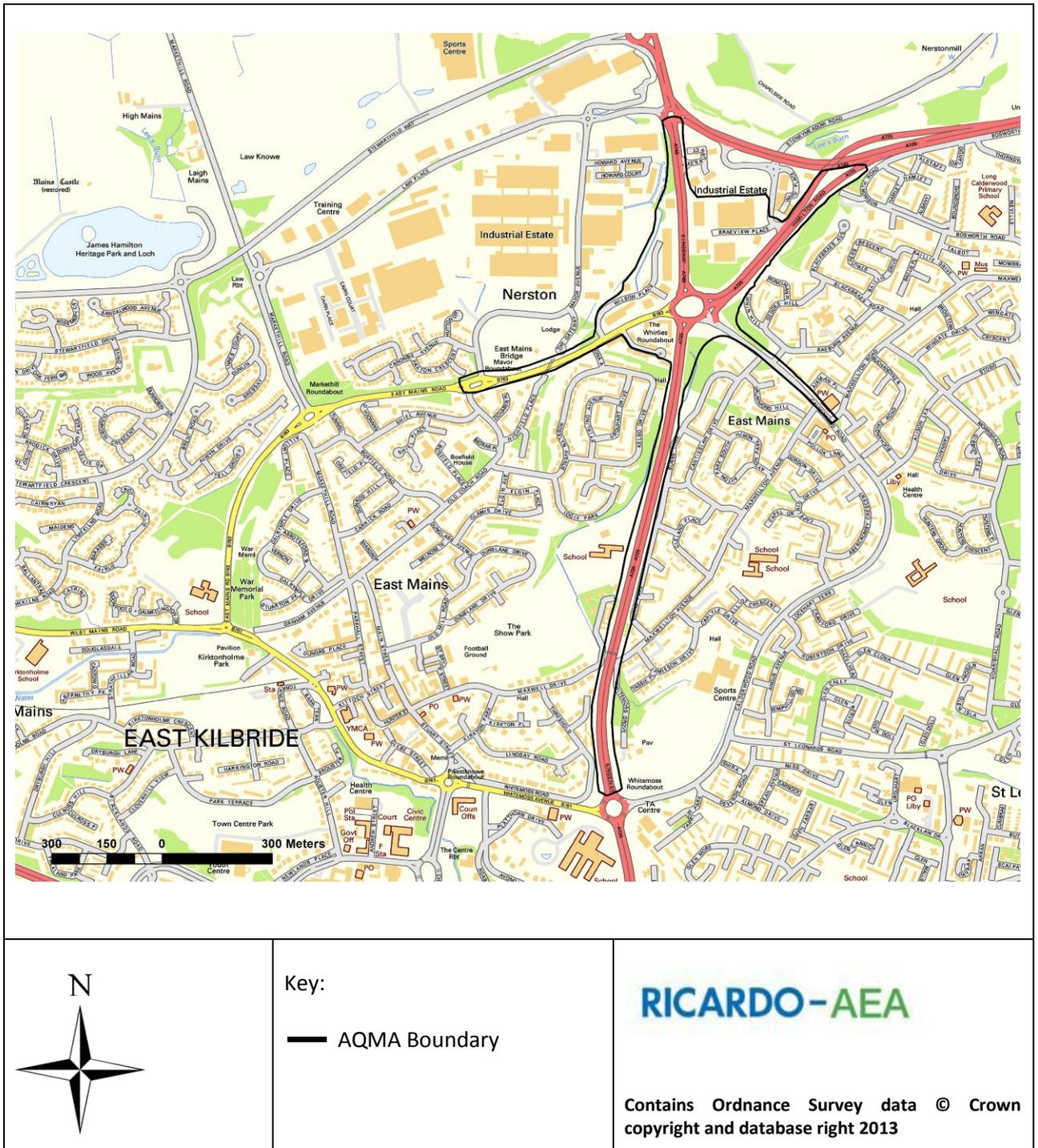
**Table 1.1: Summary of previous reviews and assessments**

Review/Assessment	Year	Outcome
Updating and screening assessment	2003	AQS objectives were likely to be met for all pollutants except for particulate matter (PM <sub>10</sub> ). Potential exceedances of the 2010 PM <sub>10</sub> objective were identified at some busy roads and junctions.
Detailed Assessment of PM <sub>10</sub> concentrations at Whirlies roundabout, East Kilbride	2005	Concluded that neither the annual mean objective nor the 24-hour objectives were likely to be exceeded in 2010.
Progress Report	2006	Reported monitoring data and local developments relevant to LAQM
Updating and screening assessment	2007	Concluded that the measured PM <sub>10</sub> annual mean at Whirlies roundabout was in excess of the 2010 objective. Annual mean NO <sub>2</sub> diffusion tube measured close by was also in excess of the NO <sub>2</sub> objective. A detailed assessment of PM <sub>10</sub> and NO <sub>2</sub> was recommended at Whirlies Roundabout.
Detailed assessment	2007	PM <sub>10</sub> annual mean objective likely to be exceeded close to Whirlies Roundabout and that declaration of an AQMA be considered. NO <sub>2</sub> annual mean was not likely to be exceeded in the study area
AQMA declaration at Whirlies Roundabout, East Kilbride	2008	Based on the conclusions of the 2007 detailed assessment an AQMA for PM <sub>10</sub> was declared at Whirlies roundabout effective from the 28 <sup>th</sup> November 2008
Progress Report	2008	Measured annual mean NO <sub>2</sub> was in excess of the 40 µg.m <sup>-3</sup> objective at three locations; further monitoring was recommended at these locations. The annual mean PM <sub>10</sub> measured at Whirlies Roundabout was in excess of the 2010 objective of 18 µg.m <sup>-3</sup>
Updating and screening assessment	2009	Based on the measured PM <sub>10</sub> and NO <sub>2</sub> concentrations and a review of roads within South Lanarkshire the report recommended: <ul style="list-style-type: none"> <li>• A further assessment of PM<sub>10</sub> in the Whirlies AQMA;</li> <li>• A detailed assessment of PM<sub>10</sub> and NO<sub>2</sub> at Rutherglen;</li> <li>• A detailed assessment of PM<sub>10</sub> and NO<sub>2</sub> at Hamilton town centre;</li> <li>• A detailed assessment of NO<sub>2</sub> in Lanark town centre;</li> <li>• A detailed assessment of NO<sub>2</sub> at Main Street, Uddingston.</li> </ul>
Progress Report	2010	Measured annual mean NO <sub>2</sub> was in excess of the 40 µg.m <sup>-3</sup> objective at three locations; further monitoring was recommended at these locations which has already been highlighted in 2009's U&SA. The annual mean PM <sub>10</sub> measured at Main Street Rutherglen was

Review/Assessment	Year	Outcome
		in excess of the 2010 objective of $18 \mu\text{g.m}^{-3}$
Detailed Assessment at Rutherglen	2010	Annual mean $\text{PM}_{10}$ concentrations in excess of the 2010 objective were predicted at multiple locations of relevant human exposure across the study area. Based on the modelling predictions it was considered necessary to declare an Air Quality Management Area (AQMA) within this area of Rutherglen for $\text{PM}_{10}$ .
Further Assessment at Whirlies Roundabout	2010	Modelling predictions of $\text{PM}_{10}$ concentrations confirmed that the declaration of the AQMA was valid and that the boundary should be maintained. Annual mean $\text{PM}_{10}$ concentrations were predicted to exceed the 2010 objective at many locations of relevant human exposure which close to the roads assessed. Source apportionment indicated that volume sources i.e. local background, are the most significant source of $\text{PM}_{10}$ concentrations at this location.
Progress Report	2011	Measured annual mean $\text{NO}_2$ concentrations increased across the monitoring network when compared to the previous year, it was noted that this could be attributable to the meteorological conditions during 2010. The 2010 $\text{NO}_2$ monitoring data confirmed the conclusions of the 2009 Updating and Screening Assessment and 2010 Progress Report which recommended proceeding with Detailed Assessments of $\text{NO}_2$ concentrations at Bannatyne Street, Lanark and at Brandon Street, Hamilton. Both Detailed Assessments were planned for completion in 2011.
Updating and Screening assessment	2012	The review of new monitoring data and screening of new sources did not identify any new locations where a detailed assessment was required for any pollutant. The 2011 annual mean $\text{NO}_2$ concentration measured in Hamilton confirmed the requirement to conduct a Detailed Assessment of $\text{NO}_2$ in Hamilton town centre; the report noted that this assessment will be conducted when there is sufficient automatic monitoring data available to inform the study
Progress Report	2013	The $\text{NO}_2$ annual mean concentration measured at the Low Patrick Street/Duje Street diffusion tube site in Hamilton confirmed the requirement to conduct a Detailed Assessment for the area surrounding the Duke Street/Quarry Street junction. The Detailed Assessment is planned for completion in early 2014 when sufficient ratified automatic monitoring data is available The review of new developments did not identify any other locations where there may be a risk of the air quality objectives being exceeded
Detailed Assessment at Lanark	2014	The Detailed Assessment concluded that there are exceedances of the $\text{NO}_2$ annual mean objective occurring at locations with relevant exposure. The exceedance area encompasses stretches of Bannatyne Street at both ground floor and 1 <sup>st</sup> floor level. South Lanarkshire Council are required to declare an Air Quality Management Area encompassing all areas of exceedance is the report also recommended that the Council expand their $\text{NO}_2$ diffusion tube network to include sections of West Port and Bloomgate where residential properties are present at ground

Review/Assessment	Year	Outcome
		level; and should consider monitoring of PM <sub>10</sub> concentrations within Lanark town centre.
Further Assessment at Rutherglen	2014	<p>The Detailed Assessment concluded that there are marginal exceedances of the PM<sub>10</sub> annual mean objective occurring at locations with relevant exposure.</p> <p>The exceedance area encompasses the section of Main St up to 40m to the east of the junction with Farmeloa Road where there are residential properties at ground floor level. South Lanarkshire Council are required to declare an Air Quality Management encompassing all areas of exceedance of the PM<sub>10</sub> annual mean objective predicted in the study.</p>
Detailed Assessment at Hamilton	2014	At the time of writing this report the Detailed Assessment had been completed and had been submitted to Scottish Government for appraisal
Detailed Assessment at Uddingston	2014	At the time of writing this report the Detailed Assessment had been completed and had been submitted to Scottish Government for appraisal

Figure 1.1: East Kilbride Whirlies Roundabout AQMA



## **2 New Monitoring Data**

### **2.1 Summary of Monitoring Undertaken**

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

Maps showing the locations of the automatic monitoring sites and diffusion tube monitoring sites are presented in Figures 2.1 to 2.13.

During 2013 there were two changes to the automatic monitoring network in South Lanarkshire. South Lanarkshire council have removed the continuous site at Glespin and is currently planning to install a continuous monitoring site at Main Street/Greenlees Rd junction in Cambuslang. At the time of writing this report this new site has still to be installed.

During early 2014 South Lanarkshire council also removed the automatic monitoring site at Raith Interchange and is planning to re-install the automatic monitoring site at Clydeview, Bothwell. This is a result of preparatory works for a planned upgrade of M74/Raith Interchange. At the time of writing this report this new site had not been installed.

**Table 2.1: Details of Automatic Monitoring Sites**

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	Monitoring technique	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
Glespin*	Roadside	280492	628150	PM <sub>10</sub>	FDMS	No	Y (10m)	5m	Yes
Rutherglen	Roadside	261128	661703	NO <sub>2</sub> , PM <sub>10</sub>	Chemiluminescence, FDMS	No	Y (10m)	2-3m	Yes
Whirlies	Roadside	264370	655670	NO <sub>2</sub> , PM <sub>10</sub>	Chemiluminescence, FDMS	Yes	Y(10m)	1m	Yes
Raith Interchange	Roadside	271125	658320	NO <sub>2</sub> , PM <sub>10</sub>	Chemiluminescence, FDMS	No	N(60m)	1-2m	Yes
Lanark	Roadside	288426	643704	NO <sub>x</sub>	Chemiluminescence	No	Y (2m)	1-2m	Yes
Hamilton	Roadside	272310	655276	NO <sub>x</sub>	Chemiluminescence	No	Y(2m)	6-7m	Yes
Uddingston	Roadside	269663	660304	NO <sub>x</sub>	Chemiluminescence	No	Y(2m)	4-5m	Yes

\* Glespin Site discontinued on 19/07/2013.

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

NO<sub>2</sub> concentrations were measured at 37 diffusion tube sites across the South Lanarkshire Council area during 2013. Details of the diffusion tube monitoring locations where measurements were conducted are presented in Table 2.2: Details of Non-automatic monitoring sites. The locations include kerbside, roadside and urban background sites. Maps showing the locations of the diffusion tube monitoring sites are presented in Figures 2.1 to 2.13.

South Lanarkshire Council currently operates two diffusion tube co-location studies at the Whirlies Roundabout, East Kilbride; and Main Street, Rutherglen NO<sub>2</sub> automatic analyser sites. Full details of the co-location studies and diffusion tube QA/QC are presented in Appendix A.

Figure 2.1: Monitoring locations (East Kilbride – Whirlies)

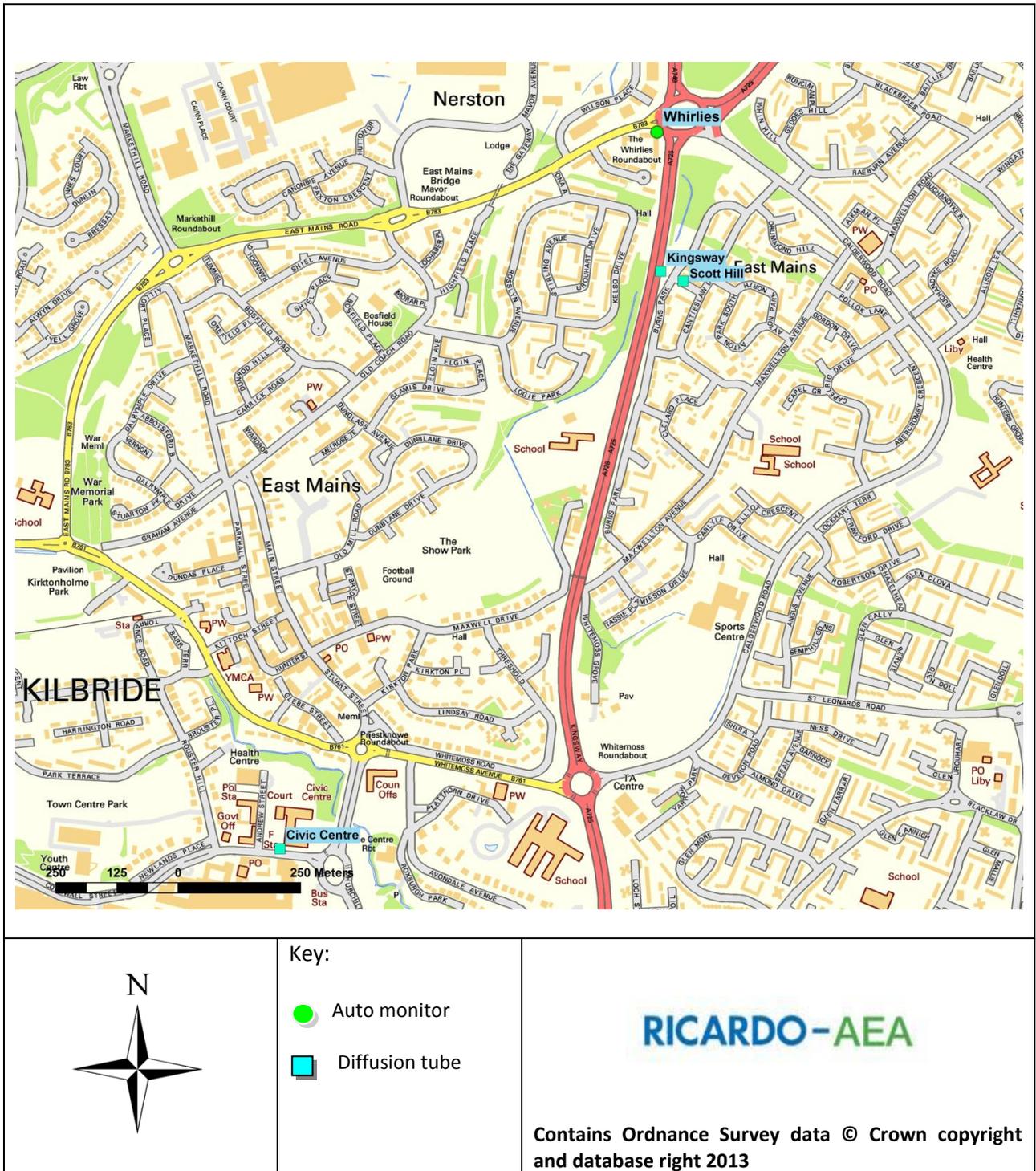


Figure 2.2: Monitoring locations (East Kilbride – West)

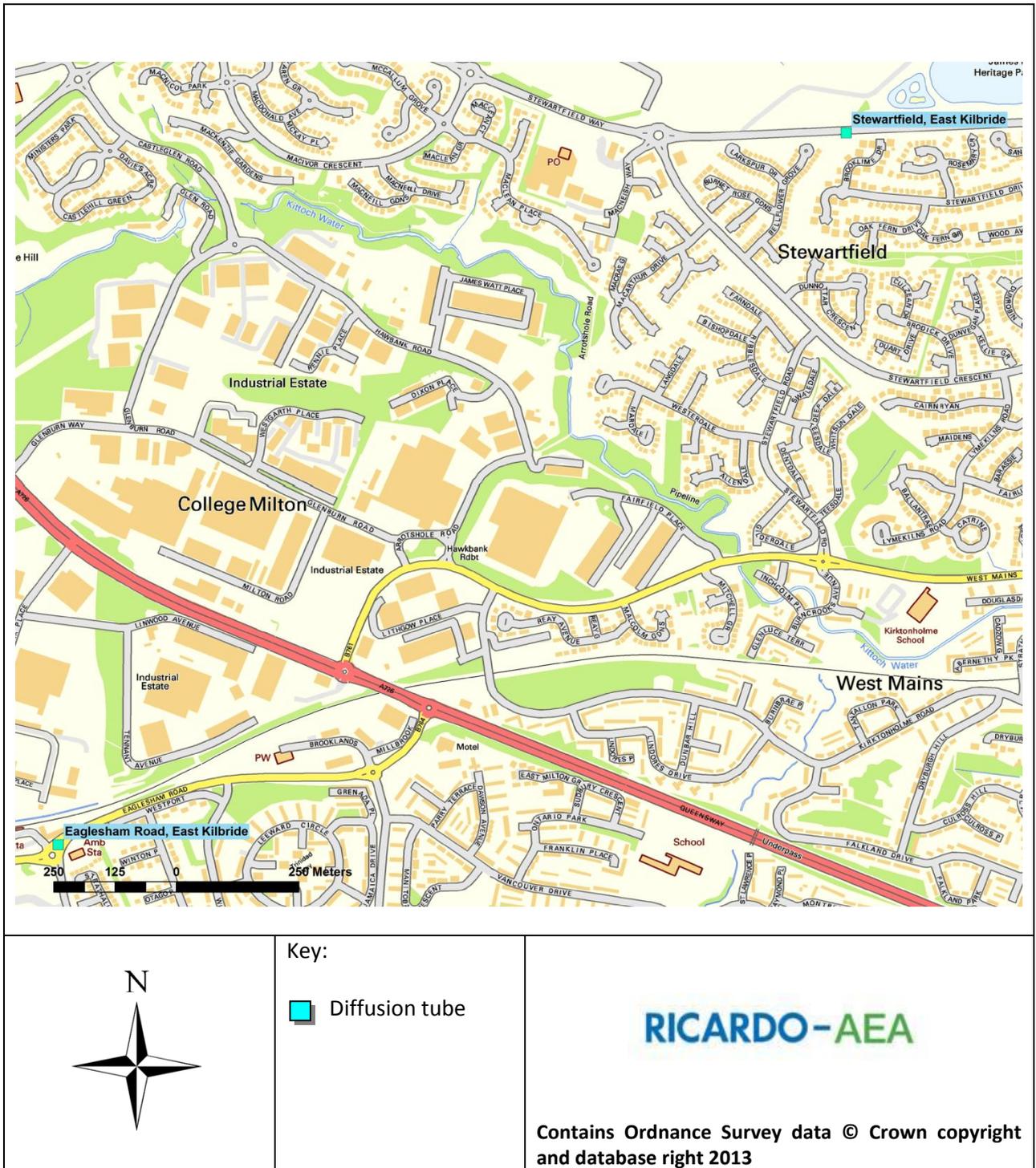


Figure 2.3: Monitoring locations (Strathaven)

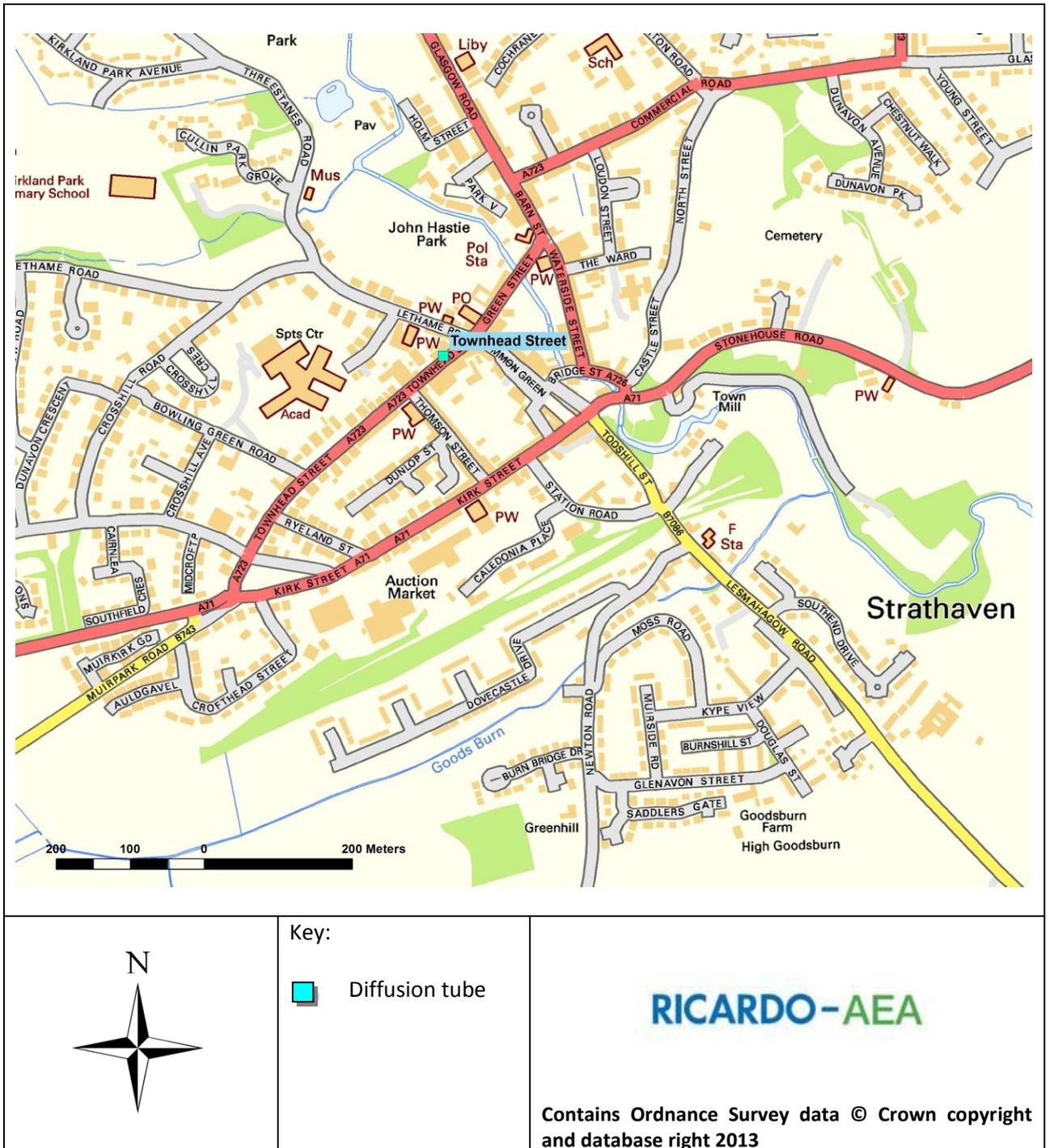


Figure 2.4: Monitoring locations (Hamilton centre)

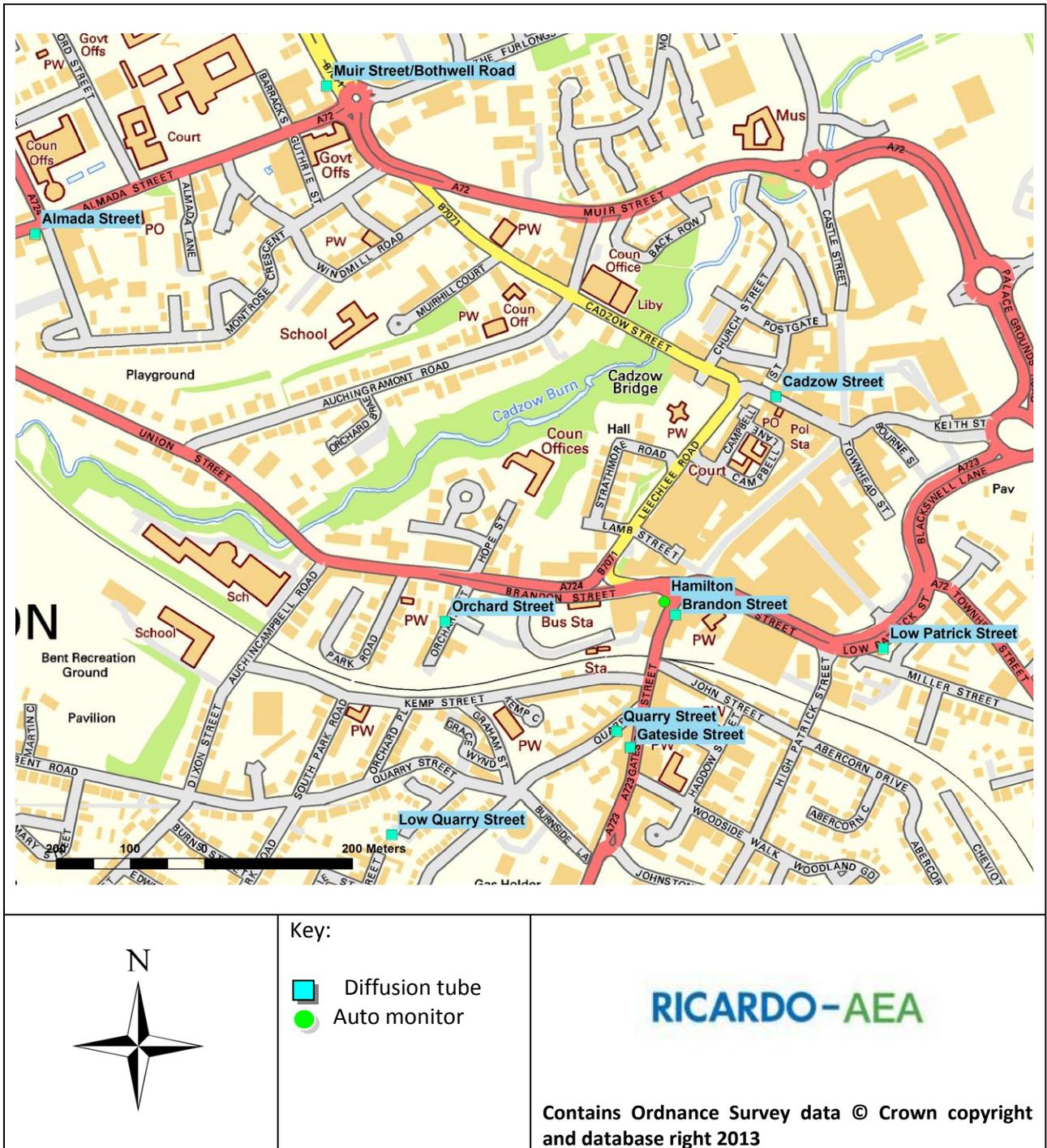


Figure 2.5: Monitoring locations (Hamilton South)

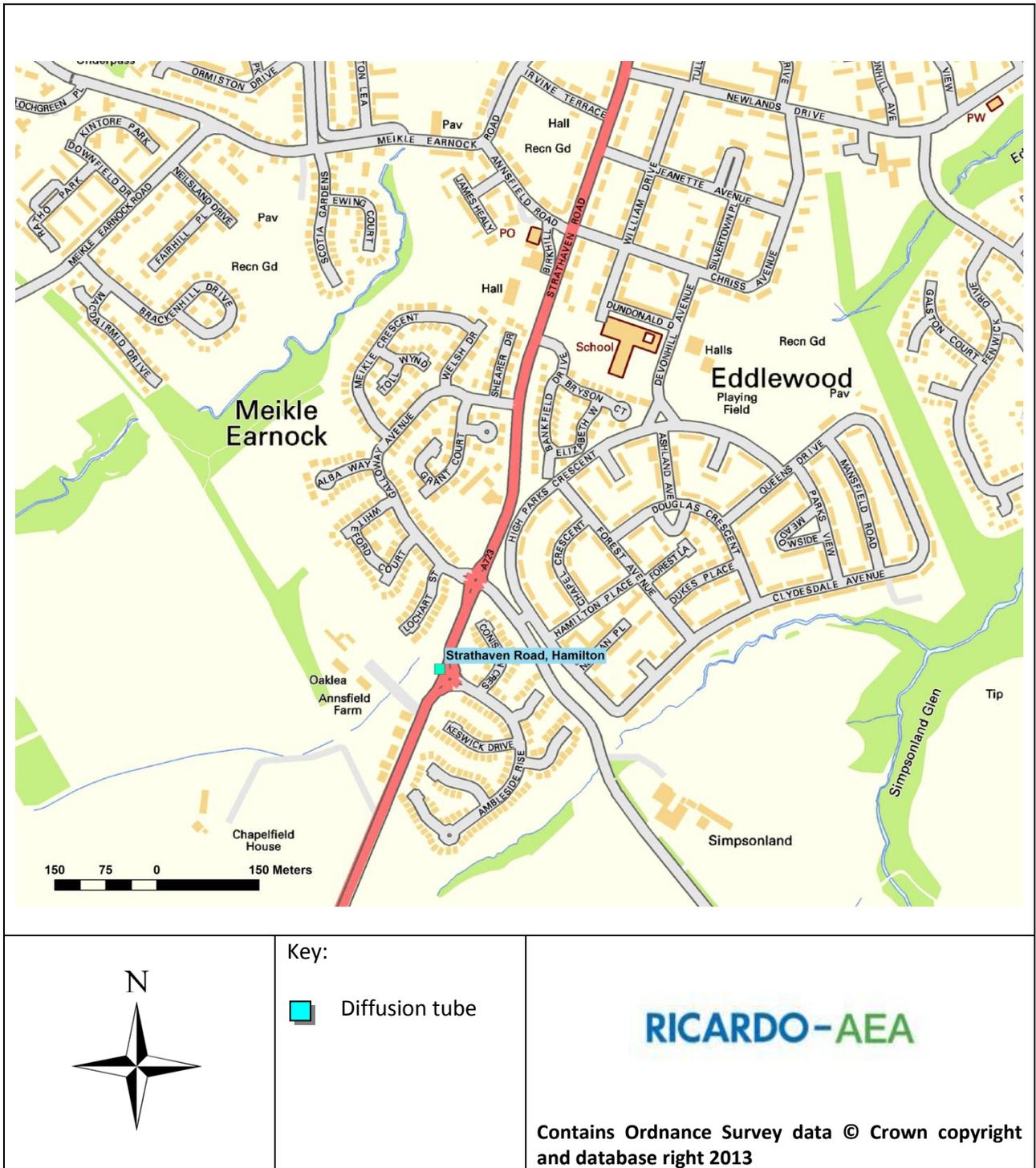


Figure 2.6: Monitoring locations (Larkhall)

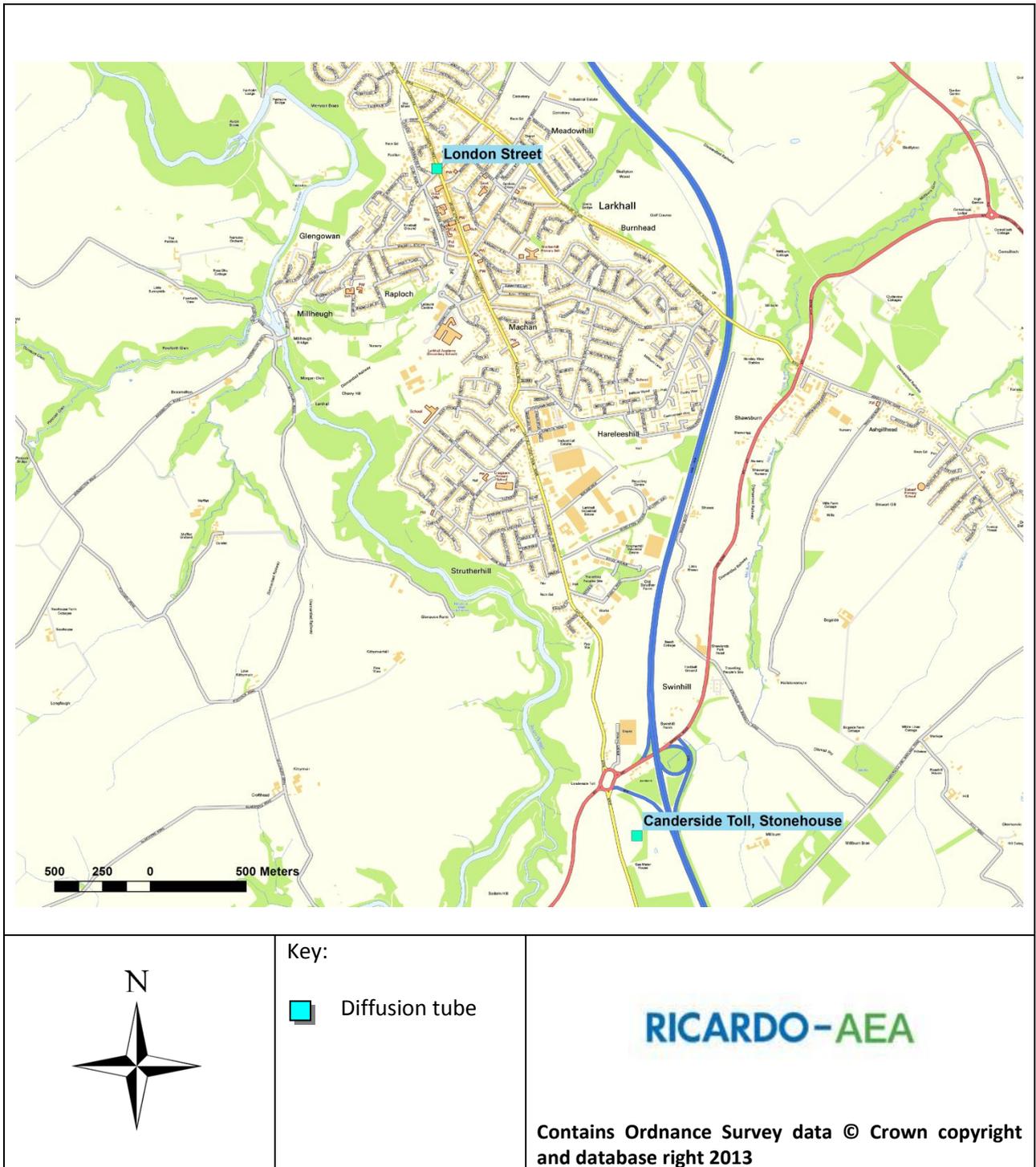
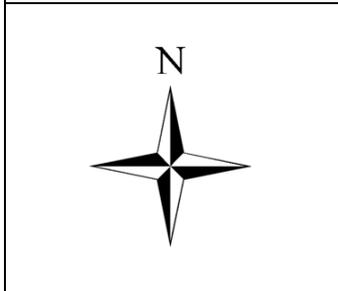


Figure 2.7: Monitoring locations (Carluke)



Figure 2.8: Monitoring locations (Lanark)



Key:

- Diffusion tube
- Auto monitor

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Figure 2.9: Monitoring locations (Bothwell/Raith interchange)

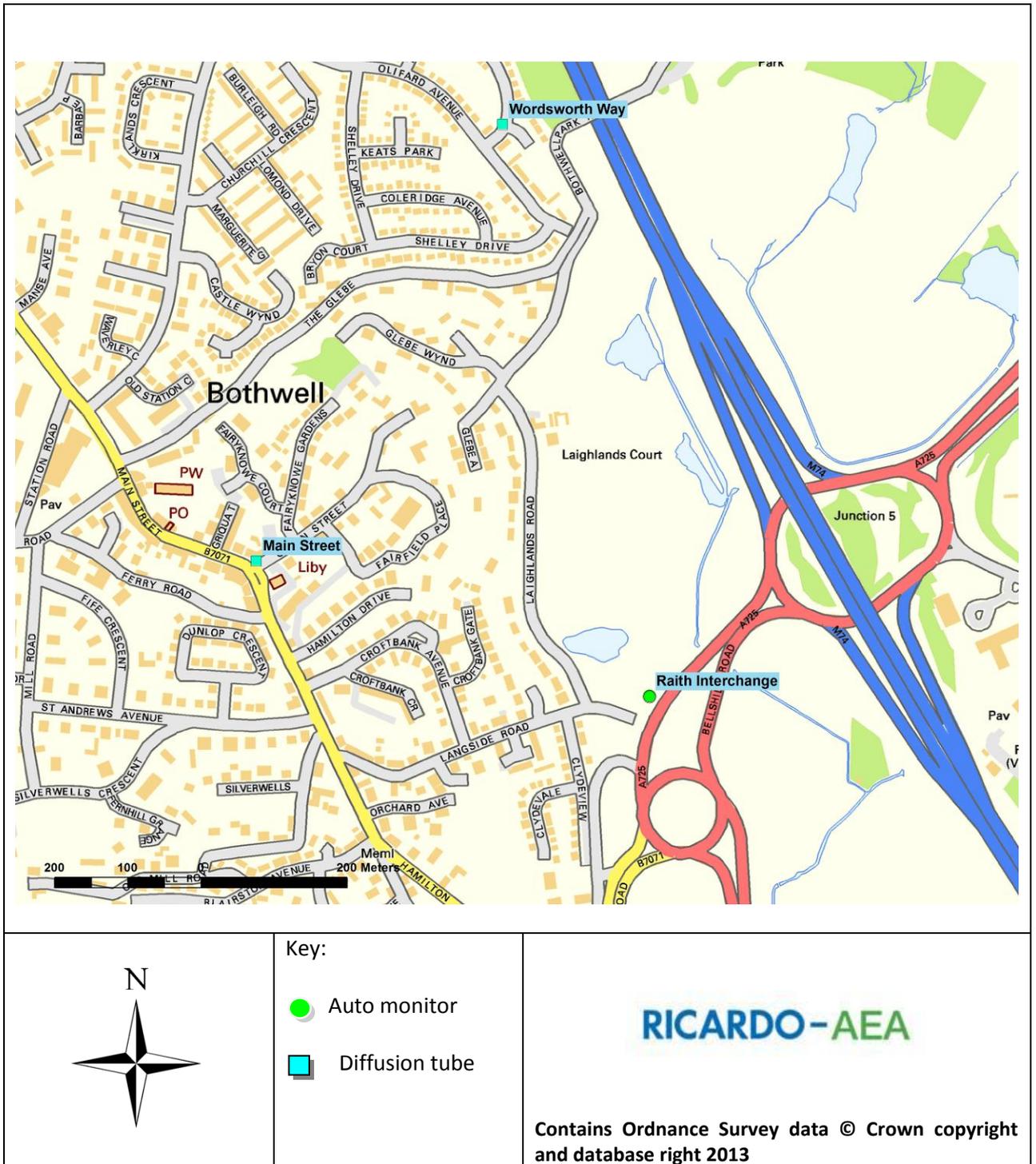


Figure 2.10: Monitoring locations (Uddingston)



Figure 2.11: Monitoring locations (Cambuslang)

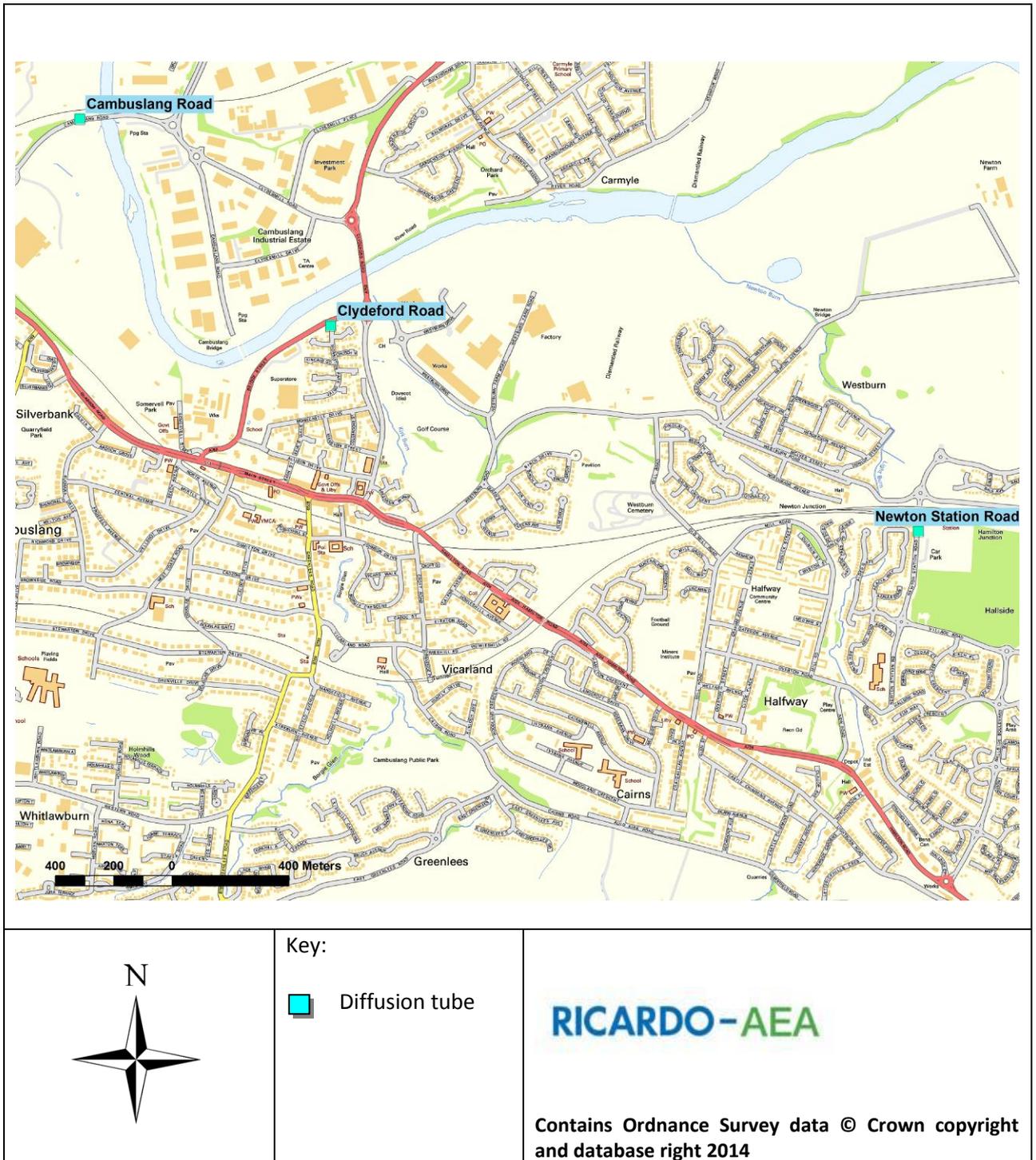


Figure 2.12: Monitoring locations (Rutherglen)

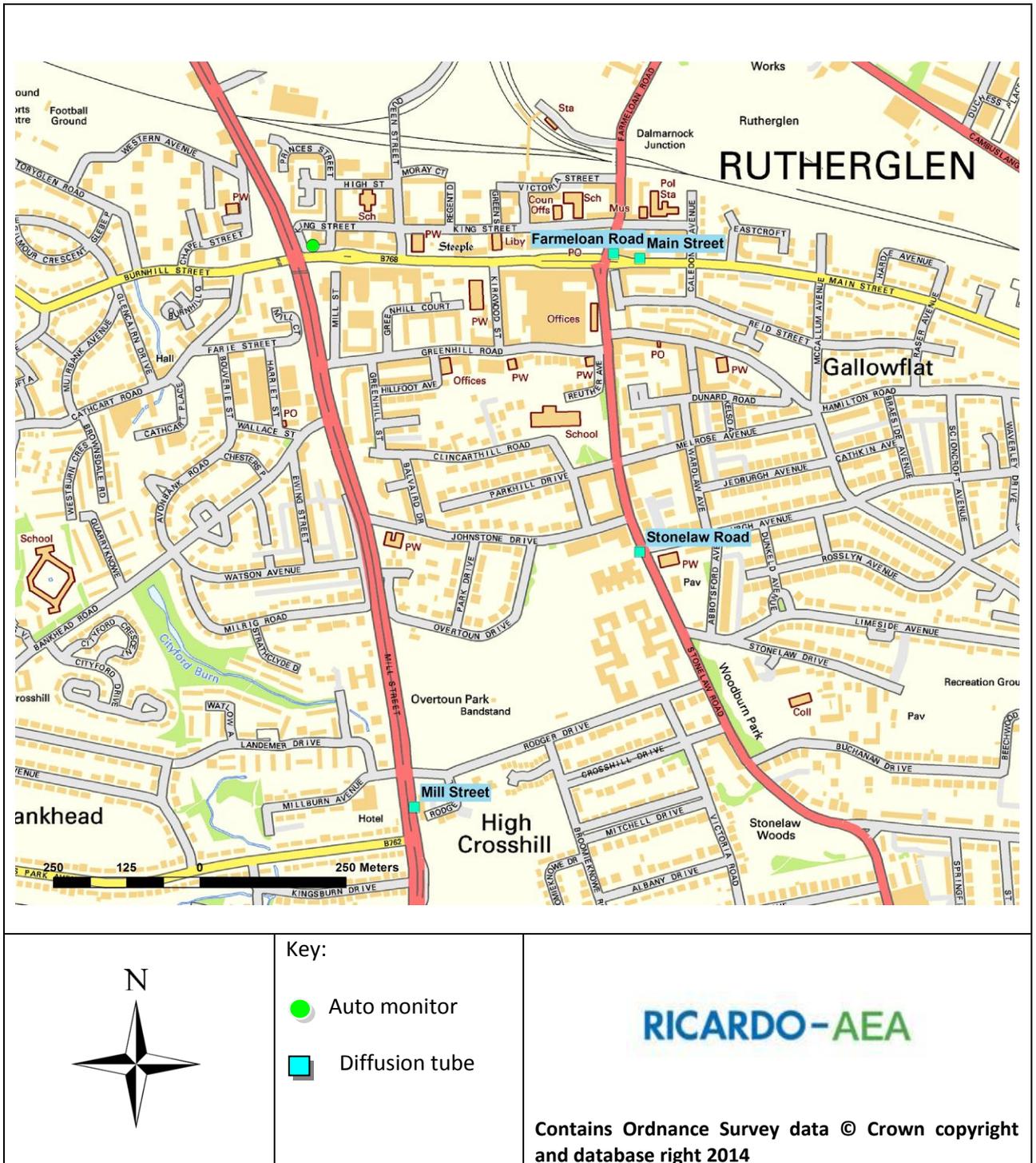
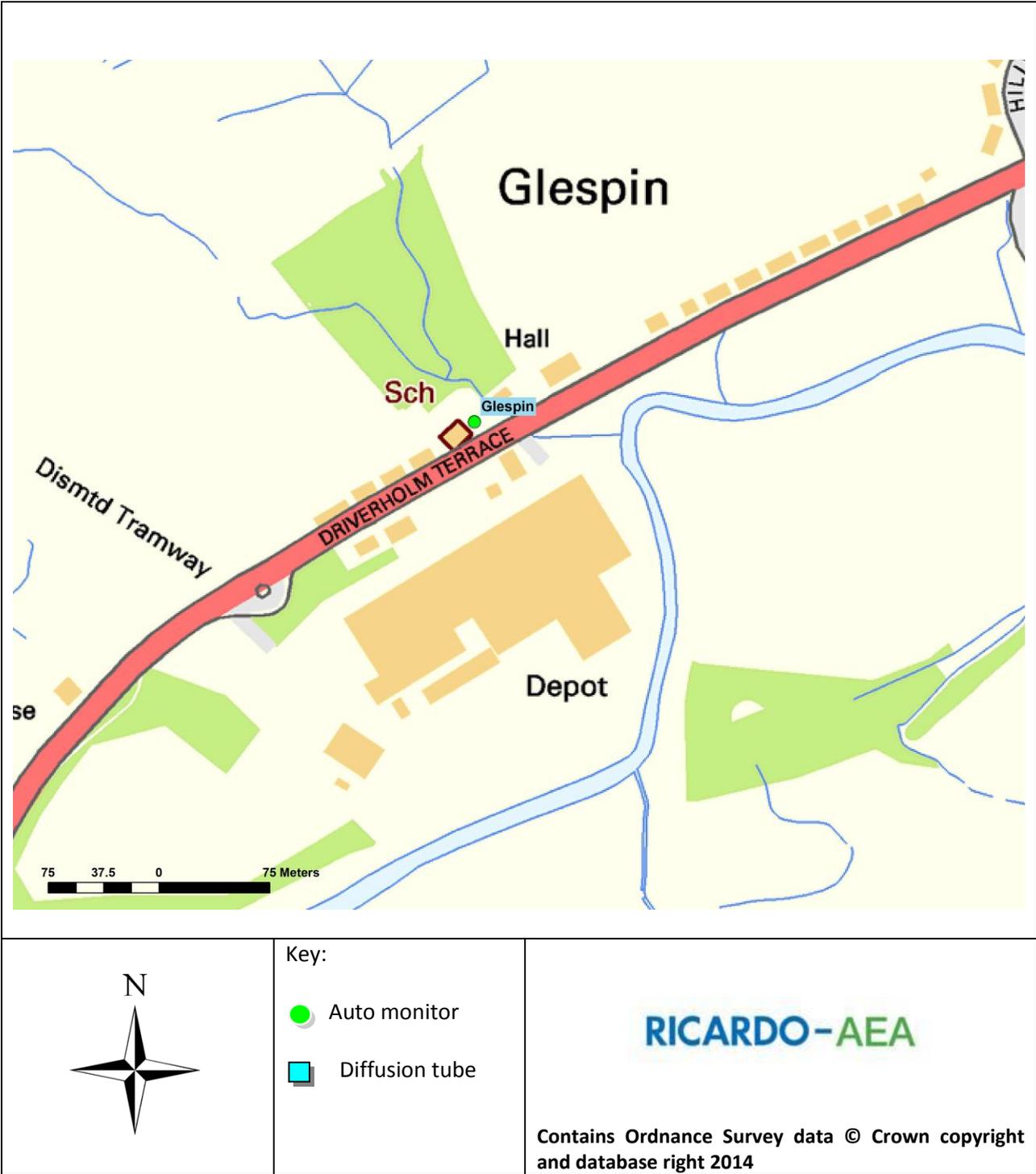


Figure 2.13: Monitoring locations (Glespin)



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

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	In AQMA?	Relevant Exposure?	Distance to kerb of nearest road	Worst-case Location?
(1) Civic Centre, East Kilbride	Roadside	263600	654194	NO <sub>2</sub>	No	No	4m	Yes
(2) Kingsway, East Kilbride	Roadside	264378	655383	NO <sub>2</sub>	Yes	No (20m)	8m	Yes
(3) Scott Hill, East Kilbride	Roadside	264424	655363	NO <sub>2</sub>	No	Yes (5m)	2m	No
(4) Townhead Street, Srathaven	Roadside	270081	644523	NO <sub>2</sub>	No	Yes (12m)	2m	No
(5) 179 Quarry Street, Hamilton	Roadside	272246	655099	NO <sub>2</sub>	No	Yes (0m)	1.5m	Yes
(6) 129 Quarry Street, Hamilton	Roadside	272325	655258	NO <sub>2</sub>	No	Yes (0.5m)	2.5m	Yes
(7) Cadzow Street, Hamilton	Roadside	272461	655556	NO <sub>2</sub>	No	No	4m	Yes
(8) Duke Street/Low Patrick Street, Hamilton	Roadside	272606	655212	NO <sub>2</sub>	No	Yes(1m)	1.5m	Yes
(9) Gateside Street, Hamilton	Roadside	272264	655077	NO <sub>2</sub>	No	Yes (0m)	2.5m	Yes
(10) Almada Street, Hamilton	Roadside	271460	655778	NO <sub>2</sub>	No	Yes (0m)	3m	Yes
(11) Muir Street/Bothwell Road	Roadside	271854	655980	NO <sub>2</sub>	No	Yes (0m)	6m	Yes
(12) Low Quarry Gardens, Hamilton	Background	271942	654958	NO <sub>2</sub>	No	n/a	n/a	n/a
(13) London Street, Larkhall	Kerbside	276090	651564	NO <sub>2</sub>	No	Yes (1m)	0.5m	Yes
(14) Kirkton Street, Carluke	Roadside	284550	650579	NO <sub>2</sub>	No	Yes (2m)	2m	Yes
(15) Hospitland Drive, Lanark	Background	289035	643842	NO <sub>2</sub>	No	Yes (5m)	2m	No
(16) Bannatyne Street, Lanark	Roadside	288475	643675	NO <sub>2</sub>	No	Yes (façade)	1m	Yes
(17) Wellgate, Lanark	Roadside	288173	643651	NO <sub>2</sub>	No	Yes (5m)	2m	Yes
(18) 4 High Street/Bloomgate, Lanark	Roadside	288122	643685	NO <sub>2</sub>	No	Yes (1m)	3m	Yes
(19) 51 High Street, Lanark	Roadside	288238	643675	NO <sub>2</sub>	No	Yes(0m)	3m	Yes
(20) Main Street, Bothwell	Roadside	270574	658508	NO <sub>2</sub>	No	Yes (2m)	2m	Yes
(21) Wordsworth Way, Bothwell (Moved Sep 2012)	Background	270933	659115	NO <sub>2</sub>	No	Yes (5m)	2m	No
(21) Wordsworth Way, Bothwell (New location from Sep 2012)	Background	270924	659109	NO <sub>2</sub>	No	Yes (5m)	2m	No
(22) North British Road, Uddingston	Background	270180	660753	NO <sub>2</sub>	No	Yes (5m)	3m	No

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	In AQMA?	Relevant Exposure?	Distance to kerb of nearest road	Worst-case Location?
(23) Burnpark Avenue, Uddingston	Roadside	268948	661476	NO <sub>2</sub>	No	Yes (5m)	30-40m (M74)	Yes
(24) 73 Main Street (St Andrews Hospice), Uddingston	Roadside	269620	660425	NO <sub>2</sub>	No	Yes (0m)	5m	Yes
(25) 86 Main Street (Ding's express), Uddingston	Roadside	269571	660654	NO <sub>2</sub>	No	Yes(0m)	3m	Yes
(26) Clydeford Road, Cambuslang (Moved Sep 2012)	Roadside	264482	661160	NO <sub>2</sub>	No	Yes (30m)	1m	Yes
(26) Clydeford Road, Cambuslang (New location from Sep 2012)	Roadside	264386	661119	NO <sub>2</sub>	No	Yes (5m)	2m	Yes
(27) Cambuslang Road, Rutherglen	Roadside	263524	661835	NO <sub>2</sub>	No	No	2m	No
(28) Farmeloa Road, Rutherglen	Roadside	261643	661689	NO <sub>2</sub>	No	Yes (25m)	2m	Yes
(29) Stonelaw Road, Rutherglen	Roadside	261688	661174	NO <sub>2</sub>	No	Yes (21m)	2m	Yes
(30) 263 Main Street, Rutherglen	Roadside	261688	661681	NO <sub>2</sub>	No	Yes (0m)	2m	Yes
(31) Mill Street, Rutherglen	Roadside	261302	660734	NO <sub>2</sub>	No	Yes (4m)	2.5m	Yes
(32) Main Street, Rutherglen Co Loc 1	Roadside	261116	661699	NO <sub>2</sub>	No	Yes (10m)	2-3m	Yes
(33) Main Street, Rutherglen Co Loc 2	Roadside	261116	661699	NO <sub>2</sub>	No	Yes (10m)	2-3m	Yes
(34) Main Street, Rutherglen Co Loc 3	Roadside	261116	661699	NO <sub>2</sub>	No	Yes (10m)	2-3m	Yes
(35) Whirlies Roundabout, EK Co Loc 1	Roadside	264383	655663	NO <sub>2</sub>	Yes	Yes (10m)	1m	Yes
(36) Whirlies Roundabout, EK Co Loc 2	Roadside	264383	655665	NO <sub>2</sub>	Yes	Yes(10m)	1m	Yes
(37) Whirlies Roundabout, EK Co Loc 3	Roadside	264383	655667	NO <sub>2</sub>	Yes	Yes(10m)	1m	Yes

## 2.2 Comparison of Monitoring Results with Air Quality Objectives

### 2.2.1 Nitrogen Dioxide (NO<sub>2</sub>)

#### Automatic Monitoring Data

The annual mean NO<sub>2</sub> concentrations measured at the automatic monitoring sites in South Lanarkshire from 2009 to 2013 are presented in Table 2.3. Concentrations in excess of the 40 µg.m<sup>-3</sup> objective are highlighted in bold.

**Table 2.3: NO<sub>2</sub> Automatic monitoring results: Comparison with annual mean objective**

Site name	Within AQMA?	Site Type	Data Capture 2013 (%)	Annual mean concentrations (µg.m <sup>-3</sup> )				
				2009	2010	2011	2012	2013
Rutherglen	No	Roadside	97%	40.3	24	37	39	36
Whirlies	Yes	Roadside	63%	37.5	49	41	34 <sup>#</sup>	29*
Raith Interchange	No	Roadside	93%	-	61	56	56	51
Lanark	No	Roadside	99%	-	17	30	29	25
Hamilton	No	Roadside	99%	-	-	41*	42 <sup>§</sup>	35
Uddingston	No	Roadside	97%	-	-	24*	31 <sup>§</sup>	27

\*no short to long term adjustment was applied, due to the sporadic nature of the data capture. As a result, these data should be used for indicative purposes only, similar to NO<sub>2</sub> diffusion tube data

<sup>#</sup>Short-term to long-term adjustment applied as data capture < 75%

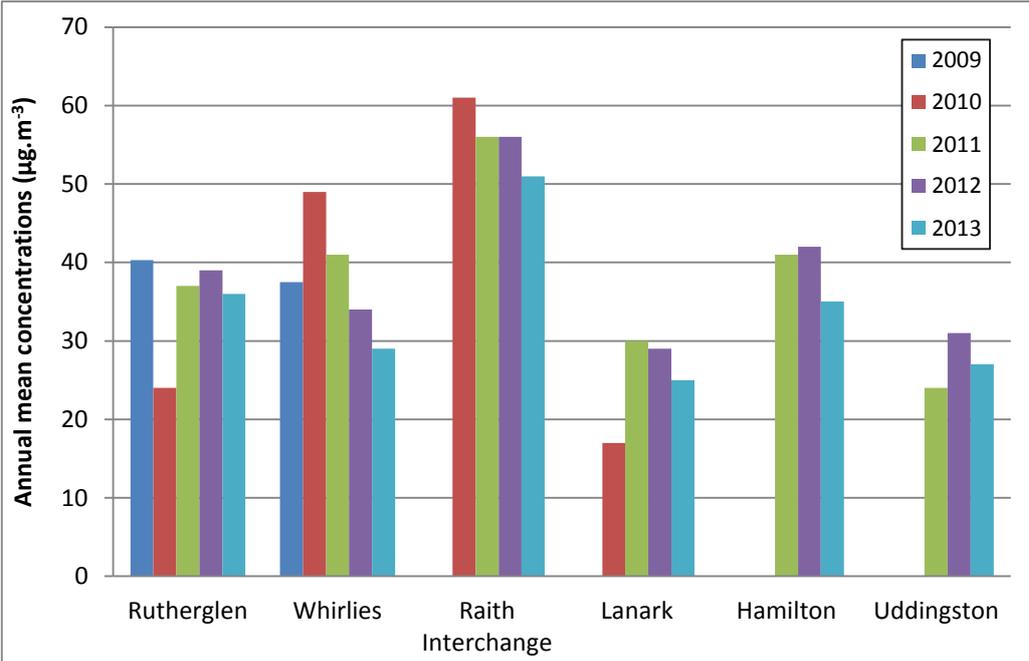
<sup>§</sup>Please note that these data are not reported as ratified due to insufficient calibration data; a scaling factor of 1.000 ppb/mV has been assumed throughout 2012. As a result, these data should be used for indicative purposes only, similar to NO<sub>2</sub> diffusion tube data

An NO<sub>2</sub> annual mean concentration in excess of the 40 µg.m<sup>-3</sup> objective was measured at the Raith Interchange automatic monitoring site. This site is located at the roadside approximately 60m from the façade of the nearest residential property; a distance correction calculation was conducted to predict the annual mean NO<sub>2</sub> concentration at the nearest location of relevant exposure. The annual mean concentration predicted at 50 m from the kerbside (the maximum distance that can be input into the distance correction calculator) was 31 µg.m<sup>-3</sup>; It is therefore considered unlikely that the 40 µg.m<sup>-3</sup> NO<sub>2</sub> annual mean objective is being exceeded at locations of relevant exposure close to Raith Interchange.

The NO<sub>2</sub> annual mean measured at Whirlies Roundabout was not adjusted to account for the low data capture rate due the sporadic nature of the data capture. The low data capture during 2013 was due to the fitting of a new monitoring cabinet. Details of the short-term to long-term adjustment calculation are presented in Appendix A.

A bar chart showing the trends in annual mean NO<sub>2</sub> concentrations measured at the automatic sites over the last five years is presented in Figure 2.14. The chart shows annual mean NO<sub>2</sub> concentrations have decreased slightly at all five sites in 2013 when compared to the previous year. Measured annual mean concentrations are still higher at the Rutherglen and Lanark sites when compared to 2010. Also the measured annual mean concentration is higher at Uddingston when compared to 2011. Continued monitoring at these sites will help establish if this is an on-going trend.

**Figure 2.14: Trends in Annual Mean NO<sub>2</sub> Concentrations Measured at Automatic Monitoring Sites**



The numbers of measured 1-hour mean NO<sub>2</sub> concentrations in excess of the 200 µg.m<sup>-3</sup> short-term objective at each of the automatic monitoring sites are presented in Table 2.4. All sites were compliant with the short-term objective. Due to low data capture the Whirlies Roundabout in East Kilbride the result was presented as the 99.79<sup>th</sup> percentile of 1-hour means; the resulting concentration of 170 µg.m<sup>-3</sup> is below the 200 µg.m<sup>-3</sup> objective.

**Table 2.4: Results of Automatic Monitoring for NO<sub>2</sub>: Comparison with 1-hour Mean Objective**

Site name	Within AQMA?	Data Capture 2012 (%)	Number of exceedences of hourly mean objective (200 µg.m <sup>-3</sup> ) For data capture < 90%, the 99.79th %ile of 1-hr means is shown in brackets (µg.m <sup>-3</sup> )				
			2009	2010	2011	2012	2013
Rutherglen	No	99.9%	0 (74)	0 (101)	0	1	1
Whirlies	Yes	66.4%	4	27(201)	12	21(226)	5 (170)
Raith Interchange	No	99.9%	-	38(227)	0	4	1
Lanark	No	99.9%	-	0 (66)	0(120)	0	0
Hamilton	No	92.6%	-	-	1(124)*	0 <sup>§</sup>	0
Uddingston	No	100%	-	-	0(107)*	1 <sup>§</sup>	0

NB: For data capture < 90%, the 99.79<sup>th</sup> %ile of 1-hr means is shown in brackets (µg.m<sup>-3</sup>)

### Diffusion Tube Monitoring Data

Details of the annual mean NO<sub>2</sub> concentrations measured at diffusion tube sites during 2013 are presented in Table 2.5. The time series of results measured from 2009 to 2013 are presented in Table 2.6. Bar charts showing the trends in measured NO<sub>2</sub> annual mean concentrations are presented in Figure 2.15. For the diffusion tube sites where data capture was less than 75% during 2013, short-term to long-term adjustment calculations have not been applied as they were at sites co-located with automatic analysers.

The national bias adjustment factor of 0.79 was used to adjust the diffusion tube results. Data capture for the diffusion tubes at the co-location study conducted at Rutherglen and East Kilbride Whirlies roundabout was too low during 2013 to derive a local bias adjustment factor. A discussion of the choice of factor used is included in Appendix A.

At locations where measured annual mean concentrations were in excess of the 40 µg.m<sup>-3</sup> objective; distance correction calculations have been conducted to predict the annual mean concentration at the nearest location of relevant exposure. The calculation was conducted using the 'NO<sub>2</sub> with distance from road calculator' available to download on the Defra LAQM support website. The predicted annual mean concentrations at the nearest relevant exposure are presented in brackets in Table 2.5 at relevant tube locations.

Annual mean NO<sub>2</sub> concentrations in excess of the 40 µg.m<sup>-3</sup> objective were measured at five diffusion tube sites during 2013 (excluding the sites co-located with automatic analysers). The estimated NO<sub>2</sub> annual mean at the nearest location of relevant exposure was in excess of the 40 µg.m<sup>-3</sup> objective at three sites as follows:

- (8) Duke Street/Low Patrick Street, Hamilton
- (10) Almada Street, Hamilton
- (16) Bannatyne Street, Lanark

At the time of this report a Detailed Assessment of NO<sub>2</sub> in Hamilton has been completed and submitted to Scottish Government for appraisal. The detailed assessment covered the area around the Duke Street/Quarry street junction. The 2013 diffusion tube measurements provide further evidence that a Detailed Assessment is required within the Quarry Street area of Hamilton town centre.

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South Lanarkshire Council are required to proceed to a detailed assessment of NO<sub>2</sub> at Almada Street, Hamilton. It is recommended that South Lanarkshire Council expand their NO<sub>2</sub> diffusion tube network in this area as additional monitoring will improve the quality of the Detailed Assessment.

A Detailed Assessment of NO<sub>2</sub> was conducted in Lanark in 2012; the assessment concluded that NO<sub>2</sub> annual mean concentration in excess of the objective were likely occurring on Bannatyne Street at residential properties, if present, at first floor level.

No annual mean NO<sub>2</sub> concentrations in excess of 60 µg.m<sup>-3</sup> were measured at any of the diffusion tube sites; it is therefore considered unlikely that there is a risk of the 1-hour mean NO<sub>2</sub> objective being exceeded at any of the tube locations.

**Table 2.5: Results of NO<sub>2</sub> Diffusion Tubes 2013**

Site ID	Location	Town	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013	2013 Annual Mean Concentration ( $\mu\text{g}/\text{m}^3$ ) - Bias Adjustment factor = 0.79
1	Civic Centre	East Kilbride	Roadside	No	N	83%	19.8
2	Kingsway	East Kilbride	Roadside	Yes	N	100%	<b>41.9 (24.9)</b>
3	Scott Hill	East Kilbride	Roadside	No	N	92%	19.4
4	Townhead Street	Strathaven	Roadside	No	N	75%	25.0
5	179 Quarry Street	Hamilton	Roadside	No	N	100%	25.5
6	129 Quarry Street	Hamilton	Roadside	No	N	92%	36.6
7	Cadzow Street	Hamilton	Roadside	No	N	100%	26.3
8	Low Patrick Street/Duke Street	Hamilton	Roadside	No	N	92%	<b>51.3 (48.0)</b>
9	Gateside Street	Hamilton	Roadside	No	N	100%	34.1
10	Almada Street	Hamilton	Roadside	No	N	100%	<b>41.7</b>
11	Bothwell Road	Hamilton	Roadside	No	N	100%	25.5
12	Low QuarryGardens	Hamilton	Background	No	N	92%	12.2
13	London Street	Larkhall	Kerbside	No	N	92%	29.7
14	Kirkton Street	Carluke	Roadside	No	N	100%	33.2
15	Hospitland Drive	Lanark	Background	No	N	92%	9.2
16	Bannatyne Street	Lanark	Roadside	No	N	100%	41.0
17	Wellgate	Lanark	Roadside	No	N	100%	21.1
18	4 High Street / Bloomgate	Lanark	Roadside	No	N	100%	<b>40.3 (38.0)</b>
19	51 High Street	Lanark	Roadside	No	N	100%	27.6
20	Main Street	Bothwell	Roadside	No	N	92%	29.0
21	Wordsworth Way	Bothwell	Background	No	N	100%	21.5
22	North British Road	Uddingston	Background	No	N	100%	27.5
23	Burnpark Avenue	Uddingston	Background	No	N	100%	29.8
24	73 Main Street	Uddingston	Roadside	No	N	100%	33.3
25	86 Main Street	Uddingston	Roadside	No	N	100%	25.9

Site ID	Location	Town	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2013	2013 Annual Mean Concentration ( $\mu\text{g}/\text{m}^3$ ) - Bias Adjustment factor = 0.79
26	Clydeford Road	Cambuslang	Roadside	No	N	100%	18.8
27	Cambuslang Road	Rutherglen	Roadside	No	N	100%	25.9
28	Farmeloan Road	Rutherglen	Roadside	No	N	100%	39.2
29	Stonelaw Road	Rutherglen	Roadside	No	N	100%	23.2
30	263 Main Street	Rutherglen	Roadside	No	N	100%	31.8
31	Mill Street	Rutherglen	Roadside	No	N	100%	29.2
(32-34)	Main Street, Rutherglen Co Location 1, 2 & 3	Rutherglen	Roadside	No	N	37%	39.1
(35-37)	Whirlies Roundabout, EK Co Location 1, 2 & 3	East Kilbride	Roadside	No	N	78%	31.1

( ) Brackets: distance correction calculations have been conducted to predict the annual mean concentrations at the nearest location of relevant exposure

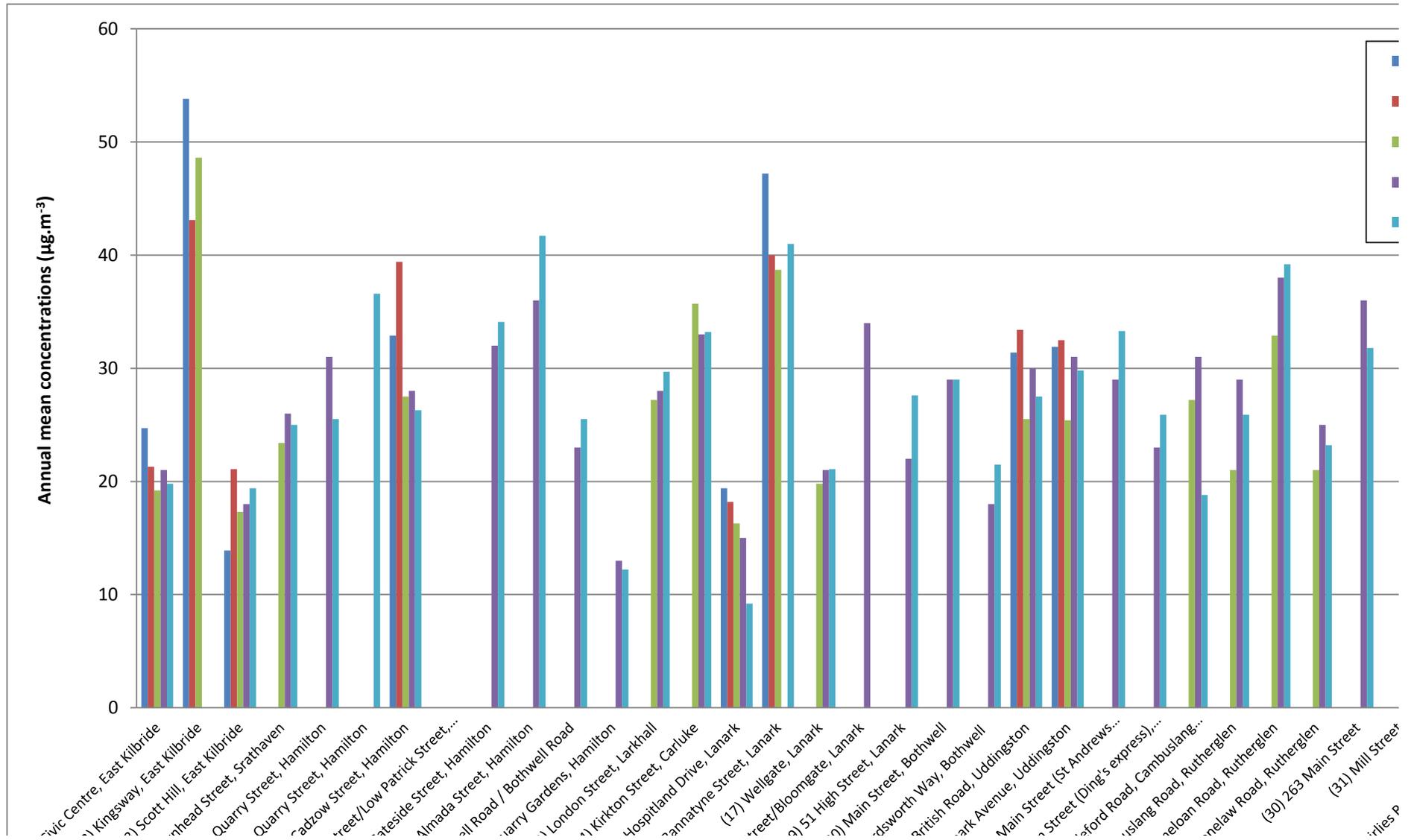
**Table 2.6: Results of NO<sub>2</sub> Diffusion Tubes (2009 to 2013)**

Location	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) µg/m <sup>3</sup>				
			2009 (Bias Adj. Factor = 0.98)	2010 (Bias Adj. Factor = 0.82)	2011 (Bias Adj. Factor = 0.84)	2012 (Bias Adj. Factor = 0.74)	2013 (Bias Adj. Factor = 0.79)
(1) Civic Centre, East Kilbride	Roadside	No	24.7	21.3	19.2	21	19.8
(2) Kingsway, East Kilbride	Roadside	Yes	<b>53.8</b>	<b>43.1</b>	<b>48.6</b>	<b>50 (37.6)</b>	<b>41.9 (24.9)</b>
(3) Scott Hill, East Kilbride	Roadside	No	13.9	21.1	17.3	18	19.4
(4) Townhead Street, Sraithaven	Roadside	No	-	-	23.4	26	25.0
(5) 179 Quarry Street, Hamilton	Roadside	No	-	-	-	31	25.5
(6) 129 Quarry Street, Hamilton	Roadside	No	-	-	-	<b>46 (45)</b>	36.6
(7) Cadzow Street, Hamilton	Roadside	No	32.9	39.4	27.5	28	26.3
(8) Low Patrick Street/Duke Street, Hamilton	Roadside	No	-	-	-	<b>50 (47.1)</b>	<b>51.3 (48.0)</b>
(9) Gateside Street, Hamilton	Roadside	No	-	-	-	32	34.1
(10) Almada Street, Hamilton	Roadside	No	-	-	-	36	<b>41.7</b>
(11) Bothwell Road / Bothwell Road	Roadside	No	-	-	-	23	25.5
(12) Low Quarry Gardens, Hamilton	Background	No	-	-	-	13	12.2
(13) London Street, Larkhall	Kerbside	No	-	-	27.2	28	29.7
(14) Kirkton Street, Carluke	Roadside	No	-	-	35.7	33	33.2
(15) Hospitland Drive, Lanark	Background	No	19.4	18.2	16.3	15	9.2
(16) Bannatyne Street, Lanark	Roadside	No	<b>47.2</b>	<b>40</b>	38.7	<b>42 (42)</b>	<b>41.0</b>
(17) Wellgate, Lanark	Roadside	No	-	-	19.8	21	21.1
(18) 4 High Street/Bloomgate, Lanark	Roadside	No	-	-	-	34	<b>40.3 (38.0)</b>
(19) 51 High Street, Lanark	Roadside	No	-	-	-	22	27.6
(20) Main Street, Bothwell	Roadside	No	-	-	-	29	29.0
(21) Wordsworth Way, Bothwell	Background	No	-	-	-	18	21.5
(22) North British Road, Uddingston	Background	No	31.4	33.4	25.5	30	27.5

Location	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$				
			2009 (Bias Adj. Factor = 0.98)	2010 (Bias Adj. Factor = 0.82)	2011 (Bias Adj. Factor = 0.84)	2012 (Bias Adj. Factor = 0.74)	2013 (Bias Adj. Factor = 0.79)
(23) Burnpark Avenue, Uddingston	Roadside	No	31.9	32.5	25.4	31	29.8
(24) 73 Main Street (St Andrews Hospice), Uddingston	Roadside	No	-	-	-	29	33.3
(25) 86 Main Street (Ding's express), Uddingston	Roadside	No	-	-	-	23	25.9
(26) Clydeford Road, Cambuslang (Moved Sep 2012)	Roadside	No	-	-	27.2	31	18.8
(27) Cambuslang Road, Rutherglen	Roadside	No	-	-	21.0	29	25.9
(28) Farmeloan Road, Rutherglen	Roadside	No	-	-	32.9	38	39.2
(29) Stonelaw Road, Rutherglen	Roadside	No	-	-	21.0	25	23.2
(30) 263 Main Street	Roadside	No	-	-	-	36	31.8
(31) Mill Street	Roadside	No	-	-	-	27	29.2
(32-34) Main Street, Rutherglen Co Location 1, 2 & 3	Roadside	No					39.1
(35-37) Whirlies Roundabout, EK Co Location 1, 2 & 3	Roadside	No					31.1

( ) Brackets: distance correction calculations have been conducted to predict the annual mean concentrations at the nearest relevant exposure

Figure 2.15: Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites 2009 - 2013



## 2.2.2 Particulate Matter (PM<sub>10</sub>)

The annual mean PM<sub>10</sub> concentrations measured from 2009 to 2013 are presented in Table 2.7 and Figure 2.16. The number of 24-hour mean PM<sub>10</sub> concentrations in excess of the 50 µg.m<sup>-3</sup> short-term objective; measured from 2009 to 2013 are presented in Table 2.8.

PM<sub>10</sub> concentrations measured at Whirlies, Glespin and Hamilton were below both the annual mean Scottish objective of 18µg m<sup>-3</sup> and hourly objective of less than seven exceedances per year.

An annual mean PM<sub>10</sub> concentration in excess of the 18 µg.m<sup>-3</sup> objective was measured at the Rutherglen automatic monitoring site. South Lanarkshire Council is currently in the process of declaring an AQMA for PM<sub>10</sub> at Rutherglen. The AQMA boundaries have been drafted and are awaiting formal public consultation which is planned to commence in October 2014. Nine daily mean concentrations in excess of the 50 µg.m<sup>-3</sup> short-term objective were measured during 2013 which is more than the seven exceedances permitted in the Scottish PM<sub>10</sub> objectives. Examination of the last five years measurements indicates that annual mean PM<sub>10</sub> concentrations have been decreasing at this location, but are still in excess of the 18 µg.m<sup>-3</sup> objective. This may be attributable to traffic which previously used the local roads now using the M74 extension which opened in June 2011.

At the Raith Interchange site an annual mean PM<sub>10</sub> concentration of 21 µg.m<sup>-3</sup> was measured during 2013 with 3 exceedances of the 50 µg.m<sup>-3</sup> daily mean objective, with a 98.1th percentile of 48 µg.m<sup>-3</sup>. The monitoring site is however located approximately 60m from the nearest relevant exposure. Based on DMRB screening calculation conducted for the 2012 Updating and Screening assessment; and that measured PM<sub>10</sub> concentrations have not increased since 2012; it is considered very unlikely that the PM<sub>10</sub> objectives are being exceeded at the nearest relevant exposure to the monitoring site.

**Table 2.7: Results of Automatic Monitoring for PM<sub>10</sub>: Comparison with Annual Mean Objective**

Site ID	Site Type	Within AQMA?	Valid Data Capture Monitoring Period	Valid Data Capture 2013 %	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration (µg/m <sup>3</sup> )				
						2009* <sup>c</sup>	2010* <sup>c</sup>	2011* <sup>c</sup>	2012* <sup>c</sup>	2013 <sup>c</sup>
Glespin	Roadside	N	97.9%	53.6%	Y	10	13	9	9	14 <sup>#</sup>
Rutherglen	Roadside	N	90.9%	90.9%	Y	23	25	21	18	19
East Kilbride Whirlies	Roadside	Y	76.5%	76.5%	Y	15	17	16	13	14
Raith Interchange	Roadside	N	64.9%	64.9%	Y	-	26	26	26	21 <sup>#</sup>
Hamilton	Roadside	N	97.9%	20.7%	Y	-	-	-	-	13*

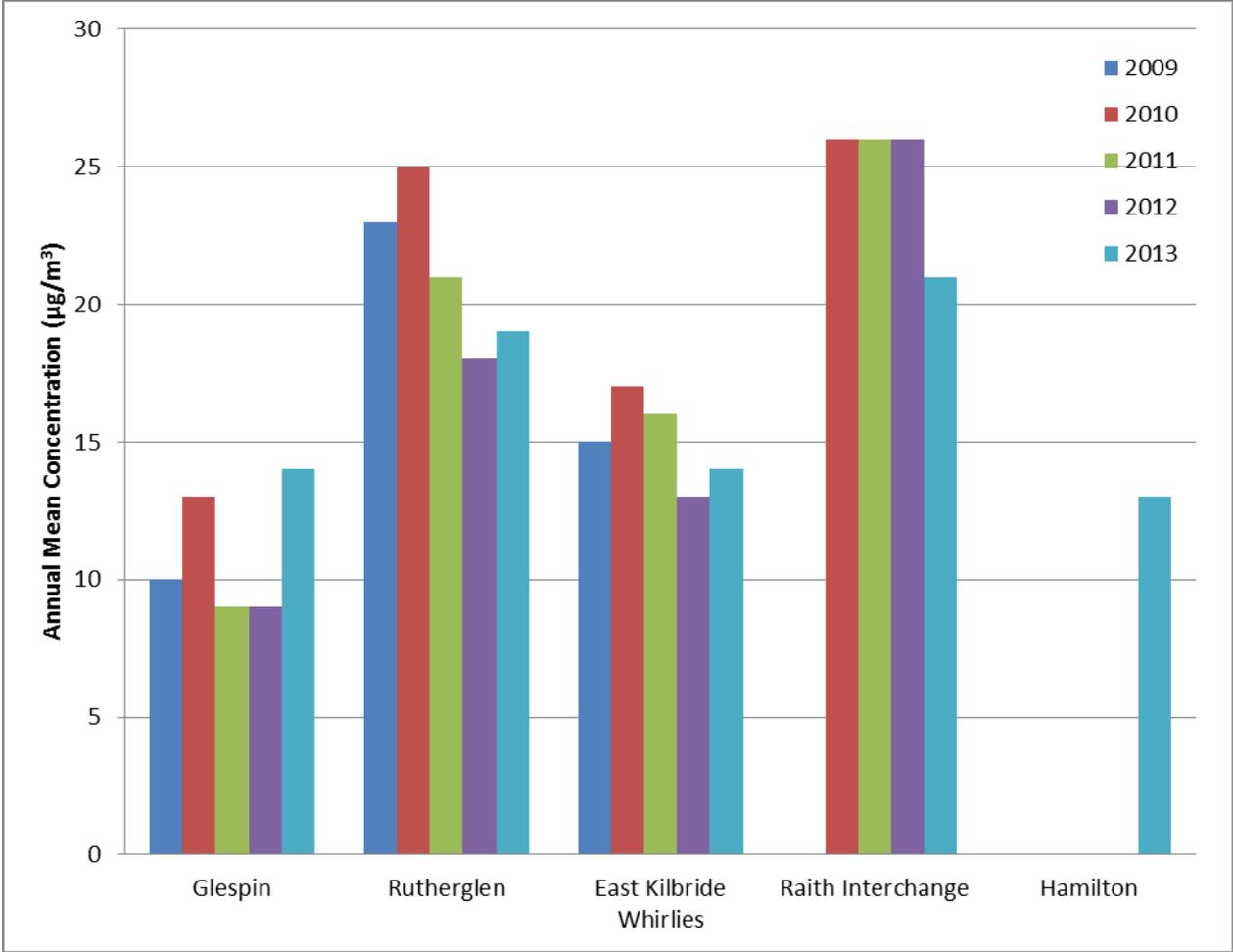
<sup>#</sup>Short-term to long-term adjustment applied as data capture < 75%

\*no short to long term adjustment was applied, due to low data capture. As a result, the data should be used for indicative purposes only. Details of the short-term to long-term adjustment calculation are presented in Appendix A.

**Table 2.8: Results of Automatic Monitoring for PM<sub>10</sub>: Comparison with 24-hour Mean Objective**

Site ID	Site Type	Within AQMA?	Valid Data Capture Monitoring Period	Valid Data Capture 2013 % <sup>b</sup>	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m <sup>3</sup> (98.1th percentile in bracket if data capture < 75%)				
						2009* <sup>c</sup>	2010* <sup>c</sup>	2011* <sup>c</sup>	2012* <sup>c</sup>	2013 <sup>c</sup>
Glespin	Roadside	N	97.9%	53.6%	Y	0	0	0	0	1 (32)
Rutherglen	Roadside	N	90.9%	90.9%	Y	-	5	13	5	9
East Kilbride Whirlies	Roadside	Y	76.5%	76.5%	Y	5	5(81)	2	4	0
Raith Interchange	Roadside	N	64.9%	64.9%	Y	8 (56)	21	21	16	3 (48)
Hamilton	Roadside	N	97.9%	20.7%	Y	-	-	-	-	0 (31)

Figure 2.16: Trends in Annual Mean PM<sub>10</sub> Concentrations



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### **2.2.3 Sulphur Dioxide (SO<sub>2</sub>)**

South Lanarkshire Council do not currently measure SO<sub>2</sub> concentrations.

### **2.2.4 Benzene**

South Lanarkshire Council do not currently measure Benzene concentrations.

### 2.2.5 Summary of Compliance with AQS Objectives

South Lanarkshire Council has examined the results from monitoring in Lanark and Rutherglen. At both locations, AQMA boundaries have been drafted and are awaiting formal public consultation which is planned to commence in October 2014. Concentrations within the proposed AQMA's still exceed the annual mean objective for NO<sub>2</sub> at Bannatyne Street, Lanark and the PM<sub>10</sub> objective at Main Street, Rutherglen and the proposed AQMA's should remain.

Concentrations outside of each AQMA are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

South Lanarkshire Council has measured concentrations of NO<sub>2</sub> above the annual mean objective at Almada Street in Hamilton and **will need to proceed to a Detailed Assessment** at this location.

## **3 New Local Developments**

### **3.1 Road Traffic Sources**

No new road traffic sources have been identified within the South Lanarkshire Council area since the last Updating and Screening assessment.

### **3.2 Other Transport Sources**

No other transport sources have been identified within the South Lanarkshire Council area since the last Updating and Screening assessment.

### **3.3 Industrial Sources**

No new industrial sources have been identified within the South Lanarkshire Council area since the last Updating and Screening assessment.

### **3.4 Commercial and Domestic Sources**

No new commercial and domestic sources have been identified within the South Lanarkshire Council area since the last Updating and Screening assessment.

### **3.5 New Developments with Fugitive or Uncontrolled Sources**

No new developments with fugitive or uncontrolled sources have been identified during 2013.

South Lanarkshire Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

South Lanarkshire Council confirms that all the following have been considered:

- Road traffic sources
- Other transport sources
- Industrial sources
- Commercial and domestic sources
- New developments with fugitive or uncontrolled sources.

## 4 Local / Regional Air Quality Strategy

A Consultative draft of South Lanarkshire Council's **Air Quality Strategy (AQS) 2014 – 2019** has been subjected to an internal consultation within the Council; and public consultation. There are still amendments to be made to take consultation comments into consideration comments, the strategy will then pass through the Council's governing procedure. South Lanarkshire Council plan to have this Strategy completed and published by December 2014.

South Lanarkshire Council is committed to promoting the continued growth and regeneration of South Lanarkshire in a sustainable manner while seeking to improve and safeguard the environment. Under the Local Air Quality Management (LAQM) regime, local authorities have a legal duty to review and assess air quality within their areas against a set of health based objectives, and where required, take measures to work towards improving air quality. South Lanarkshire Council recognise that improving the quality of air we breathe and minimising the potential for any degradation in air quality that may occur through growth and regeneration is an essential component of this commitment.

This strategy is intended as high level guidance to help inform other strategies and policies across the wide range of services that the Council provides. As well as Council staff, the strategy is also aimed at local businesses, organisations and the general public, all of whom have their role in being aware of, and contributing to air quality within our local area. This strategy, therefore, connects with a wide range of Council led policies and strategies, including, the **Sustainable Development Strategy** and the **Local Development Plan**. This Air Quality Strategy (AQS) is set out to clearly communicate the reasons and ideas behind the strategic outcomes it is intended to achieve.

### **Theme 1: People and Communities**

#### Strategic Outcome 1: South Lanarkshire residents enjoy good air quality and are healthier

South Lanarkshire Council aims improve the health of its residents. Air quality can have impacts on health and the LAQM regime is aimed at protecting health. Our air quality monitoring will be compared with South Lanarkshire wide health figures as reported in our State of the Environment report. We will investigate the possibility of the Council entering into partnership with the health authorities to monitor the number of vulnerable people with respiratory-related illnesses within areas of poor air quality.

#### Strategic Outcome 2: Awareness of transport related air quality issues is raised and sustainable transport options promoted

The Council recognises the need to plan and develop new sustainable transport schemes, and to gauge and assess public opinion on these. This will help the Council identify the most effective and efficient measures which will result in greater improvement of air quality. This outcome could be measured through the insertion of specific public transport questions into existing customer focus group opinion polls.

#### Strategic Outcome 3: The impacts on air quality caused by new development are reduced

The outcome will be achieved through implementation of the South Lanarkshire LDP and supporting Supplementary Guidance. We will monitor all relevant planning proposals and applications, the findings of appropriate air quality assessments and mitigation measures to minimise developmental impacts.

## **Theme 2: Sustainable South Lanarkshire**

### Strategic Outcome 4: The impacts of poor air quality on the environment and climate change are managed

The monitoring of this outcome directly relates to the LAQM monitoring and reporting we currently undertake for the Scottish Government and the biennial State of the Environment Report. We will continue to monitor, update and assess this data, and act in accordance with LAQM procedures. Through the identification of sites of environmental and ecological importance, the Council will be able to readily identify any new developments or changes which may result in air pollutants impacting these sites.

Using the links identified in this strategy, the Council can ensure air quality and climate change are considered where required. It will monitor future planning applications and proposals, for example, for biomass installations, to ensure air quality effects have been accounted for and appropriately mitigated. By monitoring these developments, and confirming the appropriate environmental assessments are carried out, the Council can effectively work towards meeting this strategic outcome.

### Strategic Outcome 5: Air quality in South Lanarkshire is improved through effective partnership working

Partnership working can be assessed by those involved ensuring they track not only when such collaborations have taken place, but also what proved most/least effective in the partnership, such that future improvements can be made. Specifically for air quality, increasing partnership with other departments such as transport should help to ensure air quality is not only being considered but also reduced due to this.

South Lanarkshire's **Local Development Plan** (May, 2013) sets out a framework for pursuing the continued growth and regeneration of South Lanarkshire by seeking sustainable development in an improved urban and rural environment. It promotes sustainable transport options with longer term objectives to promote change from private to public modes of transport. The policies in relation to air quality are as follows:

#### Transport

Policy 16 - New development proposals must consider and where appropriate mitigate the resulting impacts of traffic growth and have regard to the need to reduce the effects of greenhouse gas emissions but at the same time support and facilitate economic recovery, regeneration and sustainable growth. Development of walking, cycling and public transport networks which provide a viable and attractive alternative to car travel, thus reducing the effects of transport on the environment, will be supported. In addition existing and proposed walking and cycling routes will be safeguarded including former railway lines which can provide walking, cycling and horse riding opportunities.

South Lanarkshire's **Sustainable Development Strategy (SDS) 2012-2017** involves finding a balance between economic, social and environmental objectives to safeguard the wellbeing of future generations both locally and globally. It prioritises the Review and Assessment regime of LAQM. The policies that are prioritised in relation to air quality are as follows:

- Continue to monitor local environmental conditions through regular review of South Lanarkshire's State of Environment Report
- Review and assess air quality throughout South Lanarkshire as required by the Environmental Act 1995 and in line with national guidance.
- Progress the development of policies and proposals to protect and improve the environment through the South Lanarkshire Local Development Plan

## South Lanarkshire Council

- Promote opportunities for walking, cycling and horse riding using South Lanarkshire's network of core paths and developing a new outdoor access strategy
- Develop and promote learning opportunities which increase young people's knowledge and understanding of sustainable development
- Continue to educate our young people about the local environment in which they live and encourage them to reduce the impacts they have upon it

South Lanarkshire's **State of the Environment Report** aim to provide quality data that allows the evaluation of a range of environmental issues, identifying trends and providing an overall picture of the condition or state of South Lanarkshire's environment. Air Quality is highlighted as a main environment issue in the South Lanarkshire District. Transport has been highlighted as the main cause for breaches in local air quality limits particularly at busy junctions. There are no significant industrial sources of air pollution in South Lanarkshire. South Lanarkshire Council is focused on the continual monitoring is required to identify and asses further air quality hotspots.

The State of the Environment objective that is in relation to air quality is; to improve air quality, reducing the level of pollutants and the impacts on receptors.

## 5 Planning Applications

Planning applications during 2013 for which an air quality assessment was submitted were:

**HM/13/0432 – Erection of a waste processing and resource recovery facility, former Craighead School Whistleberry Road Hamilton ML3 0EG**

The Application was Refused (28/05/2014)

**HM/13/0127 - Erection of 44 dwelling houses with associated works, Bellshill Road, Uddingston, G71 6NY; and HM/13/0128 - Erection of 26 dwelling houses and 15 flatted dwellings with associated works, Bellshill Road, Uddingston, G71 6NY:** As the site is located adjacent to the M74 motorway, an air quality impact assessment was required as the development could result in the introduction of new exposure into an area of potentially poor air quality. The assessment indicated that no additional people are expected to be exposed to air pollutant concentrations exceeding the relevant objective values as a result of the site being used for residential use.

The application is registered and is with the Planning Committee.

**HM/13/0352 – Residential developments with associated landscaping, roads, neighbourhood centre, community facilities and infrastructure works. Larkhall Community Growth Area:** The air quality assessment is currently being carried out. The application is registered and is with the Planning Committee.

**HM/13/0325 – Demolition of existing buildings and erection of 79 dwellinghouses, landscaping and associated works. Carlisle Road, Ferniegair, Hamilton:** The air quality assessment included in the environmental statement for the development concluded that the main impact on local air quality at existing residential receptors during the construction will be negligible to minor adverse. The assessment indicated any emissions from construction plant operating on the site would be small in comparison to the emissions from the road traffic movements on the roads adjacent to the Site and therefore would be negligible. It was anticipated that the effect of construction vehicles entering and leaving the site would be, at worst, minor adverse, during peak construction periods, and negligible at all other times, in the context of local background pollutant concentrations and existing local road traffic emissions. All construction effects would be localised and temporary.

The assessment also concluded that the main impact on local air quality at existing residential receptors on completion would be negligible.

**EK/13/0046 - Demolition of existing building and erection of retail development (Class 1) and associated access, car parking and works. Atholl House Avondale Avenue East Kilbride G74 1LU:**

The air quality assessment carried out in support of the planning application for the proposed retail development concluded that changes in traffic flows in the local area associated to the proposed development are predicted to have a negligible effect on local air quality sites of relevant public exposure. Therefore, no mitigation measures are required for the operation phase of the development on the grounds of air quality. It is anticipated that without suitable control measures, the construction and demolition activities associated with the proposed development phase could result in nuisance dust and PM<sub>10</sub> emissions, as there are receptors within 200m of the site. A number of mitigation measures have therefore been recommended to minimise impacts during the construction phase. Provided these mitigation measures are implemented, generation of dust and PM<sub>10</sub> will be minimised.

## 6 Quality Planning Policies

### **Planning and building standards air quality information webpage**

South Lanarkshire Council does not currently have any formal supplementary planning guidance relevant to air quality; the planning and building standards section of the council website does however contain a webpage<sup>1</sup> with lots of useful information for developers relating to air quality and how it will be considered within the planning process. There is also a link to this webpage from the Environmental Health pages of the council website.

The webpage summarises the potential health impacts of poor air quality; suggests ideas that developers should consider about their proposal in relation to air quality; and also provides some reasons why an air quality impact assessment may be required in support of a planning application.

### **Planning conditions relevant to air quality**

South Lanarkshire Council uses the triggers detailed in the EPUK Planning for Air Quality Guidance<sup>2</sup> and have a number of planning conditions which are relevant to air quality.

The planning conditions are as follows:

#### **AQ01. Proposed Air Pollution Sources [Deferment]**

The applicant should be required to undertake and submit an air quality impact assessment which satisfies the Planning Authority that the Local Air Quality Management Objectives for the pollutants specified in the Air Quality Regulations, made under Part IV of the Environment Act 1995, will not be exceeded at (any location in the vicinity of the development where public exposure is relevant) AND/OR residential properties in the vicinity of the development due to the impacts of the proposed development and, or the potential increase in traffic associated with the development. The survey and report should use a method based on the principles set out in the Environmental Protection UK document Development Control: Planning for Air Quality (2010 Update) and Scottish Government publication "Local Air Quality Management Technical Guidance LAQM.TG(09)" or a method that has been agreed with the Planning Authority. [Ensure appropriate explanation is given so as to justify why the air quality impact assessment is necessary, guidance for scale of development that would fall into this is given Pg14 EPUK guide]

#### **AQ02. Proposed Air Pollution Receptors [Deferment]**

The applicant should be required to undertake and submit an air quality impact assessment which satisfies the Planning Authority that the Local Air Quality Management Objectives for the pollutants specified in the Air Quality Regulations, made under Part IV of the Environment Act 1995, will not be exceeded at the proposed development. The survey and report should use a method based on the principles set out in the Environmental Protection UK document Development Control: Planning for Air Quality (2010 Update) and Scottish Government publication "Local Air Quality Management Technical Guidance LAQM.TG(09)" or a method that has been agreed with the Planning Authority. [Ensure appropriate explanation is given so as to justify why the air quality impact assessment is necessary]

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<sup>1</sup> South Lanarkshire Council (2013)  
[http://www.southlanarkshire.gov.uk/info/200193/pollution/854/air\\_quality\\_information\\_for\\_developers](http://www.southlanarkshire.gov.uk/info/200193/pollution/854/air_quality_information_for_developers)

<sup>2</sup> Environmental Protection UK (2010) Development Control: Planning For Air Quality (2010 Update)

**AQ03 Air Quality Mitigation Measures [Approved Scheme] [Condition]** Any proposed scheme of mitigation measures designed to reduce the impacts from pollution sources or the effects upon any potential receptors shall require to be approved by the Council as Planning Authority and shall be implemented prior to the development being brought into use and where appropriate, shall be retained in accordance with the approved scheme to the satisfaction of the Council as Planning Authority.

## **Dust Control**

### **D01. Dust mitigation/control [Condition]**

Prior to development commencing on site, a scheme for the control and mitigation of dust shall be submitted to and approved in writing by the Council as Planning Authority. No changes to the approved scheme shall take place unless agreed in writing by the Council as Planning Authority. The scheme shall thereafter be implemented in accordance with a programme to be agreed in writing with the Council as Planning Authority.

[when determining if the proposed dust mitigation or control measures are appropriate regard shall be given to the principles of best practicable means to minimise the impact of dust, this will change depending on the development. e.g. EPUK Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance 2012 may be a starting reference, however there are other guides]

### **D02. Dust Monitoring [Condition]**

Prior to development commencing on site, a dust management and monitoring scheme shall be submitted to and approved in writing by the Council as Planning Authority. The scheme shall thereafter be implemented in accordance with a programme to be agreed in writing with the Council as Planning Authority. Monitoring results shall be readily available to Officers of the Council investigation adverse comments.

[when determining if the proposed dust monitoring and management is appropriate regard shall be given to the principles of best practicable means to minimise the impact of dust, this will change depending on the development. e.g. EPUK Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance 2012 may be a starting reference, however there are other guides.]

### **ADV NOTE 4 Formal action may be taken if nuisance occurs.**

None of the above conditions will preclude formal action being taken by the Executive Director of Community & Enterprise Resources against the person responsible for any nuisance which may arise due to the operation of the proposed development

## 7 Local Transport Plans and Strategies

South Lanarkshire Council's **Local Transport Strategy (LTS) for 2013 – 2023** was updated in 2013. It's policies in relation to air quality are as follows:

LTP 20- The Council will require that mjo new developments are accessible by walking cycling and public transport.

LTP 27- The Council will seek to achieve a reduction in the rate of traffic growth on its road network.

LTP 31- The Council will encourage developers to consider rail as an alternative to road for moving freight. Where road transportation is the only viable option we will encourage best practice to be pursued.

LTP 35- The Council will aim to increase the proportion of journeys that are made by foot in South Lanarkshire.

LTP 36- The council will contribute towards the achievement of the national cycling target of 10% of all trips being made by bike by the year 2020.

LTP 37- The Council will actively support and encourage children to travel actively with the aim of increasing the proportion of journeys that are made to school on foot or by bike.

LTP 39- We will actively support and encourage the development of public transport with the aim of increasing the proportion of journeys that are made by bus and by rail.

LTP 40- We will seek to improve the quality of bus services through and in partnership with SPT.

LTP 41- We will support and encourage multi modal journeys that allow the convenient interchange between rail, bus, car and bicycle. This includes supporting national government, regional transport partnerships and public transport operators in their efforts in the development of multi modal integrated, through ticketing.

LTP 42- The Council will support the introduction of low carbon vehicles as a sustainable alternative to internal combustion vehicles.

LTP 44 – The Council will continue to monitor and work to meet statutory requirements as appropriate.

LTP 45- The Council will continue to integrate air quality considerations into its strategic policies and plans.

South Lanarkshire Council's LPS also includes the following actions with regard to air quality:

LTA 26- The Council will seek to extend our cycling network including further development of the National Cycle Network and development of the local South Lanarkshire network.

## South Lanarkshire Council

LTA 27- Specific routes will be identified and prioritised for implementation. Early projects will include completing the National Cycle network in South Lanarkshire and routes connecting Hamilton, East Kilbride and Rutherglen.

LTA 28- The Council will seek to increase the number of schools that develop travel plans.

LTA 30- The Council will, in conjunction with SPT, implement prioritised public transport infrastructure improvements including bus stops and shelters.

LTA 31- Where necessary we will implement Quality Partnerships, in partnership with bus operators and SPT to improve the quality and frequency of bus services.

LTA 32- We will investigate the further provision of park and ride facilities in South Lanarkshire to facilitate sustainable multi modal journeys

LTA 33- We will develop a network of 'fast' charging stations in Council car parks throughout South Lanarkshire to facilitate public electric vehicle charging.

LTA 34- We will investigate the provision of 'rapid' charging stations at strategic locations to extend the range of electric vehicles.

LTA 35- We will require the provision of electric vehicle recharging infrastructure in all new developments.

LTA 36- Action Plan measures which have been identified through the Air Quality Steering Group, in an attempt to reduce road transport pollution around the Whirlies AQMA in East Kilbride, will be monitored and evaluated to determine their impact on the air quality at the AQMA.

LTA 37- Detailed Assessments will be carried out including assessment of PM10 and NO2 at Rutherglen Main Street and Hamilton town centre and NO2 in Lanark town centre and Main Street Uddingston.

LTA 38- The Council will operate their continuous monitoring equipment in the areas which are most likely to be closest to breaching the 2010 objectives for PM10.

LTA 39- Consideration is given to the deployment of additional monitoring sites along the new M74 extension to inform future review and assessment of air quality.

To increase more sustainable travel options the strategy also includes

Bus services in South Lanarkshire could provide a more attractive alternative to the car if waiting facilities and timetable information were improved. The Council, in partnership with SPT, has been improving facilities at bus stops including providing high quality bus shelters, making bus stops more accessible with the installation of high kerbs that are at the same height as the floor of buses and providing timetabled information at all bus stops. We are also installing real time passenger information along some of our strategic bus routes.

## 8 Implementation of Action Plans

There have been delays finalising the East Kilbride Whirlies AQMA Action Plan. An internal consultation within the Council of the action plan is scheduled to commence in September 2014. It is hoped that the public consultation stage will commence in October 2014. The publication of the action plan will follow, with a target of Early 2015.

Actions that South Lanarkshire Council have targeted to reduce the amount of vehicular movements on the road network by means of encouraging modal shift from private vehicles to public transport or to alternative modes of transport such as cycling. South Lanarkshire Council has invested in an extensive electric charging infrastructure throughout the District (at the time of writing, SLC has the biggest electric charging network in Scotland) to encourage uptake of electric vehicles by the general public. Other actions that have been taken include:

- Real Time Passenger Information installed on a number of bus stops within East Kilbride area to support uptake of public transport;
- Expansion of cycle network throughout the District and the installation of Toucan crossings at various locations. This was supplemented by an extensive advertising campaign in the summer of 2013 to promote the network and encourage cycling;
- Support given to the Scottish Government's Air Quality website through the dissemination of air quality data from sites throughout the District which also supports the "Know and Respond" text/email alert system warning subscribers of periods of poor air quality;
- Vehicle Emissions Testing Enforcement Campaign run every summer, together with Engine idling Enforcement<sup>1</sup>
- Installation of black carbon and traffic monitoring cameras at Whirlies Roundabout;
- Development of Construction/Demolition Code of Practice for Developers;
- Increased use of Section 75 Town and Country Planning (Scotland) Act 1997 agreements to formally bind developers to provide mitigation in areas of poor air quality;
- Improvement to the Bus Infrastructure in Rutherglen area
- Enhancement of Park and Ride facilities and installation of cycle storage lockers at train stations throughout the District;
- Implementation of Cycle Partnership which has been set up to ensure that the existing cycle network integrates with surrounding transport network. It aims to provide links to other sustainable transport modes including train stations and main bus stops;
- Compilation of South Lanarkshire Councils' Air Quality Strategy.
- Promotion of the "Give Me Cycle Space" campaign within Primary Schools in the District

South Lanarkshire Council have taken up a number of in-house initiatives:

- Eco friendly vehicles for pool car fleet including a number of electric vehicles;
- Eco-friendly vehicles for SLC transport fleet;
- Walk to School Week Programme and school "walking bus";
- Council mini bus service shuttling staff from main office hubs to training venues;
- Flexible working system to enable staff to travel to and from work out with peak travel flow times;

<sup>1</sup>South Lanarkshire Council (2014) Emission Testing to improve air quality  
[http://www.southlanarkshire.gov.uk/press/article/512/emission\\_testing\\_to\\_improve\\_air\\_quality](http://www.southlanarkshire.gov.uk/press/article/512/emission_testing_to_improve_air_quality)

Give Me Cycle Space



The Give Me Cycle Space campaign will be in operation at the 11 schools within South Lanarkshire. Financial contribution will assist with this.

The 11 target schools will be receiving all the elements of the campaign as detailed below.

- 🚲 Media kit comprising of the below
- 🚲 School gate banner for display outside the school
- 🚲 Advertising flag for display at the school
- 🚲 Direct mailing for P5-7 with a covering letter, leaflet, sticker etc.
- 🚲 "Cycle to school week" class competition materials for P5-7 (dates tbc)
- 🚲 Goodie bag for kids

Other media around the school aimed towards drivers, asking them to be more considerate towards cyclists.

This may include:-

- 🚲 Billboards
- 🚲 Posters
- 🚲 Lamp post banners
- 🚲 Local press activity may also be arranged by the lead media agency (in consultation with LA)
- 🚲 Interviews of drivers may also be conducted by the lead media agency

Two schools (Crawforddyke Primary, Carluke and St Anthony's Primary, Rutherglen) will also be hosting a day with the Riderz Team which includes some playground cycling activities with the Primary 5-7 pupils and a 20 minute show.

The campaign was launch at the end of April 2014.

## 9 Conclusions and Proposed Actions

### 9.1 Conclusions from New Monitoring Data

An NO<sub>2</sub> annual mean concentration of 51 µg.m<sup>-3</sup> which in excess of the 40 µg.m<sup>-3</sup> UK wide objective was measured at the Raith Interchange automatic monitoring site. The annual mean PM<sub>10</sub> concentration of 21 µg.m<sup>-3</sup> measured during 2013 was also in excess of the Scottish PM<sub>10</sub> objective. This site is however located at the roadside approximately 60m from the façade of the nearest residential property. Based on a distance correction calculation to predict the annual mean NO<sub>2</sub> concentration at the nearest location of relevant exposure; and DMRB screening calculation conducted for the 2013 Progress Report it is considered unlikely that the either the NO<sub>2</sub> or PM<sub>10</sub> annual mean objectives are being exceeded at locations of relevant exposure close to Raith Interchange. During early 2014 South Lanarkshire council had removed the automatic monitoring site at Raith Interchange and is planning to re-install the automatic monitoring site at Clydeview, Bothwell. This is a result of preparatory works for a planned upgrade of M74/Raith Interchange. At the time of this report this new site had not been re-installed.

South Lanarkshire Council has measured concentrations of NO<sub>2</sub> above the annual mean objective at Bannatyne Street in Lanark. A Detailed Assessment of NO<sub>2</sub> in Lanark was completed in February 2014 which concluded that annual mean NO<sub>2</sub> concentrations in excess of the 40 µg.m<sup>-3</sup> objective were occurring at locations of relevant exposure in Bannatyne Street. South Lanarkshire Council is currently in the process of declaring an AQMA for NO<sub>2</sub> in Lanark therefore no other actions are required at this time.

Annual mean NO<sub>2</sub> concentrations in excess of the 40 µg.m<sup>-3</sup> objective were measured at two diffusion tube sites in Hamilton, Low Patrick Street and Almada Street. No further action is required at Low Patrick Street at this time as a Detailed Assessment of NO<sub>2</sub> and PM<sub>10</sub> for the area around the Duke Street/Quarry Street junction in Hamilton, has been completed and submitted to Scottish Government for appraisal.

South Lanarkshire Council are required to proceed to a detailed assessment at Almada Street, Hamilton and will consider expanding their NO<sub>2</sub> diffusion tube network in this area to provide additional measurements for the Detailed Assessment.

An annual mean PM<sub>10</sub> concentration in excess of the 18 µg.m<sup>-3</sup> objective was measured at the Rutherglen automatic monitoring site (19 µg.m<sup>-3</sup>) this site is however at a roadside location 10m from the nearest relevant exposure. South Lanarkshire Council is currently in the process of declaring Rutherglen as an AQMA for PM<sub>10</sub>, the AQMA boundaries have been drafted and are awaiting formal public consultation to commence in August 2014. Nine daily mean concentrations in excess of the 50 µg.m<sup>-3</sup> short-term objective were measured during 2013 which is out with the seven exceedances permitted in the Scottish PM<sub>10</sub> objectives.

## **9.2 Conclusions relating to New Local Developments**

The review of local developments has not identified any locations where there may be a risk of the air quality objectives being exceeded; no additional air quality assessment is recommended at this time.

## **9.3 Proposed Actions**

The next LAQM requirements for South Lanarkshire Council are:

- Complete the public consultation process for the Whirlies Roundabout AQMA action plan and produce the finalised action plan
- Finalise Air Quality Strategy document
- Complete consultation on suggested AQMA boundary lines and declare AQMA at Rutherglen for PM<sub>10</sub>
- Complete consultation on suggested AQMA boundary lines and declare AQMA at Lanark for NO<sub>2</sub>
- Conduct the Detailed Assessments for Hamilton Almada Street area once there is sufficient monitoring data to inform the study.

## 10 References

Department for Environment, Food and Rural Affairs, (2009) Local Air Quality Management Technical Guidance LAQM.TG (09).

Department for Environment, Food and Rural Affairs, Air Quality Strategy for England, Scotland Wales and Northern Ireland, 2007.

Spreadsheet of Diffusion Tube Bias Adjustment Factors accessed at <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

South Lanarkshire Council, (2013) Local Transport Strategy 2013 - 2023

South Lanarkshire Council, (2013) State of the Environment

South Lanarkshire Council, (2012) Sustainable Development Strategy 2012 – 2017

South Lanarkshire Council, Planning and Building Standards Services, Community and Enterprise Resources (2013) Proposed South Lanarkshire Local Development Plan

South Lanarkshire Council, (2014) Consultative Draft, Air Quality Strategy 2014 - 2019

South Lanarkshire Council (2014) Emission Testing to improve air quality at

[http://www.southlanarkshire.gov.uk/press/article/512/emission\\_testing\\_to\\_improve\\_air\\_quality](http://www.southlanarkshire.gov.uk/press/article/512/emission_testing_to_improve_air_quality)

## Appendices

### Appendix A: QA:QC Data

#### QA/QC of automatic monitoring

All of South Lanarkshire Council's automatic monitoring sites are calibrated and audited by Ricardo-AEA Ltd whereby monitoring data are managed to the same procedures and standards as AURN sites.

#### PM Monitoring Adjustment

All PM<sub>10</sub> measurements were made using TEOM analysers fitted with FDMS units. The measurements are therefore considered gravimetric equivalent and no adjustments have been applied to the data. All TEOM FDMS data were fully ratified by Ricardo-AEA to AURN standards.

#### QA/QC of diffusion tube monitoring

All passive diffusion tubes (PDT) for NO<sub>2</sub> measurement were prepared and analysed by Edinburgh Scientific Services. The PDTs were prepared using the 50% triethanolamine (TEA) in water method. Edinburgh Scientific Services is a UKAS accredited laboratory with documented Quality Assurance/Quality Control (QA/QC) procedures for diffusion tube analysis.

Edinburgh Scientific Services participates in the HSL WASP NO<sub>2</sub> PT rounds and the percentage (%) of results submitted which were subsequently determined to be satisfactory during the previous five rounds in 2011 and 2012 based upon a z-score of  $< \pm 2$  were as follows:

- Jan - Mar 2013: 100%
- April- June 2013: 100%
- July- Sept 2013: 75%
- Oct- Dec 2013: 100%
- Jan- Mar 2014: 100%

Over a rolling five round WASP window, it is expected that 95 % of laboratory results should be  $\leq \pm 2$ . If this percentage is substantially lower than 95 % for a particular laboratory, within this five round window, then one can conclude that the laboratory in question may have significant systematic sources of bias in their assay. In this case the average percentage over the last five rounds is 100%.

#### Diffusion Tube Bias Adjustment Factors

Two co-location studies were conducted during 2013 at the Whirlies Roundabout and Rutherglen monitoring sites where NO<sub>2</sub> concentrations are measured using automatic analysers. Bias factors have been calculated for each site. Details of the co-location factor calculations, including the precision checks are presented in Figures A.1 to A.2. The bias factor from the national database is presented in Fig A.4.

Figure A.1: Co-location study – Whirlies Roundabout East Kilbride

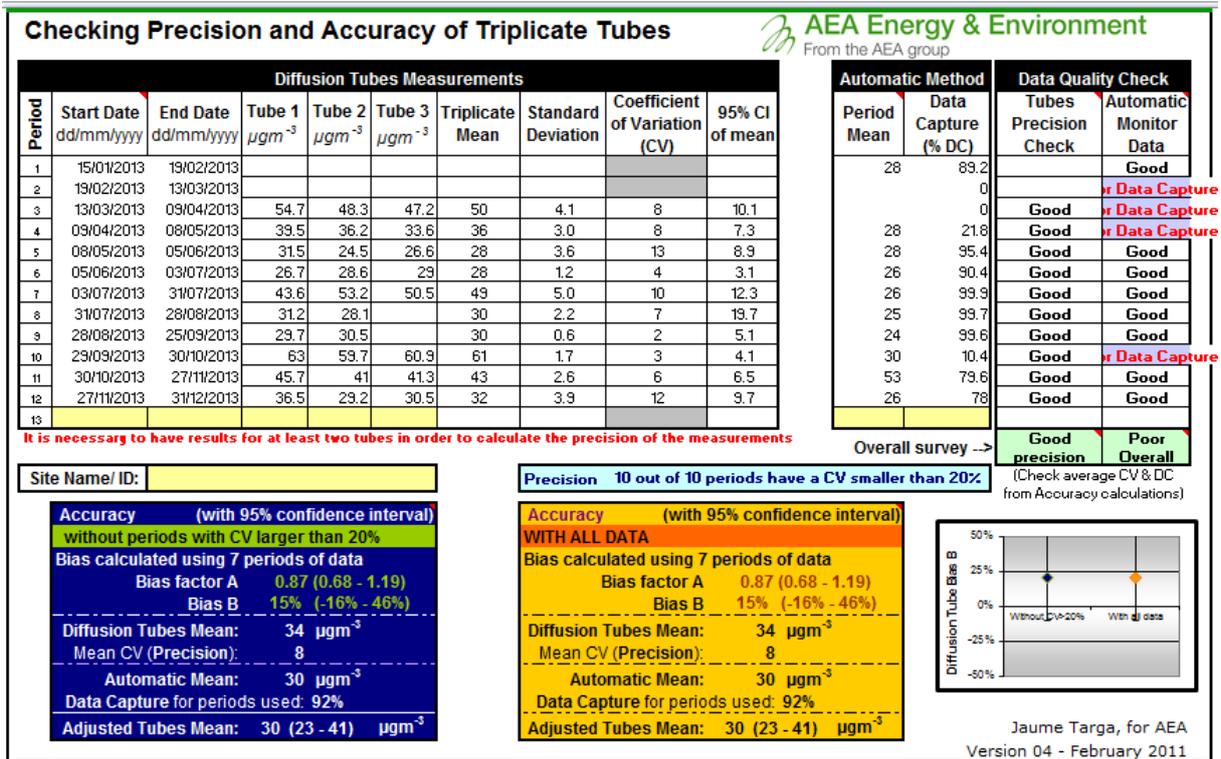
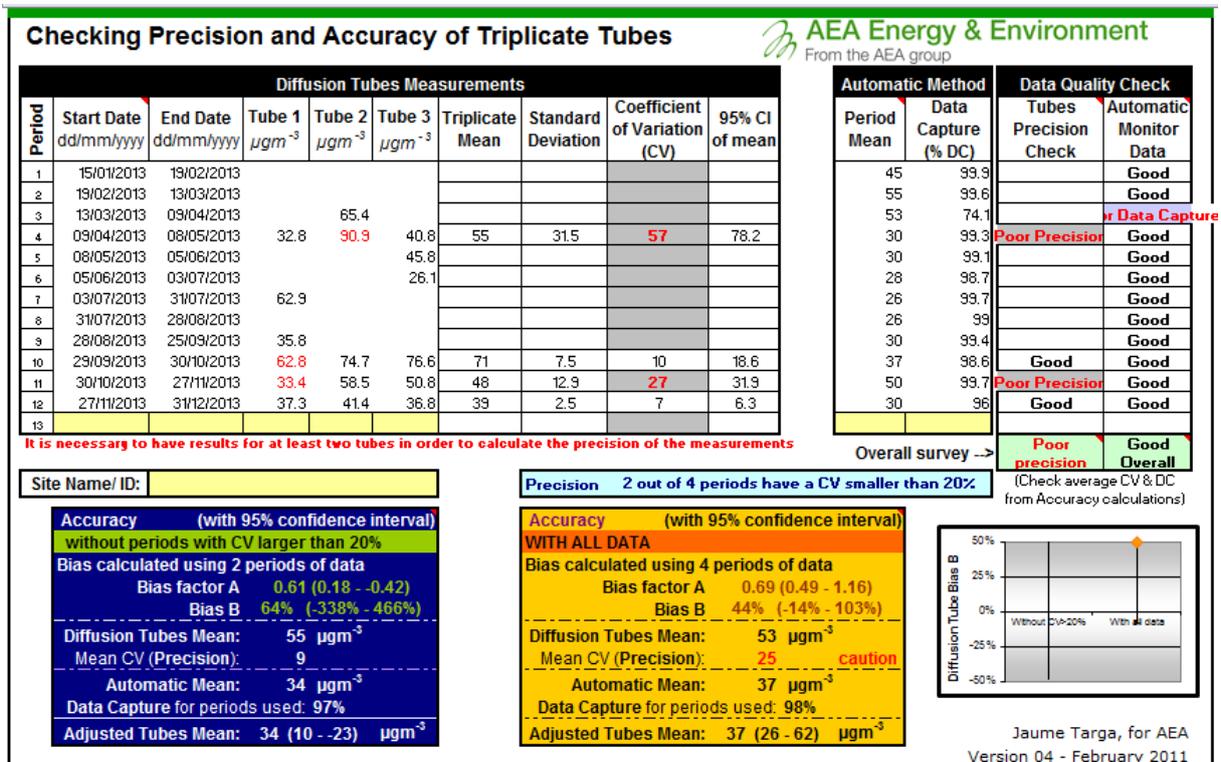


Figure A.2: Co-location study – Rutherglen



**Table A.3: Diffusion Tube Bias Adjustment Factors Spreadsheet for March 2014**

National Diffusion Tube Bias Adjustment Factor Spreadsheet							Spreadsheet Version Number: 03/14			
Follow the steps below <b>in the correct order</b> to show the results of <b>relevant</b> co-location studies							This spreadsheet will be updated at the end of June 2014			
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods							LAQM Helpdesk Website			
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet							Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.			
This spreadsheet will be updated every few months; the factors may therefore be subject to change. This should not discourage their immediate use.										
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.										
Step 1:	Step 2:	Step 3:	Step 4:							
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor <sup>2</sup> shown in blue at the foot of the final column.							
If a laboratory is not chosen, we have no data for this laboratory.	If a preparation method is not chosen, we have no data for this method at this laboratory.	If a year is not chosen, we have no data	If you have your own co-location study then see footnote <sup>4</sup> . If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953							
Analysed By <sup>1</sup>	Method <sup>2</sup> <small>To make sure you select, choose (M) from the pop-up list</small>	Year <sup>3</sup> <small>To make sure you select, choose (M)</small>	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m <sup>3</sup> )	Automatic Monitor Mean Conc. (Cm) (µg/m <sup>3</sup> )	Bias (B)	Tube Precision <sup>4</sup>	Bias Adjustment Factor (A) (Cm/Dm)
Edinburgh Scientific Services	50% TEA in acetone	2013	KS	Marlybone Road Intercomparison	12	102	81	26.8%	G	<b>0.79</b>
Edinburgh Scientific Services	50% TEA in acetone	2013		<b>Overall Factor<sup>2</sup> (1 study)</b>					<b>Use</b>	<b>0.79</b>

The national bias adjustment factor of 0.79 was used adjust to adjust the diffusion tube results. Data capture of the diffusion tubes at the co-location study conducted at Rutherglen and East Kilbride Whirrlies roundabout 2013 were too low to be used to adjust to the diffusion tube results. Short-term to long-term adjustment calculations were unable to be applied due to the sporadic nature of the data capture.

**Short-term to Long-term Data adjustment**

A short to long term data adjustment was applied to annual mean NO<sub>2</sub> measurements where the data capture was less than 75%. Five separate adjustment ratios were calculated as presented in Tables A.4 to A.5.

**Table A.4: ST to LT data adjustment – PM<sub>10</sub> Raith Interchange (1<sup>st</sup> Jan – 1<sup>st</sup> Apr 2013)**

Site Name	Site Type	Annual Mean (Am)	Period Mean (Pm)	Ratio (Am/Pm)
Alloa	Urban Background	14	16	0.875
Edinburgh St Leonards	Urban Background	14	16	0.875
Glasgow Broomhill	Urban Background	15	18	0.833
			<b>Average ratio (Am/Pm)</b>	<b>0.861</b>

**Table A.5: ST to LT Adjustment – PM<sub>10</sub> Glespin (20<sup>th</sup> July- 31<sup>st</sup> Dec 2013)- Monitoring Stopped**

Site Name	Site Type	Annual Mean (Am)	Period Mean (Pm)	Ratio (Am/Pm)
Alloa	Urban Background	14	13	1.154
Edinburgh St Leonards	Urban Background	14	13	1.188
Rutherglen	Roadside	19	16	1.077
Glasgow Broomhill	Roadside	15	13	1.077
			<b>Average ratio (Am/Pm)</b>	<b>0.124</b>

Figure A7: NO<sub>2</sub> monthly mean concentrations measured at diffusion tubes sites 2013

Tube ID	Site Address	Town	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13	Oct-13	Nov-13	Dec-13	Raw Mean	Valid Periods	Data capture	Bias adjusted mean
1	Civic Centre	East Kilbride	37.7	43.2	25.5	22.9	14.8	15.2	missing	29.5	missing	34.2	10.2	17	25.02	10	83%	19.8
2	Kingsway	East Kilbride	65.4	88.5	23	68	49.7	42	77.3	47.2	15.8	81	29.4	49.9	53.10	12	100%	41.9
3	Scott Hill	East Kilbride	26.8	35.9	69.8	17.6	14	13	21.2	15.3	missing	26.2	12.4	18.3	24.59	11	92%	19.4
4	Townhead Street	Strathaven	36.2	45.6	33.8	36.2	19.7	25.4	missing	missing	33.1	37.4	17.9	missing	31.70	9	75%	25.0
5	179 Quarry Street	Hamilton	43.4	58.5	38.5	30.7	23.8	18.7	27.6	25.9	33.3	38.4	19.4	29.2	32.28	12	100%	25.5
6	129 Quarry Street	Hamilton	70	75.4	missing	46.7	32.7	29.1	36	37	58.4	63	21.8	39.6	46.3	11	92%	36.6
7	Cadzow Street	Hamilton	43.5	58	42.8	33.3	24.9	23.2	32.9	27.5	34.9	40.6	19.1	19.4	33.34	12	100%	26.3
8	Duke Street	Hamilton	missing	106.4	75.2	44.7	57.3	45.4	56.9	60.9	74.2	76.7	72.6	44	64.94	11	92%	51.3
9	Gateside Street	Hamilton	44.3	58.9	34.2	45.5	36.6	32.4	44.1	47.2	43	50.2	59.5	22.7	43.22	12	100%	34.1
10	Almada Street	Hamilton	60.3	76.3	52.7	41.3	49.8	36.7	59.6	42	50.7	63.2	65.6	34.5	52.73	12	100%	41.7
11	Bothwell Road	Hamilton	39.8	43.2	38.1	25.8	25.7	19.8	25.5	27.8	32.2	45.5	38.9	25.3	32.30	12	100%	25.5
12	Low Quarry Gardens	Hamilton	20.5	35.9	23	10.7	10.5	7.7	11.9	10	10.7	19.2	missing	9.4	15.41	11	92%	12.2
13	London Street	Larkhall	45.8	48.7	33.5	30.8	34.1	23.5	38.9	34.9	22.1	38.7	missing	62.9	37.63	11	92%	29.7
14	Kirkton Street	Carluke	52	43.9	44.8	38.8	41.5	30.5	36.4	43.4	34.3	48.5	58	31.7	41.98	12	100%	33.2
15	Hospitland Drive	Lanark	16.1	20.3	19	10.4	7.9	6.3	4.9	8.6	7.1	10.6	17.2	missing	11.67	11	92%	9.2
16	Bannatyne Street	Lanark	64.5	83.5	59.6	43.2	56.3	38.3	46.4	47.3	35.3	63.3	58.1	27.6	51.95	12	100%	41.0
17	Wellgate	Lanark	31.8	44.3	30.5	21.7	27.9	16.3	22.2	27.7	26.5	25.1	30	15.9	26.66	12	100%	21.1
18	4 High Street / Bloomgate	Lanark	56.4	79.8	63.6	46.5	62	38.5	55.5	50.1	16.5	61.9	54.2	27.4	51.03	12	100%	40.3
19	51 High Street	Lanark	39.7	55.7	44.2	29.2	43.6	24.4	39.3	18.6	38.2	36.7	33	16.3	34.91	12	100%	27.6
20	Main Street	Bothwell	47.2	69.4	57.5	22.4	32.7	17.5	missing	24.3	20.8	41.7	48.6	21.9	36.73	11	92%	29.0
21	Wordsworth Way	Bothwell	33.2	50.6	38.5	15.3	21.3	14.1	25.7	20.7	15.8	37	39.5	15	27.23	12	100%	21.5
22	North British Road	Uddingston	41.8	71.8	59	23.1	29.7	18.6	28.7	19.1	18.2	53.7	30.3	24	34.83	12	100%	27.5
23	Burnpark Avenue	Uddingston	47.8	62.7	67.2	25.4	36.2	22.4	34.3	24.2	22.2	46.8	36.8	26.8	37.73	12	100%	29.8
24	81 Main Street	Uddingston	50.4	55.5	45.9	33.9	36.4	25.8	40.9	40.2	32.2	47.7	50.8	46.5	42.18	12	100%	33.3
25	86 Main Street	Uddingston	43.7	51.3	48.1	22.9	26.3	17.5	24.3	25.1	22.6	54.2	33.5	24.4	32.83	12	100%	25.9
26	Clydeford Road	Cambuslang	31.4	41.4	28.8	16.3	20.6	12.7	22.3	15.3	17.1	31.6	29	18.5	23.75	12	100%	18.8
27	Cambuslang Road	Rutherglen	41.9	48.3	40	25.3	27.4	20.9	36.1	23.4	26.2	41.9	42.5	19.4	32.78	12	100%	25.9
28	Farmeloa Road	Rutherglen	62.6	73.6	68.6	41.1	48.9	32.1	46.9	32.7	34.2	69.7	50.3	33.7	49.53	12	100%	39.1
29	Stonelaw Road	Rutherglen	39.9	54.9	47.7	16.8	21	15.5	23.8	12.6	17.5	47.2	25.8	30.4	29.43	12	100%	23.2
30	263 Main Street	Rutherglen	56.4	52.2	51	31	36.2	28.2	40	28.7	32.3	51.3	43.2	33	40.29	12	100%	31.8
31	Mill Street	Rutherglen	48.4	59.4	52.1	21.1	32.5	29.1	43.9	24.5	31.9	50.2	33.4	17.7	37.02	12	100%	29.2
32	Main Street, Rutherglen Co Loc 1	Rutherglen	missing	missing	missing	32.8	missing	missing	62.9	missing	35.8	62.8	33.4	37.3	44.17	6	50%	34.9
33	Main Street, Rutherglen Co Loc 2	Rutherglen	missing	missing	65.4	90.9	missing	missing	missing	missing	missing	74.7	58.5	41.4	66.18	5	42%	52.3
34	Main Street, Rutherglen Co Loc 3	Rutherglen	missing	missing	missing	40.8	45.8	26.1	missing	missing	missing	76.6	50.8	36.8	46.15	6	50%	36.5
35	Whirlies Roundabout, EK Co Loc 1	East Kilbride	missing	missing	54.7	39.5	31.5	26.7	43.6	31.2	29.7	63	45.7	36.5	40.21	10	83%	31.8
36	Whirlies Roundabout, EK Co Loc 2	East Kilbride	missing	missing	48.3	36.2	24.5	28.6	53.2	28.1	30.5	59.7	41	29.2	37.93	10	83%	30.0
37	Whirlies Roundabout, EK Co Loc 3	East Kilbride	missing	missing	47.2	33.6	26.6	29	50.5	missing	missing	60.9	41.3	30.5	39.95	8	67%	31.6
38	Travel Blank		<1	1.4	1.8	1.3	<1	2.6	<1	<1	<1.0	<1.0	<1	<1.0	1.78			