



# ***Renfrewshire Council Annual Progress Report 2018***

*Bureau Veritas*





*May, 2018*

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## Annual Progress Report (APR)



2018 Air Quality Annual Progress Report (APR) for  
Renfrewshire Council

In fulfilment of Part IV of the  
Environment Act 1995

Local Air Quality Management

May 2018

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## **Executive Summary: Air Quality in Our Area**

### **Air Quality in Renfrewshire Council**

There are currently three Air Quality Management Areas (AQMAs) within Renfrewshire; these are located within Paisley Town Centre, Johnstone High Street and Renfrew Town Centre. The AQMAs have been declared due to exceedances of the air quality objective (AQO) levels for nitrogen dioxide (NO<sub>2</sub>) and particulate matter (PM<sub>10</sub>, Paisley only). Compared to five years ago, the monitored concentrations of both NO<sub>2</sub> and PM<sub>10</sub> have gradually fallen across Renfrewshire.

Concentrations of the annual mean and short term objectives for NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> recorded at all automatic monitoring sites during 2017 were below AQO levels. Monitoring of PM<sub>10</sub> and PM<sub>2.5</sub> commenced at the new automatic monitoring station in Johnstone in July 2017.

There were two exceedances of the NO<sub>2</sub> annual mean AQO (following bias adjustment and distance correction) recorded in 2017 at diffusion tube monitoring locations across Renfrewshire. The exceedances were recorded at locations within the Renfrew Town Centre AQMA and the Johnstone High Street AQMA.

Within the Paisley Town Centre AQMA there were no exceedances of any AQOs where relevant pollutant monitoring is completed (NO<sub>2</sub> and PM<sub>10</sub>). The AQMA has been declared for annual mean and short term NO<sub>2</sub> exceedances, and for annual mean PM<sub>10</sub> exceedances. There have now been three consecutive years where compliance of the relevant AQOs has been achieved. A further years' worth of monitoring data will be collated before consideration will be given to the possible amendment or revocation of the Paisley Town Centre AQMA.

Upon review of the monitoring data from 2017 it was concluded that there is no requirement to proceed to additional Detailed Assessments for any area of the Council.

### **Actions to Improve Air Quality**

Renfrewshire Council have prepared (awaiting approval), a Renfrewshire-wide Air Quality Action Plan (AQAP) which has been developed to incorporate all three current AQMAs. The new AQAP has been approved by the Council Board and has been submitted to the Scottish Government and Scottish Environment Protection Agency (SEPA). Upon final approval, the AQAP will be implemented and the Council

will act upon a new set of measures that have been designed to improve the air quality within the existing AQMAs and the Council area in general. The new AQAP will replace the current Paisley Town Centre AQAP (2014).

Sixteen measures are documented within the revised AQMA and they address the following topic areas:

- Freight and delivery management;
- Policy guidance and development control;
- Promoting low emission transport;
- Promoting travel alternatives;
- Public information;
- Transport planning and infrastructure;
- Traffic management; and
- Vehicle fleet efficiency.

### **Local Priorities and Challenges**

The proposed actions and LAQM requirements for Renfrewshire Council are as follows:

- Complete the implementation of the revised AQAP once this has been approved by the Scottish Government and SEPA;
- Continue to improve the Councils fleet of vehicles and begin to implement phase 1 of the Pool Car Scheme;
- Continue the expansion of the ECO Stars scheme from its initial trial to full implementation;
- Begin the production of a Corporate Travel Plan;
- Raising awareness of air pollution at a local level through vehicle anti idling campaigns and 2018 Clean Air Day,
- Assess the 2018 monitoring data within the Paisley Town Centre AQMA when available with consideration to revoking/amending the AQMA based upon the results;

## **Renfrewshire Council**

- Continue to review all air quality assessments that are submitted as part of planning applications in relation to possible impacts upon local air quality;
- Continue to monitor NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> at all relevant locations throughout Renfrewshire; and
- Submit the 2019 Annual Progress Report.

### **How to Get Involved**

The general public can find out more about air quality and how to get involved on the Renfrewshire Council web site at <http://www.renfrewshire.gov.uk/airquality>, current and historic pollution levels and up to date forecasts are available at <http://www.scottishairquality.co.uk/>, and further details on the 2018 Clean Air Day are available at <https://www.cleanairday.org.uk/clean-air-scotland>.

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## 1. Local Air Quality Management

This report provides an overview of air quality in Renfrewshire Council during 2017. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) 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 (AQOs) are likely to be achieved. Where an exceedance is considered likely the local authority must 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. This Annual Progress Report (APR) summarises the work being undertaken by Renfrewshire Council to improve air quality and any progress that has been made.

**Table 1.1 – Summary of Air Quality Objectives in Scotland**

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
<b>Nitrogen dioxide (NO<sub>2</sub>)</b>	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
<b>Particulate Matter (PM<sub>10</sub>)</b>	50 µg/m <sup>3</sup> , not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18 µg/m <sup>3</sup>	Annual mean	31.12.2010
<b>Particulate Matter (PM<sub>2.5</sub>)</b>	10 µg/m <sup>3</sup>	Annual mean	31.12.2020
<b>Sulphur dioxide (SO<sub>2</sub>)</b>	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
<b>Benzene</b>	3.25 µg/m <sup>3</sup>	Running annual mean	31.12.2010
<b>1,3 Butadiene</b>	2.25 µg/m <sup>3</sup>	Running annual mean	31.12.2003
<b>Carbon Monoxide</b>	10.0 mg/m <sup>3</sup>	Running 8-Hour mean	31.12.2003
<b>Lead</b>	0.25 µg/m <sup>3</sup>	Annual Mean	31.12.2008

## 2. Actions to Improve Air Quality

### 2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12 months, setting out measures it intends to put in place in pursuit of the objectives.

A summary of AQMAs declared by Renfrewshire Council can be found in Table 2.1.

Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at <http://www.scottishairquality.co.uk/laqm/aqma?id=382> or by following the links included within Table 2.1.

There are no changes proposed to the existing AQMAs within 2018. There has now been a 3 year period (2015, 2016 and 2017), where there has been no exceedances of the NO<sub>2</sub> and PM<sub>10</sub> AQOs within the Paisley AQMA. Consideration will be given to the possible amendment or revocation of the Paisley AQMA in 2019 when the full set of 2018 NO<sub>2</sub> monitoring data is available.

**Table 2.1 – Declared Air Quality Management Areas**

<b>AQMA Name</b>	<b>Pollutants and Air Quality Objectives</b>	<b>City / Town</b>	<b>Description</b>	<b>Action Plan</b>
Paisley Town Centre (PTC)	<ul style="list-style-type: none"> <li>• NO<sub>2</sub> annual mean</li> <li>• NO<sub>2</sub> 1-hour mean</li> <li>• PM<sub>10</sub> annual mean</li> </ul>	Paisley	An area encompassing a large part of central Paisley and extending a short distance along some radial roads	Paisley Town Centre Air Quality Action Plan 2014 <a href="http://www.renfrewshire.gov.uk/media/1124/Paisley-Town-Centre-Air-Quality-Action-Plan-2014/pdf/AirQualityActionPlan2014.pdf">http://www.renfrewshire.gov.uk/media/1124/Paisley-Town-Centre-Air-Quality-Action-Plan-2014/pdf/AirQualityActionPlan2014.pdf</a>
Johnstone High Street	<ul style="list-style-type: none"> <li>• NO<sub>2</sub> annual mean</li> </ul>	Johnstone	From the junction of High Street and Peockland Place; thence along High Street to the junction of	Renfrewshire Council Air Quality Action Plan 2018 to be implemented in 2018

AQMA Name	Pollutants and Air Quality Objectives	City / Town	Description	Action Plan
			Barrochan Road and Napier Street.	
Renfrew Town Centre	<ul style="list-style-type: none"> <li>• NO<sub>2</sub> annual mean</li> <li>• NO<sub>2</sub> 1-hour mean</li> </ul>	Renfrew	From the junction of Paisley Road, Inchinnan Road, Hairst Street and Glebe Street; thence along Glebe Street to property number 4 Glebe St; thence along Paisley Road to the junction of Donaldson Drive; thence along Inchinnan Road to the junction of Longcroft Drive; thence along Hairst Street to the junction with Canal Street and High Street; thence along Canal St to the junction with Ferry Road.	Renfrewshire Council Air Quality Action Plan 2018 to be implemented in 2018

## 2.2 Progress and Impact of Measures to address Air Quality in Renfrewshire

The Council is currently in the process of adopting a new AQAP; the Renfrewshire Council Air Quality Action Plan 2018. An initial draft has been approved by the Council Board, and following this the AQAP has been submitted to the Scottish Government and the Scottish Environment Protection Agency (SEPA). Once the revised AQAP has been reviewed, and any comments addressed, it will be approved and work will begin on the measures listed within the AQAP.

The 2018 AQAP incorporates the three existing AQMAs within Renfrewshire, and once adopted will supersede the current 2014 Paisley Town Centre AQAP. Within the 2018 AQAP 16 measures have been documented to help improve air quality conditions across Renfrewshire. The priorities of the measures include tackling emissions from congestion, promoting low emission transport, and encouraging travel alternatives.

The proposed action measures address the following topic areas:

- Freight and delivery management;

- Policy guidance and development control;
- Promoting low emission transport;
- Promoting travel alternatives;
- Public information;
- Transport planning and infrastructure;
- Traffic management; and
- Vehicle fleet efficiency.

The measures that are documented within the 2018 AQAP are presented in Table 2.2.

Renfrewshire Council has taken forward a number of measures during the current reporting year of 2017 in pursuit of improving local air quality.

#### Upgrades & Improvements to the Council's Urban Traffic Control (UTC) System

Repair and the replacement of defective loops within the UTC was undertaken in June 2017, with validation of traffic signals and Programmable Read Only Memory (PROM) updates completed in November 2017. An evaluation of the effectiveness of upgrades post works is to be undertaken in Spring/Summer 2018.

#### Ongoing Council Vehicle Fleet Improvements

Within Renfrewshire there is an annual vehicle replacement programme whereby vehicles at the end of their service life are replaced with an improved EURO class vehicle or an electric alternative. During 2017/18 twelve EURO V HGVs were replaced with EURO VI. Full replacement of the HGV fleet with minimum EURO VI vehicles will be undertaken by 2022 at latest.

In terms of electric vehicles (EVs) and associated charging infrastructure the Council aim to increase the number of these on an annual basis. There are currently 28 EVs (cars/vans) in the fleet which will be increased to 42 EVs by the end of April 2018. These will replace existing diesel LGVs. An additional 5 new EV charging points were installed during 2017/18.

### Masternaut Connect Fleet Telemetrics System

An upgrade has been completed to the fleet tracking telemetric system fitted to all Council vehicles, optimising the utilisation of the current fleet. The tracking system allows close monitoring of movement and operating status of all fleet vehicles. The system became effective from 1st April 2017. A dedicated member of staff will be employed from summer 2018 to work solely with the Masternaut system to provide regular reports and identify problem areas e.g. low mileage users and excessive idling.

### Renfrewshire Local Transport Strategy

Renfrewshire's Local Transport Strategy (LTS) was approved in 2007 setting out a vision for transport over a 10-20 year timeframe and which supports the wider economic, environmental and social objectives of the Council. A key objective of the strategy is to ensure a healthy and sustainable environment. There are several specific aims relevant to improving air quality. These include the following:

- The Council will continue to develop strategies for travel planning and parking which reduces the growth of trips by private car and achieves a shift to walking, cycling, public transport and car sharing thus having a positive impact upon air quality and climate change;
- The Council will strive to achieve the most efficient operation of the road network to minimise delays for road users, particularly for public transport;
- The Council will develop transport actions for Paisley specifically which support and complement the wider economic regeneration strategy, improve accessibility, particularly for cycling, walking and public transport, minimise congestion around the Paisley Town Centre ring road and enhance the street environment; and
- The Council will prioritise development to sustainable locations in transport terms.

A review and refresh of the Local Transport Strategy was undertaken in February 2017 to provide an update on the Council's achievements against the actions set out in the 2007 Strategy. A great deal of progress has been made with most actions now implemented and outcomes measured. The review also confirmed that much of the

content of the 2007 strategy, including the vision and key objectives, are still relevant. The refreshed Local Transport Strategy including the update on measured outcomes can be found at <http://www.renfrewshire.gov.uk/article/3556/Local-Transport-Strategy>.

The National Transport Strategy and the West of Scotland Regional Transport Strategy are also currently under review by the Scottish Government and Strathclyde Partnership for Transport respectively. The Council's current refreshed Local Transport Strategy sets out a broad direction of travel for Renfrewshire while the content of the new National and Regional Transport Strategies are awaited following which a new Renfrewshire Local Transport Strategy will be produced. The new Renfrewshire Local Transport Strategy will build upon the 2007 strategy, providing a framework to deliver an affordable, sustainable and effective travel and transport network. It will continue to identify short, medium and long-term priorities that contribute towards relevant local, regional and national transport targets and goals.

Given that road transport is a significant contributor to local pollutant levels within Renfrewshire, this new Renfrewshire LTS and any key specific measures it may contain will play a significant role in improving air quality across Renfrewshire. This has therefore been included as an action measure within the 2018 AQAP.

### Town Centre Strategies

In line with Scottish Planning Policy and the 'Town Centre First' approach, Renfrewshire Council has prepared Centre Strategies and associated Action Plans for numerous Centres in Renfrewshire, including Johnstone and Renfrew.

Centres are at the heart of Renfrewshire's communities and are the hubs for a range of activities. Many people live and work in centres and it is important for the local economy that town centres thrive and meet the needs of residents, businesses and visitors. The strategies provide a framework for future growth and/or enhancement of Renfrewshire's Centres, central to which is connectivity and ensuring town centres are more accessible by walking, cycling and public transport.

There are several key actions within the Johnstone and Renfrew Centre strategies aimed at delivering growth which are also relevant to improving air quality. The Johnstone Strategy, in particular, identifies better traffic management to improve traffic flow along the High Street corridor as a key action, as well as improvements to



gateways and strengthening pedestrian links to the town centre. Proposals for a Johnstone Town Centre transportation plan have therefore been developed in relation to these aims.

The Renfrew Strategy highlights improvements to traffic management that will be implemented through the City Deal Projects, which is discussed later within the Annual Progress Report in Section 5. Development of a Renfrew Town Centre transportation plan was not considered appropriate at this time due to the proposed City Deal Projects and the significant impact these will have on traffic within that area.

#### Paisley Town Centre Action Plan

The Paisley Town Centre 2016-2026 Action Plan identifies key priorities to increase regeneration activities and investment in Paisley Town Centre. It details a clear vision for Paisley and sets out strategic activity areas to deliver these transformational changes. The vision goals relevant to air quality include making Paisley a liveable, green, connected and accessible place.

Five specific activity areas and associated objectives have been identified. Those with the greatest potential to impact on air quality include the following:

- Gilmour Street Gateway – develop a masterplan for Paisley Gilmour Street station and surrounding area to create a modern, integrated rail station with improved connectivity links to enable efficient transfer between different modes of transport e.g. rail, cycle, bus (by 2021-2026);
- Improving Connections – the development of a clear transport strategy to encourage use of the town centre by different forms of transport and the production of a feasibility study to redesign the Paisley Town Centre ring road to overcome the physical and perceived barriers presented by the ring road (by 2018). Improvements to car parking and key gateways including signage and traffic flow by 2021 and the long term vision of completion of the delivery of the ring road design by 2026.

#### Paisley Transport Strategy Feasibility Study

A key objective identified within the Paisley Town Centre 2016-2026 Action Plan is the creation of a clear transport strategy for Paisley in order to improve connectivity,

linkages and accessibility issues within the town centre. To assist with this, Renfrewshire Council's Environment & Communities Roads Service instructed an external consultancy to produce a feasibility study of potential transport interventions for Paisley titled 'Paisley Transport Strategy'. This was undertaken in consultation with all relevant Renfrewshire Council Services e.g. Development & Housing Services (Policy & Regeneration, Planning and City Deals) and other external stakeholders e.g. SPT, local bus operators, Scotrail, Glasgow Airport, Paisley First, Chamber of Commerce, Taxi Trade Association, Police Scotland and Scottish Fire & Rescue.

Paisley is unique in that it has the 4th busiest railway station in Scotland. The town centre is less than two miles from Glasgow International Airport and within close proximity to the strategic motorway network. Despite this, previous studies have indicated that there are several barriers to connecting Paisley town centre with surrounding assets and neighbourhoods, including the railway line, the White Cart River and in particular the existing large circulatory ring road around Paisley which can act as a barrier to pedestrian and cycle access to the town centre. This results in traffic dominating at the expense of pedestrian and cyclist movements and with the rail infrastructure, creating a separation between the town centre and the surrounding residential areas.

The Paisley Transport Strategy feasibility study details a programme of phased interventions covering the short, medium and long term. The strategy presents 14 short-term interventions for consideration which could be in place by 2021 but also details further medium and long term aspirations which will allow Paisley to reach a vision for a more connected and accessible place with significant environmental and air quality benefits.

Interventions cover various modes of transport, including road, bus, rail, walking and cycling and provides key recommendations with regards to the movement of traffic and pedestrians such as re-instating two-way traffic flows on the existing one-way system, amending key junction nodes to improve connectivity for pedestrians and cyclists, improving options and facilities for public and active transport, improving bus journey time reliability, recommendations for rationalising and promoting car parking provision and increasing provision for cycling.

The options presented within the feasibility study are intentionally high level, providing ideas of potential key transport interventions which could be taken forward in Paisley. Some of these measures will now be developed from the current concept phase taking into account traffic modelling and allowing for appropriate assessment, design and eventual delivery where appropriate. It is recognised that the future implementation of recommended interventions may have a significant impact on traffic movement throughout Paisley town centre and therefore air quality. Effects on air quality from proposed interventions will be modelled as a requirement of the next phase of this study and updates provided in the Council's Annual Progress Reports

#### Johnstone Town Centre Strategy

The Johnstone Town Centre Strategy identifies better traffic management to improve traffic flow along the High Street corridor as a key action, as well as improvements to gateways and strengthening pedestrian links to the town centre. A proposal for a Johnstone Town Centre transportation plan has therefore been produced by Environment & Communities Roads Service specifically in relation to these aims.

The main traffic issue in Johnstone is congestion exacerbated by traffic signal operations and illegal parking. It is therefore proposed that the yellow line restrictions in the town centre be reviewed and, where necessary, amendments to existing restrictions proposed. It is also proposed to erect new parking signage which will encourage better use of off-street car parks, to remove some pavement build outs at Houston Square on the High Street and relocate bus stops to free up more road space.

A review of the operation of the traffic signals at the Barrochan Interchange will also be undertaken. An update of the traffic signals urban traffic control system (SCOOT) is currently being undertaken at the main junctions on the High Street in order to ensure they are operating at optimum efficiency.

Proposals will be discussed with the Community Council, Local Development Trust and Elected Members and will be implemented in a phased basis following approval.

#### Renfrewshire Council Cycle Strategy and Action Plan

The Renfrewshire Cycling Strategy 2016 – 2025 provides an up to date framework reflecting the increased focus on cycling across Scotland along with aiming to

achieve the National targets that have been set for cycling. The Cycle Strategy was approved by the Policy Board in December 2016.

The aim of the Cycling Strategy is to increase cycling use within Renfrewshire. The strategy considers infrastructure and attitudes to cycling as existing and makes recommendations to achieve a step change. The key features to deliver step change are associated with improving and expanding the existing cycling infrastructure, providing better signage and network information, promoting and marketing cycle usage and running events to raise to emphasis the benefits of cycling.

A significant amount of cycling infrastructure has already been constructed throughout Renfrewshire over the past few years. The Paisley South link is now complete and was delivered in 6 phases linking Barrhead to Linwood. The cost of this route was funded from Strathclyde Partnership for Transport (SPT) capital allocations, Sustrans and the Scottish Government. The route from Castle Semple in Lochwinnoch to the railway station was completed in 2015 and was funded in a similar way to the Paisley South Link. This project involved the construction of three bridges and significant raised embankments within a flood plain.

The Cycle Strategy also identifies local improvements to cycle infrastructure such as toucan crossings to assist cyclists cross roads and traffic calming to ensure lower traffic speeds to assist cyclists. Cycle parking has also been installed at a number of locations throughout Renfrewshire. These measures will be funded from the Cycling Walking and Safer Streets grant.

The strategy contains a Cycling Action Plan which sets out a programme of activities and network interventions for the coming ten years including upgrades and expansion of cycle networks, upgrading the Council's facilities for cyclists and updating the Council's Travel Plan.

The Council also has a 'Try Bikes' scheme which provides a pool of bikes for business travel by employees. In recognition of its work towards encouraging its staff to travel actively, the Council was awarded the accolade of Cycle Friendly Employer in 2016 by the Neilston Development Trust which manages the Cycle Friendly Employer scheme in Renfrewshire.

An increase in cycling will ultimately help achieve the Council's vision for a greener Renfrewshire by reducing congestion on the roads, cutting vehicle emissions and improving air quality.

The priorities that have been identified for Renfrewshire for the coming year are as follows.

#### Ongoing Council Fleet Improvements

In terms of increasing the numbers EVs and associated charging infrastructure the following feasibility studies are currently being undertaken:

- An EV Fleet Strategy feasibility study to determine the maximum number of EVs that could replace the current diesel fleet vehicles. There is the potential for up to 200 EV vehicles to be purchased over the following 3 years. The conclusions of this study will be presented to the Council's Policy Board in 2018 with implementation 2018/19 subject to funding and capital; and
- A feasibility study in relation to EV charging infrastructure at the Council's main transport depot at Underwood Road in Paisley. The study will identify how many EV charging points can be accommodated at this depot in terms of available space and electrical infrastructure. There are 6 EV charging bays at present and the Council are looking to determine whether up to an additional 24 bays can be installed on site.

#### Introduction of a Council Pool Car Scheme

Supply high mileage users with council cars and introduce a fleet of pool cars to replace business mileage for employees. Phase 1 of the Pool Car Scheme will be introduced across Environment & Communities during 2018/19. This will involve 33 vehicles being available for use to staff within this service. Staff will be required to use the fleet cars in replacement of their own cars.

#### ECO Stars (Efficient and Cleaner Operations) Fleet Recognition Scheme

A fuel management and operational efficiency support programme aimed at operators of goods vehicles, vans, buses, taxis and coaches. Scheme first initiated at the end of 2016 on a small scale trial period, during which 10 members were established. Scottish Government AQAP funding has been received to fully implement the scheme during 2018/19. This is a measure that will allow local

businesses with a fleet of vehicles to get involved in potentially improving air quality at a local level.

#### Renfrewshire Council Corporate Travel Plan

The Scottish Government's Cleaner Air for Scotland Strategy requires local authorities with AQMAs to prepare a corporate travel plan that is consistent with its AQAP. Funding from the Scottish Government's 2018/19 AQAP grant has been applied for to assist with the production of such a plan. Should funding be provided, this has been identified as a priority measure during 2018/19.

On a local level the general public are able to get involved in reducing air pollution within Renfrewshire in a number of ways.

#### Vehicle Idling Awareness Raising

Renfrewshire's Community Safety Partnership undertake regular campaigns that are targeted to raise awareness regarding idling vehicles and the impact on concentrations of local air pollution. Campaigns can be aimed at specific categories of drivers, in response to complaints, or in areas where vehicles idle unnecessarily e.g. schools, bus terminals, taxi ranks. The measure improves overall awareness of fuel efficiency and environmental impacts of vehicles particularly at areas of sensitive receptors e.g. primary schools.

A successful School Parking and Idling campaign has been running for the past 3 years within Renfrewshire. The campaign targets 10 schools in Renfrewshire each year. Over a three-day period, Renfrewshire Wardens attend the schools to encourage drivers to think about their behaviour and the impact it has on children. The schools also assist by distributing leaflets via children, issuing text messages and highlighting the issue in the school newsletter. This provides an opportunity for the general public to get involved in improving air quality at a local level.

#### Clean Air Day

Renfrewshire Council will also be involved in promoting Clean Air Day on 21 June 2018 with details yet to be confirmed. This is a valuable awareness raising event to encourage people to consider environmentally friendly modes of transport and think about how their individual actions impact on the environment. Further information

regarding the 2018 Clean Air Day can be found online at  
<https://www.cleanairday.org.uk/clean-air-scotland>.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
1	<b>Glasgow City Region City Deal Projects</b>  - Clyde Waterfront & Renfrew Riverside Project (CWRR)  - Glasgow Airport Investment Area Project (GAIA)	Transport Planning and Infrastructure  Traffic Management  Promoting Travel Alternatives	Two regeneration projects within Renfrewshire that are designed with transport being a key factor.  New roads and bridges are proposed to reduce congestion of current traffic, and travel planning is to promote the use of walking and cycling with the creation of pedestrian and cycling paths.	Scottish Government & Local Authorities (LAs) across the region.  The decision making body is the Glasgow City Region Cabinet.  The Renfrewshire projects are lead within the Council by Development & Housing Services, City Deals team.	March 2017 – proposal of Application Notices submitted.  April to May 2017 – consultation with Elected Members/ Community Councils/ public.  June 2017 - submission of planning applications (GAIA 'Core' 17/0485/PP, GAIA 'Cycleway' 17/0487/PP & CWRR 17/0486/PP).	<b>GAIA</b>  2018 – start of construction.  2020 – complete construction; roads & bridges open .  <b>CWRR</b>  2019 – start of construction.  2021 – complete construction; roads & bridges open.  (All dates are dependent on planning application outcomes and timescales).	Various –reduced traffic volume through Renfrew Town Centre following construction of Renfrew North Development Road thus reducing congestion and journey times.  KPIs may be measured via:  - % change in traffic flow: annual traffic counts on key commuter routes  - % improvement in journey times  - % reduction in queue lengths	<b>Renfrew AQMA</b>  The AQAs submitted with the planning applications for both developments state that pollutant concentrations at receptors due to traffic flow changes will be below AQO levels. The 2020 baseline concentrations vs 2020 with CWRR development will result in a minor to moderate beneficial impact on air quality levels (a reduction of up to 3.9ug/m <sup>3</sup> ) measured at the 3 diffusion tubes on Inchinnan Road where the highest levels of NO <sub>2</sub> within the town centre are measured.  Reference should be made to the AQAs for full details.	Planning application submitted July 2017. GAIA 'core' consented Nov 2017. GAIA 'cycleway' under consideration by Planning Authority (RC).  CWRR is being determined by Scottish Ministers. Method and timescale for determination to be confirmed.	GAIA 2020  CWRR 2021	Once the 2018 AQAP has been accepted and published, refer to section 3.1.7 for further details on this measure.



Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
2	<p><b>Upgrades &amp; Improvements to the Council's Urban Traffic Control (UTC) system.</b></p> <p>Identification of faults within the Council's UTC SCOOT system, repair/ replacement of defective loops, validation of traffic signals &amp; PROM updates to traffic controllers to ensure full optimisation of traffic signals in order to reduce congestion.</p>	Traffic Management (UTC, congestion management)	Management of the current SCOOT system to ensure that it is working at full optimisation in order to reduce congestion.	Environment & Communities Roads	<p>Jan/Feb 2017 preparation and advertising of tender.</p> <p>March 2017 award of tender.</p>	May - November 2017	<p>An effective SCOOT system may reduce traffic delay by an average of 20%. Peak time congestion is a particular issue within the AQMAs. If this can be reduced then traffic would flow more freely resulting in a reduction in emissions.</p> <p>Data in relation to traffic congestion pre and post SCOOT updates will be compared to identify the level of improvement achieved.</p> <p>KPIs may be measured via:</p> <ul style="list-style-type: none"> <li>- reduction in congestion monitored by an increase in overall speed through the junctions.</li> <li>- % improvement in journey times</li> <li>-improved traffic flow</li> </ul>	<p>Paisley &amp; Johnstone AQMA</p> <p>Paisley – 9 traffic signal sites identified for repair/validation on the Paisley Town Centre (PTC) ring road. The PTC source apportionment analysis confirmed that congestion contributes to pollutant levels to varying degrees dependant on location within the AQMA.</p> <p>Johnstone – 2 sites on High St identified for repair/validation.</p>	<p>Repair/ replacement of defective loops undertaken June 2017.</p> <p>Validation of traffic signals &amp; PROM updates completed in November 2017.</p>	<p>Physical works completed November 2017.</p> <p>Evaluation post works to be undertaken Spring 2018.</p>	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
3	<p><b>Council Fleet Improvements</b></p> <p>Continue to improve the standard of fleet</p>	<p><b>Promoting Low Emission Transport</b></p> <p>(Company vehicle procurement -Prioritising uptake of low emission vehicles)</p>	Continually improving the standard of the Council's vehicle fleet, therefore reducing vehicle emissions.	Environment & Communities Transport	<p>Ongoing.</p> <p>There is an annual vehicle replacement programme whereby vehicles at the end of their service life are replaced with an improved EURO standard or an electric alternative.</p> <p>The Council fleet consists of approx 440 vehicles of which &gt;85% are of EURO V or VI standard.</p> <p>There are approx 80 HGV vehicles, 20 of which are EURO VI standard with the remaining 60 being of EURO V standard. The EURO V HGVs are prioritised for replacement with EURO VI vehicles.</p> <p>Small number of EURO 4 standard vans targeted for replacement thereafter.</p>	<p>Ongoing</p> <p>In 2016/17 12 HGVs were replaced with EURO VI standard.</p> <p>Further 12 EURO V HGVs will be replaced with EURO VI HGVs during 2017/18 (this will be 10 HGV lorries and 2 buses).</p>	<p>Reduces number of polluting vehicles, operational running costs of vehicles and CO2 emissions across entire Council area.</p> <p>Existing Council KPIs:</p> <ul style="list-style-type: none"> <li>- 2017/18 twelve EURO V HGVs will be replaced with EURO VI standard vehicles</li> <li>- amount of CO<sub>2</sub> emitted by vehicle fleet.</li> </ul> <p>KPIs may also be measured via:</p> <ul style="list-style-type: none"> <li>-an annual review of Council vehicle fleet inventory in order to track year on year improvements which can then be reported in AQAP updates.</li> </ul>	<p>All AQMAs, council wide air quality improvements.</p> <p>Improves overall environmental impact of vehicles.</p> <p>Paisley – the Council's transport depot is located within the Paisley AQMA therefore all vehicles travelling to and from the depot will go through the AQMA in addition to operating within it. The Council's HQ is also located within the Paisley AQMA. Several thousand employees work from this location.</p>	Approximately 20 HGVs are currently EURO VI standard.	Ongoing.	<p>The Council will continue to improve the standard of fleet and introduce greener vehicles where opportunities and funding permits.</p> <p>Full replacement of HGV fleet with minimum EURO VI vehicles by 2022 at latest.</p>
4	<p><b>Council Fleet Improvements</b></p> <ul style="list-style-type: none"> <li>- Increase numbers of electric vehicles (EVs) &amp; associated charging infrastructure</li> <li>- Purchase EV Bus</li> <li>- EV Fleet Strategy Feasibility Study</li> </ul>	<p><b>Promoting Low Emission Transport</b></p> <p>(Company vehicle procurement prioritising uptake of low emission vehicles &amp; Procuring alternative refuelling infrastructure to promote low emission vehicles, EV recharging)</p>	To increase the number of EVs, and associated infrastructure within Renfrewshire.	Environment & Communities Transport	<p>Ongoing. First Council EVs and charging points purchased and installed 2012.</p> <p>The Council is looking to purchase an 18 seat EV bus to be used for Council purposes. This would be the first EV bus being used by a Scottish LA (subject to receiving gap funding from Transport Scotland).</p> <p>An EV Fleet Strategy feasibility study is currently being undertaken to determine the maximum no. of EVs that could replace current diesel fleet vehicles. There is the potential for up to 200 EV vehicles to be purchased over the following 3 years.</p>	<p>Ongoing</p> <p>Currently 28 EVs (cars/vans) in fleet.</p> <p>Further approx 10 EV vehicles will be introduced into fleet in 2017/18 replacing existing diesel LGVs.</p> <p>There are 20 council operated charging points, 6 of which members of the public can use. Additional 5 new charging points being installed 2017/18 – 2 within Johnstone Town Centre, 2 at the Council's HQ in Paisley and 1 at Council's Transport Depot.</p>	<p>Existing Council KPIs:</p> <ul style="list-style-type: none"> <li>-% of the vehicle fleet which uses alternative fuels i.e. electricity (2016/17 target was 5% and achieved 6.7%)</li> <li>- amount of CO<sub>2</sub> emitted by vehicle fleet.</li> </ul>	<p>All AQMAs, council wide air quality improvements.</p> <p>By acting to reduce its own emissions through the uptake of low emissions technology and vehicles, the Council will hopefully encourage other vehicle users to consider greener fuel options.</p> <p>Target pollution reduction may potentially be measured via:</p> <ul style="list-style-type: none"> <li>-An annual review of the mileage undertaken by each EV that has replaced a diesel alternative and the equivalent 'savings' in emissions.</li> </ul>	<p>Fleet currently contains 28 EVs.</p> <p>There are 20 council operated charging points.</p> <p>EV Bus – awaiting confirmation of funding through TS.</p> <p>EV Fleet Strategy being prepared and due for completion before the end of 2017. The conclusions will then be presented to the Infrastructure, Land &amp; Environment Policy Board in 2018 with implementation 2018/19 subject to funding and capital.</p>		

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
5	<b>Masternaut Connect Fleet Telemetrics System</b>  - Upgrade of fleet tracking telemetric system fitted to all Council vehicles to optimise utilisation of fleet. The tracking system allows close monitoring of movement and operating status of all fleet vehicles.	<b>Freight and Delivery Management</b> (Route management plans/ Strategic routing strategy for HGV's)  <b>Vehicle Fleet Efficiency</b> (other)	Ongoing improvement of the fleet tracking system to ensure that the movement and operating status of all fleet vehicles is up to date.	Environment & Communities Transport	Masternaut was originally installed in all council vehicles in 2009-10. This was upgraded to a newer Masternaut Connect version early 2017 which provides an easier reporting system and focuses in more detail on driver behaviour, vehicle utilisation etc.  Procurement process undertaken during 2016 and awarded at the end of 2016 following approval by Council Board.	System effective from 1st April 2017.  Dedicated member of staff will be employed from summer 2018 to work solely with the Masternaut system to provide regular reports and identify problem areas e.g. low mileage users, excessive idling. Mileage of EV vehicles will also be monitored to ensure EV vehicles are being used to their optimum.	Improved scheduling and routing of journeys via optimising vehicle movements and increased utilisation of fleet thus reducing the no. of vehicles in operation.  Reduction of idling is also a key area to reduce fuel and maintenance costs & to lower emissions. Masternaut is able to monitor vehicle idling times and this is a specific area that will be monitored and addressed during 2017/18.  KPIs may be measured via:  -reduction in vehicle fleet numbers due to identification of under utilisation of vehicles.  -reduction of idling times  -improvements in driver behaviour e.g. harsh braking/ acceleration.	All AQMAs, council wide air quality improvements.  The new Masternaut provides an easier reporting system which may allow calculations to be undertaken on emissions reductions. This will be reviewed once the system has been fully operational for a period of time and the dedicated staff member is in post.	System operational from April 2017.  Dedicated member of staff to be employed April 2018 however there is a temporary member of staff currently working on system periodically when necessary.	Operational and ongoing.	
6	<b>Introduction of Council Pool Car Scheme</b>  Supply high mileage users with council cars and introduce a fleet of pool cars to replace business mileage for employees	<b>Alternatives to Private Vehicle Use</b> (Car clubs/sharing schemes)  <b>Promoting Low Emission Transport</b>	To replace the use of personal vehicle use with that of fleet and pool cars.	Environment & Communities Transport	Phase 1 of the Pool Car Scheme will be introduced across Environment & Communities during 2018/19. This will involve 33 vehicles being available for use to staff within this Service. Staff will require to use the fleet cars in replacement of their own cars.	Phase 1 – anticipated by end of 2017/18 financial year.  A trial pool car scheme was undertaken in 2016/17 with one EV pool car being available for use by the Environmental Improvements team within Environment & Communities. The purchase of this vehicle was funded via the Scottish Gov AQAP grant fund.	In theory the introduction of pool cars generally sees a reduction of approx 20% in business mileage.  KPIs may be measured via:  -reduction in annual mileage undertaken per Service/Team since scheme implementation.	All AQMAs, council wide air quality improvements.  Renfrewshire House, the Council's HQ is situated within the Paisley AQMA. Therefore business trips undertaken by staff based here will start and end within the Paisley AQMA.  Target pollution reduction may potentially be measured via:  -An annual review of the reduction in mileage and the equivalent 'savings' in emissions.	Ongoing, details still to be finalised, anticipated implementation by end of 2017/18 financial year.	To be confirmed	The introduction of the Pool Car Scheme will mean that officers no longer require to use their own car for work purposes. From experience this leads to officers travelling into work by alternative means e.g. train, cycling as observed from the trial of the EV pool car by the Environmental Improvements team.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
7	<p><b>ECO Stars (Efficient and Cleaner Operations) Fleet Recognition Scheme</b></p> <p>A fuel management and operational efficiency support programme aimed at operators of goods vehicles, vans, buses, taxis and coaches.</p>	<b>Vehicle Efficiency</b> (Fleet efficiency and recognition schemes)	A scheme that encourages and helps vehicle operators run fleets in the most efficient way possible	Environment & Communities Environmental Improvements	<p>Scheme was initiated on a small scale during 2016/17.</p> <p>Scottish Gov funding received to fully implement during 2017/18 &amp; 2018/19.</p> <p>The procurement process has been undertaken and the tender issue is to be awarded in summer 2018.</p>	<p>Full scheme implementation expected following procurement process Winter 2017.</p> <p>Public launch to be undertaken 2018/19.</p>	<p>KPIs may be measured via:</p> <p>Membership numbers &amp; numbers of vehicles within scheme.</p> <p>Total no. of members as of Dec 2017 – 29.</p> <p>Total no. of vehicles operated by those 29 members – 1748.</p>	<p><b>All AQMAs, Council wide air quality improvements.</b></p> <p>The ECO Stars emissions toolkit, which provides a quantitative estimate of the reduction in NO<sub>x</sub> and PM as a direct result of adopting ECO Stars and the recommended interventions, will be applied (subject to funding) to our own fleet. Funding will be applied for from the Scottish Gov air quality grant fund 2018/19.</p>	<p>Scheme first initiated at the end of 2016 on a small scale trial period. 10 members established during this time.</p> <p>Continuation of scheme during 2017/18 and into 2019 will commence following procurement process.</p>	<p>Will be ongoing.</p> <p>Current scheme funded until March 2019.</p>	
8	<p><b>Renfrewshire's Local Transport Strategy</b></p> <p>A new LTS to replace the Council's 2007 LTS will be undertaken.</p>	<b>Policy Guidance and Development Control</b> (Other policy)	The three current AQMAs that are in force within Renfrewshire are due to transport emissions. A revised LTS, in addition to a revised AQAP will allow the two to work together to identify problematic roads in respect to emissions and develop measures and actions to reduce emissions.	<p>Development &amp; Housing Services – Policy &amp; Regeneration</p> <p>Environment &amp; Communities Roads</p>	The Council's 2007 LTS set out key objectives and a vision for transport over 10-20 yrs. A refresh was undertaken in Feb 2017 providing an update on the Council's achievements to date. A new Renfrewshire LTS will be prepared following publication of the new National and Regional Transport Strategies which are currently under review. The new LTS will identify short, medium and long term priorities that contribute towards relevant local, regional and national transport targets and goals.	New Renfrewshire LTS will be produced following publication of the new National and Regional Transport Strategies which are currently under review.	<p>The 2007 LTS contains measures relevant to AQ e.g. development of a transport strategy for Paisley town centre (measure no.9 of this AQAP). Progress against these is detailed within the Feb 2017 refreshed LTS.</p> <p>The new LTS will provide detailed aims and actions with specific KPIs associated with these.</p> <p>In addition the following KPIs may be relevant:</p> <ul style="list-style-type: none"> <li>- % change in traffic flow: annual traffic counts on key commuter routes</li> <li>- % improvement in journey times</li> <li>- % reduction in queue lengths.</li> </ul>	<p><b>All AQMAs, Council wide air quality improvements.</b></p> <p>Any potential target pollution reduction will be dependent on the proposed new/updated action measures within the Renfrewshire Local Transport Strategy.</p>	A refresh of the Renfrewshire LTS was undertaken Feb 2017 but awaiting publication of the new National and Regional Transport Strategies before a new Renfrewshire LTS will be prepared.	To be determined	Once the 2018 AQAP has been accepted and published, refer to section 3.1.2 for further details on this measure.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
9	<p><b>Transport Strategy for Paisley</b></p> <p>-The strategy aims to allow Paisley to reach a vision for a more connected and accessible place with significant environmental and air quality benefits.</p> <p>- Undertake a feasibility study of potential transport interventions for Paisley town centre e.g. reinstating two-way traffic flows, amending key junctions, review of lining &amp; signage and trial removal of certain traffic lights on ring road.</p> <p>- The study will also identify a possible location for an active travel hub and determine how it would be operated.</p>	<p><b>Policy Guidance and Development Control</b> (Other policy)</p> <p><b>Traffic Management</b> (Congestion management)</p>		Environment & Communities Roads	<p>The development of a Transport Strategy for Paisley Town Centre (PTC) was identified as a key action within the Renfrewshire LTS and PTC 2016-2026 Action Plan.</p> <p>A tender process for a consultancy to undertake this work was undertaken and awarded the beginning of 2017.</p> <p>A first draft of the feasibility study has been produced which establishes initial proposals and reports on potential areas of improvement, their technical feasibility, benefits and deliverability.</p>	<p>Ongoing. The proposed options are intentionally high level, providing ideas of key potential transport interventions for Paisley. Some of these measures will now be developed from the current concept phase taking into account traffic modelling and allowing for appropriate assessment, design and eventual delivery.</p> <p>The conclusions will then be subject to senior management review, Board approval and consultation with stakeholders before any decisions are made on potential action measures.</p> <p>Implementation of final proposals will thereafter be subject to identification of funding streams.</p>	<p>The final Transport Strategy for Paisley will provide detailed aims and actions with specific KPIs associated with these.</p> <p>In addition the following KPIs may be relevant::</p> <p>- % change in traffic flow: annual traffic counts on key commuter routes</p> <p>-improved flow in traffic</p> <p>- % reduction in queue lengths</p> <p>-overall reduction in congestion</p> <p>-% improvement in journey times</p> <p>-% improvement in bus journey times</p> <p>-improved connectivity and accessibility within the town centre.</p>	<p><b>Paisley AQMA</b></p> <p>In terms of target pollution reduction, it is recognised that the future implementation of recommended interventions may have a significant impact on traffic movement throughout Paisley town centre and therefore air quality. A requirement of the next phase of this study will be modelling the effect on air quality from proposed interventions.</p> <p>The findings of this will be reported within the AQAP Progress Report.</p>	<p>The draft feasibility study details a programme of phased interventions covering the short, medium and long term. The strategy presents 14 short-term interventions for consideration which could be in place by 2021 but also details further medium and long term aspirations. Some of these measures will now be developed further taking into account traffic modelling and including an assessment of their air quality impact.</p>	<p>The further modelling work is anticipated to be completed during 2018 with the final TS to follow thereafter.</p> <p>A timeline for implementation of actual measures will be included within the final Strategy. It is intended to be a long term strategy in line with the PTC 10yr Action Plan, however the Council wish a series of shorter term interventions to be complete by 2021.</p> <p>The feasibility study has been funded via SPT. Funding of any future proposed measures will be subject to availability of capital funding with the potential of funding from external partners also e.g. SPT.</p>	Once the 2018 AQAP has been accepted and published, refer to section 3.1.5 for further details on this measure.
10	<p><b>Johnstone Town Centre Transportation Plan</b></p>	<p><b>Policy Guidance and Development Control</b> (Other policy)</p> <p><b>Traffic Management</b> (Parking enforcement on Highway)</p>	The transportation plan is aimed to improve the traffic management within the town centre of Johnstone.	<p>Environment &amp; Communities Roads &amp; Wardens Service</p> <p>Development &amp; Housing Services– Policy &amp; Regeneration, Planning</p>	<p>Ongoing.</p> <p>An initial survey of Johnstone Town Centre has been undertaken with traffic management issues/problem areas identified.</p> <p>Initial infrastructure improvements proposed e.g. review of TRO yellow line restrictions and effective enforcement of these, new parking signage and relocation of bus stops.</p>	<p>A final strategy and implementation plan requires to be developed which will then be subject to consultation with the Community Council, Local Development Trust, elected members etc.</p> <p>This will then be implemented in a phased basis following approval.</p>	<p>The final Johnstone Town Centre Strategy &amp; Action Plan will provide detailed aims and actions with perhaps some specific KPIs associated with these.</p> <p>In addition the following KPIs may be relevant:</p> <p>- % change in traffic flow: annual traffic counts on key commuter routes</p> <p>- % improvement in journey times</p> <p>- % reduction in queue lengths</p>	<p><b>Johnstone AQMA</b></p> <p>Any potential target pollution reduction will be dependent on the proposed action measures within the final Johnstone Town Centre Transportation Plan.</p>	Ongoing. As per information within the Planning Phase.	Implementation of measures will be subject to approval and capital funding but expected to be complete by 2019/20.	Once the 2018 AQAP has been accepted and published, refer to section 3.1.6 for further details on this measure.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
11	<b>Improvements in the Bus Fleet Standard</b>	<b>Vehicle Fleet Efficiency</b> (Promoting Low Emission Public Transport)	Working with local bus companies to promote the use of low emission public transport and improve bus fleet standards.	Renfrewshire Council Environment & Communities in consultation with Local Bus Companies and SPT	Consultation with local bus companies and SPT still to be undertaken.	Subject to consultation outcomes	KPIs may be measured via:  -% of buses meeting set EURO standard.	<b>Johnstone AQMA primarily but possibly Council wide benefits.</b>  This is something which could potentially be modelled once a decision is made on implementation of the measure. A more definite target pollution reduction could therefore be determined.		To be determined	Once consultation on this measure has taken place, the Council will require considering how this is implemented and taken forward. This would be a voluntary measure at this time with the cooperation of local bus companies.
12	<b>Vehicle Idling Awareness Raising</b>  - Regular targeted campaigns to raise awareness regarding idling vehicles & air pollution. Campaigns aimed at specific categories of drivers or in areas where vehicles idle unnecessarily e.g. schools, bus terminals, taxi ranks or in response to complaints	<b>Traffic Management</b> (Anti-idling enforcement)  <b>Public Information</b> (via other mechanisms)	To encourage drivers to switch off their engines when their vehicle is stationary.	Renfrewshire Community Safety Partnership;  Environment & Communities Wardens Service		Ongoing since 2011	Improves overall awareness of fuel efficiency & environmental impacts of vehicles particularly at areas of sensitive receptors e.g. primary schools.  15 vehicle idling complaints received in 2015/16.  KPI may be measured via:  -annual review of % change in vehicle idling complaints.  However an effective awareness raising campaign may actually increase the number of complaints received.  Also need to be aware that cold weather can affect personal preferences to idle engines.	<b>All AQMAs</b>  Measure is more an awareness raising tool however it is also a useful measure to prevent vehicles idling and stopping in inappropriate places that may cause congestion, which is a significant cause of emissions generated in the AQMA. The measure can be used where necessary to reduce congestion and keep traffic flowing.	The success of the School Idling Initiative and the provision of 2016/17 Scottish Gov funding will enable the School Initiative to be rolled out at every primary school in Renfrewshire.	Ongoing measure subject to Scottish Gov funding.	The use of Fixed Penalty Notices was not adopted by the Council, drivers are instead requested to turn their engines off to which all drivers invariably comply. It provides the Wardens Service with a valuable opportunity to educate and engage with the public.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
13	<b>Vehicle Emissions Testing</b>  Programme of roadside vehicle emissions testing of private vehicles in accordance with the Road Traffic (Vehicle Emissions) (Fixed Penalty) (Scotland) Regulations 2003.	<b>Vehicle Fleet Efficiency</b> (Testing vehicle emissions)	A roadside emissions vehicle test to ensure that vehicles are in compliance with current legislation.	Renfrewshire's Community Safety Partnership; Environment & Communities Wardens Service & Police Scotland with assistance from Glasgow, East Renfrewshire & North Lanarkshire Council's taxi enforcement and emissions testing officers.	An awareness raising and communication strategy is undertaken prior to testing. This includes:  -publication of a public notice and press release in local and national press  -information letters and idling leaflets sent to bus, taxi and large transport businesses operating within Renfrewshire  -information being made available on the Council's website.  All drivers stopped & tested are given a Renfrewshire Council "Don't Be An Idler" information leaflet & an explanatory letter.	From 2011 to current.	Improves overall awareness of fuel efficiency & environmental impacts of vehicles. Reduces numbers of polluting vehicles.  KPI may be measured via:  -% of vehicles failing the emissions test.	<b>All AQMAs</b>  The testing location is chosen to be within or as close to the AQMAs as possible.  Target pollution reduction would be minimal but measure is an effective awareness raising tool.	Testing undertaken over two days twice a year since 2011.  Where vehicles fail relevant emissions standards, drivers are issued with a fixed penalty notice. However, the notice is complied with if the driver presents an MOT test certificate within 14 days indicating that the fault has been repaired and vehicle exhaust emissions comply with current legislation.  The most recent test was undertaken over two days in October 2017.  432 vehicles were tested and 3 FPNs were served for failing the emissions test.	Ongoing measure subject to Scottish Gov funding.	
14	<b>Renfrewshire Council Corporate Travel Plan</b>	<b>Promoting Alternatives</b> (Workplace Planning)	<b>Travel</b> To develop a corporate travel plan to firstly identify the travel details of employees, and secondly to develop actions to reduce the amount of travel and the % of travel completed by more polluting travel modes.	Environment & Communities Roads	The Scottish Gov's Cleaner Air for Scotland Strategy requires LAs with AQMAs to prepare a corporate travel plan that is consistent with its AQAP. Funding from the Scottish Gov's 2018/19 AQAP grant has been awarded to assist with this. A procurement process will now be undertaken, estimated June-Sept 2018.	Dependant on procurement phase but likely Sept 2018 – March 2019.	KPIs would be an integral part of the Travel Plan and would be determined during development of the plan.  KPIs may be measured via:  -the overall distance travelled by Council staff per year on company business.  -% of travel by staff using public transport per year.	<b>All AQMAs, Council wide air quality improvements.</b>	Funding received from Scottish Government May 2018	March 2019	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
15	<b>Renfrewshire Council Cycle Strategy &amp; Action Plan</b>  The strategy contains a Cycling Action Plan which sets out a programme of activities and network interventions for the coming ten years including upgrades and expansion of cycle networks, upgrading the Council's facilities for cyclists and updating the Council's Travel Plan.	<b>Promoting Travel Alternatives</b> (Promotion of cycling)	The promotion of increase cycle use within Renfrewshire.	Environment & Communities Roads	2014-2016	The Cycle Strategy was approved by Policy Board in Dec 2016. Measures contained within the action plan will be implemented dependant on funding.	KPIs are detailed within the Cycle Strategy and Action Plan.  Currently there is a low level of everyday cycle use within Renfrewshire and so the KPI focus is on a small number of key targets to be achieved by 2025. For example  -3% of all journeys to work being made by bicycle  -% of children travelling to school by bicycle  -% of primary schools offered Bikeability Level 2 training.	<b>All AQMAs, Council wide air quality improvements.</b>  The strategy identifies areas of improvement required on existing cycle routes, areas of potential expansion of the cycle network and methods to encourage increased cycle usage. Action measures associated with these have been identified, prioritised and timelines provided.  The target pollution reduction will be non-measureable.	Upgrade and development of the cycling network is ongoing as per the strategy priorities.	Ongoing	Once the 2018 AQAP has been accepted and published, refer to section 3.1.8 for further details on this measure.
16	<b>Renfrewshire Council Staff Cycling Incentives</b>  <b>- Staff Cycle to Work Scheme</b> Council employees can participate in this Government approved salary sacrifice scheme which allows them to purchase a bike with tax free benefits.  <b>- Staff Bike Hire Scheme 'Try Me'</b> Bikes are available to staff for work purposes e.g. cycle to and from meetings	<b>Promoting Travel Alternatives</b> (Promotion of cycling)	The promotion of increase cycle use within Renfrewshire.	Environment & Communities Roads		Ongoing	KPIs may be measured via:  -% of employees participating in scheme and who regularly travel to work by cycle  -usage of the hire bikes	<b>All AQMAs, Council wide air quality improvements.</b>	Cycle to work scheme last open to employees Oct 2016.  Hire bikes are being used but aim is to increase awareness through further advertising to employees.	Ongoing	



## **2.3 Cleaner Air for Scotland**

Cleaner Air for Scotland – The Road to a Healthier Future (CAFS) is a national cross-government strategy that sets out how the Scottish Government and its partner organisations propose to reduce air pollution further to protect human health and fulfil Scotland's legal responsibilities as soon as possible. A series of actions across a range of policy areas are outlined, a summary of which is available at <http://www.gov.scot/Publications/2015/11/5671/17>. Progress by Renfrewshire Council against relevant actions within this strategy is demonstrated below.

### **2.3.1 Transport – Avoiding travel – T1**

During 2017 Renfrewshire has reviewed the Local Transport Strategy, reviewing and updating the original documented measures. A cycling strategy (2016 – 2025) has been completed with the aim to increase the numbers of people within Renfrewshire using cycling as an alternative mode of transport. In addition, in line with Scottish Planning Policy and the Town Centre First approach, Renfrewshire has prepared Town Centre Strategies for both Paisley and Johnstone.

Details of the overall aims for all of the documents stated above are outlined in Section 2.2.

### **2.3.2 Climate Change – Effective co-ordination of climate change and air quality policies to deliver co-benefits – CC2**

Scottish Government expects any Scottish local authority which has or is currently developing a Sustainable Energy Action Plan to ensure that air quality considerations are covered. Renfrewshire Council has an existing Carbon Management Plan (2014) which includes the replacement of inefficient appliances in buildings, continual investment in cleaner vehicles and the purchase of energy from renewable sources, all of which have a positive impact upon air pollution concentrations.

A carbon reduction of 28.35% was achieved between 2009 and 2014 when the previous Carbon Management Plan was in place (2009/10 – 2013/14). From the implementation of the revised 2014 plan a target carbon reduction of 36% has been set for the end of the financial year 2019/20.

### 3. Air Quality Monitoring Data and Comparison with Air Quality Objectives

This section sets out the monitoring that has taken place across Renfrewshire, both in 2017 and in previous years, and how monitored concentrations of NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> compare with the AQOs.

#### 3.1 Summary of Monitoring Undertaken

Air pollutant monitoring was undertaken at four automatic sites and sixty two passive sites during 2017 for three pollutants: NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub>. The majority of the monitoring remained as it was in 2016, but the following changes were made:

##### Discontinued Monitoring Sites

- Paisley 4, 39 and 42 diffusion tube sites; and
- Renfrew 23 diffusion tube site.

##### Newly Installed Monitoring Sites

- Johnstone 85, 86 and 87 diffusion tube sites;
- Paisley 88 diffusion tube site; and
- The High Street, Johnstone automatic monitoring site.

The listed discontinued diffusion tube monitoring sites have been removed due to the tubes reporting consistently lower concentrations of NO<sub>2</sub> when compared to previous years monitoring. Therefore it had been identified that NO<sub>2</sub> concentrations at these locations was not of concern. The four available diffusion tubes have consequently been relocated to four new locations. The locations of the new diffusion tubes are highlighted in green within Table A.2.

Monitoring commenced at the High Street, Johnstone automatic site in July 2017, with PM<sub>10</sub> and PM<sub>2.5</sub> concentrations monitored using a FIDAS analyser. This increased the number of automatic monitors in operation within Renfrewshire to four.

Trend graphs for all monitoring locations presenting up to 5 years of monitoring data are presented in Appendix A. The results presented have been annualised and bias adjusted where applicable, but are not distance corrected as per Table A.3 and Table B.1.

### 3.1.1 Automatic Monitoring Sites

Renfrewshire Council undertook automatic (continuous) monitoring at four sites during 2017. Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at <http://www.scottishairquality.co.uk/>.

All four of the automatic monitors within Renfrewshire are part of the Scottish Air Quality Database network, whereby monitoring data is managed by Ricardo Energy and Environment to the same procedures and standards as AURN monitoring sites.

Maps showing the location of the monitoring sites are provided in Appendix A in Figure A.1, Figure A.2 and Figure A.3. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

### 3.1.2 Non-Automatic Monitoring Sites

Renfrewshire Council undertook non- automatic (passive) monitoring of NO<sub>2</sub> at sixty two sites during 2017. Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix A. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

## 3.2 Individual pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for annualisation and bias. Further details on adjustments are provided in Appendix C.

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

Table A.3 in Appendix A compares the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past 5 years with the air quality objective of 40µg/m<sup>3</sup>.

Annual mean NO<sub>2</sub> concentrations recorded at all automatic monitoring sites in 2017 were below the annual average AQO.

There were two exceedances of the annual mean AQO (following bias adjustment and distance correction) at diffusion tubes located within the existing AQMAs; Renfrew 8 (Renfrew Town Centre AQMA) and Johnstone 59 (Johnstone High Street AQMA). There were no exceedances recorded within the Paisley Town Centre AQMA although the concentration at Paisley 79 (Incle Street) was 39.6µg/m<sup>3</sup>.

There were no exceedances of the annual mean AQO at any of the diffusion tube monitoring locations outside of the existing AQMA (following bias adjustment and distance correction).

For diffusion tubes, the full 2017 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO<sub>2</sub> hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m<sup>3</sup>, not to be exceeded more than 18 times per year. There were 3 hourly means recorded above the 200µg/m<sup>3</sup> concentration limit at the Gordon Street Paisley automatic monitor site during 2017. No exceedances were recorded at the Cockels Loan, Paisley automatic monitoring site.

Compliance with the annual mean and short term NO<sub>2</sub> AQOs was achieved within the Paisley town Centre AQMA in 2017. The highest concentration recorded within the Paisley AQMA was at Paisley 79 (Incle St), and an additional two monitoring locations were within 10% of the NO<sub>2</sub> annual mean objective (Paisley 34, Causeyside St and Paisley 82, Well St).

There have now been three continuous years where the AQOs have been achieved within the Paisley town centre AQMA. Following the results of monitoring within 2018, all monitoring data will be reviewed and compared over a five year period. Once the review has been completed, consideration will be given to the possible amendment or revocation of the existing Paisley AQMA.

### **3.2.2 Particulate Matter (PM<sub>10</sub>)**

Table A.5 in Appendix A compares the ratified and adjusted monitored PM<sub>10</sub> annual mean concentrations for the past 5 years with the air quality objective of 18µg/m<sup>3</sup>.

Table A.6 in Appendix A compares the ratified continuous monitored PM<sub>10</sub> daily mean concentrations for the past 5 years with the air quality objective of 50µg/m<sup>3</sup>, not to be exceeded more than 7 times per year.

Annual mean PM<sub>10</sub> concentrations recorded at all automatic monitoring sites were below the annual mean AQO in 2017.

There were three exceedances of the PM<sub>10</sub> short-term objective recorded at the Cockels Loan, Paisley monitoring during 2017, as seen in Table A.6. This is below

the objective limit of seven exceedances per year. There were no further exceedances recorded during 2017 at any other automatic monitoring site.

### **3.2.3 Particulate Matter (PM<sub>2.5</sub>)**

Table A.7 in Appendix A compares the ratified and adjusted monitored PM<sub>2.5</sub> annual mean concentrations for the past 5 years with the air quality objective of 10µg/m<sup>3</sup>. The High Street, Johnstone monitor commenced monitoring in July 2017 therefore there was a low data capture for the site during 2017 and the data had to be annualised in order to calculate an annual mean. The monitor will run throughout 2018 and should return a far higher data capture thus providing a more robust annual mean concentration result.

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

Renfrewshire Council does not currently monitor SO<sub>2</sub> within the Council area. Historically SO<sub>2</sub> was measured at the Glasgow Airport monitoring station, due to the concentrations recorded being substantially below the AQO, monitoring of SO<sub>2</sub> was discontinued at the monitoring site at the end of 2007.

### **3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene**

Renfrewshire Council does not currently monitor carbon monoxide, lead or 1,3-Butadiene concentrations within the Council area. No significant sources of these pollutants have been identified in previous rounds of Review and Assessment.

#### **4. New Local Developments**

In addition to local knowledge, this section has been completed in consultation with other relevant Council services including Community Resources Roads and Transport, and Planning and Housing.

Two planning applications that were outlined in Section 2.2 of the 2017 Annual Progress Report were submitted to the Council in July 2017; Clyde Waterfront and Renfrew Riverside (CWRR) and Glasgow Airport Investment Area Projects (GAIA). The two projects are part of a wider City Deal generation project that consists of 20 infrastructure projects across the Glasgow City Region. The £1.13bn City Deal has been designed to create thousands of new jobs, improve public transport and connectivity; and deliver significant economic growth through investment within Renfrewshire.

A third major project that is part of the wider City Deal; the Glasgow Airport Access Project (AAP) is currently being development with a full planning application not yet completed.

The AAP will provide a direct link between Glasgow Central Station, Paisley Gilmour Street Station and Glasgow Airport. A new state-of-the-art system is proposed to carry passengers on specially designed tram-trains using both the existing railway network and a new light spur from Paisley to the airport. The tram-train model was chosen as the preferred option after an appraisal established it offered the greatest opportunity of encouraging people to travel to and from the airport via public transport.

The AAP will support the continued expansion of Glasgow Airport and consolidate and extend the benefits of the other two City Deals infrastructure projects in Renfrewshire. It will help to open up the City Region, enabling growth and unlocking Renfrewshire's economic potential. The project will be delivered jointly by Renfrewshire Council and Glasgow City Council and involve key stakeholders including Glasgow Airport, Transport Scotland and Network Rail.

Due to technical complexities and constraints involved, the AAP has a significantly longer development process, with construction expected to start in 2022 and operation of services by 2025.

Upon receipt of the Environmental Impact Assessment (EIA) to be completed and submitted as part of the planning application for the AAP, the impacts upon air quality will be reviewed by the Council and conditions recommended where required.

Glasgow Airport Investment Area (17/0485/PP)

The GAIA project will help facilitate the creation of a world class business and commercial location focussed around Glasgow Airport. The project will deliver infrastructure and environmental improvements, all aimed at improving connections between the Westway, Inchinnan and Airport Business Parks, including the realignment of Abbotsinch Road, a new crossing over the White Cart Water, improved links for cyclists and pedestrians, including a new pedestrian and cycle bridge across the Black Cart.

As well as enabling the continued growth and expansion of Glasgow Airport and surrounding businesses, this investment in infrastructure will help to make Renfrewshire a more attractive, vibrant and sustainable place to live and work by better connecting communities and businesses. Work is expected to start on site in 2018 with construction complete in 2020.

An EIA was submitted as part of the planning application including air quality and traffic impact assessments. The air quality assessment confirms there will be changes in traffic flows on the local road network following construction of the new infrastructure outlined above and as development takes place, however local air quality pollutant concentrations at sensitive receptors will be below statutory air quality objectives. In addition, no new receptors will be introduced into an area of existing poor air quality. The assessment therefore concludes there will be no negative effects in relation to air quality as a result of the proposed development.

There was however the potential for the GAIA project to affect local air quality during the construction phase, therefore the following condition has been recommended:

- No works shall commence on site until the applicant has produced a Construction Environmental Management Plan (CEMP) which has been submitted to, and approved by, the Planning Authority. The plan shall set out how potential dust arising during development of the site will be managed to prevent or minimise emissions during these works. The plan shall take cognisance of the Institute of Air Quality Management (IAQM) 2014 document

‘Guidance on the Assessment of Dust from Demolition and Construction’ in assessing dust impact risk and where necessary identify appropriate mitigation measures.

Clyde Waterfront and Renfrew Riverside Investment Project (17/0486/PP)

The CWRR project will see the construction of a new bridge across the River Clyde connecting the communities of Renfrew, Yoker and Clydebank. Proposals also include the construction of new roads and cycle routes aimed at opening up access to development sites and providing an alternative route around Renfrew Town Centre.

The new bridge will accommodate vehicles, pedestrians and cyclists with work expected to commence in 2019 (subject to planning application outcomes and timescales) and be complete in 2021.

Construction of the Renfrew North Development Road will provide an alternative route avoiding Renfrew Town Centre. This will optimise the operation of the local road network resulting in improved traffic flows in and around Renfrew Town centre and improved journey time reliability. A cycleway will also be provided on both sides of the new Development Road.

An EIA was submitted as part of the planning application for the new infrastructure which included air quality and traffic impact assessments. While the findings predict an increase in traffic at certain locations within Renfrew as development takes place, in terms of the Town Centre AQMA, construction of the Renfrew North Development Road will result in a positive impact on air quality levels on Inchinnan Road where the highest levels of NO<sub>2</sub> within the AQMA are currently measured by the Council.

The air quality assessment predicts that local air quality pollutant concentrations at sensitive receptors as a result of traffic flow changes will be below statutory air quality objectives. In addition, no new receptors will be introduced into an area of existing poor air quality. The assessment therefore concludes there will be no negative effects in relation to air quality as a result of the proposals. This is also the case when considering the CWRR project cumulatively with the GAIA project.

There was however the potential for the CWRR project to affect local air quality during the construction phase, therefore the following condition has been recommended:



- No works shall commence on site until the applicant has produced a CEMP which has been submitted to, and approved by, the Planning Authority. The plan shall set out how potential dust arising during development of the site will be managed to prevent or minimise emissions during these works. The plan shall take cognisance of the IAQM 2014 document 'Guidance on the Assessment of Dust from Demolition and Construction' in assessing dust impact risk and where necessary identify appropriate mitigation measures.

Currently this application has not been approved, it has been called in by Scottish Ministers for review and a decision will be made upon completion of this review.

#### **4.1 Road Traffic Sources**

Four planning applications have been received by Renfrewshire Council during 2017 that have been identified as having the potential to change traffic flows on the road network within Renfrewshire. Three of the applications relate to residential developments with associated car parking, and the fourth application is for a retail development with drive through facilities and a car park. Air quality assessments have been completed for all four applications and these have been reviewed by Renfrewshire Council. Details on each application are presented in Table 5.1.

#### **4.2 Other Transport Sources**

Renfrewshire Council confirms that there are none of the following new or significantly changed transport sources:

- Airports;
- Locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m;
- Locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m; and
- Ports for shipping.

#### **4.3 Industrial Sources**

Two industrial planning applications have been received by Renfrewshire Council during 2017, both of which relate to electricity generation facilities. Air quality assessments have been completed for both applications, and these have been reviewed by Renfrewshire Council. Details on both industrial applications are presented in Table 5.1.

#### **4.4 Commercial and Domestic Sources**

Renfrewshire Council confirms that there are none of the following new or significantly changed commercial and domestic sources:

- Areas where the combined impact of several biomass combustion sources may be relevant;
- Areas where domestic solid fuel burning may be relevant; and
- Combined Heat and Power (CHP) plant.

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

Renfrewshire Council confirms that there are none of the following new or significantly changed fugitive or uncontrolled sources:

- Landfill sites;
- Quarries;
- Unmade haulage roads on industrial sites;
- Waste transfer stations, etc; and
- Other potential sources of fugitive particulate matter emissions.

## 5. Planning Applications

This section summarises the planning applications for which air quality assessments were required aside from the City Deal applications, and those for which Renfrewshire Council carried out screening assessments.

The applications and outcomes are summarised in Table 5.1.

**Table 5.1 – Details of Planning Applications Requiring Air Quality Assessments or Screening Assessments**

Planning Application Reference	Data Submitted by the Applicant	Screening Assessment Completed by Renfrewshire Council	Outcome
<b>16/0139/PP – 144 Hawkhead Rd, Paisley PA2 7BG.</b>  Erection of residential development with associated remediation/enabling works and formation of vehicular access.	Air Quality Assessment submitted with planning application.	-	Conclusions of the assessment accepted and permission granted in December 2016 with planning conditions relating to air quality.  A site specific Dust Management Plan required in order to mitigate against emissions to air from the construction phase of the development.
<b>16/0541/PP – 1 Wallneuk Rd, Paisley PA3 4BT.</b>  Erection of retail development including retail (Class 1) units and restaurant (Class 3) with drive through facilities, associated access, servicing, landscaping and car parking.	Air Quality Assessment submitted with planning application.	-	Conclusions of the assessment accepted and permission granted in November 2017 with planning conditions relating to air quality.  A site specific Dust Management Plan required in order to mitigate against emissions to air from the construction phase of the development.
<b>16/0883/PP - 41 Wellmeadow Street, Paisley, PA1 2JN.</b>  Erection of residential development comprising 24 flats and 15 dwelling houses and associated access, parking and landscaping.	Air Quality Assessment submitted with planning application.	-	Conclusions of the assessment accepted and permission granted in June 2017 with planning conditions relating to air quality.  A site specific Dust Management Plan required in order to mitigate against emissions to air from the construction phase of the development.

<p><b>17/0387/PP – 10 Christie Lane, Paisley.</b></p> <p>Demolition of former nightclub and erection of residential development comprising 32 flats with associated access, parking and landscaping.</p>	<p>Air Quality Assessment submitted with planning application.</p>	<p>-</p>	<p>Conclusions of the assessment accepted and permission granted in November 2017 with planning conditions relating to air quality.</p> <p>A site specific Dust Management Plan required in order to mitigate against emissions to air from the construction phase of the development.</p>
<p><b>17/0311/PP – 105 Abercorn St, Paisley PA3 4AT.</b></p> <p>Change of use of former vehicle body spray facility (Class 5) to electricity and heat generating plant (sui generis), erection of exhaust stack, siting of external heat dump radiators and associated external alterations.</p>	<p>Air Quality Assessment submitted with planning application.</p>	<p>-</p>	<p>Conclusions of the assessment accepted and permission granted in June 2017 with planning conditions relating to air quality.</p> <p>Minimum stack height and restriction on operating hours.</p>
<p><b>17/0640/PP - Land to West of roundabout junction with Underwood Road, Well Street, Paisley.</b></p> <p>Installation of a gas powered electricity generation plant and containerised electricity storage facility with associated security columns, gate and fence.</p>	<p>Air Quality Assessment submitted with planning application.</p>	<p>-</p>	<p>Conclusions of the assessment accepted and permission granted in December 2017 with planning conditions relating to air quality.</p> <p>Restriction on operating hours.</p>

## 6. Conclusions and Proposed Actions

### 6.1 Conclusions from New Monitoring Data

There were two exceedances of the NO<sub>2</sub> annual mean AQO (following bias adjustment and distance correction) recorded in 2017 at monitoring locations across Renfrewshire. The exceedances were recorded at Renfrew 8, Inchinnan Road (within the Renfrew Town Centre AQMA) and Johnstone 59, High St (within the Johnstone High Street AQMA), there were no exceedances within the Paisley Town Centre AQMA.

There were no exceedances of either the PM<sub>10</sub> or PM<sub>2.5</sub> AQOs at any monitoring locations during 2017.

Within the Paisley Town Centre AQMA there were no exceedances of any AQOs where relevant pollutant monitoring is completed (NO<sub>2</sub> and PM<sub>10</sub>). The AQMA has been declared for annual mean and short term NO<sub>2</sub> exceedances, and for annual mean PM<sub>10</sub> exceedances. There have now been three consecutive years where all of these AQOs have been compiled with. Once 2018 monitoring data becomes available and has been assessed, consideration will be given to the possible amendment or revocation of the Paisley Town Centre AQMA.

Within the Renfrew AQMA there was one exceedance recorded of the NO<sub>2</sub> annual mean AQO, this was at Renfrew 8 located at 15 Inchinnan Road. There are seven diffusion tube locations within the AQMA and Renfrew 8 is located within the centre of the AQMA close to the cross junction of Inchinnan Road, Glebe Street and Hairst Street.

Within the Johnstone AQMA there was one exceedance recorded of the NO<sub>2</sub> annual mean AQO, this was at Johnstone 59 located on the High Street. Monitoring of PM<sub>10</sub> and PM<sub>2.5</sub> commenced at the new automatic monitoring station in Johnstone in July 2017. The data recorded in 2017 was annualised due to the low data capture, a full calendar year of data should be available at the end of 2018.

A revised AQAP that covers the three current AQMAs within Renfrewshire has been approved by the Council Board and has been submitted to the Scottish Government and SEPA. Upon approval, the AQAP will be implemented and the Council will act upon the measures outlined within the Plan to improve air quality within the AQMAs and across the Council area in general.

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

Renfrewshire Council is satisfied that any new developments likely to have an impact upon local air quality, or potentially introduce new receptors into areas of poor air quality have been adequately assessed during the planning process. Processes and guidance notes are in place to ensure that prospective developers and Renfrewshire Council Planning Officers have clear instructions on what information is required in relation to certain types of development, especially biomass, and when to request more detailed information on the potential impacts of the proposals.

## **6.3 Proposed Actions**

The proposed actions and LAQM requirements for Renfrewshire Council are as follows:

- Complete the implementation of the revised AQAP once this has been approved by the Scottish Government and SEPA;
- Continue to improve the Council's fleet of vehicles and begin to implement phase 1 of the Pool Car Scheme;
- Continue the expansion of the ECO Stars scheme from its initial trial to full implementation;
- Begin the production of a Corporate Travel Plan;
- Raising awareness of air pollution at a local level through vehicle anti idling campaigns and 2018's Clean Air Day,
- Assess the 2018 monitoring data within the Paisley Town Centre AQMA when available with consideration to revoking/amending the AQMA based upon the results;
- Continue to review all air quality assessments that are submitted as part of planning applications in relation to possible impacts upon local air quality;
- Continue to monitor NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> at all relevant locations throughout Renfrewshire; and
- Submit the 2019 Annual Progress Report.

## Appendix A: Monitoring Results

**Table A.1 – Details of Automatic Monitoring Sites**

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Inlet Height (m)
	Gordon St/ Causeyside St, Paisley	Roadside	248316	663612	NO <sub>2</sub> ; PM <sub>10</sub>	Y	Chemiluminescent; FDMS	6.5	10	NO <sub>x</sub> – 2.2 PM <sub>10</sub> – 2.4
	St James St, Paisley	Roadside	248173	664320	PM <sub>10</sub>	Y	FDMS	0	4	2.35
	Cockels Loan	Roadside	250463	665934	NO <sub>2</sub> ; PM <sub>10</sub>	N	Chemiluminescent; FDMS	0	18	NO <sub>x</sub> – 2.2m PM <sub>10</sub> – 2.8
	High Street, Johnstone	Roadside	242984	663178	PM <sub>10</sub> ; PM <sub>2.5</sub>	Y	FIDAS 200	0.5 <sup>(3)</sup>	2.9	1.9

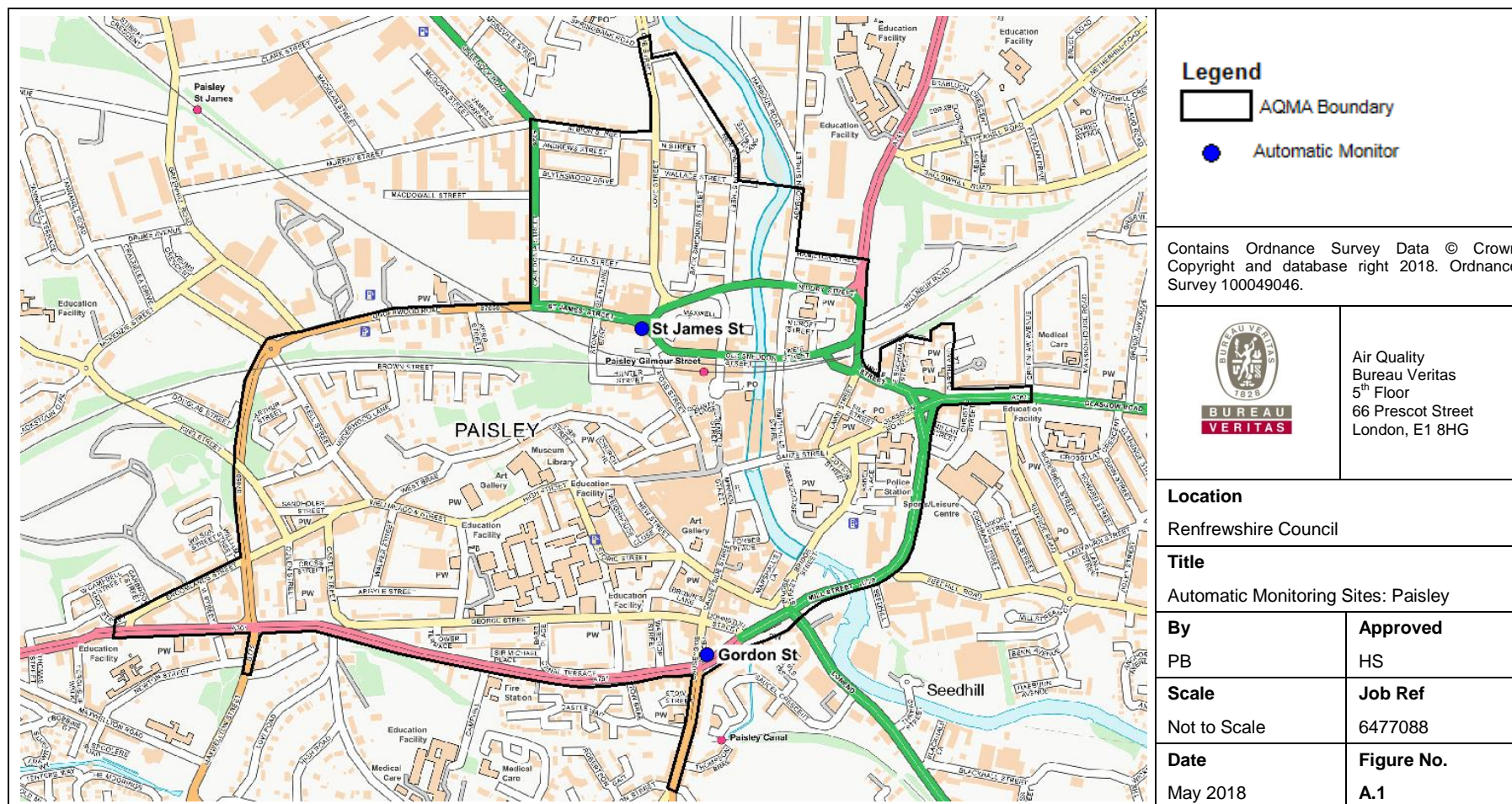
(1) 0 if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

(3) The distance of 0.5m is to the façade of the closest building, there are commercial units at ground level and residential on the first floor.

The locations of the automatic monitoring sites are presented in Figure A.1, Figure A.2 and Figure A.3.

Figure A.1 – Automatic Monitoring Sites: Paisley





**Figure A.2 – Automatic Monitoring Site: Cockels Loan, Renfrew**

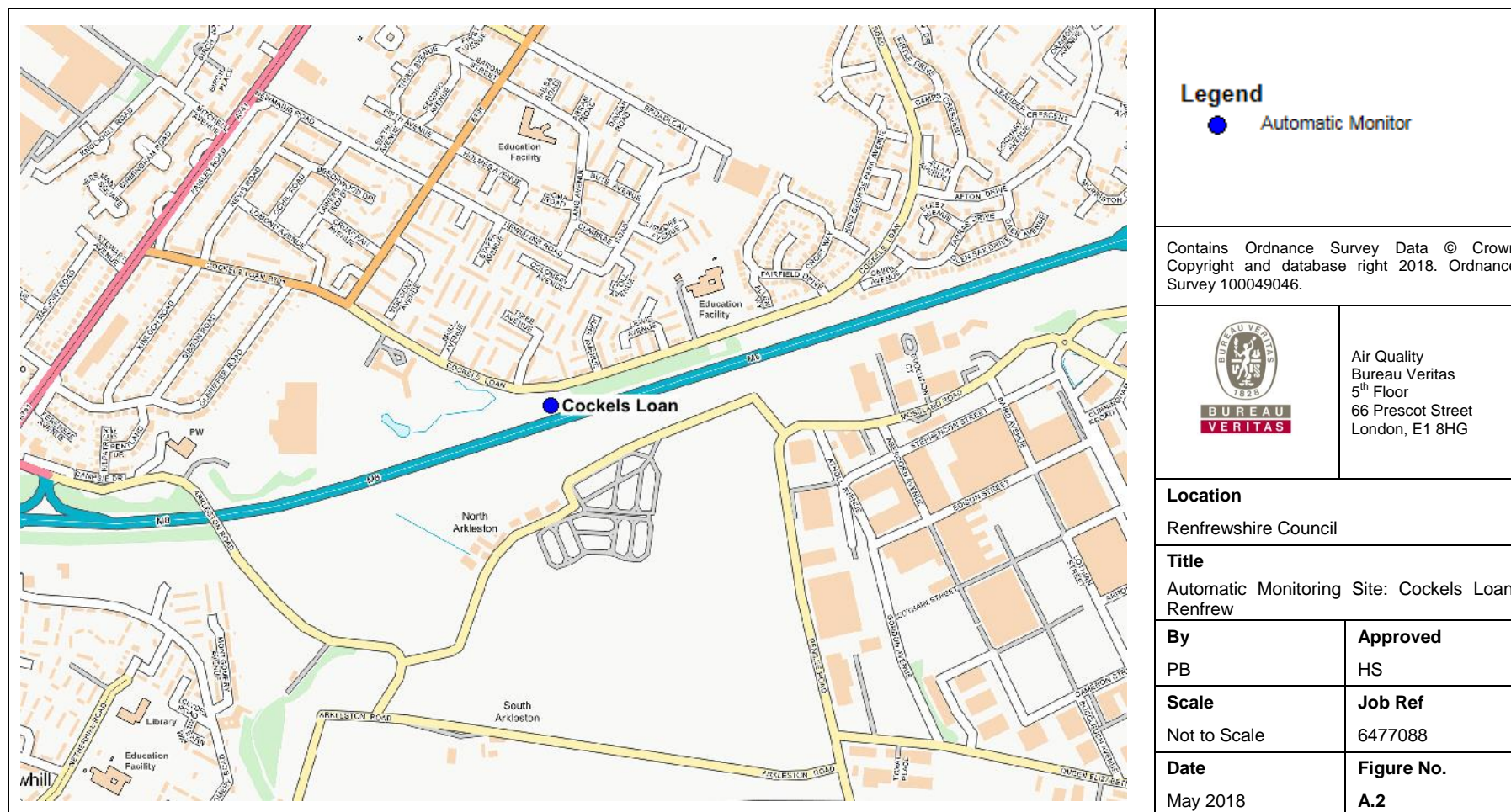


Figure A.3 – Automatic Monitoring Site: High Street, Johnstone

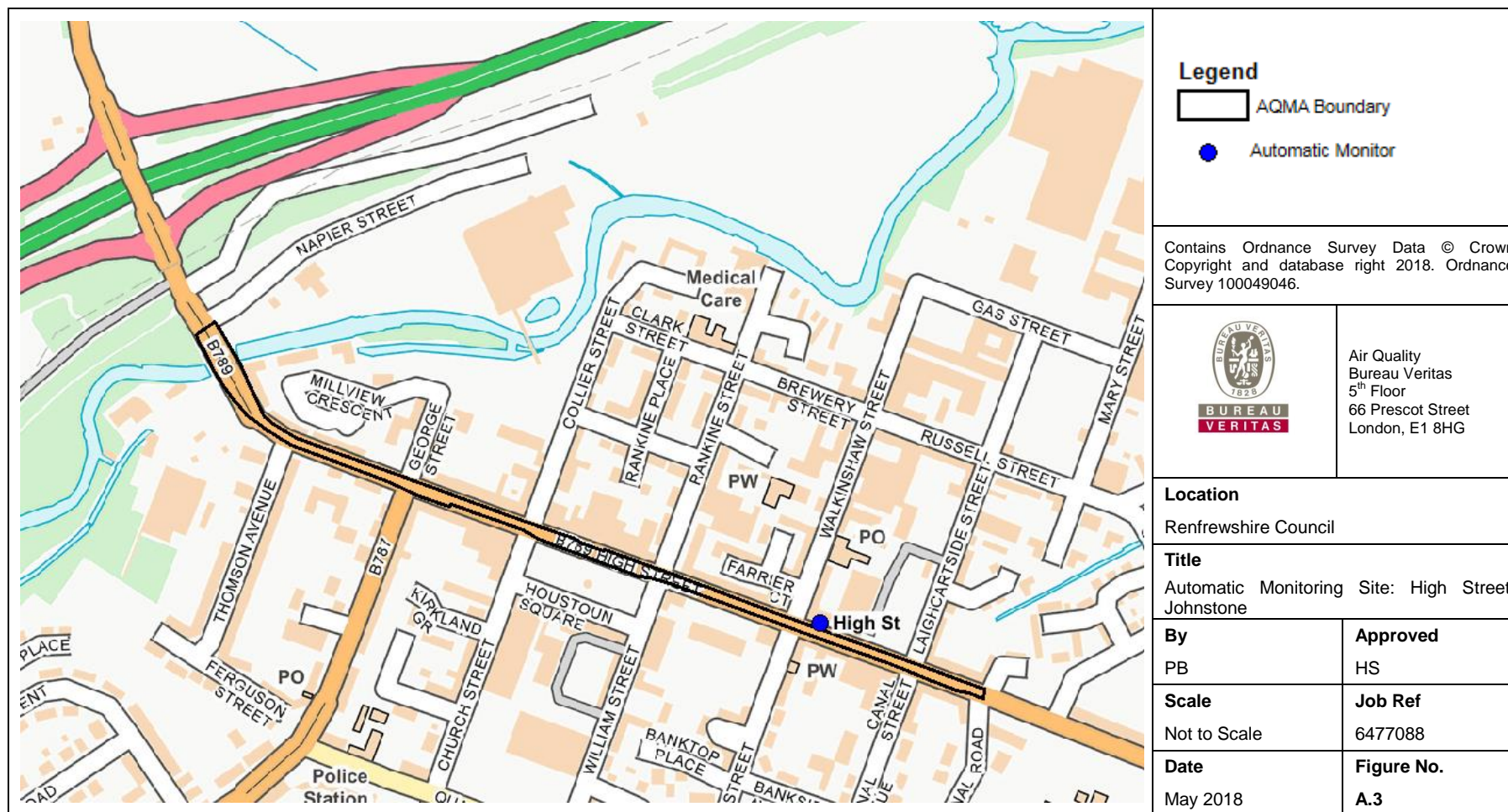


Table A.2 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube collocated with a Continuous Analyser?
1	Gilmour St, Paisley	Urban Centre	248350	664082	NO <sub>2</sub>	Y	N/A	68	N
2	Oakshaw St, Paisley	Urban Background	247925	664052	NO <sub>2</sub>	Y	11	35	N
3	Lochfield Dr, Paisely	Urban Background	249004	662142	NO <sub>2</sub>	N	8	1.5	N
8	15 Inchinnan Rd, Renfrew	Kerbside	250589	667547	NO <sub>2</sub>	Y <sup>(3)</sup>	0.1	2.6	N
9	Station Rd, Bishopton	Roadside	243975	670545	NO <sub>2</sub>	N	13	3	N
13	Greenock Rd, Paisley	Urban Background	247371	665674	NO <sub>2</sub>	N	12	23 (M8)	N
15	Montgomery Dr, Paisley	Urban Background	249185	665713	NO <sub>2</sub>	N	4.3	1.6 (11.5 to M8 slip-road)	N
17	Tanar Way, Renfrew	Roadside	251524	666287	NO <sub>2</sub>	N	5	29 (M8)	N
19	Linwood Rd, Johnstone	Roadside	245701	663604	NO <sub>2</sub>	N	5	2.5	N
20	High St, Johnstone	Kerbside	242675	663286	NO <sub>2</sub>	Y <sup>(3)</sup>	1.6	0.1	N
21	Causeyside St, Paisley (triplicate)	Roadside	248316	663612	NO <sub>2</sub>	Y	6.3	9.9	Y
27	Rossland	Suburban	243183	671188	NO <sub>2</sub>	N	6	2	N

Renfrewshire Council

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube collocated with a Continuous Analyser?
	Gardens, Bishopton								
31	West Walkinshaw	Roadside	246189	666141	NO <sub>2</sub>	N	14	17 (M8)	N
33	76 Causeyside St, Paisley	Roadside	248277	663524	NO <sub>2</sub>	Y	1.1	2.9	N
34	63 Causeyside St, Paisley	Roadside	248303	663566	NO <sub>2</sub>	Y	3	0.7	N
35	Old Sneddon St, Paisley	Roadside	248360	664272	NO <sub>2</sub>	Y	0.4	3.4	N
36	Caledonia St, Paisley	Roadside	247948	664774	NO <sub>2</sub>	Y	4.5	3.3	N
38	99 Paisley Road, Renfrew	Roadside	250108	666856	NO <sub>2</sub>	N	0.6	2.5	N
40	Hairst St, Renfrew	Roadside	250763	667631	NO <sub>2</sub>	Y <sup>(3)</sup>	0.25	6.2	N
41	Smithhills St (West), Paisley	Roadside	248463	664175	NO <sub>2</sub>	Y	16	5	N
43	Smithhills St (East), Paisley	Roadside	248481	664153	NO <sub>2</sub>	Y	0	2.5	N
44	Love St,	Roadside	248209	664474	NO <sub>2</sub>	Y	0.2	2.2	N



Renfrewshire Council

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube collocated with a Continuous Analyser?
	Paisley								
45	Xscape. Renfrew	Kerbside	251803	667365	NO <sub>2</sub>	N	18	2	N
48	Glen Sax Dr, Renfrew	Roadside	251264	666217	NO <sub>2</sub>	N	9	45 (M8)	N
49	Tanar Way 2, Renfrew	Roadside	251462	666326	NO <sub>2</sub>	N	9	85 (M8)	N
50	Renfrew Rd, Paisley	Roadside	248985	665494	NO <sub>2</sub>	N	7	12	N
52	Glasgow Rd 2, Renfrew	Roadside	251515	666955	NO <sub>2</sub>	N	4	3	N
53	Old Greenock Rd, Inchinnan	Roadside	248154	668832	NO <sub>2</sub>	N	9	1.5	N
54	Easwald Bank, Kilbarchan	Roadside	241059	662743	NO <sub>2</sub>	N	4.5	1.2	N
56	Paisley Rd, Renfrew	Roadside	250579	667488	NO <sub>2</sub>	Y <sup>(3)</sup>	3.5	4.5	N
57	Paisley Rd, Renfrew	Roadside	250597	667473	NO <sub>2</sub>	Y <sup>(3)</sup>	1.2	6	N
58	Glebe St, Renfrew	Roadside	250667	667448	NO <sub>2</sub>	N	4.5	2.8	N
59	High St, Johnstone	Roadside	242656	663281	NO <sub>2</sub>	Y <sup>(3)</sup>	0.1	1.7	N

Renfrewshire Council

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube collocated with a Continuous Analyser?
60	Underwood Rd, Paisley	Roadside	247525	664326	NO <sub>2</sub>	Y	7.8	0.5	N
61	High Barholm, Kilbarchan	Roadside	240584	663007	NO <sub>2</sub>	N	0.1	1	N
62	Cockels Loan, Renfrew	Roadside	250463	665934	NO <sub>2</sub>	N	0	18	Y
63	Renfrew Rd, Paisley	Roadside	249159	665710	NO <sub>2</sub>	N	6.8	3.7	N
64	Montgomery Rd, Paisley	Roadside	249202	665708	NO <sub>2</sub>	N	8.8	0.15	N
65	High Barholm, Kilbarchan	Roadside	240599	663000	NO <sub>2</sub>	N	0.4	2	N
66	High Barholm, Kilbarchan	Roadside	240573	663021	NO <sub>2</sub>	N	0.4	1.6	N
67	High Barholm, Kilbarchan	Roadside	240512	663027	NO <sub>2</sub>	N	1.8	3	N
68	Paisley Rd, Renfrew	Roadside	250522	667419	NO <sub>2</sub>	N	0.2	3	N
69	Incinnan Rd, Renfrew	Roadside	250537	667602	NO <sub>2</sub>	Y <sup>(3)</sup>	0.1	2.9	N
70	Incinnan Rd,	Roadside	250599	667561	NO <sub>2</sub>	Y <sup>(3)</sup>	4.5	3.7	N

Renfrewshire Council

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube collocated with a Continuous Analyser?
	Renfrew								
71	Braille Drive, Renfrew	Roadside	251729	666360	NO <sub>2</sub>	N	0	25 (M8)	N
72	High St, Johnstone	Roadside	243080	663140	NO <sub>2</sub>	Y	0.45	3	N
73	Lawn St, Paisley	Roadside	248566	664072	NO <sub>2</sub>	Y	0.45	3	N
74	Causeyside St, Paisley	Roadside	248313	663621	NO <sub>2</sub>	Y	0.19	1.95	N
75	Canal St, Renfrew	Roadside	250853	667747	NO <sub>2</sub>	Y <sup>(3)</sup>	0.19	3.3	N
76	Main Rd, Bridge of Weir	Roadside	238899	665488	NO <sub>2</sub>	N	0.17	5	N
77	Main Rd / Houston Rd, Bridge of Weir	Roadside	238570	665892	NO <sub>2</sub>	N	0.15	4.73	N
78	Neilston Rd, Paisley	Roadside	248339	662575	NO <sub>2</sub>	N	0.15	2.26	N
79	Incle St, Paisley	Roadside	248632	664212	NO <sub>2</sub>	Y	0.18	2.8	N
80	Glasgow Rd, Paisley	Roadside	249653	664123	NO <sub>2</sub>	N	1.9	2.1	N
81	Glasgow Airport	Roadside	247346	665805	NO <sub>2</sub>	N	32	33 (M8)	N

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube collocated with a Continuous Analyser?
82	Well Street, Paisley	Roadside	247513	664024	NO <sub>2</sub>	Y	0.2	2.27	N
83	Wellmeadow St, Paisley	Roadside	247671	663913	NO <sub>2</sub>	Y	0.4	3.32	N
84	Ferry Village, Renfrew	Kerbside	251254	667876	NO <sub>2</sub>	N	18	0.5	N
85	High St, Johnstone	Roadside	242622	663306	NO <sub>2</sub>	Y	0.62	1.1	N
86	High St, Johnstone	Roadside	242495	663358	NO <sub>2</sub>	Y	0.14	2.7	N
87	High St, Johnstone	Roadside	243117	663127	NO <sub>2</sub>	Y	0.35	3	N
88	Hawkhead Road, Paisley	Roadside	249850	663991	NO <sub>2</sub>	N	7	2.05	N

(1) 0 if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).

(2) N/A if not applicable.

(3) Monitoring locations have not previously been listed as within an AQMA. The sites are located at the closest possible locations to the AQMA boundaries and therefore have been classed as being within the AQMA they have been sited to monitor.

Note: Sites that are highlighted in green are new sites that have commenced monitoring in 2017.



Figure A.4 – Diffusion Tube Monitoring Locations: Paisley Central

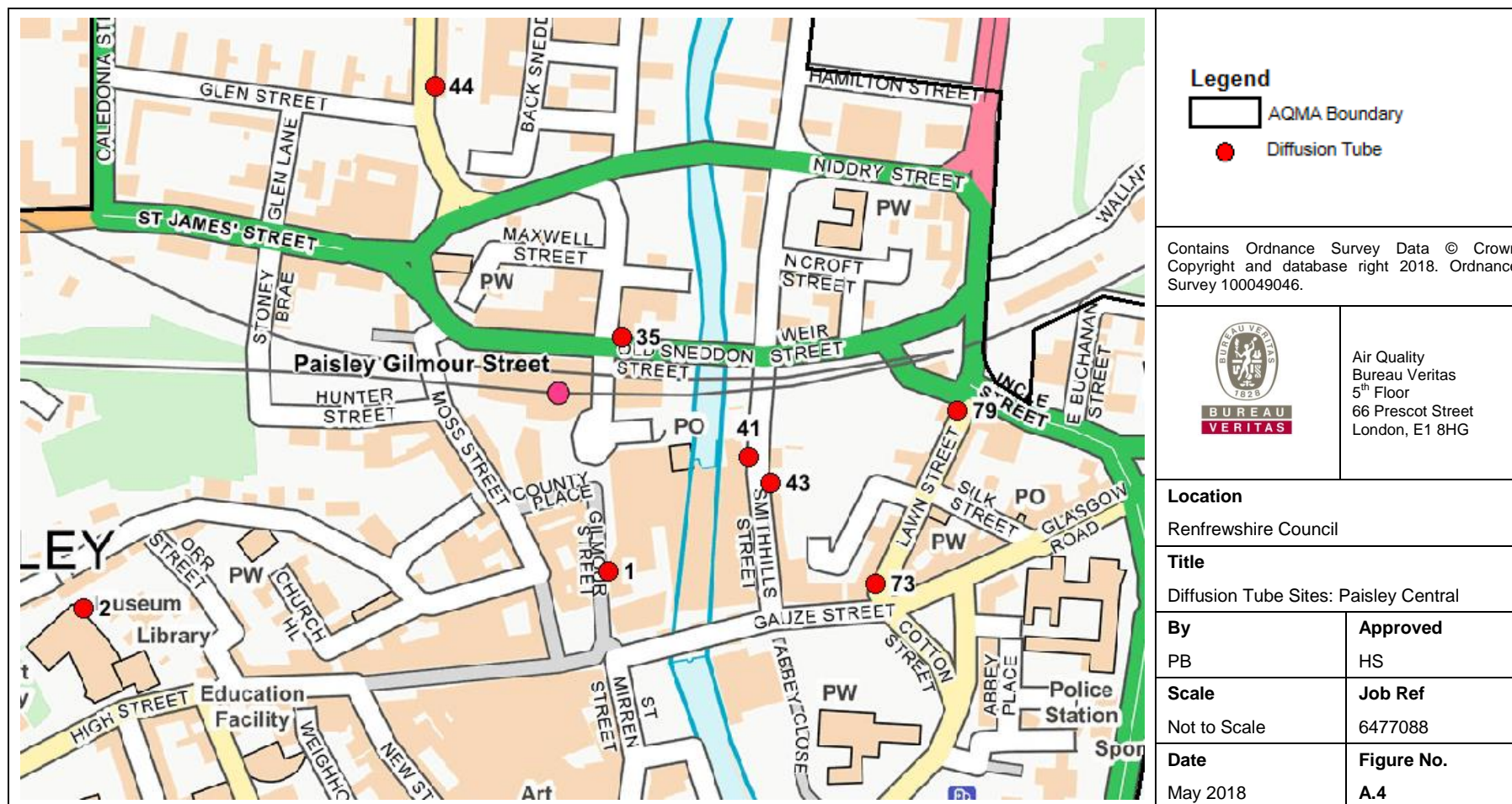


Figure A5 – Diffusion Tube Monitoring Locations: Paisley West

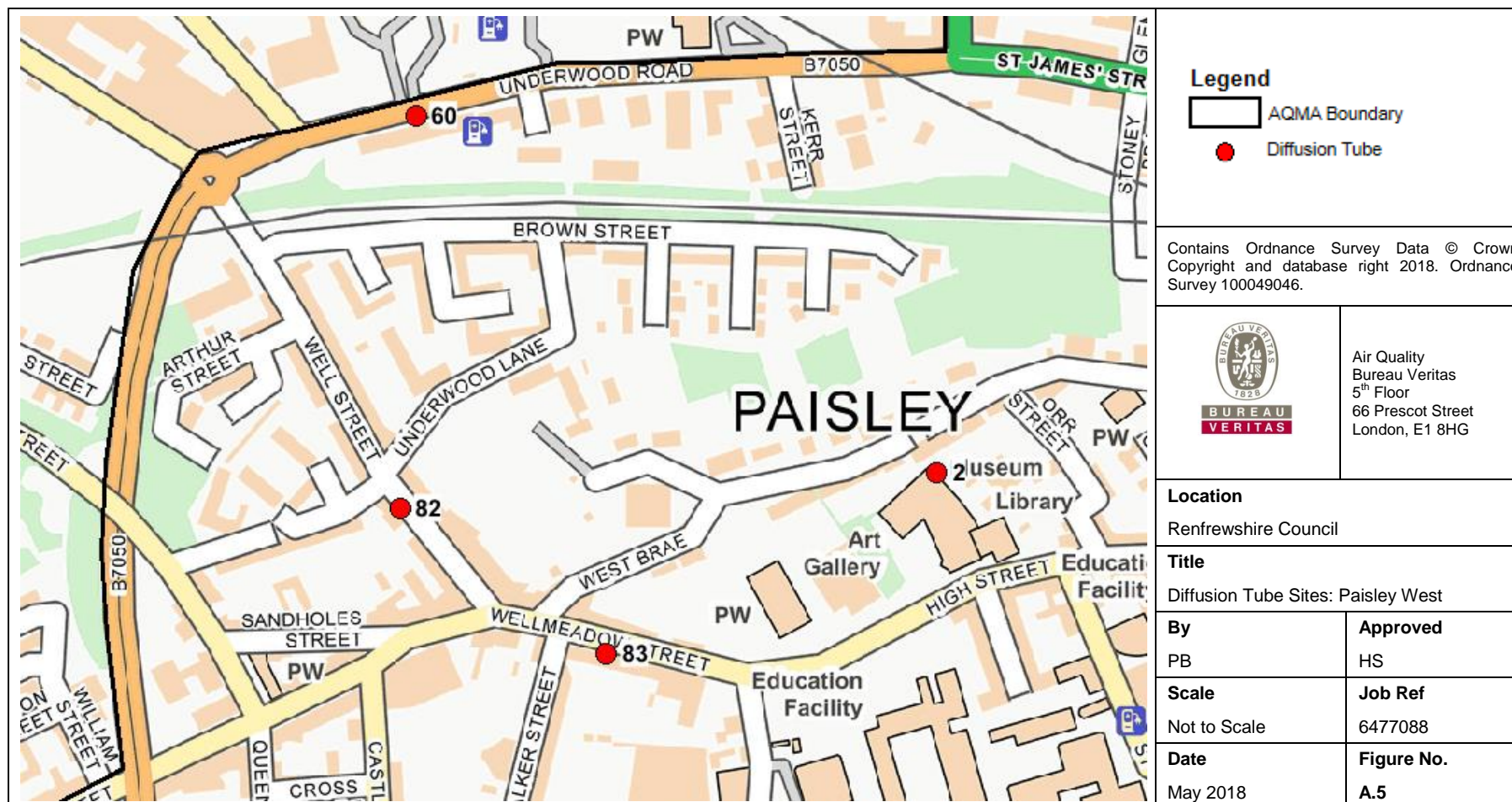




Figure A.6 – Diffusion Tube Monitoring Locations: Paisley North

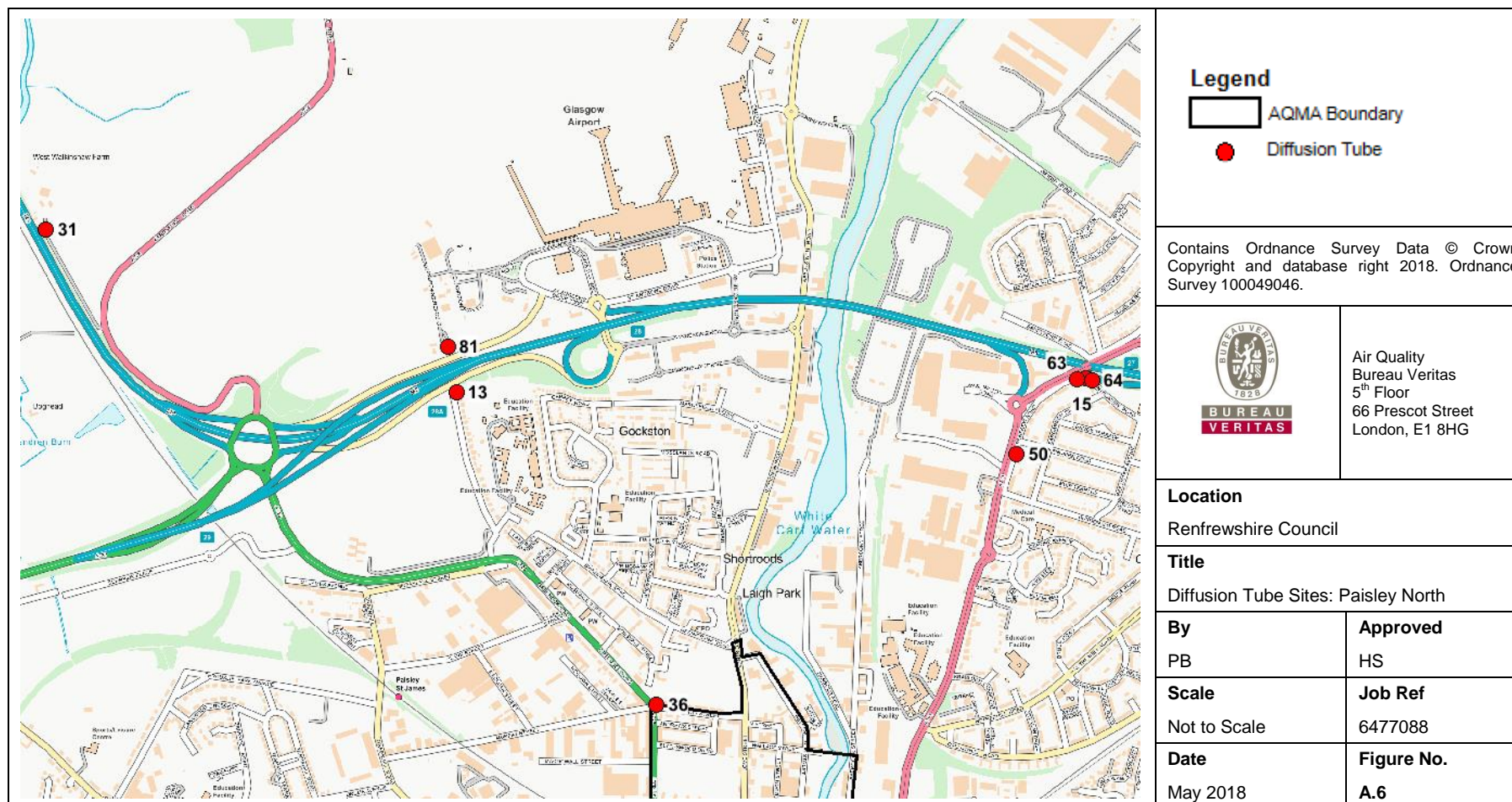


Figure A.7 – Diffusion Tube Monitoring Locations: Paisley South

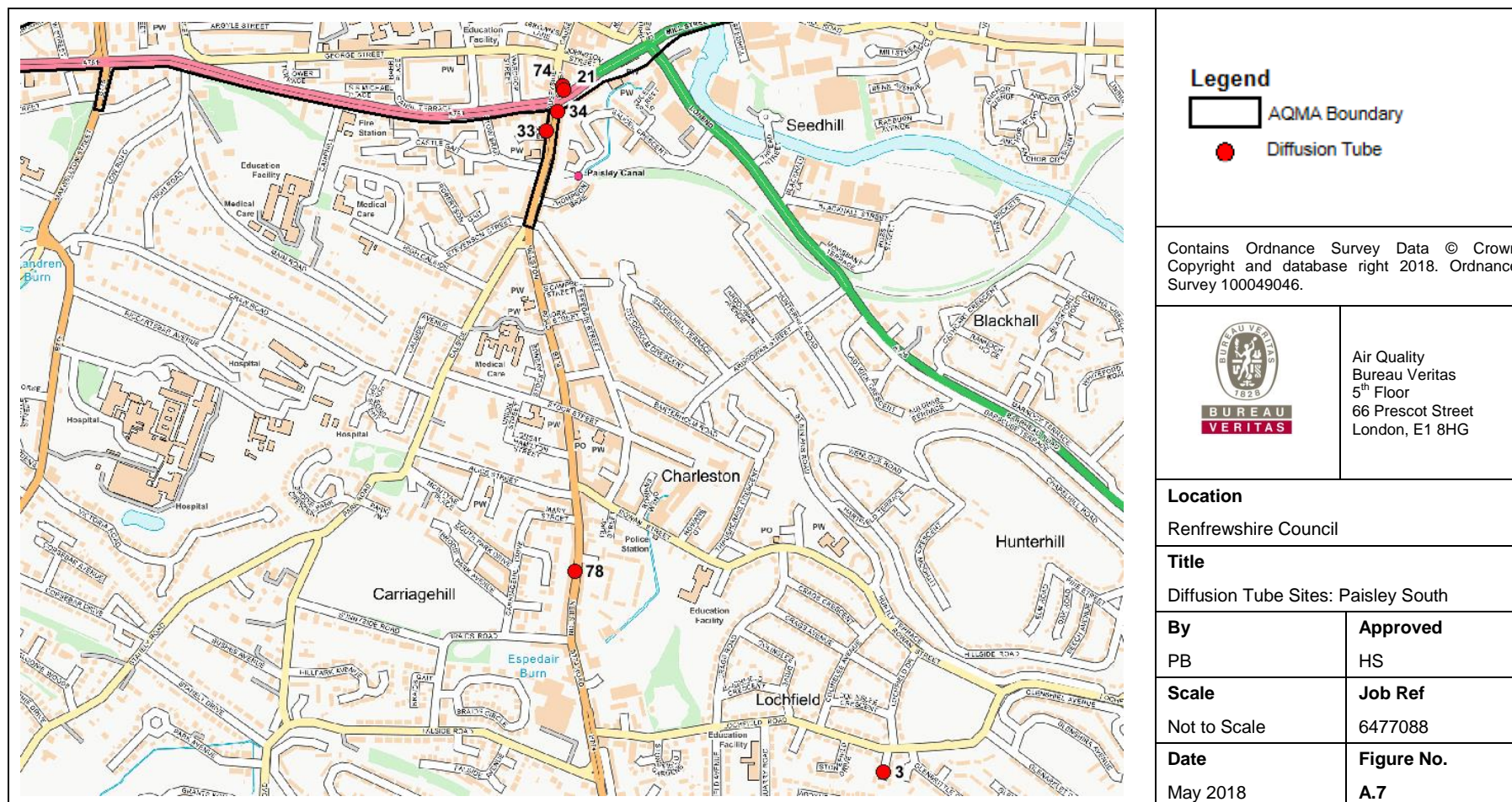




Figure A.8 – Diffusion Tube Monitoring Locations: Paisley East

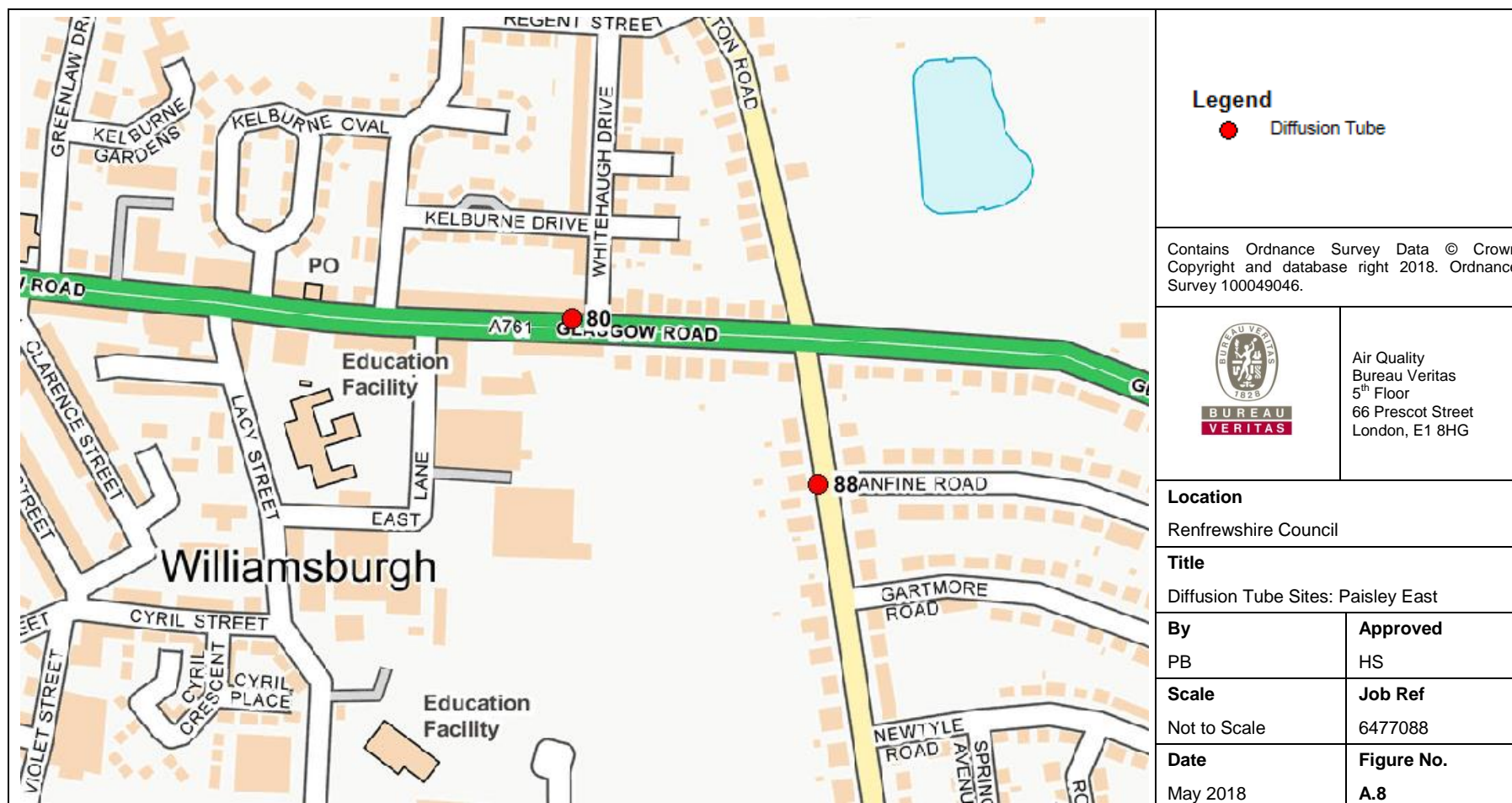


Figure A.9 – Diffusion Tube Monitoring Locations: Paisley South West





Figure A.10 – Diffusion Tube Monitoring Locations: Renfrew Central

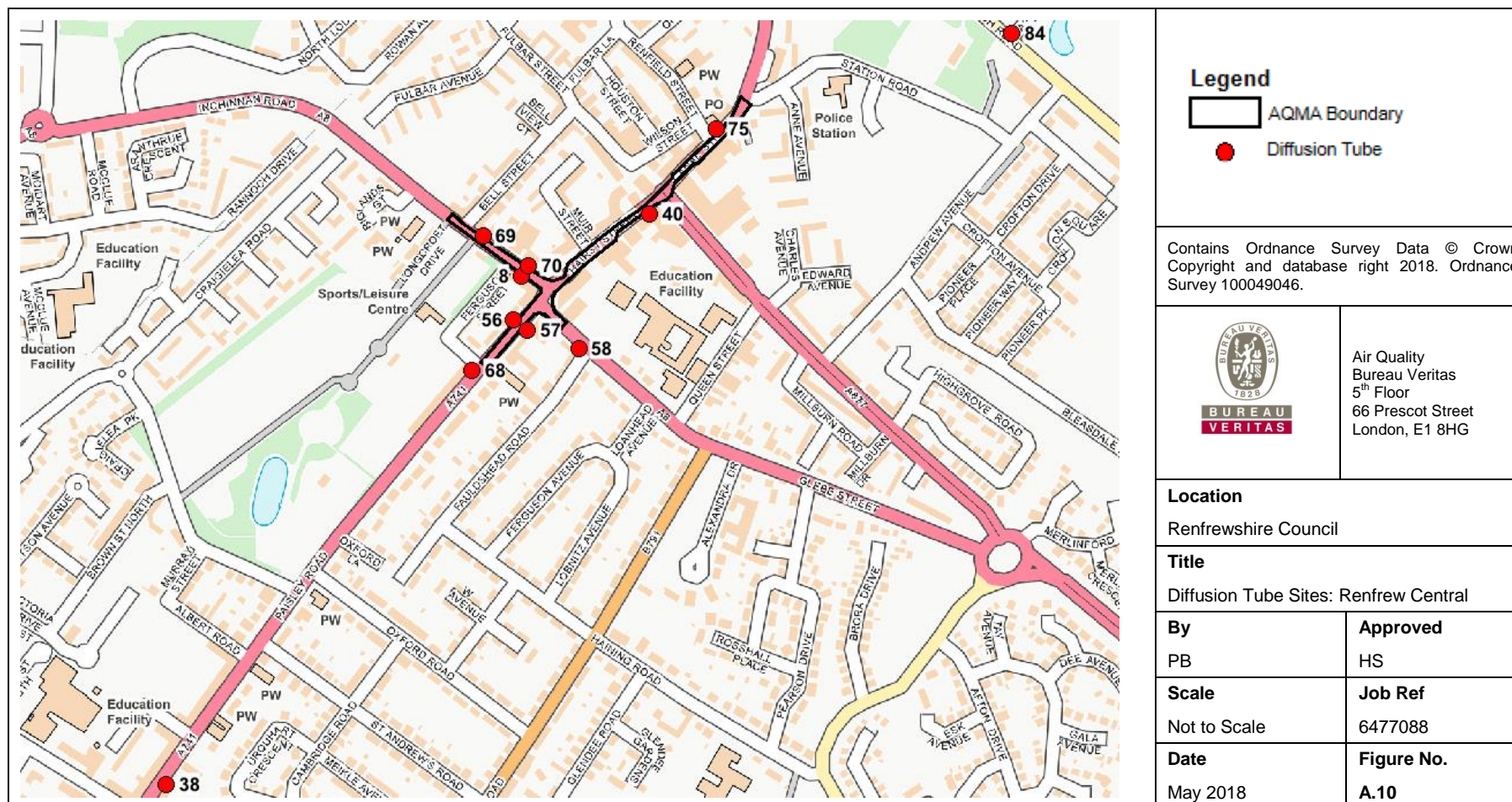




Figure A.11 – Diffusion Tube Monitoring Locations: Renfrew East

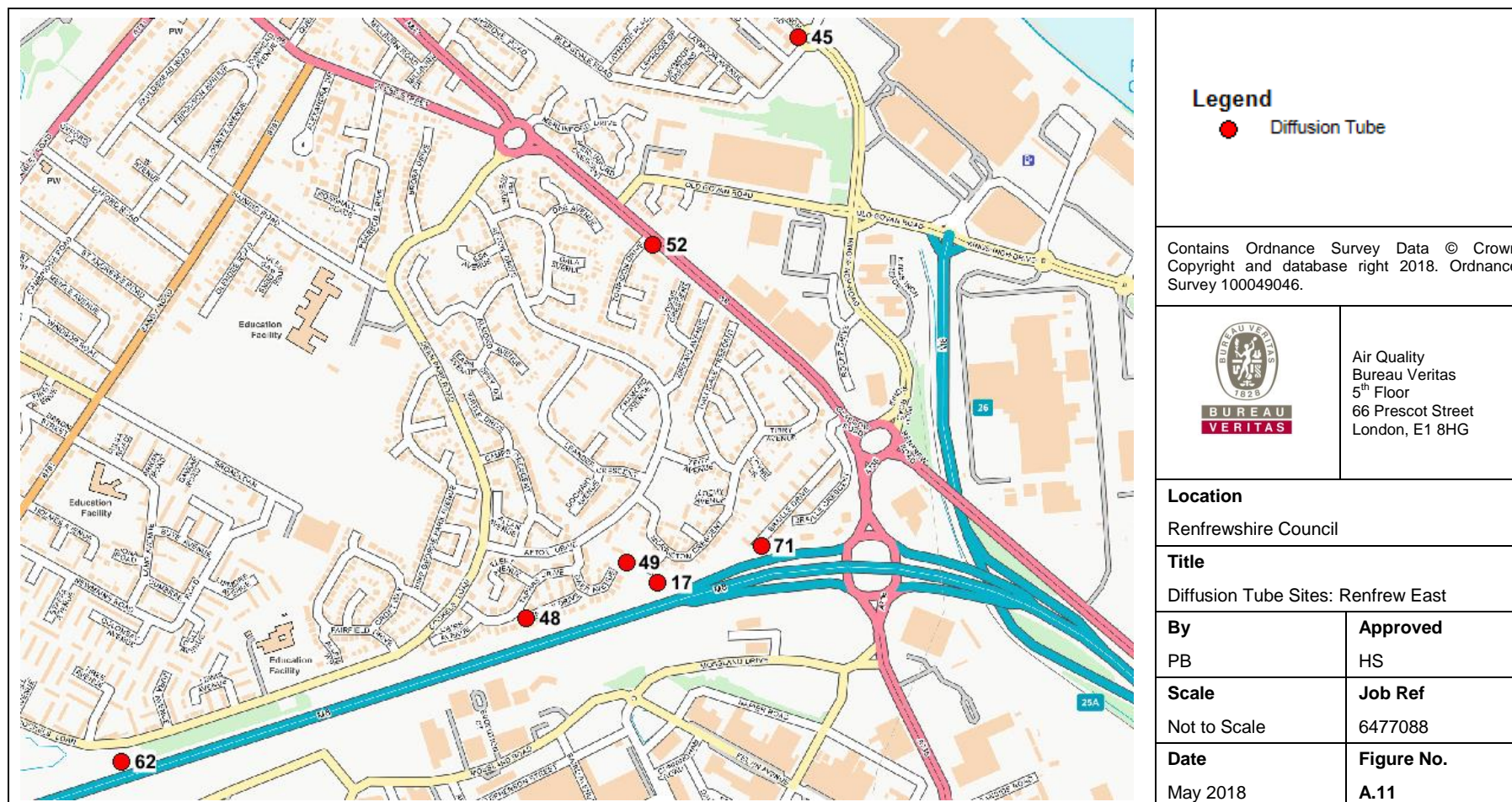




Figure A.12 – Diffusion Tube Monitoring Locations: Johnstone

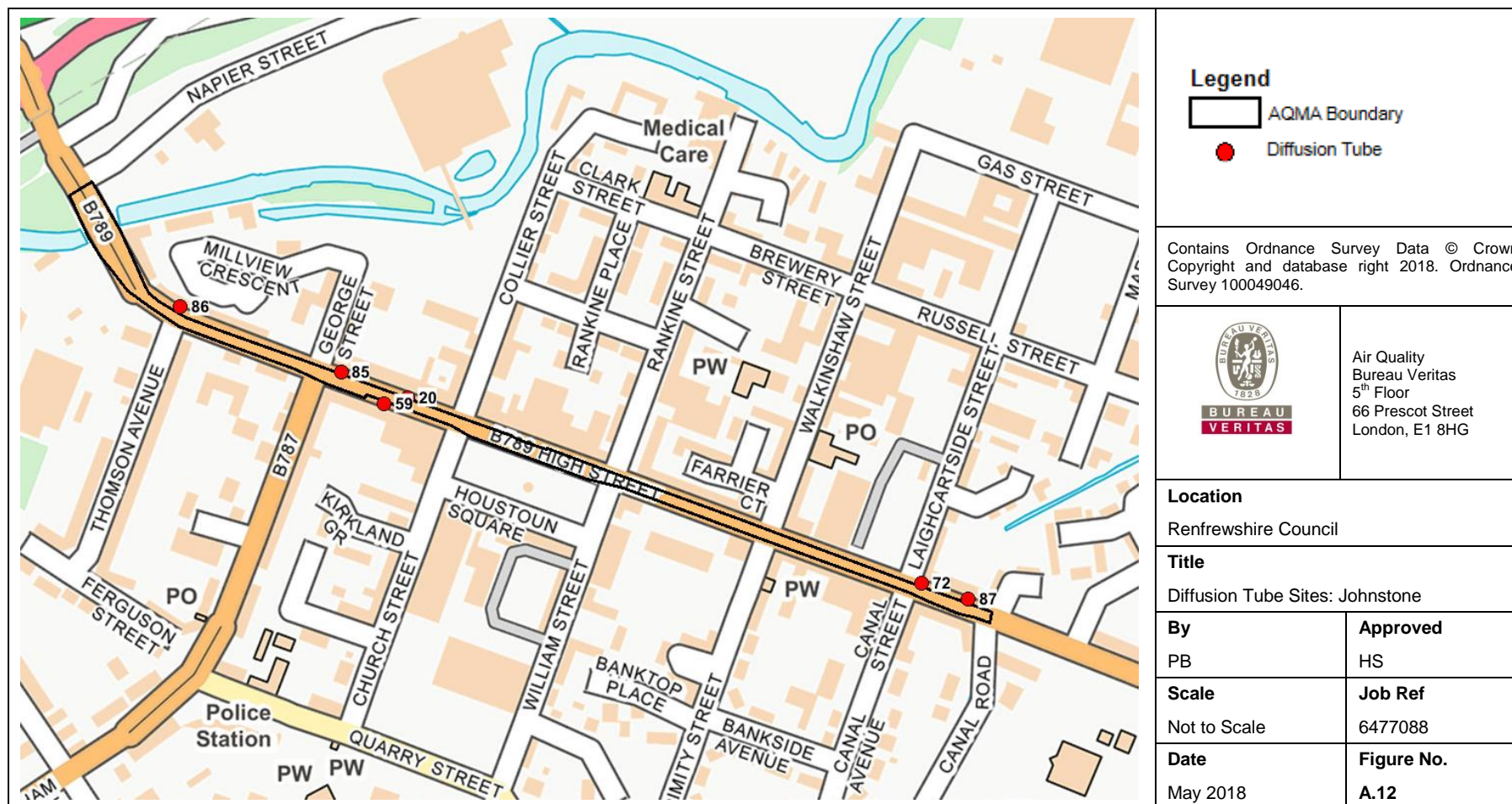


Figure A.13 – Diffusion Tube Monitoring Locations: Kilbarchan

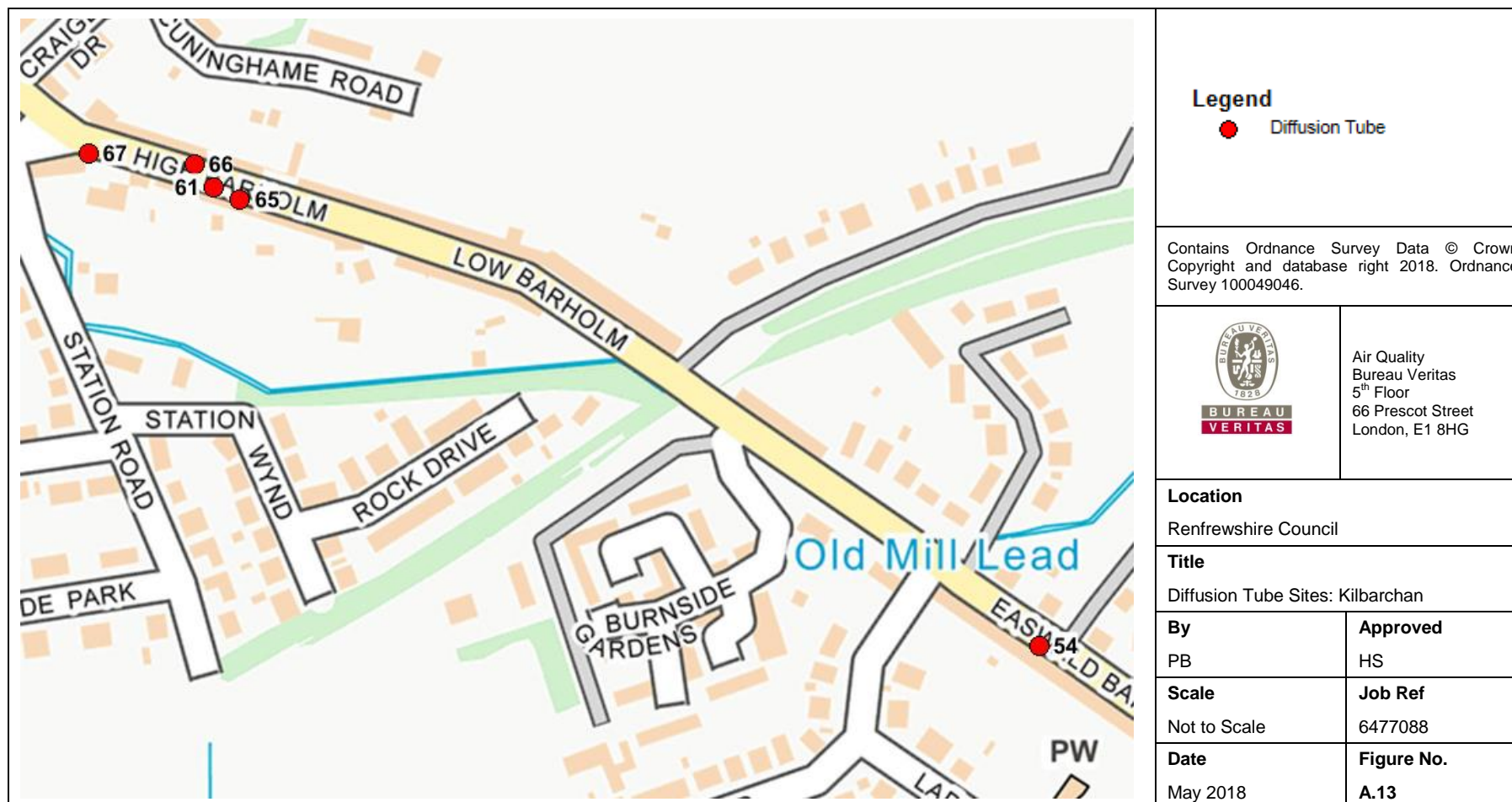




Figure A.14 – Diffusion Tube Monitoring Locations: Bridge of Weir



**Figure A.15 – Diffusion Tube Monitoring Locations: Bishopton**

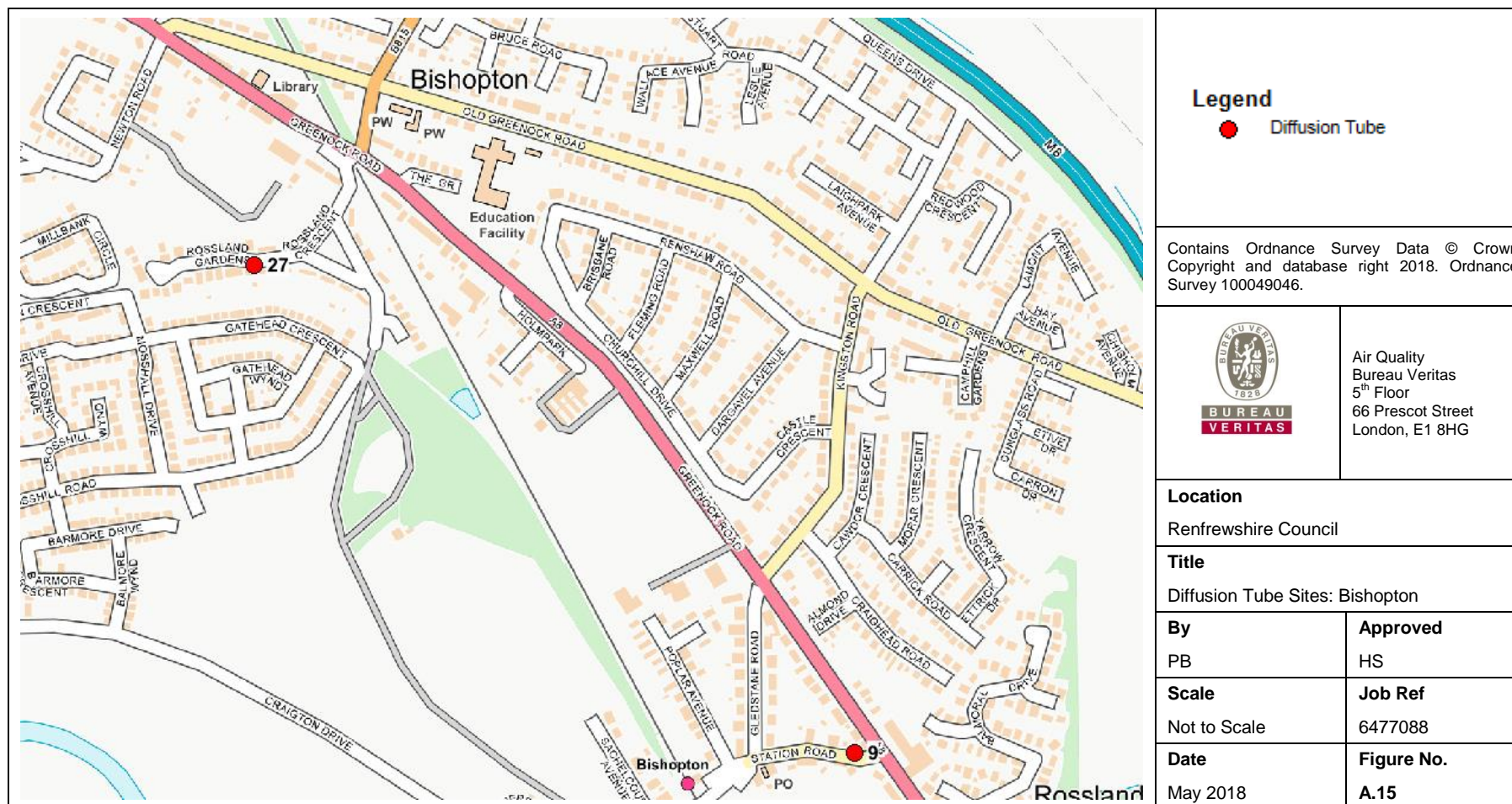




Figure A.16 – Diffusion Tube Monitoring Locations: Inchinnan



Table A.3 – Annual Mean NO<sub>2</sub> Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2017 (%) <sup>(2)</sup>	NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> ) <sup>(3) (4)</sup>				
					2013	2014	2015	2016	2017
Gordon St	Roadside	Automatic	69.6	69.6	34*	28	27	30.0	27.4**
Cockels Loan	Roadside	Automatic	98.1	98.1	-	34	36	34.0	32.1
Paisley 1	Urban C	Passive	91.7	91.7	27.0	29.4	18.8	18.0	21.1
Paisley 2	Urban B	Passive	100.0	100.0	20.0	17.8	12.7	14.8	12.5
Paisley 3	Urban B	Passive	91.7	91.7	13.6	12.4	9.3	9.8	9.5
Paisley 4	Urban B	Passive	-	-	19.0	18.0	13.1	12.4	Stopped
Renfrew 8	Kerbside	Passive	66.7	66.7	53.8 (53.8)	62.0 (61.6)	43.4 (43.2)	37.8	42.8** (42.5)
Bishopton 9	Roadside	Passive	100.0	100.0	20.9	19.2	13.1	13.2	14.5
Paisley 13	Urban B	Passive	100.0	100.0	28.2	27.9 (30.6)	20.5 (21.3)	23.2 (26.7)	24.0 (26.8)
Paisley 15	Urban B	Passive	100.0	100.0	43.7 (42.1)	41.2 (36.2)	26.2	31.1	28.9
Renfrew 17	Roadside	Passive	100.0	100.0	45.2 (42.6)	40.0 (42.1)	32.5 (34.1)	32.5	31.5
Paisley 19	Roadside	Passive	100.0	100.0	38.0	34.8	24.5	25.5	25.6
Johnstone 20	Kerbside	Passive	100.0	100.0	46.6 (34.3)	45.2	33.2	27.8	28.5
Paisley 21	Roadside	Passive	88.9	88.9	37.7	39.4 (48.1)	28 (31.6)	28.8 (35.0)	28.6
Renfrew 23	Roadside	Passive	-	-	30.3	35.0	22.1	16.9	Stopped
Bishopton 27	Suburban	Passive	91.7	91.7	13.8	12.3	8.1	9.1	12.4
Paisley 31 West Walkingshaw Farm	Roadside	Passive	91.7	91.7	36.9	33.1 (44.6)	26.4 (32.8)	26.6 (39.2)	25.8 (35.9)
Paisley 33	Roadside	Passive	100.0	100.0	45.9 (44.9)	42.0 (40.0)	33.2	30.1	32.8
Paisley 34	Roadside	Passive	91.7	91.7	48.6 (35.8)	46.5 (36.9)	35.4	36.9	37.1 (29.8)
Paisley 35	Roadside	Passive	100.0	100.0	48.6 (48.6)	47.3 (46.5)	30.5	34.4	32.6
Paisley 36	Roadside	Passive	83.3	83.3	39.8	38.7	29.8	27.4	28.7
Renfrew 38	Roadside	Passive	100.0	100.0	34.0	32.3	24.5	23.1	25.6
Paisley 39	Roadside	Passive	-	-	23.0	21.3	18.1	23.4	Stopped
Renfrew 40	Roadside	Passive	100.0	100.0	36.5	38.5	27.6	28.1	28.7
Paisley 41	Roadside	Passive	91.7	91.7	45.5	48.8 (36.5)	37.9	33.8	32.1

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2017 (%) <sup>(2)</sup>	NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> ) <sup>(3)(4)</sup>				
					2013	2014	2015	2016	2017
Paisley 42	Roadside	Passive	-	-	42.6	29.1	17.7	15.7	Stopped
Paisley 43	Roadside	Passive	100.0	100.0	41.9	41.9 (41.9)	32.1	30.0	28.5
Paisley 44	Roadside	Passive	83.3	83.3	38.7	29.5	21.8	21.5	22.5
Renfrew 45	Kerbside	Passive	83.3	83.3	34.6	30.2	23.6	23.2	24.5
Renfrew 48	Roadside	Passive	100.0	100.0	40.6 (47.3)	35.2 (38.3)	28.7 (30.7)	29.0 (31.3)	28.7 (33.6)
Renfrew 49	Roadside	Passive	91.7	91.7	34.9	34.2	22.4	24.3	28.2
Paisley 50	Roadside	Passive	83.3	83.3	33.4	32.9	25.6	23.5	32.3
Renfrew 52	Roadside	Passive	100.0	100.0	32.6	34.3	27.2	26.8	29.1
Inchinnan 53	Roadside	Passive	91.7	91.7	32.0	28.1	22.9	23.6	23.0
Kilbarchan 54	Roadside	Passive	100.0	100.0	31.0	29.9	20.7	22.4	22.6
Renfrew 56	Roadside	Passive	100.0	100.0	43.9 (39.5)	39.3	30.2	30.6	30.6
Renfrew 57	Roadside	Passive	91.7	91.7	27.5	37.8	24.0	22.3	26.0
Renfrew 58	Roadside	Passive	91.7	91.7	25.7	26.5	18.5	20.7	20.8
Johnstone 59	Roadside	Passive	100.0	100.0	64.1 (64.1)	57.0 (56.4)	45.3 (45.0)	39.1	41.0 (40.6)
Paisley 60	Roadside	Passive	100.0	100.0	52.2 (31.1)	42.2 (28.9)	28.9	31.6	30.3
Kilbarchan 61	Roadside	Passive	100.0	100.0	47.5 (47.5)	40.3 (39.7)	31.2	30.4	36.7 (36.1)
Cockles Loan 62	Roadside	Passive	100.0	100.0	60.8 (60.8)	46.4 (43.4)	35.3	32.3	34.6
Paisley 63	Roadside	Passive	100.0	100.0	-	40.1 (35.5)	29.7	31.2	32.5
Paisley 64	Roadside	Passive	100.0	100.0	-	32.3	27.8	26.0	29.2
Kilbarchan 65	Roadside	Passive	83.3	83.3	-	37.7	28.2	26.6	33.2
Kilbarchan 66	Roadside	Passive	100.0	100.0	-	21.5	18.7	18.1	23.0
Kilbarchan 67	Roadside	Passive	91.7	91.7	-	19.1	14.7	14.3	17.3
Renfrew 68	Roadside	Passive	83.3	83.3	-	33.8	27.3	25.9	27.3
Renfrew 69	Roadside	Passive	83.3	83.3	-	44.3 (44.0)	31.8	39.7	31.2
Renfrew 70	Roadside	Passive	91.7	91.7	-	32.0	29.2	26.0	26.8
Renfrew 71	Roadside	Passive	91.7	91.7	-	38.5	28.9	28.1	29.7
Johnstone 72	Roadside	Passive	100.0	100.0	-	-	-	22.3	20.9
Paisley 73	Roadside	Passive	100.0	100.0	-	-	-	35.8	35.1
Paisley 74	Roadside	Passive	91.7	91.7	-	-	-	30.8	28.0
Renfrew 75	Roadside	Passive	100.0	100.0	-	-	-	23.7	25.3

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2017 (%) <sup>(2)</sup>	NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> ) <sup>(3)(4)</sup>				
					2013	2014	2015	2016	2017
BoW 76	Roadside	Passive	100.0	100.0	-	-	-	22.9	21.3
BoW 77	Roadside	Passive	100.0	100.0	-	-	-	24.1	24.3
Paisley 78	Roadside	Passive	100.0	100.0	-	-	-	28.8	27.8
Paisley 79	Roadside	Passive	100.0	100.0	-	-	-	34.4	39.6 (39.2)
Paisley 80	Roadside	Passive	100.0	100.0	-	-	-	23.1	25.8
Glasgow Airport 81	Roadside	Passive	100.0	100.0	-	-	-	25.3	22.5
Paisley 82	Roadside	Passive	100.0	100.0	-	-	-	39.5	37.7 (37.2)
Paisley 83	Roadside	Passive	83.3	83.3	-	-	-	38.1	30.5
Paisley 84	Kerbside	Passive	100.0	100.0	-	-	-	32.9	20.2
Johnstone 85	Roadside	Passive	100.0	100.0	-	-	-	-	28.5
Johnstone 86	Roadside	Passive	91.7	91.7	-	-	-	-	19.5
Johnstone 87	Roadside	Passive	100.0	100.0	-	-	-	-	22.5
Paisley 88	Roadside	Passive	100.0	100.0	-	-	-	-	18.5

Notes: Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG(16) if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(4) As per LAQM.TG(16) guidance distance correction has been applied to all concentrations above the NO<sub>2</sub> annual mean objective, and also those within 10% of the objective. Distance corrected NO<sub>2</sub> annual means are shown in brackets. Where a concentration has increased, the receptor is closer to the kerbside than the monitor. Those sites that are still exceeding 40µg/m<sup>3</sup> following distance correction are shaded in rose.

\* - Annualised as per LAQM.TG(09) guidance.

\*\* - Annualised as per LAQM.TG(16) guidance.



Table A.4 – 1-Hour Mean NO<sub>2</sub> Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2017 (%) <sup>(2)</sup>	NO <sub>2</sub> 1-Hour Means > 200µg/m <sup>3</sup> <sup>(3)</sup>				
					2013	2014	2015	2016	2017
Gordon St	Roadside	Automatic	69.6	69.6	<b>46</b> (304)	0	0	0	3 (149)
Cockels Loan	Roadside	Automatic	98.1	98.1	-	-	0	0	0

Notes: Exceedances of the NO<sub>2</sub> 1-hour mean objective (200µg/m<sup>3</sup> not to be exceeded more than 18 times/year) are shown in **bold**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 99.8<sup>th</sup> percentile of 1-hour means is provided in brackets.

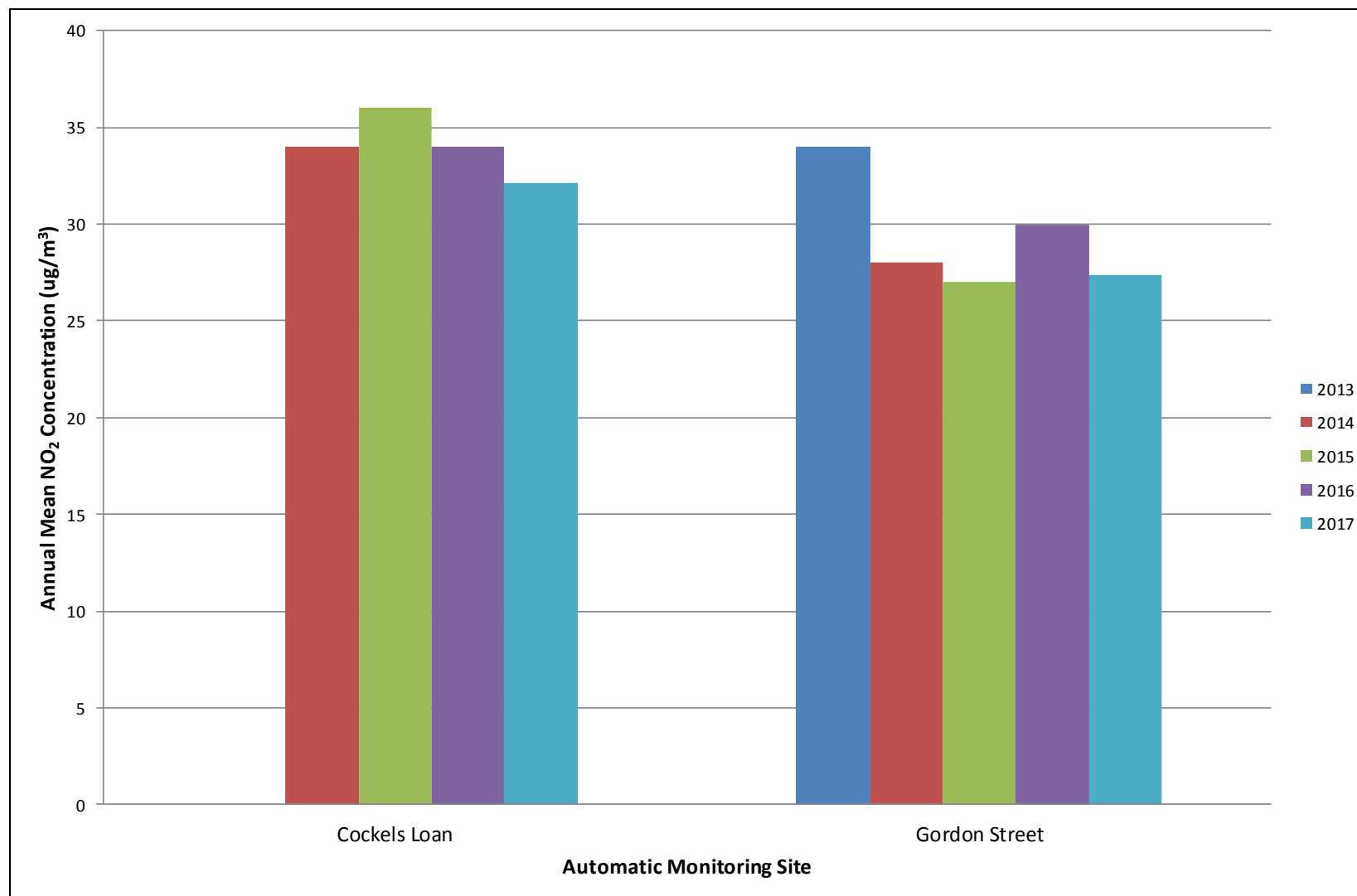
Figure A.17 – Automatic Monitoring Sites Annual Mean NO<sub>2</sub> Trends

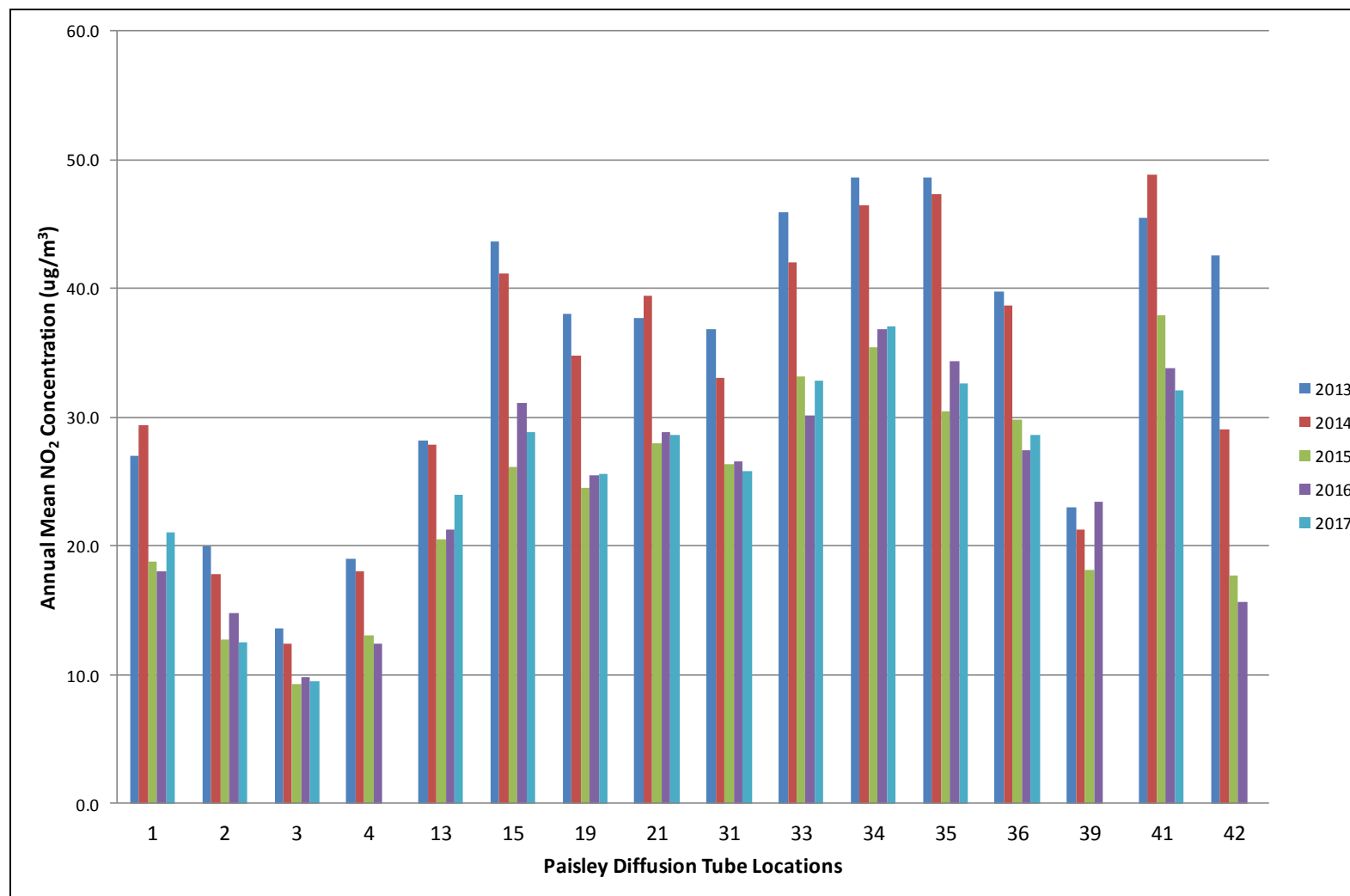
Figure A.18 – Passive Monitoring Sites Annual Mean NO<sub>2</sub> Trends: Paisley 1

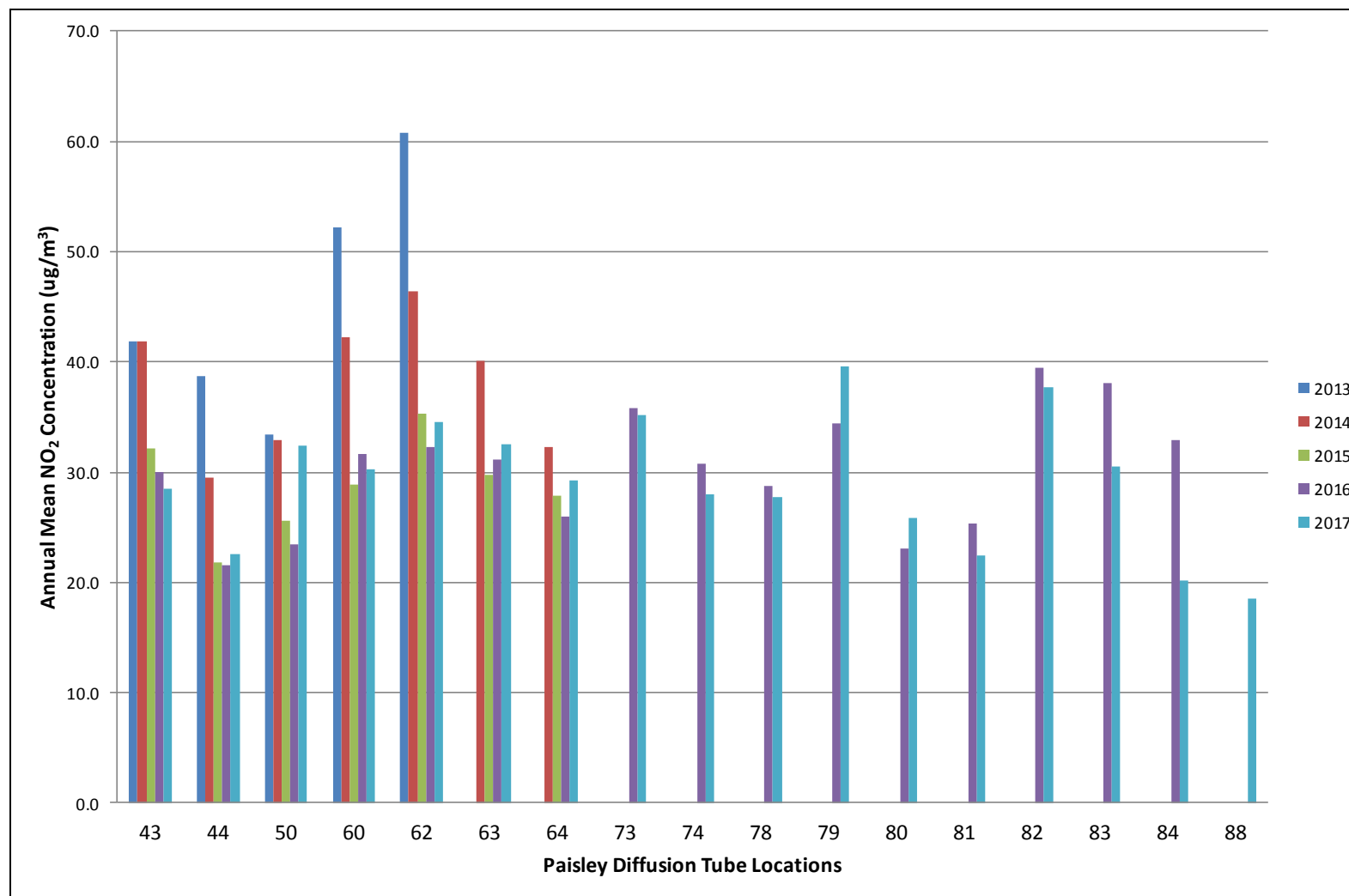
Figure A.19 – Passive Monitoring Sites Annual Mean NO<sub>2</sub> Trends: Paisley 2

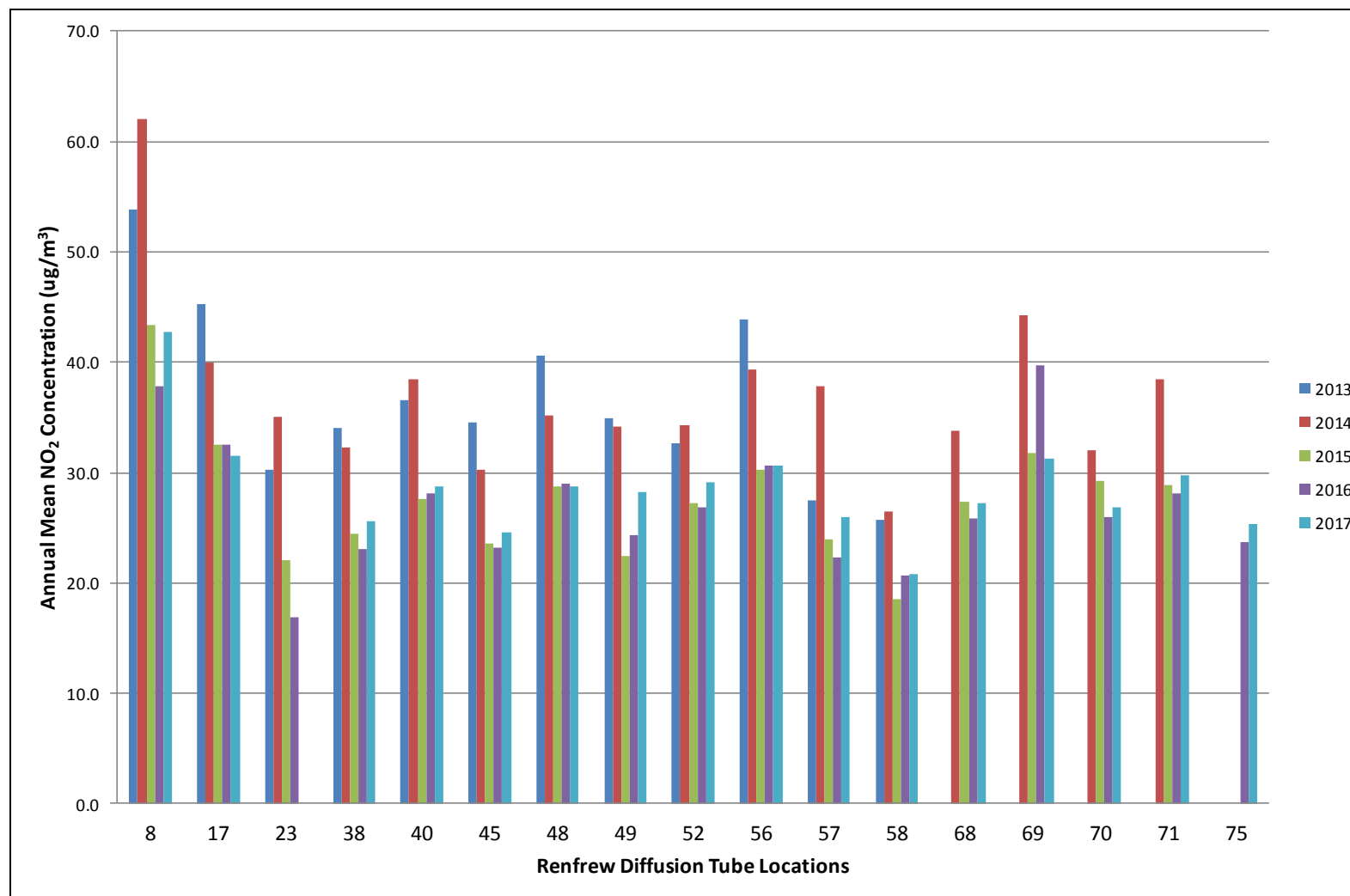
Figure A.20 – Passive Monitoring Sites Annual Mean NO<sub>2</sub> Trends: Renfrew

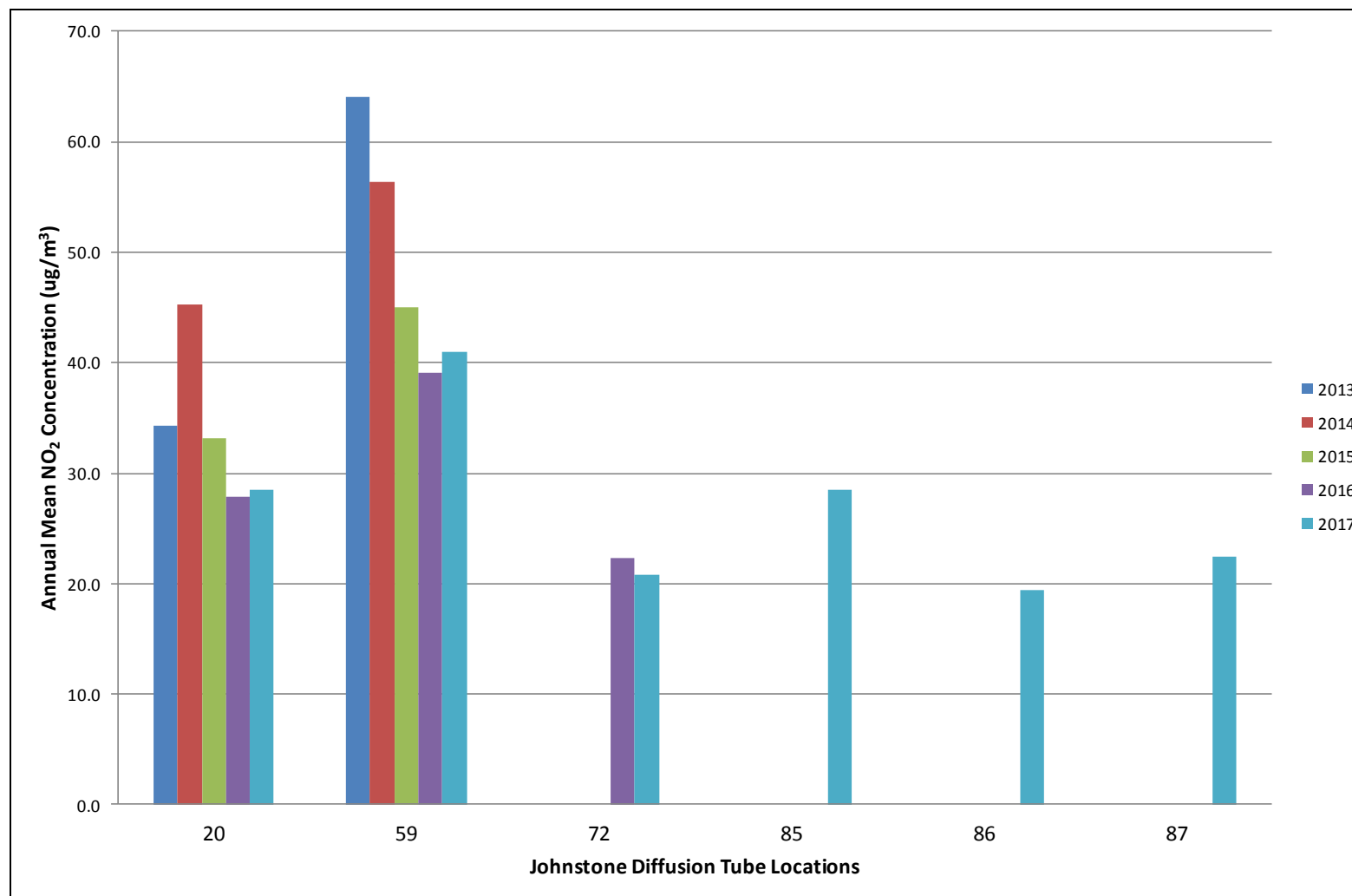
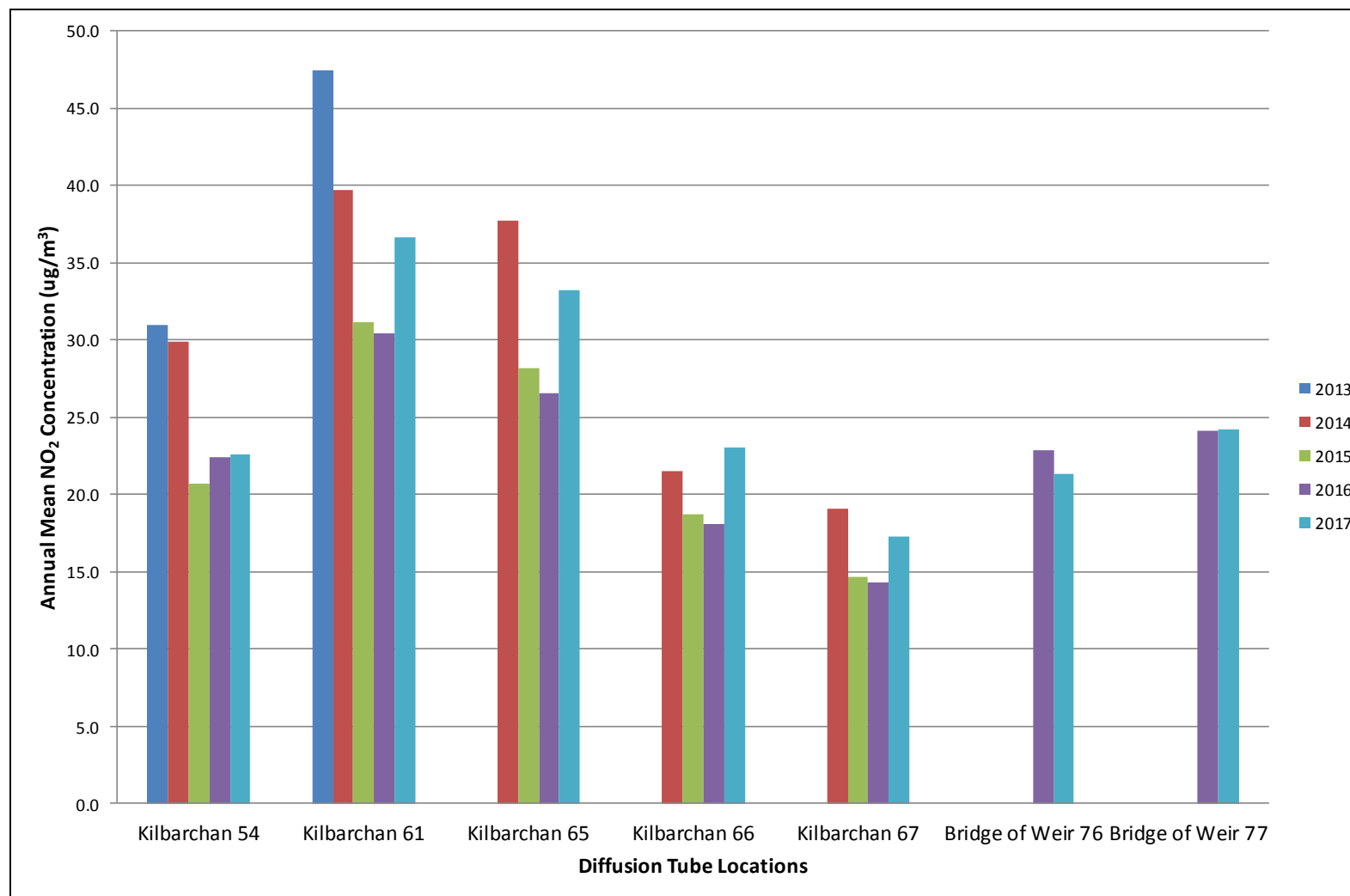
Figure A.21 – Passive Monitoring Sites Annual Mean NO<sub>2</sub> Trends: Johnstone

Figure A.22 – Passive Monitoring Sites Annual Mean NO<sub>2</sub> Trends: Kilbarchan and Bridge of Weir

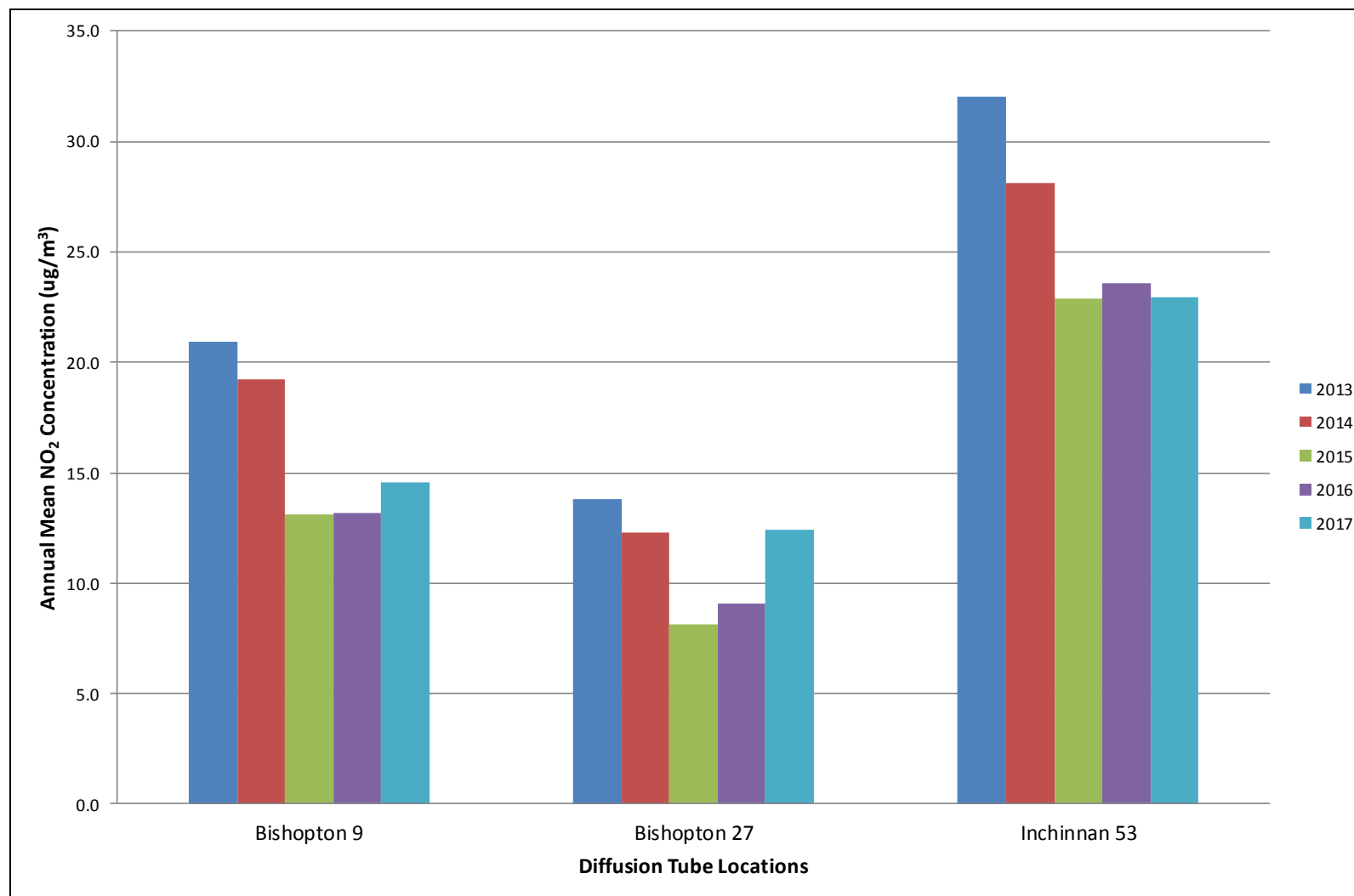
**Figure A.23 – Passive Monitoring Sites Annual Mean NO<sub>2</sub> Trends: Bishopton and Inchinnan**



Table A.5 – Annual Mean PM<sub>10</sub> Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2017 (%) <sup>(2)</sup>	PM <sub>10</sub> Annual Mean Concentration (µg/m <sup>3</sup> ) <sup>(3)</sup>				
				2013	2014	2015	2016	2017
Gordon St	Roadside	74.8	74.8	17.9*	<b>21.2*</b>	15.2**	14	14.7**
St James St	Roadside	97.2	97.2	14.5	14.8	13	13	12.5
Cockels Loan	Roadside	98.4	98.4	-	16.2*	13.1**	14	13.6
High St	Roadside	89.9 <sup>(4)</sup>	37.8	-	-	-	-	11.7**

Notes: Exceedances of the PM<sub>10</sub> annual mean objective of 18µg/m<sup>3</sup> are shown in **bold**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been “annualised” as per LAQM.TG(16), valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(4) The High Street, Johnstone monitor commenced monitoring on the 31<sup>st</sup> of July 2017.

\* - Annualised as per LAQM.TG(09) guidance.

\*\* - Annualised as per LAQM.TG(16) guidance.

Table A.6 – 24-Hour Mean PM<sub>10</sub> Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2017 (%) (2)	PM <sub>10</sub> 24-Hour Means > 50µg/m <sup>3</sup> (3)				
				2013	2014	2015	2016	2017
Gordon St	Roadside	74.8	74.8	2 (40)	1 (49)	0 (33)	0	0 (36)
St James Street	Roadside	97.2	97.2	0	0 (42)	1	0	0
Cockels Loan	Roadside	98.4	98.4	-	0 (43)	3	1 (37)	3
High St	Roadside	89.9 (4)	37.8	-	-	-	-	0 (25)

Notes: Exceedances of the PM<sub>10</sub> 24-hour mean objective (50µg/m<sup>3</sup> not to be exceeded more than 7 times/year) are shown in **bold**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 98.1<sup>st</sup> percentile of 24-hour means is provided in brackets.

(4) The High Street, Johnstone monitor commenced monitoring on the 31<sup>st</sup> of July 2017.

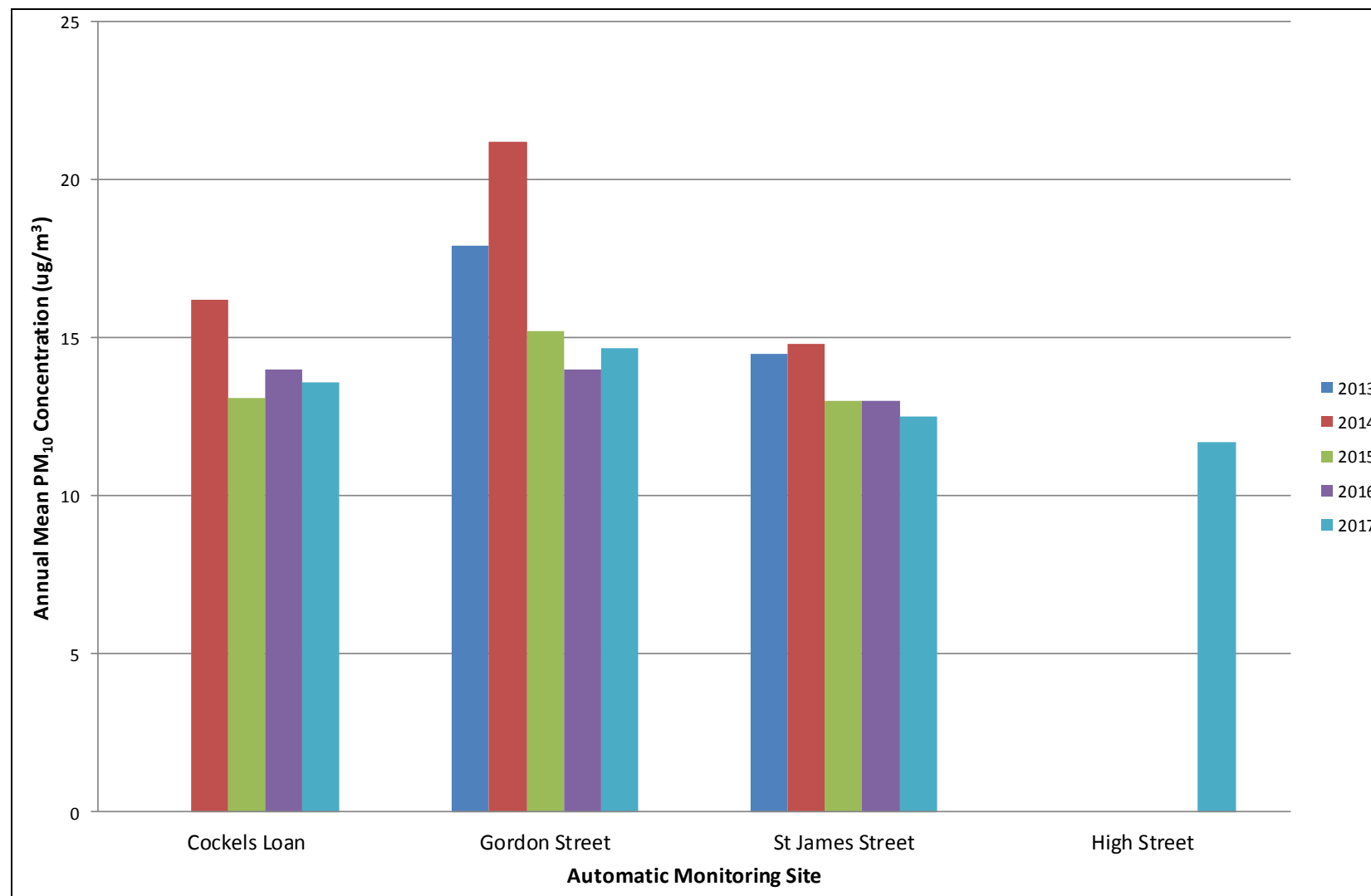
Figure A.24 – Automatic Monitoring Sites Annual Mean PM<sub>10</sub> Trends

Table A.7 – Annual Mean PM<sub>2.5</sub> Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) <sup>(1)</sup>	Valid Data Capture 2017 (%) <sup>(2)</sup>	PM <sub>2.5</sub> Annual Mean Concentration (µg/m <sup>3</sup> ) <sup>(3)</sup>				
				2013	2014	2015	2016	2017
High St	Roadside	89.9 <sup>(4)</sup>	37.8	-	-	-	-	7.1*

Notes: Exceedances of the PM<sub>10</sub> annual mean objective of 10µg/m<sup>3</sup> are shown in **bold**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been “annualised” as per LAQM.TG(16), valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(4) The High Street, Johnstone monitor commenced monitoring on the 31<sup>st</sup> of July 2017.

\* - Annualised as per LAQM.TG(16) guidance.

## Appendix B: Full Monthly Diffusion Tube Results for 2017

Table B.1 – NO<sub>2</sub> Monthly Diffusion Tube Results for 2017

Site ID	NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> ) <sup>(1)</sup>													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data <sup>(3)</sup>	Bias Adjusted <sup>(3) (4) (5)</sup>
Paisley 1	35.1	31.3	24.9	14.8	20.2	11.8	14.6	-	19.6	15.2	32.7	35.1	23.2	21.1
Paisley 2	26.0	20.0	18.7	8.3	12.1	7.1	9.0	7.4	14.0	6.7	12.7	22.6	13.7	12.5
Paisley 3	17.2	16.6	12.5	5.1	7.1	5.7	6.1	4.9	8.7	-	12.8	17.6	10.4	9.5
Renfrew 8 <sup>(2)</sup>	65.5	43.5	46.7	54.0	-	-	-	-	53.5	35.1	73.5	73.1	<b>55.6</b>	<b>42.8</b>
Bishopton 9	23.0	20.2	22.2	10.5	10.5	11.1	10.2	10.6	16.1	8.9	22.0	26.3	16.0	14.5
Paisley 13	27.0	44.7	33.8	29.3	28.4	16.5	21.1	16.3	28.4	14.4	27.2	29.5	26.4	24.0
Paisley 15	46.7	24.3	25.3	23.4	36.9	24.4	27.2	27.6	37.2	23.6	42.6	42.2	31.8	28.9
Renfrew 17	50.8	44.2	34.9	25.5	30.5	22.9	24.5	22.8	45.4	28.5	44.1	40.8	34.6	31.5
Paisley 19	45.3	36.1	35.8	20.7	19.3	18.0	20.0	21.1	28.6	18.5	35.7	38.6	28.1	25.6
Johnstone 20	43.8	34.8	36.6	27.6	25.8	22.6	26.1	23.5	34.6	19.9	38.5	41.9	31.3	28.5
Paisley 21 (1)	44.0	37.6	35.4	-	27.0	20.1	25.6	26.4	34.2	25.5	38.9	39.9	32.2	29.3
Paisley 21 (2)	42.1	38.0	42.1	-	30.9	22.5	21.3	22.7	32.4	26.1	37.3	42.6	32.5	29.6
Paisley 21 (3) <sup>(1)</sup>	25.9	-	44.6	-	26.7	20.4	20.9	22.9	31.6	24.0	34.3	42.9	29.4	26.8
Bishopton 27	16.0	29.6	37.4	5.2	7.2	4.3	5.9	5.0	8.8	-	13.1	17.9	13.7	12.4
Paisley 31 (1)	35.0	29.2	12.5	28.5	22.1	22.1	17.7	22.2	30.9	18.5	-	38.1	25.2	22.9
Paisley 31 (2)	42.3	29.4	32.3	28.9	24.0	23.3	19.0	22.5	32.3	24.3	-	42.6	29.2	26.5
Paisley 31 (3)	40.6	46.9	35.7	31.4	19.8	23.8	19.8	28.7	31.1	23.8	-	36.8	30.8	28.0
Paisley 33	46.0	44.2	31.8	39.3	34.1	29.2	28.0	28.6	36.9	22.9	42.5	49.2	36.1	32.8
Paisley 34	50.2	39.4	42.9	38.8	47.9	-	35.2	27.3	39.5	28.9	44.6	53.2	<b>40.7</b>	37.1
Paisley 35	46.4	30.7	45.0	34.8	34.2	24.7	26.1	29.7	36.8	24.7	50.1	47.3	35.9	32.6
Paisley 36	47.7	31.2	40.1	29.4	29.1	22.8	25.0	24.8	-	26.2	38.6	-	31.5	28.7
Renfrew 38	40.7	35.6	43.2	22.5	20.4	18.0	16.9	22.5	27.5	17.4	34.9	37.8	28.1	25.6
Renfrew 40	43.5	35.9	33.7	23.7	24.8	21.4	27.4	26.2	32.7	22.5	39.5	47.8	31.6	28.7
Paisley 41	49.4	39.5	35.7	38.6	30.5	23.9	26.6	33.7	36.9	24.1	-	49.0	35.3	32.1
Paisley 43	37.6	35.3	39.4	34.0	24.0	14.1	26.2	27.3	31.6	20.8	41.2	44.2	31.3	28.5

Site ID	NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> ) <sup>(1)</sup>													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data <sup>(3)</sup>	Bias Adjusted <sup>(3) (4) (5)</sup>
Paisley 44	37.8	-	37.8	14.8	21.7	-	18.8	14.5	24.8	11.3	29.7	36.2	24.7	22.5
Renfrew 45	39.8	28.3	34.9	16.5	17.4	17.0	21.3	21.9	29.9	-	-	42.7	27.0	24.5
Renfrew 48	42.3	41.6	30.4	17.1	23.0	23.6	21.7	23.9	36.6	27.9	39.8	51.0	31.6	28.7
Renfrew 49 <sup>(1)</sup>	48.8	37.9	43.7	-	19.4	18.2	17.8	24.4	30.2	19.5	36.1	45.2	31.0	28.2
Paisley 50	48.7	29.8	35.4	26.2	-	48.3	24.2	-	31.5	18.2	44.1	49.0	35.5	32.3
Renfrew 52	42.7	37.2	40.9	23.5	20.7	22.0	20.9	21.7	36.0	22.3	42.2	53.7	32.0	29.1
Inchinnan 53	41.3	29.6	36.2	19.3	16.6	18.5	16.0	20.4	27.9	16.6	35.1	-	25.2	23.0
Kilbarchan 54	37.4	26.1	30.0	23.5	22.8	17.7	14.3	17.3	24.6	14.8	35.2	34.7	24.9	22.6
Renfrew 56	46.2	38.2	30.0	30.0	26.3	22.6	26.0	32.4	34.0	24.0	47.6	46.2	33.6	30.6
Renfrew 57	29.9	31.4	40.8	20.9	22.9	17.1	-	44.4	26.6	14.4	28.4	37.4	28.6	26.0
Renfrew 58	-	29.1	44.8	16.4	17.3	10.6	16.1	15.2	20.7	11.1	31.7	38.4	22.9	20.8
Johnstone 59	64.7	50.9	39.7	47.1	35.6	35.8	27.7	40.3	50.6	33.1	52.0	63.6	<b>45.1</b>	<b>41.0</b>
Paisley 60	47.4	40.2	30.2	27.0	30.8	19.2	25.0	28.3	35.5	21.8	40.9	53.0	33.3	30.3
Kilbarchan 61	50.3	34.5	60.6	41.3	33.2	27.9	29.0	29.5	47.1	30.6	48.4	51.4	<b>40.3</b>	36.7
Cockels Loan 62 (1)	56.0	39.0	39.3	34.0	31.8	24.7	30.4	31.8	39.7	28.0	42.3	56.3	37.8	34.4
Cockels Loan 62 (2)	50.0	51.0	39.5	39.6	26.2	25.3	26.0	33.0	40.1	23.6	48.2	55.8	38.2	34.8
Cockels Loan 62 (3)	55.7	44.6	39.3	37.7	26.5	24.6	29.4	34.3	40.8	27.2	43.7	52.5	38.0	34.6
Paisley 63	48.7	47.6	42.6	31.5	28.1	22.7	22.1	25.7	37.6	22.8	45.9	53.6	35.7	32.5
Paisley 64	42.4	38.5	42.3	29.9	31.2	17.7	20.5	25.0	31.3	19.8	37.9	49.2	32.1	29.2
Kilbarchan 65	45.4	34.6	45.5	33.4	-	41.0	24.0	24.3	41.3	26.9	48.7	-	36.5	33.2
Kilbarchan 66	36.8	32.2	39.7	17.9	19.9	15.3	14.1	14.3	23.1	28.6	30.0	31.7	25.3	23.0
Kilbarchan 67	25.4	25.5	25.4	13.8	15.5	13.5	11.6	11.4		12.1	26.6	28.3	19.0	17.3
Renfrew 68	38.7	21.5	19.1	24.7	-	17.1	-	29.2	29.3	20.3	45.4	54.4	30.0	27.3
Renfrew 69	46.6	42.2	35.1	22.4	26.2	-	-	22.0	37.3	21.3	40.3	49.6	34.3	31.2
Renfrew 70	46.2	35.9	38.8	26.1	25.1	22.1	24.6	20.8	22.2	21.6	40.9	-	29.5	26.8
Renfrew 71	48.0	35.5	42.1	23.1	23.6	19.0	24.5	29.0	23.8	-	40.9	49.6	32.6	29.7
Johnstone 72	33.7	40.5	26.3	17.1	18.9	15.8	18.0	15.4	17.2	14.4	26.2	31.6	22.9	20.9
Paisley 73	50.3	40.8	39.6	37.8	27.5	23.1	28.9	35.8	40.0	28.8	49.1	61.3	38.6	35.1
Paisley 74	37.6	33.3	41.6	22.4	-	24.2	28.5	23.2	29.8	20.1	30.9	47.4	30.8	28.0

Site ID	NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> ) <sup>(1)</sup>													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data <sup>(3)</sup>	Bias Adjusted <sup>(3) (4) (5)</sup>
Renfrew 75	41.4	33.7	29.9	21.6	17.8	17.8	19.9	22.7	27.5	19.6	38.4	43.3	27.8	25.3
BoW 76	30.4	39.9	37.1	13.3	15.8	16.0	16.9	16.7	24.5	14.3	26.4	30.2	23.5	21.3
BoW 77	33.0	29.0	26.6	27.9	21.9	21.2	19.6	24.4	26.6	17.5	37.4	34.8	26.7	24.3
Paisley 78	41.1	30.4	26.7	29.2	20.5	22.7	23.6	25.6	34.4	20.9	42.6	48.6	30.5	27.8
Paisley 79	76.0	29.0	42.7	26.6	20.8	22.1	29.0	32.7	37.4	73.7	57.5	75.3	43.6	39.6
Paisley 80	34.0	36.2	37.7	23.4	21.5	14.6	18.3	16.7	30.0	18.0	43.7	46.1	28.4	25.8
Airport 81	36.8	37.2	31.2	15.6	20.0	13.6	16.5	18.2	22.6	16.0	32.7	36.0	24.7	22.5
Paisley 82	33.8	25.4	82.8	37.3	21.5	30.3	13.5	42.6	37.4	42.0	76.7	53.5	41.4	37.7
Paisley 83	-	39.2	43.6	33.5	22.9	-	29.2	20.3	34.6	26.6	40.7	44.5	33.5	30.5
Paisley 84	34.6	29.1	25.6	15.0	12.9	15.0	15.4	16.2	24.0	9.5	30.5	38.4	22.2	20.2
Johnstone 85	40.9	26.1	38.6	25.9	31.2	19.7	24.0	25.5	32.6	33.9	34.5	42.5	31.3	28.5
Johnstone 86	31.2	-	30.1	14.0	21.5	14.5	19.4	17.8	18.4	15.2	26.4	26.9	21.4	19.5
Johnstone 87	34.2	60.0	31.1	10.9	20.6	11.9	17.7	14.9	21.3	13.9	26.3	33.4	24.7	22.5
Paisley 88	29.1	24.6	27.2	15.3	13.8	11.8	13.3	12.2	18.9	10.7	31.3	35.6	20.3	18.5

## Notes:

(1) The monthly diffusion tube concentrations have been processed so that in addition to months where diffusion tubes were not returned, results have been removed if any insects were found within the diffusion tube, if the monthly concentration was below 5µg/m<sup>3</sup> or above 85µg/m<sup>3</sup> and if any of the monthly results appeared erroneous.

(2) For location Renfrew 8 the monthly concentrations for June, July and August have been removed from the data set. This is due to the June and July diffusion tubes being exposed in an incorrect location by contractors, and the August diffusion tube being exposed since May.

(3) Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**. NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective are shown in **bold and underlined**.

(4) Results have not been distance corrected.

(5) See Appendix C for details on bias adjustment.

## Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

### Diffusion Tube Local Bias Adjustment Factors

During 2017 there were two co-location studies where triplicate sets of NO<sub>2</sub> diffusion tubes were located with NO<sub>x</sub> automatic analysers; Gordon Street and Cockels Loan. Local bias adjustment factors have been calculated for both locations using the Precision and Bias adjustment spreadsheet (v04), the outputs are presented below in Figure C.1 and Figure C.2.

Figure C.1 – Local Bias Correction Output: Gordon Street (Tube 21)

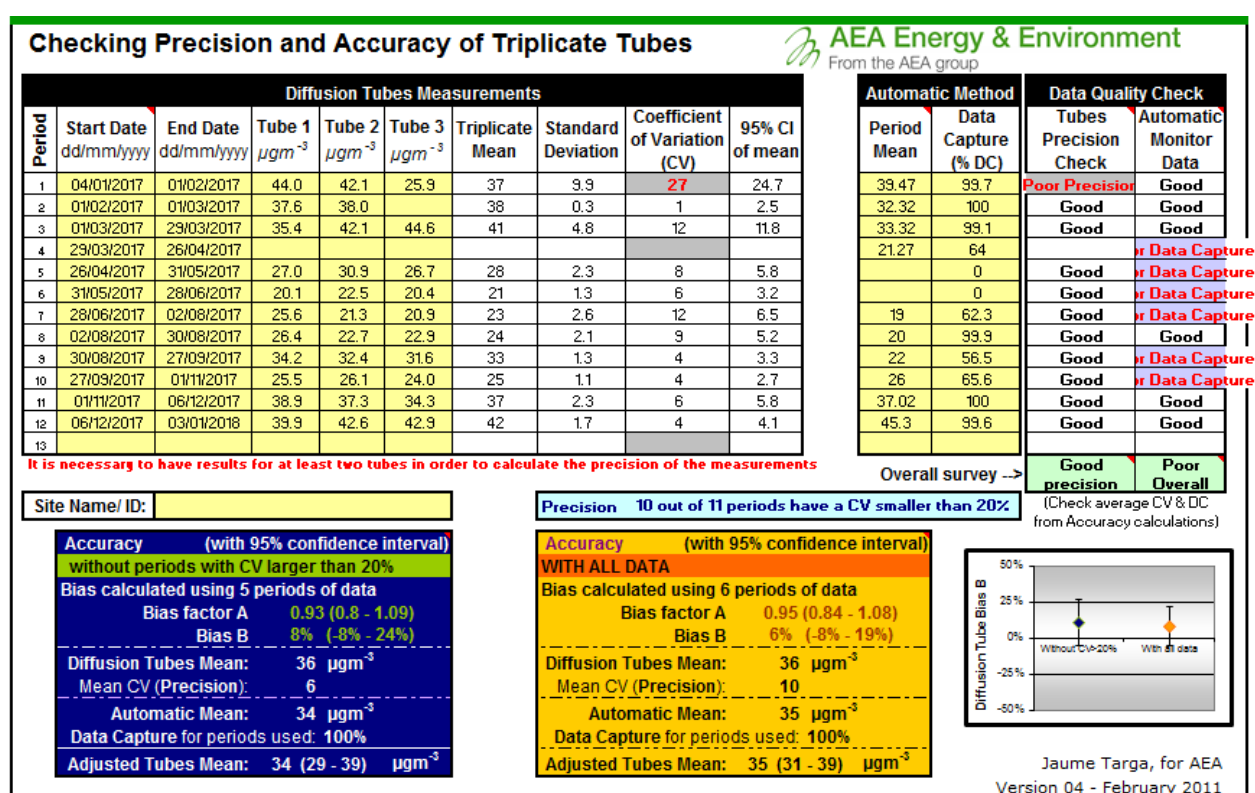
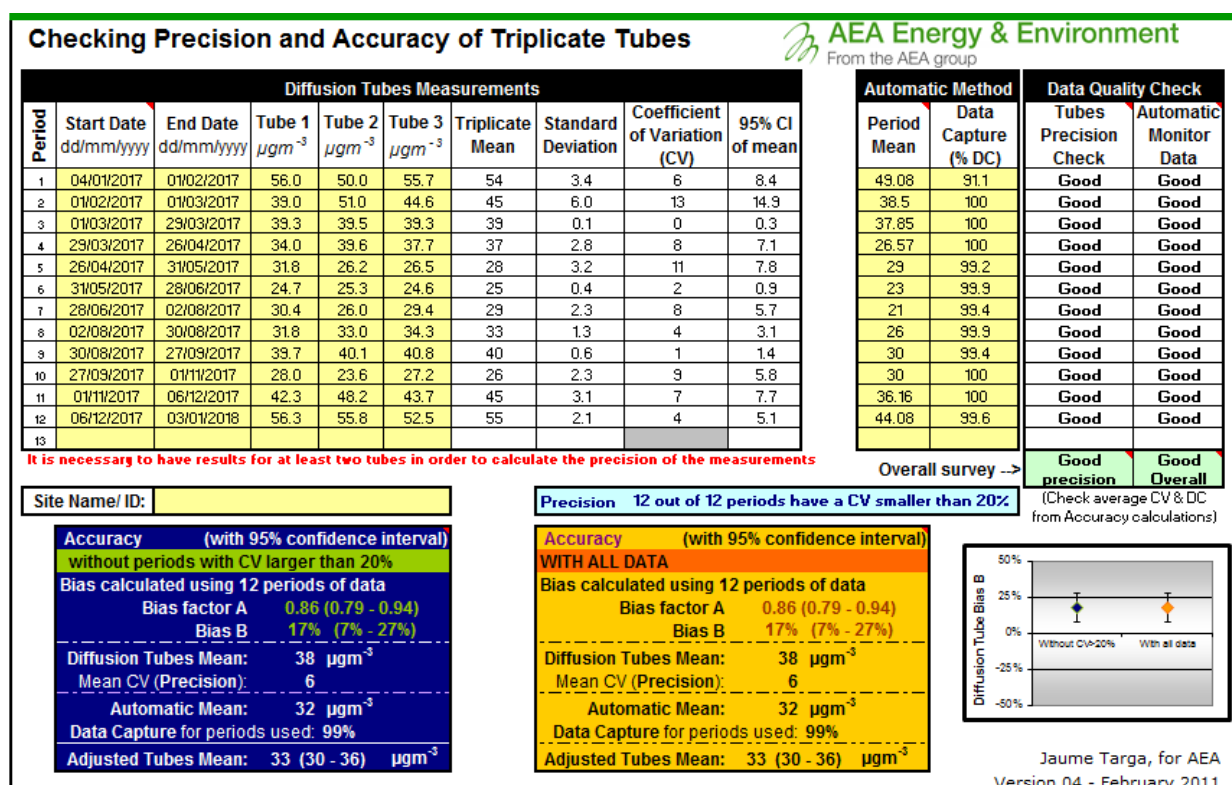




Figure C.2 – Local Bias Correction Output: Cockels Loan (Tube 62)



## Diffusion Tube National Bias Adjustment Factors

The diffusion tubes used by Renfrewshire Council are supplied and analysed by Glasgow Scientific Services (GSS), the tubes were prepared using the 20% TEA in water preparation method. The national bias adjustment factor for GSS 20% TEA in water is 0.91, based on six studies for the year 2017, as derived from the national bias adjustment factor spreadsheet as presented in Figure C.3.

Figure C.3 – GSS 2017 National Bias Adjustment Factor

National Diffusion Tube Bias Adjustment Factor Spreadsheet								Spreadsheet Version Number: 03/18											
Follow the steps below in <u>the correct order</u> to show the results of <u>relevant</u> co-location studies														This spreadsheet will be updated at the end of June 2018					
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																			
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.								Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.											
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>1</sup> shown in blue at the foot of the final column													
If a laboratory is not shown, we have no data for this laboratory.		If a preparation method is not shown, we have no data for this method at this laboratory.		If a year is not shown, we have no data		If you have your own co-location study then see footnote <sup>1</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 <small>To make your selection, choose (All) from the pop-up list</small>		Year <small>To make your selection, choose (All)</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>2</sup>		Bias Adjustment Factor (A) (Cm/Dm)	
Glasgow Scientific Services		20% TEA in water		2017		UB Glasgow City Council		12		34		25		32.9%		G		0.75	
Glasgow Scientific Services		20% TEA in water		2017		R Glasgow City Council		12		38		37		2.9%		G		0.97	
Glasgow Scientific Services		20% TEA in water		2017		R Glasgow City Council		10		35		34		3.6%		P		0.97	
Glasgow Scientific Services		20% TEA in water		2017		KS Glasgow City Council		12		63		59		6.2%		G		0.94	
Glasgow Scientific Services		20% TEA in water		2017		R Glasgow City Council		12		45		36		24.5%		P		0.80	
Glasgow Scientific Services		20% TEA in water		2017		KS Manlybone Road Intercomparison		12		77		79		-2.2%		G		1.02	
Glasgow Scientific Services		20% TEA in water		2017		Overall Factor <sup>1</sup> (6 studies)										Use		0.91	

### Discussion of Choice of Factor to Use

The diffusion tube data has been corrected using a bias adjustment factor, this is an estimate of the difference between diffusion tube concentration and continuous monitoring, the latter assumed to be a more accurate method of monitoring. Defra LAQM.TG(16) provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring.

Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO<sub>x</sub>/NO<sub>2</sub> continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

With regard to the application of a bias adjustment factor for diffusion tubes, Defra LAQM.TG(16) and the LAQM Helpdesk recommend the use of a local bias adjustment factor where available and relevant to the diffusion tube sites. A summary of the local and national bias adjustment factors is presented in Table C.1.

**Table C.1 – Summary of Bias Adjustment Factors**

Co-location site	Tube Precision	Automatic Data Quality	Bias Factor A (excluding periods with CV >25%)	Bias Factor B (excluding periods with CV >25%)
Cockels Loan, Renfrew	Good Precision	Good Overall	0.86	17%
Gordon Street, Paisley	Good Precision	Poor Overall	0.93	8%
Local Average				0.89
From National Studies taken from sites with Good Precision				0.91
From National Studies taken from all studies				0.91

Note – averaging of bias factors completed in accordance with paragraph 7.193 in LAQM.TG(16).

Diffusion tube bias adjustment factors for 2017 are available from two co-location studies and the national database of co-location studies. Historically Renfrewshire Council have used an average of the local adjustment factors to adjust their diffusion tube results.

A summary of the local bias factors, both excluding periods with a CV > 25% and using all twelve periods are presented in Table C.1. When adjusting single tube measurements the factor calculated using all twelve periods should be used. It is

therefore important that this is representative of the bias calculated using triplicate tube surveys with 'good' precision.

The average of the factors derived from the two local co-locations studies is 0.89. At the Gordon St co-location, six out of the twelve periods had a poor data capture, and one period had poor precision. Due to this the factor derived from the Gordon St co-location has not been used.

The national adjustment factor is based on six studies of which two are of poor precision, and four are of good precision. Taking the average of all national studies, and also when taking an average of only the studies with good precision gives a factor of 0.91.

In previous years an average of the two local factors has been used for the bias adjustment factor. For 2017 the bias adjustment factor of 0.91 from the national study has been used. This is due to the Gordon St co-location having a poor data capture for 2017 and the national factor being higher, this will offer a more conservative approach to the bias adjustment.

### **QA/QC of Diffusion Tube Monitoring**

The diffusion tubes for the year 2017 were supplied and analysed by GSS, the tubes were prepared using the 20% TEA in water preparation method. All results have been bias adjusted and annualised (where required) before being presented in Table A.3.

GSS is a UKAS accredited laboratory and participates in the AIR-PT Scheme (a continuation of the Workplace Analysis Scheme for Proficiency (WASP)) for NO<sub>2</sub> tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO<sub>2</sub> concentrations reported are of a high calibre.

The latest AIR-PT results were as follows:

- AIR-PT AR016 (September to October 2016) – 100%
- AIR-PT AR018 (January to February 2017 – 100%
- AIR-PT AR019 (April to May 2017) – 50%
- AIR-PT AR021 (July to August 2017) – 0%
- AIR-PT AR022 (September to October 2016) – 100%

Over a rolling five round AIR-PT window, it is expected that 95% of laboratory results should be  $\leq +2$ . 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 sources of error within their analytical procedure.

For the latest five round window 70% of GSS results were  $\leq +2$  therefore the diffusion tube performance over this period has been assessed as unsatisfactory and the results presented should be treated with caution.

### **QA/QC of Automatic Monitoring**

Automatic monitoring of  $\text{NO}_x$ ,  $\text{PM}_{10}$  and  $\text{PM}_{2.5}$  is completed within Renfrewshire Council using Chemiluminescence ( $\text{NO}_x$ ), FDMS ( $\text{PM}_{10}$ ) and Fidas ( $\text{PM}_{10}$  and  $\text{PM}_{2.5}$ ) analysers. All data is available in real-time, and following data dissemination is ratified by Ricardo Energy and Environment to AURN standards.

## Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO <sub>2</sub>	Sulphur Dioxide

## References

Local Air Quality Management Technical Guidance LAQM.TG(16). May 2016.

Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland

Local Air Quality Management Policy Guidance LAQM.PG(16). May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland

Renfrewshire Council (2017) Annual Progress Report

Air Quality in Scotland website (2017 data), available at

<http://www.scottishairquality.co.uk/>

AEA\_DifTPAB\_v04.xls, available at <http://laqm.defra.gov.uk/bias-adjustment-factors/local-bias.html>

National Diffusion Tube Bias Adjustment Factor Spreadsheet version 03/18 available at <https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>

Defra LAQM helpdesk – <https://laqm.defra.gov.uk/>

Paisley Town Centre Air Quality Action Plan (2014)

Renfrewshire Council Local Transport Strategy (2007)

Paisley Town Centre Action Plan 2016 – 2026

Renfrewshire Council Carbon Management Plan 2014/15 – 2019/20

Renfrewshire Cycling Strategy 2016 – 2025