



2015 Updating and Screening
Assessment for
City of Edinburgh Council

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

August 2015

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Executive Summary

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in Part IV of the Environment Act 1995 and the National Air Quality Strategy 2007. The report has been completed in accordance with Technical Guidance (LAQM, TG09) document, produced by DEFRA and the Devolved Administrations.

Nitrogen Dioxide: Data for calendar year 2014 shows that there are no new breaches of the relevant standards beyond the boundaries of the existing Air Quality Management Areas (AQMAs). This is the first year of recorded monitoring where there is no identified need to take forward additional Detailed Assessments for the pollutant and consequently no requirement for extending or declaring additional AQMAs.

A number of monitoring locations within each of the Air Quality Management Areas (AQMAs) continue to exceed the annual mean air quality objective; therefore these, remain valid. Consistent with previous years, a number of monitoring locations within the AQMA boundaries also meet the objectives. The city's AQMAs are designed to support the Council and its partners implement a combination of local and strategic management measures appropriate for dynamic, high-volume urban traffic environments; consequently their boundaries, including any approved amendments or extensions, will be maintained until sufficient and consistent evidence is available to support any potential contraction.

Exceedences of the annual mean objective also continue to be evidenced within the location of previously-proposed extensions to the Central AQMA. Although the 2014 monitoring in these areas (South Bridge / Nicolson Street corridor and Ardmillan / Slateford Road) suggests an improving picture, the continuing exceedences mean it remains valid for the relevant AQMA amendment Orders (as described in the 2014 Progress Report and approved by City of Edinburgh Council) - to be taken forward.

A single monitoring location outwith the AQMAs exceeds the annual mean objective, at Queensferry Road (ID64). This passive diffusion tube site has previously been identified as anomalous when compared with adjacent monitoring data (including automatic data). Supplementary monitoring commenced January 2015, to provide

further insight into localised circumstances, and to check whether concentrations at the residential facade do comply with the standards. See map on page 142.

The automatic monitoring station (AQMS) on St John's Road at Clermiston Road junction, recorded one breach of the short term one hour NO₂ objective. This is the second consecutive year the site has been in compliance. If the trend is sustainable then the NO₂ hourly mean AQMA could be revoked, but the NO₂ annual mean AQMA would remain in force. This assessment is based on an updated report received from Ricardo-AEA at the end of July 2015 due to errors in their data verification process.

Analysis of passive diffusion tube data suggests that no other sites exceeded the hourly mean objective for NO₂ in 2014. A potential breach is observed however at West Port (ID 28b) where an annual mean of 56ug/m³ was recorded. This, along with the other PDT sites, is being kept under close review.

Particulate Matter (PM₁₀): Data from all monitoring locations in 2014 meet the UK National Objectives. Data from the St Leonard's urban background site and Currie suburban site readily meet the Scottish Government annual mean objective of 18µg/m³, while roadside sites at Queen Street and Glasgow Road marginally meet it. The draft Low Emission Strategy for Scotland, published for consultation by Scottish Government in January 2015, proposes to amend the annual mean objective for PM₁₀ to 20µg/m³ to correspond with World Health Organisation standards.

Monitoring data from Queensferry Road AQMS shows continuing exceedence of the existing Scottish objective, but it is anticipated that the proposed new objective will be met. Data from the Salamander Street AQMS shows continuing exceedence of the existing Scottish PM¹⁰ objective and of the proposed new objective. The data trend suggests the site will meet the proposed revised objective, in line with similar trends in Edinburgh and other locations Scotland. This will influence how matters at Salamander Street are best addressed. The Council intends to describe its proposals for relevant action here and elsewhere in Edinburgh in the outcomes of its city-wide Detailed Assessment for PM₁₀, to be completed following formal release of the amended standards by Scottish Government

Trend Analysis: The 2014 data shows a general downward pattern of both NO₂ and PM₁₀ pollutants at the majority of monitoring locations in the City.

Traffic flows are normalising after completion of the Edinburgh Trams construction project. Changes and enhancements to the entire transport system across Edinburgh are continuing and it is anticipated that these will continue to deliver an effective and efficient network, address congestion and encourage multi-mode integration. Many of the planned changes are substantial and will take time to evolve and fully settle in. It will therefore necessitate some time to pass before a sufficient degree of confidence can be attributed to air quality trend analysis.

Sources: A number of significant changes that may impact on local air quality are noted since the last round of Review and Assessment, namely:

- introduction of a new 20mph speed limit across large parts of the city's road network;
- proposed major residential development in Midlothian, adjacent to Edinburgh's southern boundary, with potential for significant additional transport demand into the city;
- installation of a number of large-scale Combined Heat and Power (CHP) plants within in the city centre.

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Abbreviations

AQMA – Air Quality Management Area

CHP – Combined Heat and Power

DEFRA – Department for Environment, Food and Rural Affairs

LAQM – Local Air Quality Management

NO₂ – Nitrogen Dioxide

PM₁₀ – Particulate Matter (10microgrammes in diameter)

SEPA – Scottish Environmental Protection Agency

SEStran – South East Scotland Transport Partnership

PPC – Pollution and Prevention Control

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1 Introduction

1.1 Description of Local Authority Area

Edinburgh is the capital city of Scotland and the seat of the Scottish Parliament. It is the second largest city in Scotland and the seventh most populous in the United Kingdom. Located in the south east of Scotland's central belt it is bounded by the Firth of Forth to the North and the Pentlands Hills to the South. The latter ranges 20 miles in length and includes farming and recreational land. The peripheral areas of the city to the West and South West are predominately semi-rural. The city is a financial, commercial and tourist centre and attracts over one million visitors annually.

Edinburgh's population grew by nearly 28,000 between the 2001 Census and the 2011 Census – an increase of 6.2%, to 476,600. In terms of absolute numbers this was the largest increase of any local authority area in Scotland. Although there has been a substantial growth in population, the Census has shown that this has not been as fast as previously thought. This means that future population estimates and projections will need to be recalibrated to reflect the detailed and comprehensive information now available. The revised population figure for the city could have a number of implications for future land use allocations.

Edinburgh has a large proportion of households living in flats (64%), compared to the Scottish average (37%). This means that the city is relatively compact and high density, where residents are mostly within easy reach of jobs, shops and services - which in turn encourages sustainable travel modes including walking, cycling and public transport.

Many of Edinburgh's main streets and the major radial routes into the city are narrow, with tenement buildings four to five storeys high on either side of the roadway, forming many street canyons. In many instances, the distances from the edge of the road to the façade of residential properties can be as little as two metres.

The majority of tenement properties are located in the central and northern areas of the city. There has also been substantial growth of additional residential flats in these locations mostly as a result of the re-development of former industrial land. The

southern and western peripheral areas of the city consist predominantly of detached and semi-detached housing.

As a major employment centre, Edinburgh attracts a substantial amount of road and rail commuter traffic. The City has one of the highest levels of sustainable travel to work in the country and the highest proportion travelling by bus of any major UK City (26%) (Census, 2011) The proportion of people in Edinburgh utilising 'active' travel modes to get to work is the highest in Scotland (23%, including 5% by cycling) The converse of high public transport and active transport usage is lower levels of car use However, with significant new housing development in surrounding local authority areas, increased car use and journeys into Edinburgh have been generated as a result.

The main UK East Coast rail line is routed through the city centre and there are further rail links to Glasgow, Fife and the major population centres to the north.

Smoke Control Orders cover the entire City of Edinburgh Council area and significant improvements in air quality have been achieved since their introduction, especially due to use of natural gas in the domestic and commercial sectors.

The major cause of poor air quality in parts of Edinburgh, as with many urban environments, is associated with road traffic.

1.2 Purpose of Report

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

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The U&SA

report should provide an update of any outstanding information requested previously in Review and Assessment reports.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in **Scotland** are set out in the Air Quality (Scotland) Regulations 2000 (Scottish SI 2000 No 97), the Air Quality (Scotland) Amendment Regulations 2002 (Scottish SI 2002 No 297), and are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in Scotland

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	3.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
Particles (PM ₁₀) (gravimetric)	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2010
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

The UK Review and Assessment process of Local Air Quality Management (LAQM) commenced in 1997.

A summary of the City of Edinburgh's findings and description of the five AQMAs are detailed in Tables 1.2 and 1.3. Maps of the boundaries of the AQMAs are presented in Figures 1.1 to 1.5.

Table 1.2 Summary of previous Review and Assessments

Round / Report		Date	Outcome
1	Review & Assessment of Air Quality Stage 1&2	1998	Potential exceedences of NO ₂ and PM ₁₀
1	City of Edinburgh Council Review Stage 3	2000	Exceedences of NO ₂ annual mean objective. Attributed to traffic emissions AQMA declared for City Centre
1	Review & Assessment of Air Quality Stage 4	2002	Source apportionment identified that buses were the major contributors of NO ₂
2	Air Quality Action Plan	2003	Key actions; cleaner vehicles HGVs and buses, congestion charging, tram network.
2	Updating & Screening Assessment Phase 2	2003	Detailed Assessment required city-wide for PM ₁₀ due to high background concentrations and tightening of air quality objectives for Scotland. Detailed Assessment for NO ₂ at St John's Road.
2	Detailed Assessment Report	2004	Partisol co-location study with TEOM gave local gravimetric conversion factor of 1.14 AQMA not required for PM ₁₀ using 1.14. AQMA required for NO ₂ at St John's Road.
2	Progress Report	2005	Potential exceedences of NO ₂ at West Port and Great Junction Street Four locations in Central AQMA likely to fail EU limit value – West Maitland St, Torphichen PI, Princes St and Roseburn Terrace. Concerns were raised with respect to density of development in city centre and North Edinburgh Waterfront.
3	Updating & Screening	2006	Exceedences of NO ₂ within Central AQMA & St John's Road

Round / Report	Date	Outcome
Assessment Report		AQMA declared for St John's Rd 31.12.2006
3 Detailed Assessment for Nitrogen Dioxide at Great Junction St and West Port	2007	AQMA required for NO ₂ at Gt. Junction Street and West Port. West Port also likely to not meet hourly NO ₂ objective. Council to explore various options to extend existing Central AQMA to cover both areas or West Port. Declare two separate AQMAs. Preferred option to extend Central AQMA.
3 Air Quality Progress Report.	2008	<p>NO₂ exceedences within AQMAs. Number of locations also did not meet hourly mean objective. Based on 2007 data predictions EU limit values are likely to be exceeded within AQMAs. Exceedences of NO₂ at Bernard St, Commercial St, Ferry Rd, Easter Rd, London Rd, Hope Park Terrace, Glasgow Rd. Detailed Assessment required.</p> <p>City-wide Detailed Assessment required for PM₁₀ due to exceedences of Scottish Air Quality Objectives using 1.14 local gravimetric factor.</p> <p>AQMA declared for Gt. Junction. Central AQMA amended to include West Port and exceedences of hourly mean NO₂ objective. St John's Rd AQMA amended to include exceedence of hourly mean NO₂</p>
3 Air Quality Action Plan	2008	Revised, Congestion charge removed as an action. Include St John's Road AQMA
4 Updating and Screening Assessment	2009	<p>NO₂ exceedences within AQMAs. Existing AQMAs remain valid. NO₂ annual exceedences noted at Glasgow Rd, Easter Rd, London Rd, Bernard St, Grassmarket, Cowgate, Queensferry Rd/ Barnton and Hillhouse Rd. Potential exceedences of NO₂ at Hope Park Terrace, Broughton Rd and Commercial Street.</p> <p>City-wide Detailed Assessment for PM₁₀ required, which will address the four biomass installations and poultry farm complex at Gogarburn. Most congested main roads in city centre are likely to exceed Scottish annual objective for PM₁₀ based on monitoring</p>

Round / Report	Date	Outcome
		at Queen Street, Haymarket and DMRB modelling.
4 Progress Report	2010	NO ₂ exceedences within all 3 AQMAs. AQMAs remain valid. Exceedences of NO ₂ at, Portobello High St, Inverleith Row, Bernard Street, Glasgow Road, Easter Road, London Road, Queensferry Road, Grassmarket. Potential exceedences at, Broughton Rd, Commercial St, Hope Park Terrace, Cowgate, Hillhouse Road.
4 Further Assessment: St John's Road West Port (extension of Central AQMA) Great Junction Street	2011	<p>NO₂ exceedence within 3 AQMAs, which remain valid.</p> <p>Source apportionment –Within local vehicle fleet, buses contribute the greatest percentage of the measured NO₂ at St John's Rd and Gt. Junction St, whilst at West Port the greatest contribution is attributed to cars.</p> <p>% Range of roadside NO_x reduction required to meet NO₂ Annual Mean Objective (40µg/m³). Using both UK and Scottish (SG) background maps.</p> <p>Gt. Junction St UK 40.7% SG 49.9%</p> <p>St John's Rd UK 70.6% SG 76.8%</p> <p>West Port UK 74.9% SG 86.4%</p>
4 Progress Report	2011	<p>NO₂ exceedences in all 3 AQMAs. Existing AQMAs remain valid. NO₂ exceedences outwith existing AQMAs – London Road, Easter Road, Grassmarket, Cowgate, Bernard Street, Hope Park Terrace, Queensferry Road, Glasgow Road, Inverleith Row, Hillhouse Road Angle Park Terrace, Slateford Road, Fountainbridge / Tollcross and Gorgie Road / Delhaig. NO₂ potential exceedences identified at Broughton Road, Ferry Road, Commercial Street, Salamander Street/Bath St and Portobello High St.</p> <p>NO₂ Detailed Assessment work being progressed at Queensferry Road, Portobello, Inverleith Row and required for Hope Park Terrace / Clerk Street junction, Hillhouse</p>

Round / Report	Date	Outcome
		<p>Road, Slateford Road, Fountainbridge / Tollcross and Angle Park Terrace</p> <p>Extend Central AQMA and & Great Junction St AQMA for exceedences of NO₂</p> <p>Declare Glasgow Road/Newbridge for exceedences of NO₂</p>
5 Updating and Screening Assessment	2012	<p>NO₂ exceedences in all 4 AQMAs. Existing AQMAs remain valid. Exceedences in proposed new Glasgow Road AQMA and extensions to existing Central and Great Junction Street AQMAs. Other exceedences at Inverleith Row, Queensferry Road, Portobello Road and Angle Park Terrace. Potential exceedences of NO₂ identified at Slateford Road, Fountainbridge/Tollcross, Hope Park Terrace, Hillhouse Road, Salamander Street/Baltic, Salamander Street/Bath Road and Ferry Road. Ongoing Detailed Assessment work at Hope Park Terrace/Clerk Street, Hillhouse Road, Slateford Road, Fountainbridge/Tollcross and Angle Park Terrace. Progress with declaration of Glasgow Road AQMA and extensions of Central and Great Junction Street AQMAs.</p> <p>Declare AQMA at Inverleith Row for exceedences of annual mean objective for NO₂</p>
5 Progress Report	2013	<p>NO₂ exceedences in all 5 AQMAs. Existing AQMAs remain valid. Exceedences outwith AQMAs at Queensferry Road, Angle Park Terrace, Slateford Road, Nicolson Street and South Clerk Street. Potential exceedences of NO₂ identified at Broughton Road, Queensferry Road, Hope Park Terrace, Ferry Road, Salamander Street and Fountainbridge.</p> <p>Detailed Assessment work in relation to Clerk Street & Angle Park Terrace not concluded due to complications originating from temporary traffic management arrangements. Ongoing Detailed Assessment at Portobello Road & Fountainbridge.</p> <p>Further Assessment work being progressed with regards to the declared AQMAs at</p>

Round / Report	Date	Outcome		
		<p>Inverleith Row/Ferry Road junction and Glasgow Road; and the extension to the Central and Great Junction Street AQMAs.</p> <p>Exceedences of the PM₁₀ annual and 24hr mean objectives.</p>		
Further Assessment	2013	<p>Further Assessment work completed with regards to the declared AQMAs at Inverleith Row/Ferry Road junction and Glasgow Road; and the extension to the Central and Great Junction Street AQMAs.</p> <p>Source apportionment studies identified buses having a marginal role in Cowgate and Grassmarket to having the largest impacts at London Road, Gorgie/Chesser and Inverleith Row. Cars were shown to have a significant impact in all areas and LGVs showed the least.</p> <p>The required reduction in NO_x emissions from local roads to attain the annual mean nitrogen dioxide Air Quality Objective were defined as follows;</p> <table border="0" data-bbox="696 874 1939 1174"> <tr> <td data-bbox="696 874 1232 1174"> <p>Central AQMA:</p> <ul style="list-style-type: none"> ▶ Cowgate 17% ▶ Easter Road 26.5% ▶ Gorgie Road/Chesser 12.3% ▶ Grassmarket 24.7% ▶ London Road 30.4% </td> <td data-bbox="1232 874 1939 1174"> <p>Great Junction Street AQMA:</p> <ul style="list-style-type: none"> ▶ Bernard Street 21.3% <p>Glasgow Road/Ratho Station AQMA:</p> <ul style="list-style-type: none"> ▶ Newbridge junction 43.3% ▶ Ratho Station 35% <p>Inverleith Row/Ferry Road junction AQMA:</p> <ul style="list-style-type: none"> ▶ Inverleith Row 28.1% </td> </tr> </table>	<p>Central AQMA:</p> <ul style="list-style-type: none"> ▶ Cowgate 17% ▶ Easter Road 26.5% ▶ Gorgie Road/Chesser 12.3% ▶ Grassmarket 24.7% ▶ London Road 30.4% 	<p>Great Junction Street AQMA:</p> <ul style="list-style-type: none"> ▶ Bernard Street 21.3% <p>Glasgow Road/Ratho Station AQMA:</p> <ul style="list-style-type: none"> ▶ Newbridge junction 43.3% ▶ Ratho Station 35% <p>Inverleith Row/Ferry Road junction AQMA:</p> <ul style="list-style-type: none"> ▶ Inverleith Row 28.1%
<p>Central AQMA:</p> <ul style="list-style-type: none"> ▶ Cowgate 17% ▶ Easter Road 26.5% ▶ Gorgie Road/Chesser 12.3% ▶ Grassmarket 24.7% ▶ London Road 30.4% 	<p>Great Junction Street AQMA:</p> <ul style="list-style-type: none"> ▶ Bernard Street 21.3% <p>Glasgow Road/Ratho Station AQMA:</p> <ul style="list-style-type: none"> ▶ Newbridge junction 43.3% ▶ Ratho Station 35% <p>Inverleith Row/Ferry Road junction AQMA:</p> <ul style="list-style-type: none"> ▶ Inverleith Row 28.1% 			
5 Progress Report	2014	<p>Exceedences of NO₂ objective in all 5 AQMAs. Existing AQMAs remain valid. Exceedences outwith AQMAs at Angle Park Terrace, Dundee Street, Nicolson Street, Queensferry Road, South Bridge, South Clerk Street, and Slateford Road. Potential exceedences of NO₂ identified at Balgreen Road, Broughton Road, Clerk Street,</p>		

Round / Report	Date	Outcome
		<p>Fountainbridge, Hope Park Terrace, Portobello Road and Queensferry Road/Hillhouse Road.</p> <p>Detailed Assessment work in relation to Clerk Street & Angle Park Terrace areas concluded. Central AQMA to be extended to include these areas. Other Detailed Assessment work at Portobello Road & Fountainbridge found that AQMAs are not required as there are no exceedences of the objective.</p> <p>Exceedences of the PM₁₀ annual and 24hr mean objectives. Detailed Assessment on-going.</p>

Table 1.3 Descriptions of AQMAs

Description AQMA / Declaration (Date)	Pollutant / Source	Amendments
<p>Central AQMA 31/12/2000</p> <p>Includes area of City Centre and main arterial routes leading into the city centre. Exceedences mostly in locations where there are street canyons, high percentage of bus movements and congested traffic. Residential properties at basement, ground, first, second, third, and fourth level, 2 – 4 metres from road edge.</p> <p>Busy shopping areas include Princes Street, George Street, Dalry/Gorgie Rd, Leith Walk, North Bridge, West Port, Grassmarket, London Road and Easter Road.</p> <p>Upwards road gradient Leith Walk, North Bridge (south bound) and West</p>	<p>NO₂</p> <p>Traffic</p>	<p>09/03/2009 Extended to include West Port – Amended to cover hourly breach as well as annual breach of NO₂ air quality objective</p> <p>26/04/2013 Extended to include Gorgie Road / Chesser, Grassmarket/Cowgate and London Road/Easter Road</p> <p>2015 <i>To be extended</i> to include Angle Park Terrace and Clerk Street/Nicolson</p>

Description AQMA / Declaration (Date)	Pollutant / Source	Amendments
Port.		Street areas
<p>St John's Road 31/12/2006</p> <p>Part of the A8 route at Corstorphine area. Residential properties at ground, first, second, third and fourth floor level within 2m of kerb edge. Street canyon effect in part. Busy shopping area. Congested flat road with high percentage of bus movements.</p>	<p>NO₂</p> <p>Traffic</p>	<p>09/03/2009</p> <p>Amended to cover hourly breach as well as annual breach of NO₂.</p>
<p>Great Junction Street 09/03/2009</p> <p>The full length of road to the depth of the building facades, including the Ferry Road Junction area. Residential properties at first, second, third and fourth floor level. Street canyon, congested traffic and busy shopping area. Receptors close to road edge. High percentage of bus movements.</p>	<p>NO₂</p> <p>Traffic</p>	<p>26/04/2013</p> <p>Extended to include Bernard Street, Commercial Street and North Junction Street.</p>
<p>Glasgow Road 26/04/2013</p> <p>Part length of A8, between Newbridge Roundabout and Ratho Station, to the depth of the building facades.</p>	<p>NO₂</p> <p>Traffic</p>	
<p>Inverleith Row 26/04/2013</p> <p>The road comprising the junction of Inverleith Row and Ferry Road, to the depth of building facades.</p>	<p>NO₂</p> <p>Traffic</p>	

Figure 1.1 Map of Central AQMA Boundaries including draft extension (2015)

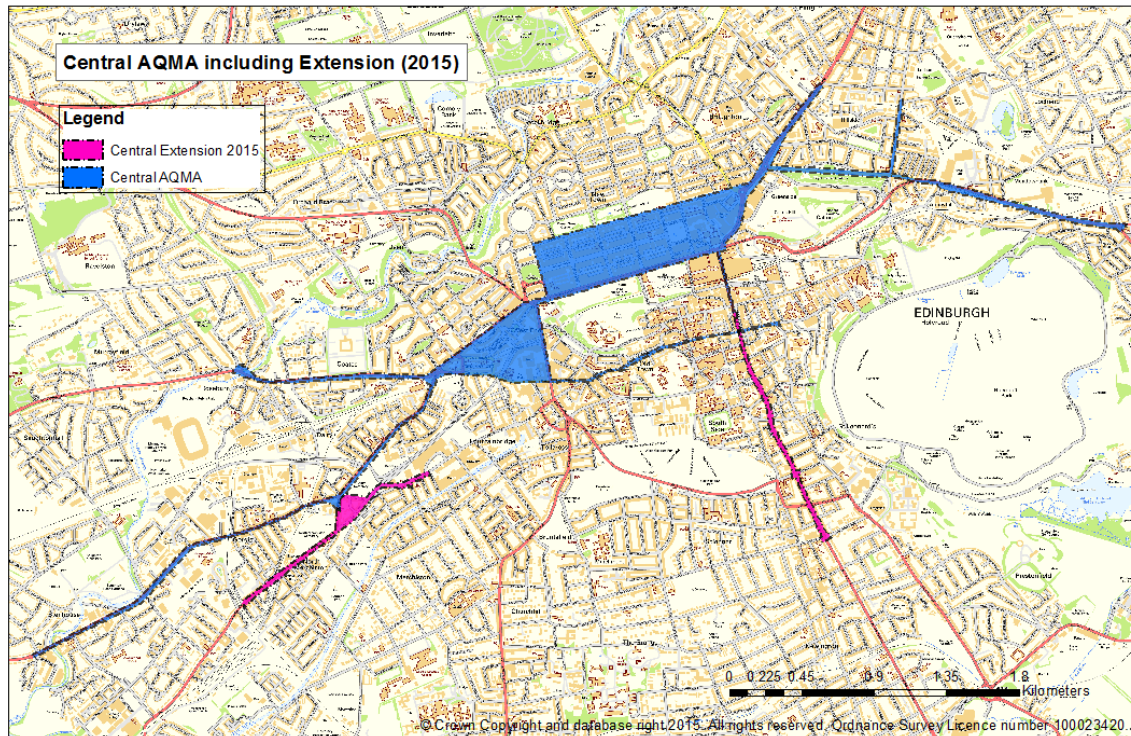


Figure 1.2 Map of St John's Road AQMA Boundaries



Figure 1.3 Map of Great Junction Street AQMA Boundaries



Figure 1.4 Map of Glasgow Road AQMA Boundaries

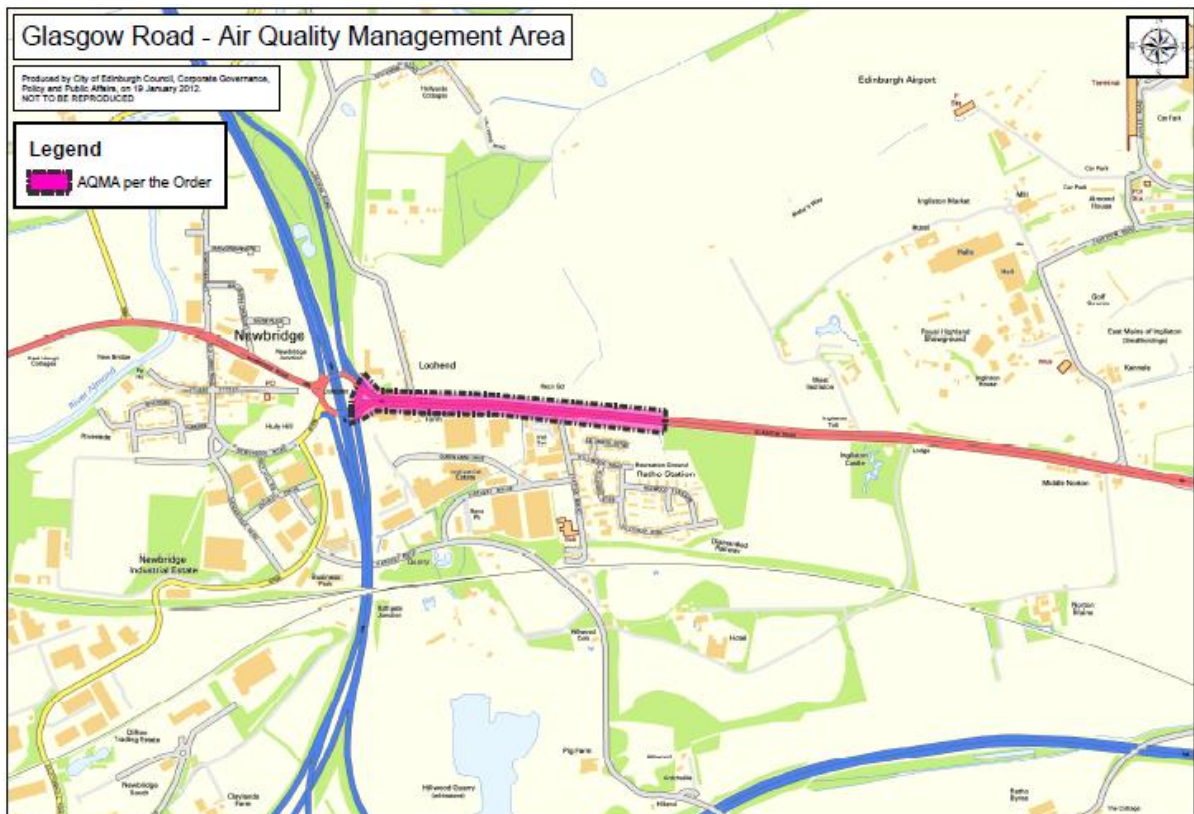
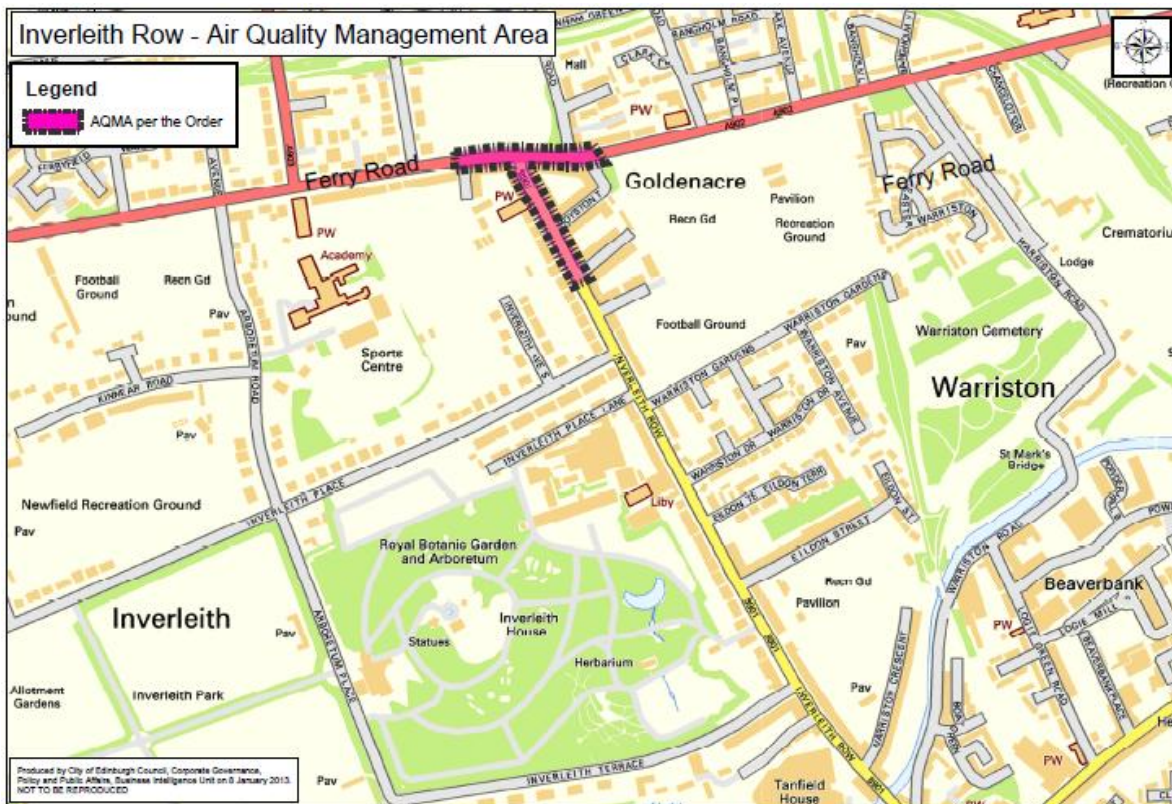


Figure 1.5 Map of Inverleith Row AQMA Boundaries



Developments since Progress Report 2014

Nitrogen Dioxide

Our Progress Report 2014 concluded that it was necessary to extend the Central AQMA to include exceedences at Angle Park Terrace, Dundee Street, Nicolson Street, South Bridge, South Clerk Street, and Slateford Road. The Council is currently progressing a Legal Order to this effect, with an expectation of it coming into effect in autumn 2015. Figure 1.1 (above) shows the proposed extension in relationship to the exiting Central AQMA.

Additional monitoring was established in 2015 at a number of sites in the periphery of the city, including Gilmerton (Drum Street) and Howden Hall Road junction on the A701 arterial road, both in the south of the city, as well as at Duke Street in Leith. Further monitoring commenced at Queensferry Road at the facade of a residential property, concurrent with the existing roadside passive diffusion tube site, where exceedences have been recorded.

Particulate Matter PM₁₀

A draft Low Emission Strategy for Scotland, published by Scottish Government for consultation in January 2015 proposes to amend the annual mean objective for PM₁₀ from 18 to 20µg/m³, which is in line with World Health Organisation standards.

The Local Authority is continuing to progress a city-wide Detailed Assessment for this pollutant and will necessarily take account of these planned changes. Salamander Street however continues to require ongoing review, with monitored concentrations there being above both the existing and proposed standard. A modelling study commissioned by the Council and supported by grant funding from the Scottish Government has provided recommendations regarding the extent of an AQMA boundary to account for fugitive and road sources.

The Detailed Assessment for Particulate Matter PM₁₀ will be concluded and published separately in 2015 or early in 2016 when Scottish Government publish the PM standards.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Edinburgh has eight operating automatic monitoring stations currently collecting data. One of the stations at St Leonards is part of the UK Automated Urban and Rural National Network (AURN). This station underwent refurbishment between September and December 2014. Data could not be collected during this period. All other automatic stations were operational throughout 2014.

Details and descriptions of the automatic monitoring stations, including historical locations which are provided for completeness of information, are shown in Figure 2.1 and Tables 2.1 and 2.1a.

QA/QC procedures on the automated monitoring sites are shown in Appendix A.

Figure 2.1 Map of Automatic Monitoring Sites

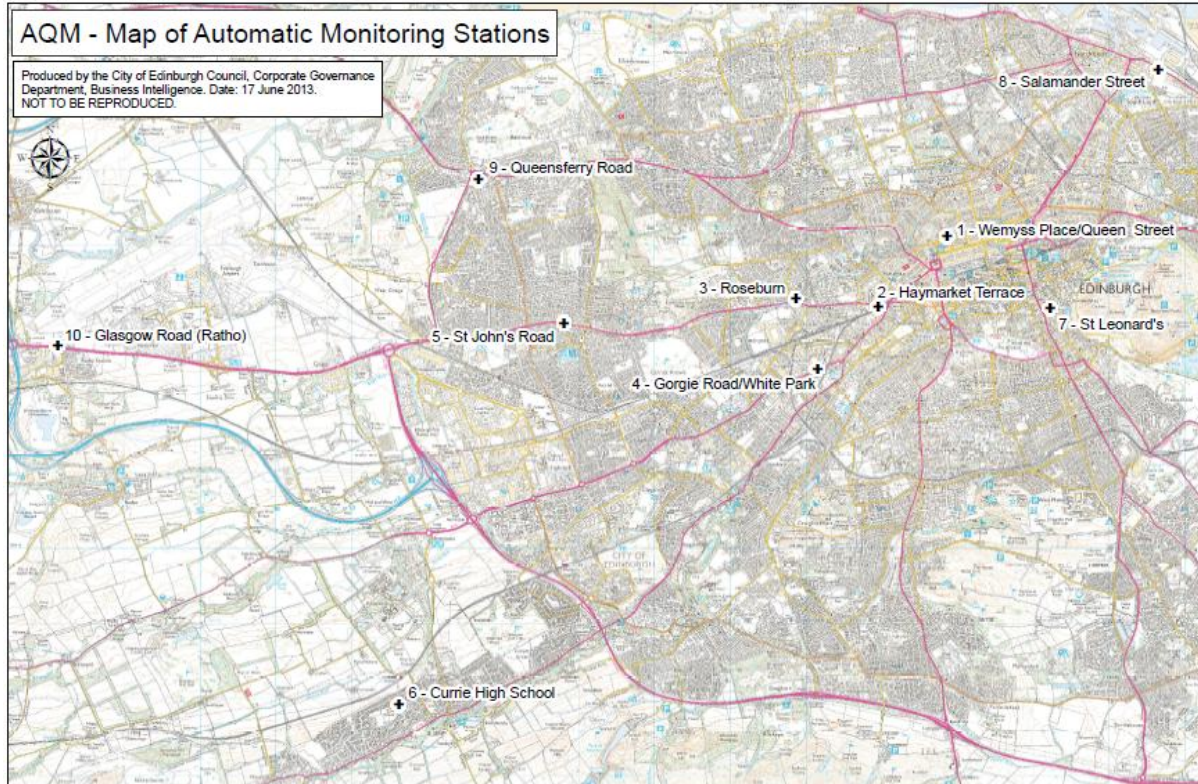


Table 2.1 Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref.	Y OS Grid Ref.	Inlet Height (m)	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
ID1	Queen Street	Roadside	324826	674078	2.87	NO ₂ PM ₁₀	Yes	Chemilum TEOM	Y (façade)	5.2m	Y
ID2	Haymarket ¹	Roadside	323896	673197	N/A	NO ₂ PM ₁₀	Yes	Chemilum TEOM	Y (7m)	9.2m	N
ID3	Roseburn ¹	Roadside	322939	673233	n/a	NO ₂ PM ₁₀	Yes	Chemilum TEOM	Y (4.9m)	7.6m	N
ID4	Gorgie Road	Roadside	323121	672314	2.63	NO ₂	Yes	Chemilum	Y (façade)	2.5m	Y
ID5	St. John's Road	Kerbside	320101	672907	1.98	NO ₂	Yes	Chemilum	Y (1.35m)	0.5m	Y
ID6	Currie High School	Suburban	317595	667909	3.59 3.24	NO ₂ PM ₁₀	No	Chemilum TEOM	Y (rear of school)	N/A	N/A

Continued overleaf/...

City of Edinburgh Council

Site ID	Site Name	Site Type	X OS Grid Ref.	Y OS Grid Ref.	Inlet Height (m)	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
ID7	St. Leonards	Urban Back-ground (AURN)	326265	673129	3.4m – 3.2m – 3.1m – 3.4m – 3.4m – 3.4m – 3.4m –	NO ₂ PM ₁₀ PM _{2.5} O ₃ CO SO ₂ PAH	No	Chemilum FDMS FDMS UV absorp IR absorp UV absorp Digitalsamp	Y (29.0m)	35m	N/A
ID8	Salamander Street	Roadside	327615	676333	2.86	NO ₂ PM ₁₀	No	Chemilum TEOM	Y (façade) ²	2.13m	Y
ID9	Queensferry Road	Roadside	318736	674930	2.96	NO ₂ PM ₁₀	No	Chemilum TEOM/FDMS	Y (6.5m)	1.7m	Y
ID10	Glasgow Road	Roadside	313103	672663	2.84	NO ₂ PM ₁₀	Yes	Chemilum TEOM	Y (facade) ²	6m	Y

¹ Historic monitoring location

² Adjacent residential properties comparable distance from roadside as the monitoring station

Table 2.1a Description of Automatic Monitoring Locations

Site ID	Site Name	Description of automatic monitoring location
ID1	Queen Street	Pavement in line with residential property located 5.2m from road edge. No buildings at rear of monitoring unit. Relevant exposure.
ID2	Haymarket	Now decommissioned, this monitoring site was located in a car parking bay at Haymarket Station 9.2m from the main road, set back from the façade of residential property. Not in street canyon.
ID3	Roseburn	Now decommissioned, it was located on footbridge over the water of Leith 7.6m from kerb edge. Set back from line of residential property. Does not take account of canyon at Roseburn Terrace.
ID4	Gorgie Road	Located in line with façade of adjacent residential flats on edge of children's play park. Within 2.5m of kerb edge. Not located in canyon area of street. Relevant exposure.
ID5	St John's Road	Pavement (kerbside) of busy shopping street. Residential properties within 2.1m of kerb edge. Takes account of junction and street canyon. Relevant exposure and worst-case location.
ID6	Currie High School	Located adjacent to school building at rear of school. Representative of suburban / semi-rural exposure.
ID7	St. Leonard's	Located in small park area adjacent to Medical centre 35m from nearest main road. Representative of urban exposure.
ID8	Salamander Street	Located on pavement 2.13m from road edge, in line with adjacent residential property.
ID9	Queensferry Road	Located on pavement 1.7m from busy road edge and adjacent bus stop. 6.5m in front of residential property.
ID10	Glasgow Road	Located on recreational land 6m from A8 northbound carriageway, in line with nearby residential properties.

2.1.2 Non-Automatic Monitoring Sites

There is an extensive network of more than 150 passive diffusion tube (PDT) samplers located across the city to monitor nitrogen dioxide. These are within and outwith the AQMAs. Many locations are in street canyons where tenement-style residential properties are within 2 to 3 metres of the road edge. The PDTs are sited at the building facades of residential properties, where possible. Details are tabulated into six different geographical areas of the city (Table 2.2) Maps illustrating the network across the city are shown in Appendix B.

To ensure no additional areas of concerns are appearing in the city additional monitoring sites were identified at a number of city centre locations namely; St Leonard's Street (ID28e), St Mary's Street (ID48f), Torphichen Place (ID3b), Leith Street (ID74g) and Bruntsfield Place (ID6a). Locations outside the city centre were also identified including two sites in Kirkliston (ID146 & ID146a), Corstorphine High Street (ID145), Commercial Street (ID9d) and further monitoring within the Glasgow Road AQMA (ID16b & ID15a). Monitoring commenced at these sites at the beginning of 2014. Three new sites were also identified along St John's Road. A number of sampling sites were relocated due to poor data collection and/or identification of more suitable sites. These included Grassmarket (ID37), Torphichen Street (ID3), North Junction Street (ID9c) and Angle Park Terrace (ID76b).

In 2014, PDT monitoring was reduced at four sites where concentrations are not of concern i.e Telford Road (ID40a), Marischall Place (ID40e), Piersfield Terrace (ID82) and Portobello High Street (ID73b), and at other sites where data capture rates have been repeatedly poor: George Street (ID74e), Nicolson Street (ID137) and Cowgate (ID48b) Duplicate sampling at West Maitland Street (ID2) was reduced to one PDT.

Quality Control and Quality Assurance (QA/QC) work associated with the PDT method of monitoring is contained in the following Appendices:

- A1 Nitrogen Dioxide (NO₂) PDT bias adjustment factors
- A2 NO₂ Bias Adjustment Factor from Local Co-location studies
- A3 Discussion of Choice of Factor to use
- A5 Short-term to Long-Term data adjustment for NO₂
- A7 QA/QC of PDT monitoring.

All PDTs are fixed at a height of approximately two metres.

Table 2.2 Details of Non-Automatic Monitoring Sites

Site ID	Site Name / Address	Site Type	X OS Grid Ref.	Y OS Grid Ref.	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (m) (N/A if not applicable)	Worst-case Location?
	NORTH							
29	Bernard Street/CA	Roadside	327148	676507	Yes	Y façade	2.2	Y
29a	Bernard Street/Kings Chambers	Roadside	327137	676529	Yes	Y façade	2.1	Y
29b	Bernard Street 32	Roadside	327192	676513	Yes	Y façade	2.2	Y
29c	Bernard Street/PS	Roadside	327135	676515	Yes	Y façade	2.1	Y
9d	Commercial Street ⁱ	Roadside	326477	676759	Yes	Y façade	2.6	Y
9	Commercial Street 88	Roadside	326879	676626	Yes	Y façade	2.6	Y
9a	Commercial St/Portland Place	Roadside	326430	676754	Yes	Y (3.90)	1.47	Y
52	Ferry Road 268	Roadside	324946	676070	No	Y (4.6)	1.65	Y
53	Ferry Road/Bowhill Terrace 6	Roadside	324726	676004	Yes	Y (1.57)	1.75 +2.85 ⁱⁱ	Y
45b	Ferry Road/Maderia Street	Roadside	326359	676420	No	Y façade	7.5	Y
45	Ferry Road/North Fort Street	Roadside	326136	676361	No	Y façade	3.7	Y
45d	Ferry Road/North Junction Street	Roadside	326503	674436	Yes	Y façade	3.1	Y
30b	Great Junction Street 137	Roadside	326740	676138	Yes	Y façade	2.9	Y
30c	Great Junction Street 14	Roadside	326925	675949	Yes	Y façade	2.8	Y
30d	Great Junction Street/WC	Roadside	326757	676144	Yes	Y façade	2.8	Y
30e	Great Junction Street/CG	Roadside	326845	676015	Yes	Y façade	2.7	Y
30	Great Junction Street/FV	Roadside	326884	675997	Yes	Y façade	2.8	Y
55	Inverleith Row/Ferry Road	Roadside	324638	675993	Yes	Y façade	4.65	Y
55c	Inverleith Row/Montague	Roadside	324686	675941	Yes	Y (1.06)	2.28 + 2.0 ⁱⁱ	Y
9c	North Junction Street ⁱⁱⁱ	Roadside	326448	676710	Yes	Y (2.05)	2.65	Y
9b	Ocean Drive/Leith	Roadside	326455	676805	No	Y façade	4.2	Y

Site ID	Site Name / Address	Site Type	X OS Grid Ref.	Y OS Grid Ref.	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (m) (N/A if not applicable)	Worst-case Location?
51c	Salamander Street/Baltic Street	Roadside	327476	676418	No	Y façade	2.25	Y
51b	Salamander Street/Bath Road	Roadside	327665	676331	No	Y façade	1.8	Y
14	Trinity Crescent	Roadside	324896	676991	No	Y (4.0)	2.0	Y
	EAST							
19	Baileyfield Road	Background	329997	674274	No	N	18	Y
31	Dalkeith Road 187	Roadside	327231	671782	No	Y (4.9)	1.8	Y
25	Easter Road/CH Shop	Roadside	326934	674503	Yes	Y façade	2.3	Y
25b	Easter Road/Rossie Place	Roadside	326950	674624	Yes	Y façade	3.3	Y
25c	Easter Road 105/109	Roadside	326958	674770	Yes	Y façade	3.25	Y
25d	Easter Road/Bothwick	Roadside	326974	674780	Yes	Y façade	2.8	Y
25e	Easter Road 198	Roadside	326999	674940	Yes	Y façade	3.95	Y
25f	Easter Road 271	Roadside	327010	675149	No	Y façade	2.8	Y
25g	Easter Road 327	Roadside	327071	675467	No	Y façade	3.0	Y
46b	London Road/Brunton Place	Roadside	326779	674487	Yes	Y facade	6.9 + 2 ⁱⁱ	Y
81	London Rd/East Norton Place	Roadside	326980	674446	Yes	Y façade	2.5	Y
67	London Road/Earlston Place	Roadside	327190	674433	Yes	Y façade	2.7	Y
68	Parsons Green Terrace	Roadside	328049	674174	Yes	Y façade	2.7	Y
69	London Road/Wolseley Place	Roadside	328272	674143	Yes	Y façade	2.62	Y
70	London Road/Wolseley Terrace	Roadside	328337	674129	Yes	Y façade	4.6	Y
66	London Road/Cadzow Place	Roadside	327468	674362	Yes	Y façade	2.04 + 2.0 ⁱⁱ	Y
46	London Road/Easter Road	Roadside	326944	674472	Yes	Y façade	5.6	Y
32	Niddrie Mains Road 28	Kerbside	328889	671649	No	Y (4.7)	0.2 + 2.4 ⁱⁱ	Y
71	Portobello High Street 185	Roadside	330533	673850	No	Y façade	3.0	Y
73a	Portobello Road/Ramsay 1	Roadside	329923	674389	No	Y (1.98)	2.8	Y
73d	Portobello Road/Ramsay F	Roadside	329917	674388	No	Y façade	3.7	Y

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Site ID	Site Name / Address	Site Type	X OS Grid Ref.	Y OS Grid Ref.	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (m) (N/A if not applicable)	Worst-case Location?
73e	Portobello Road/Ramsay 2	Roadside	329885	674384	No	Y (2)	2.5	Y
73f	Portobello Road /College Court	Roadside	329848	674371	No	Y façade	10.3	Y
73g	Portobello Road/Inchview Terr	Roadside	329839	674697	No	Y (8.4)	4.5	Y
72	Seafield Road East 10	Roadside	329993	674457	No	Y façade	4.5	Y
72a	Seafield Road East 7	Roadside	330001	674444	No	Y façade	8.5	Y
	CITY CENTRE NORTH							
43	Broughton Road	Roadside	325513	675134	No	Y façade	2.0	Y
44	Broughton Street	Roadside	325855	674527	No	Y façade	4.5	Y
13	Deanhaugh Street	Kerbside	324603	674555	No	Y (5.1)	0.6 + 2.1 ⁱⁱ	Y
35	Dundas Street	Kerbside	325243	674400	No	Y (7.3)	0.3 + 2.1 ⁱⁱ	Y
74f	George Street 112	Roadside	324880	673891	Yes	Y façade	6.8	Y
75b	Great Stuart Street 7 ^{iv}	Roadside	324488	673978	No	Y (6.1)	2.5	Y
75f	Great Stuart Street 14	Roadside	324487	673936	No	Y facade	7.2 + 2.4 ⁱⁱ	Y
75e	Great Stuart Street 9	Roadside	324476	673967	No	Y facade	7.25 + 2.1 ⁱⁱ	Y
143	Hamilton Place 72	Roadside	324734	674683	No	Y facade	4.6m	Y
143a	Hamilton Place Library	Roadside	324699	674651	No	Y play area	2.1m	Y
34	India Street	Background	324790	674341	No	N	0.4 + 2.1 ⁱⁱ	N
55b	Inverleith Row/Summer Place	Roadside	325052	675217	No	Y façade	6.1	Y
74g	Leith Street 35 ⁱ	Roadside	325945	674095	Yes	Y façade	3.65	Y
21	Leith Walk/Brunswick Road	Roadside	326386	674872	Yes	Y (3.4)	1.16	Y
20	Leith Walk/McDonald Road	Kerbside	326361	674882	Yes	Y façade	5.6	Y
47	Princes Street (Eastbound)	Roadside	325049	673791	Yes	Y (6.5)	9.0	Y
24	Princes Street/Mound	Kerbside	325397	673869	Yes	Y (10.2)	1.0	Y
33	Queen Street/Hanover Street	Roadside	325362	674205	Yes	Y (4.25)	2.2 + 2.0 ⁱⁱ	Y
75a	St Colme Street	Kerbside	324624	674012	No	Y (5.1)	0.6	Y

Site ID	Site Name / Address	Site Type	X OS Grid Ref.	Y OS Grid Ref.	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (m) (N/A if not applicable)	Worst-case Location?
75d	St Colme Street 4	Roadside	324646	674025	No	Y facade	6.2	Y
36	York Place	Roadside	325828	674362	Yes	Y (2.7)	5.5	Y
	CITY CENTRE SOUTH							
6a	Bruntsfield Place 210ⁱ	Roadside	324495	672035	No	Y façade	2.8	Y
138	Clerk Street 15	Roadside	326229	672287	No	Y façade	2.35 +2 ⁱⁱ	Y
48	Cowgate/Guthrie Street	Roadside	325881	673471	Yes	Y façade	4.5	Y
48a	Cowgate/Blair Street	Roadside	325929	673490	Yes	Y façade	3.2	Y
48f	Cowgate/50 St Mary's Streetⁱ	Roadside	326198	673587	No	Y façade	2.6	Y
48c	Cowgate Blackfriars	Roadside	326047	673519	Yes	Y façade	2.4	Y
48e	Cowgatehead 2	Roadside	325537	673405	Yes	Y façade	1.9	Y
79d	Dundee Street/Yeaman Place	Roadside	323926	672550	No	Y façade	2.3	Y
79a	Fountainbridge 103	Roadside	324731	672984	No	Y façade	2.2	Y
79b	Fountainbridge/Grove Street	Roadside	324438	672859	No	Y façade	2.2	Y
79	Fountainbridge/Tollcross	Roadside	324682	672939	No	Y façade	3.3	Y
37	Grassmarketⁱⁱⁱ	Roadside	325398	673358	Yes	Y (5.0)	1.95 + 2.1 ⁱⁱ	Y
37a	Grassmarket 41	Roadside	325401	673340	Yes	Y façade	3.4	Y
37b	Grassmarket 75	Roadside	325471	673369	Yes	Y façade	5.0	Y
37c	Grassmarket/Thompsons Court	Background	325397	673377	Yes	Y façade	21 + 2.1 ⁱⁱ	N
10	Home Street	Roadside	324905	672893	No	Y façade	2.8	Y
17a	Hope Park Terrace/VS	Roadside	326312	672614	No	Y façade	5	Y
139	Hope Park Terrace 5	Roadside	326244	672581	No	Y facade	4.9	Y
140	Hope Park Terrace/Clerk Street	Roadside	326323	672596	No	Y (3.5)	1.3	Y
38	Melville Drive	Roadside	325141	672733	No	Y (10.0)	2.8	Y
42	Midmar Drive	Background	325105	670511	No	N	1.4	N
8	Morningside Road	Kerbside	324538	671166	No	Y (2.8)	0.7	Y

Site ID	Site Name / Address	Site Type	X OS Grid Ref.	Y OS Grid Ref.	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (m) (N/A if not applicable)	Worst-case Location?
49	Morrison Street	Roadside	324167	673249	Yes	Y (2.4)	2.2	Y
135	Nicolson Street 69	Roadside	326112	673115	No	Y façade	3 + 2	Y
136	Nicolson Street 92	Roadside	326164	673054	No	Y façade	3.74 + 2 ⁱⁱ	Y
27	North Bridge – South	Roadside	325944	673670	Yes	Y façade	3.5	Y
144	South Bridge 59	Roadside	326020	673370	No	Y façade	2.3	Y
142	South Clerk Street 41a	Roadside	326367	672554	No	Y façade	1.96 + 2 ⁱⁱ	Y
141	South Clerk Street 84	Roadside	326383	672472	No	Y façade	2.57 + 2 ⁱⁱ	Y
28e	St Leonards Street 145a ⁱ	Roadside	326559	672610	No	Y façade	3.4	Y
3	Torphichen Place CH ⁱⁱⁱ	Roadside	324258	673295	Yes	Y façade	2.25	Y
3b	Torphichen Place 1 ⁱ	Roadside	324277	673309	Yes	Y façade	4.8	Y
3a	Torphichen Street	Roadside	326020	673370	Yes	Y façade	5.8	Y
2	West Maitland Street	Kerbside	324193	673346	Yes	Y (5.2)	0.5	Y
28b	West Port 62	Roadside	325166	673242	Yes	Y façade	1.4	Y
28c	West Port Opp. 50	Roadside	325184	673261	Yes	Y façade	3.0	Y
28d	West Port 42	Roadside	325203	673250	Yes	Y façade	2.7	Y
	WEST							
145	Corstorphine High Street ⁱ	Roadside	319957	672697	No	Y façade	2.75	Y
56	Glasgow Road /Drumrae	Roadside	319212	672921	No	Y (4.6)	0.57 + 2 ⁱⁱ	Y
57	Glasgow Road 158	Roadside	318185	672756	No	Y (8.5)	3.6	Y
16	Glasgow Road 68	Roadside	313028	672633	Yes	Y (4.4)	1.8	Y
16a	Glasgow Road 68 facade	Roadside	313028	672629	Yes	Y façade	6.2	Y
16b	Glasgow Road/Ratho Station 94 ⁱ	Roadside	313211	672612	Yes	Y façade	2.9	Y
58	Glasgow Road Newbridge	Roadside	312693	672670	Yes	Y (5.2)	2.8	Y
15	Glasgow Road Newbridge	Roadside	312664	672672	Yes	Y (3.8)	1.6 + 2.4 ⁱⁱ	Y
15a	Glasgow Road 9 ⁱ	Roadside	312702	672675	Yes	Y façade	7.5	Y

Site ID	Site Name / Address	Site Type	X OS Grid Ref.	Y OS Grid Ref.	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (m) (N/A if not applicable)	Worst-case Location?
40f	Hillhouse Road 118	Roadside	322478	674406	No	Y (2.57)	2.6	Y
40c	Hillhouse Road 240	Roadside	322082	674543	No	Y façade	3.2	Y
40b	Hillhouse/Craigcrook Terrace	Roadside	321990	674586	No	Y (4.9)	2.1	Y
40d	Hillhouse/Marischall Place No4	Roadside	322123	674492	No	Y façade	3.1	Y
41	Hillview Terrace	Background	320081	673232	No	N	1.0	N
61	Maybury Road/Barnton	Roadside	318612	674924	No	Y (12.5)	2.8	Y
40	Queensferry Rd/Hillhouse Rd	Roadside	322144	674497	No	Y façade	2.0 + 2 ^{II}	Y
63	Queensferry Road 544	Roadside	318723	674963	No	Y façade	13.6	Y
64	Queensferry Road 550	Roadside	318698	674955	No	Y (9.2)	1.49	Y
64a	Queensferry Road 552	Roadside	318698	674964	No	Y façade	10.5	Y
62	Queensferry Road 561	Roadside	318810	674903	No	Y façade	16.9	Y
23	Roseburn Terrace	Kerbside	323007	673198	Yes	Y (2.3)	0.23	Y
1	St John's Road SB	Kerbside	320122	672917	Yes	Y (1.8)	0.54	Y
1b	St John's Road IR	Roadside	320154	672911	Yes	Y façade	2.0	Y
SJ1	St John's Road Kaimes Rd	Kerbside	320571	672809	Yes	Y (2.255)	0.278	Y
SJ2	St John's Road 63	Kerbside	320436	672830	Yes	Y (9.148)	0.371	Y
SJ3	St John's Road 81	Roadside	320316	672857	Yes	Y (14.475)	1.148	Y
1d	St John's Road 131	Roadside	320096	672907	Yes	Y façade	2.1	Y
39	St John's Road/Victor Pk	Roadside	319677	672991	Yes	Y (4.15)	1.6	Y
146a	Station Road 2 Kirkliston ^I	Roadside	312586	674505	No	Y façade	0.85	Y
146	Station Road 41 Kirkliston ^I	Roadside	312629	674393	No	Y façade	1.9	Y
50a	Whitehouse Rd/Barnton Grove	Roadside	318571	675028	No	Y (1.57)	3.5	Y
	SOUTH WEST							
76	Angle Park/Harrison Road	Roadside	323498	672263	No	Y façade	2.20	Y
76c	Angle Park Terrace 25	Roadside	323587	672360	No	Y façade	4.75	Y

Site ID	Site Name / Address	Site Type	X OS Grid Ref.	Y OS Grid Ref.	In AQMA ?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (m) (N/A if not applicable)	Worst-case Location?
76b	Angle Park Terrace 74 ⁱⁱⁱ	Roadside	323526	672285	No	Y façade	2.1	Y
76a	Ardmillan Terrace 22	Roadside	323487	672287	No	Y façade	2.2	Y
80d	Balgreen Road / School	Roadside	322069	672317	No	Y play area	2.9	Y
80e	Balgreen Road / Library	Roadside	322110	672268	No	Y play area	2	Y
4	Calder Road	Roadside	319062	670543	No	Y (25)	1.6	Y
18	Gorgie Road 8	Roadside	323477	672476	Yes	Y façade	2.4	Y
80c	Gorgie Road 87	Roadside	323265	672394	Yes	Y façade	2.5	Y
80b	Gorgie Road 549	Roadside	321724	671557	Yes	Y façade	2.5	Y
80	Gorgie Road / Delhaig	Roadside	321967	671666	Yes	Y façade	2.6	Y
80a	Gorgie Road Glen Lea	Roadside	322381	671950	Yes	Y façade	2.6	Y
5	Gorgie Road/Murieston Road	Kerbside	323484	672478	Yes	Y (4.9)	0.3	Y
76d	Henderson Terrace	Roadside	323632	672449	No	Y façade	1.8	Y
11	Lanark Road 610	Roadside	319527	668420	No	Y (3.7)	1.5	Y
77a	Slateford Road 51	Roadside	323167	672009	No	Y façade	2.3	Y
77b	Slateford Road 93/95	Roadside	322999	671876	No	Y façade	2.6	Y
77	Slateford Road 97	Roadside	322960	671846	No	Y façade	2.67	Y
78	Slateford Road/The Maltings	Roadside	322772	671606	No	Y façade	2.2	Y

Notes for table:

- i. New monitoring location in 2014
- ii. Distance to nominal kerb, due to parking bay in front of monitoring location
- iii. Site relocated in 2014 in close proximity to previous site
- iv. Amendments made to details following review

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

All automatic monitoring locations, other than Queensferry Road, represent relevant exposure as they are either at or aligned with a residential facade. The Queensferry Road station is set 6.5m to the front of residential facades; hence measured concentrations are likely to overestimate relevant exposure. Data has therefore been corrected using DEFRA's Distance Correction Calculator Tool¹.

Automatic monitoring data for 2014, corrected where necessary, complied with the annual and hourly mean nitrogen dioxide objectives except at the automatic monitoring station (AQMS) on St John's Road at Clermiston Road junction. This site recorded one breach of the short term one hour NO₂ objective which is the second consecutive year of compliance. If the trend is sustainable then the NO₂ hourly mean AQMA could be revoked, but the NO₂ annual mean AQMA would remain in force. The annual mean concentration of 59 µg/m³ NO₂ was a slight increase on the 2013 data. The site has had some technical difficulties with failures of the air conditioning unit and service engineers found a leak in the sampling system suspected of causing internal sampling and readings of greater than 350 µg/m³ NO₂. As a result Ricardo-AEA issued an amended report for the site in July 2015 to take account of the suspect data.

Data capture was poor at St Leonard's AURN station due to an extended period of refurbishment works by DEFRA. Consequently, data has been annualised in line with LAQM Technical Guidance TG09² to give an estimated annual concentration. The calculation is shown in Appendix A5. Automatic data is shown in Tables 2.3a & 2.3b.

Table 2.3a Results of Automatic Monitoring for NO₂: Comparison with Annual Mean Objective

Site ID	Site Name	Within AQMA?	Valid Data Capture 2014 % ^a	Annual Mean Concentration (µg/m ³)						
				2008	2009	2010	2011	2012	2013	2014
1	Queen Street	Y	94	32	33	37	29	28	28	26
2	Haymarket	Y	N/A	41 (49)	N/A	N/A	N/A	N/A	N/A	N/A
3	Roseburn	Y	N/A	28 (31)	26 (28)	30 (33)	24 ^b	N/A	N/A	N/A
4	Gorgie Road	Y	98	42	38	41	37	39	38	34
5	St John's Road	Y	95	75	70	71	65	58	57	59
6	Currie	N	98	N/A	N/A	10	6	8	8	7
7	St Leonard's	N	72	31	24	31	25	24	22	22 ^b
8	Salamander St	N	98	N/A	30 ^b	30	29	30	28	27
9	Queensferry Rd	N	94	N/A	N/A	N/A	41 (29)	52 (40)	43 (34) ^b	46 (36)
10	Glasgow Road	Y	99	N/A	N/A	N/A	N/A	29 ^b	27	27

Notes for table;

In bold and red, exceedence of the NO₂ annual mean objective of 40µg/m³ and in bold black, result of 40µg/m³ shown

a data capture for the full calendar year

b annualised mean per TGO9 (valid data capture < 75%)

Data in brackets represents the estimated annual concentration at relevant receptors using the NO₂ Fall Off with Distance calculator (DEFRA website, LAQM, Tools, 2013). Details are shown in Appendix D.

Table 2.3b Results of Automatic Monitoring for NO₂: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture 2014 % ^a	Number of Hourly Means > 200µg/m ³						
				2008	2009	2010	2011	2012	2013	2014
1	Queen Street	Y	94	0	0	0	0	0	0	0
2	Haymarket	Y	N/A	1	N/A	N/A	N/A	N/A	N/A	N/A
3	Roseburn	Y	N/A	0	0	1	0 (101) ^b	N/A	N/A	N/A
4	Gorgie Road	Y	98	0	0 (130) ^b	0 (122) ^b	0	0	0 (115)	0
5	St John's Road	Y	95	166	114	60	52	62	8	1
6	Currie	N	98	N/A	N/A	0	0	0	0	0
7	St Leonard's	N	72	0	0	0	0	0	0	0 (69)
8	Salamander St	N	98	0	0 (144) ^b	0	0	0	0	0
9	Queensferry Rd	N	94	N/A	N/A	N/A	0	3	0 (145)	0
10	Glasgow Road	Y	99	N/A	N/A	N/A	0	0	0	0

Notes for table;

In bold and red, exceedence of the NO₂ hourly mean objective (200µg/m³ – not to be exceeded more than 18 times per year).

a data capture for the full calendar year.

b if data capture for full calendar year is < 90%, the 99.8th percentile of hourly means is shown in brackets.

Trends in Annual Mean NO₂ Concentrations Measured at Automatic Monitoring Sites

Trend analysis has been undertaken at all monitoring locations that have five or more years of valid data. Annual mean nitrogen dioxide concentrations have been plotted for successive years at St Leonard's, Queen Street, Gorgie Road, St John's Road, Salamander Street and, for the first time, Currie which joined the network later than the other stations. Trend lines have been drawn using an Excel simple regression statistical program. Analysis has also been carried out with the hourly mean data from St John's Road. Data trends are shown in Figures 2.3 to 2.8 and summarised in Table 2.4.

Table 2.4 Summary of Annual Mean Nitrogen Dioxide trends measured at Automatic Monitoring Sites

Monitoring Location	Site Type	Trend in annual mean NO ₂ (years included)	Concentrations of NO ₂
Currie	Suburban	(2010 to 2014) ↓	Slight Decrease
Gorgie Road	Roadside	(1999 to 2014) ↓	Slight Decrease
Queen Street	Roadside	(2006 to 2014) ↓	Decreasing
Salamander St	Roadside	(2009 to 2014) ↓	Slight Decrease
St John's Road	Kerbside	(2007 to 2014) ↓	Decreasing
St Leonard's	Urban background	(2004 to 2014) ↓	Slight decrease

Trend analysis of the annual mean nitrogen-dioxide concentrations at a number of sites shows a slight decrease, namely; St Leonard's, Gorgie Road, Salamander Street and Currie. These sites are a combination of urban background, roadside and suburban sites. The new trend analysis for Currie should be considered with some caution as data from the site was not subject to quality assurance and quality control by Ricardo-AEA (on behalf of the Scottish Government) until 2013.

There are defined downward trends at Queen Street and St John's Road in respect to annual mean concentrations, albeit there is a slight increase in the annual mean at St John's Road in 2014. Although there was a clear increase in the number of hourly exceedences at St John's Road compared with the 2013 data, the overall trend remains downward.

Traffic flows in Edinburgh are normalising after completion of Tram construction works. Changes and enhancements to the wider transport system are however continuing in order to ensure an effective network, tackle congestion and encourage multi-mode integration. Consequently, it will be some time before a sufficiently high degree of confidence can be attributed to the ongoing trend analyses.

Figure 2.3 Trend in Annual Mean Nitrogen Dioxide Concentrations ($\mu\text{g}/\text{m}^3$) measured at St Leonard's AURN

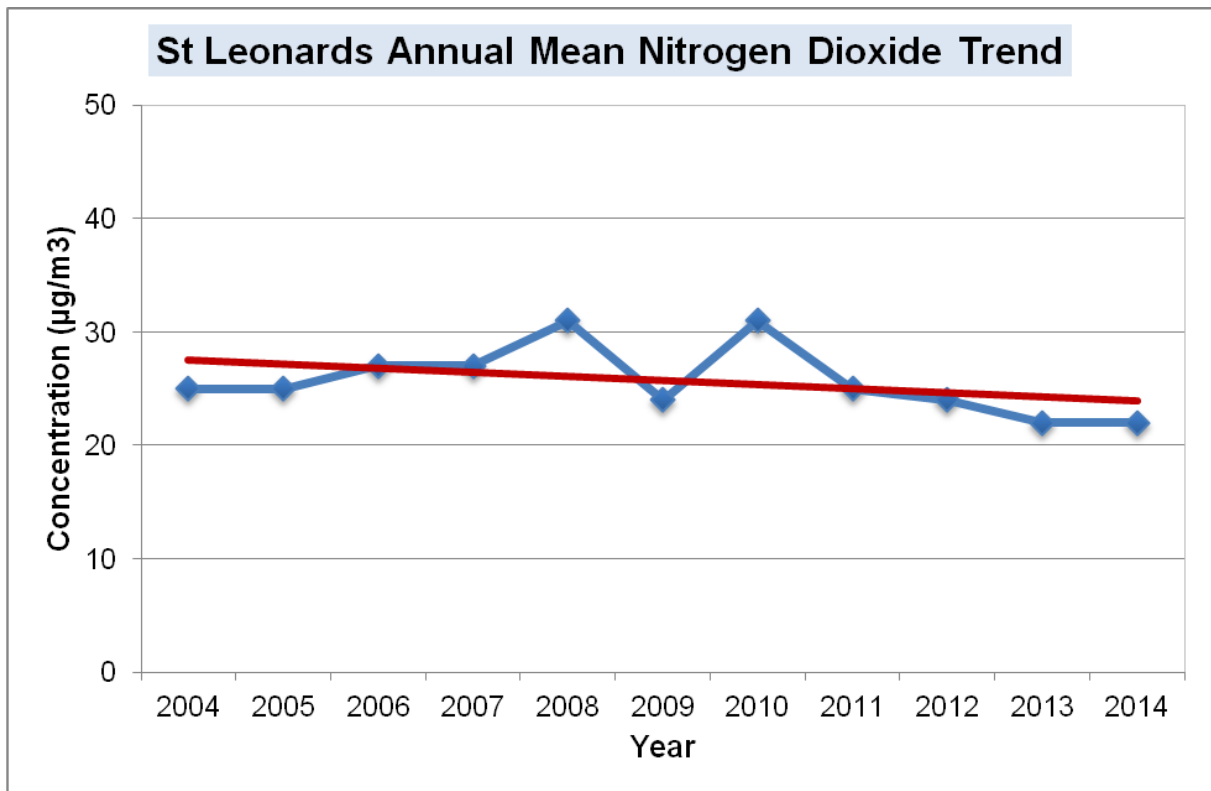


Figure 2.4 Trend in Annual Mean Nitrogen Dioxide Concentrations ($\mu\text{g}/\text{m}^3$) measured at Queen Street

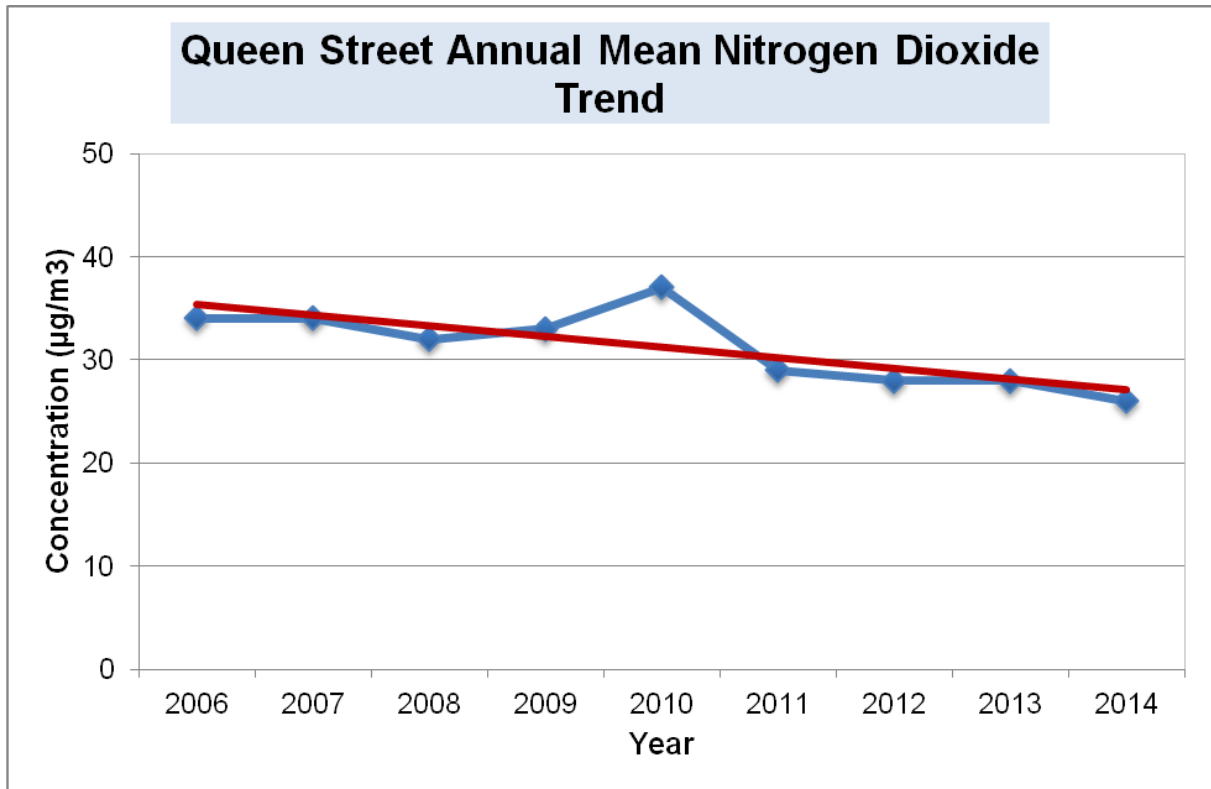


Figure 2.5 Trend in Annual Mean Nitrogen Dioxide Concentrations ($\mu\text{g}/\text{m}^3$) measured at Gorgie Road

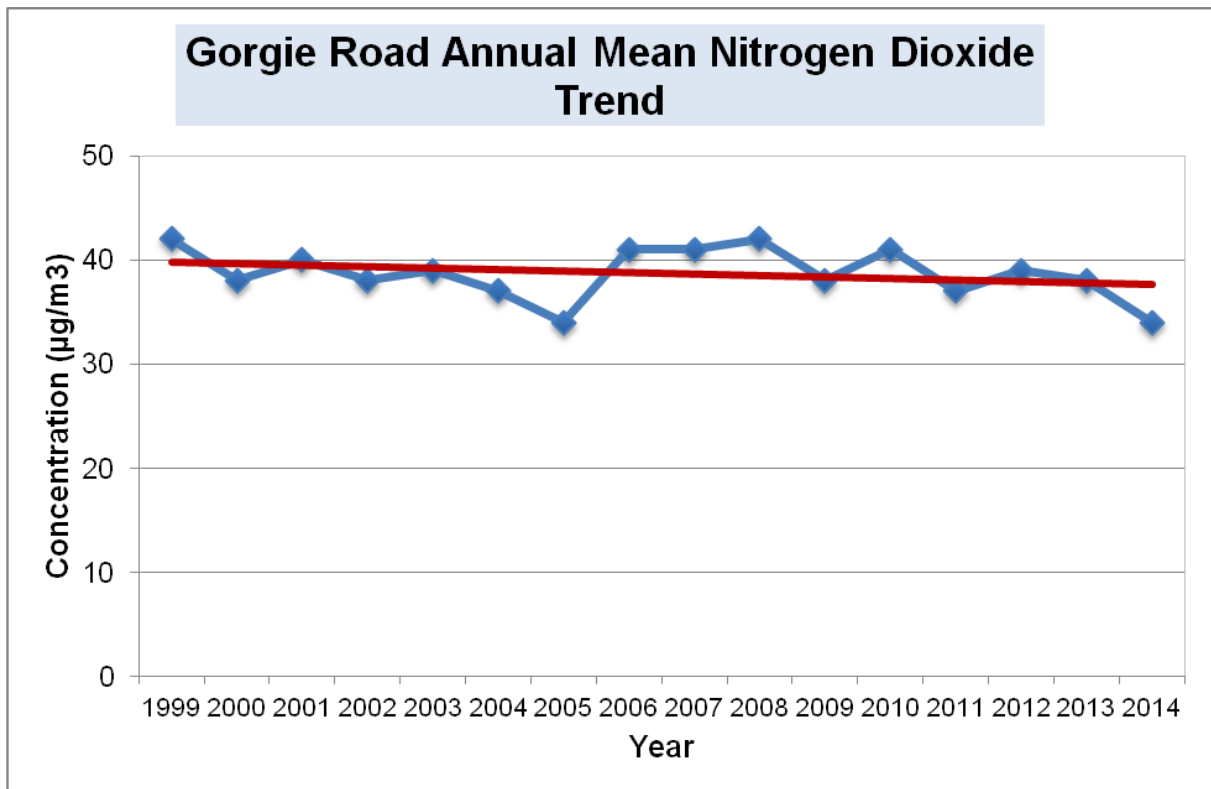


Figure 2.6 Trend in Annual Mean Nitrogen Dioxide Concentrations ($\mu\text{g}/\text{m}^3$) measured at Salamander Street

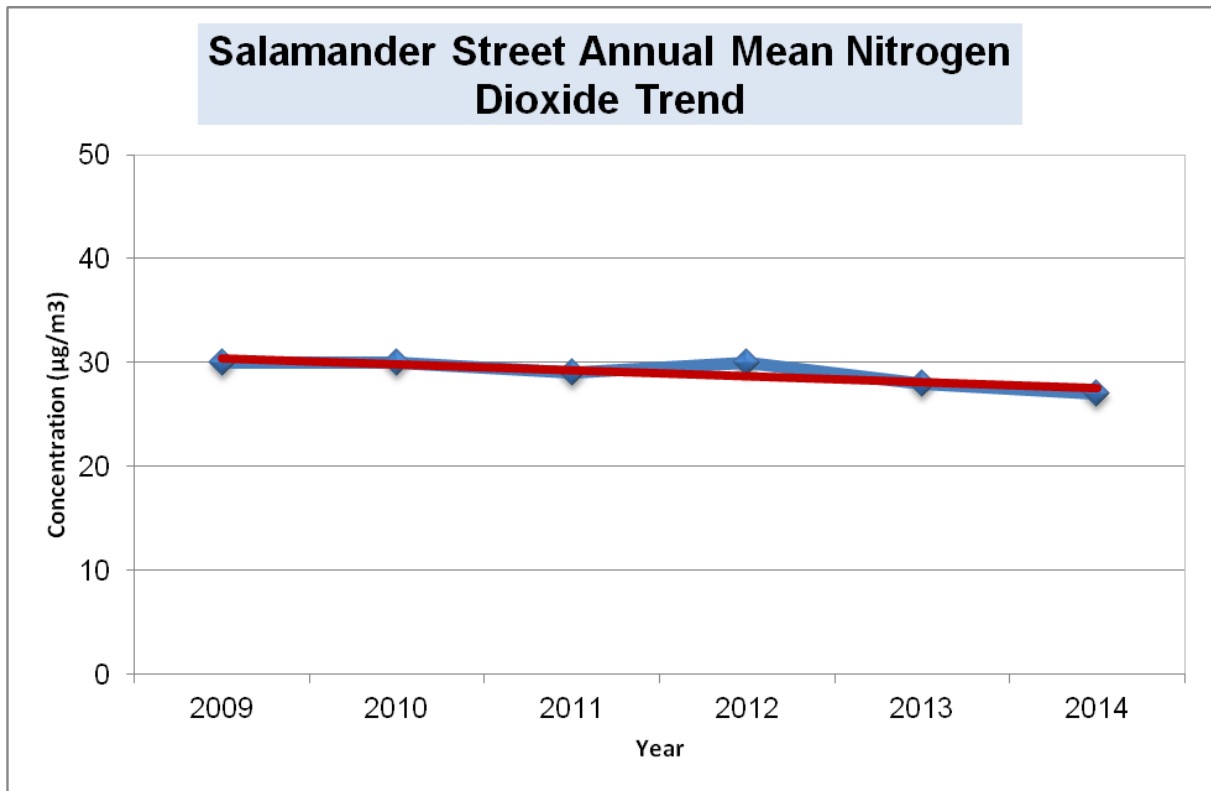


Figure 2.7 Trend in Annual Mean Nitrogen Dioxide Concentrations ($\mu\text{g}/\text{m}^3$) measured at Currie

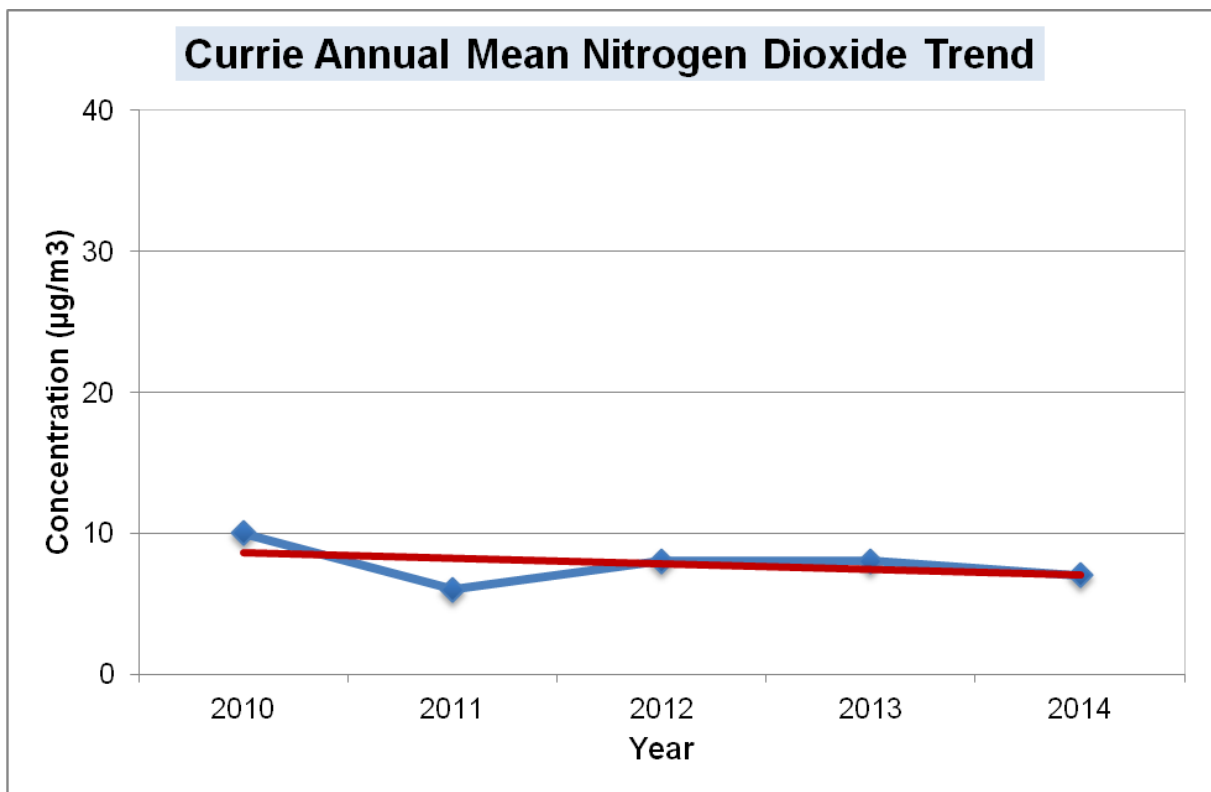


Figure 2.8a Trend in Annual Mean Nitrogen Dioxide Concentrations ($\mu\text{g}/\text{m}^3$) measured at St John's Road

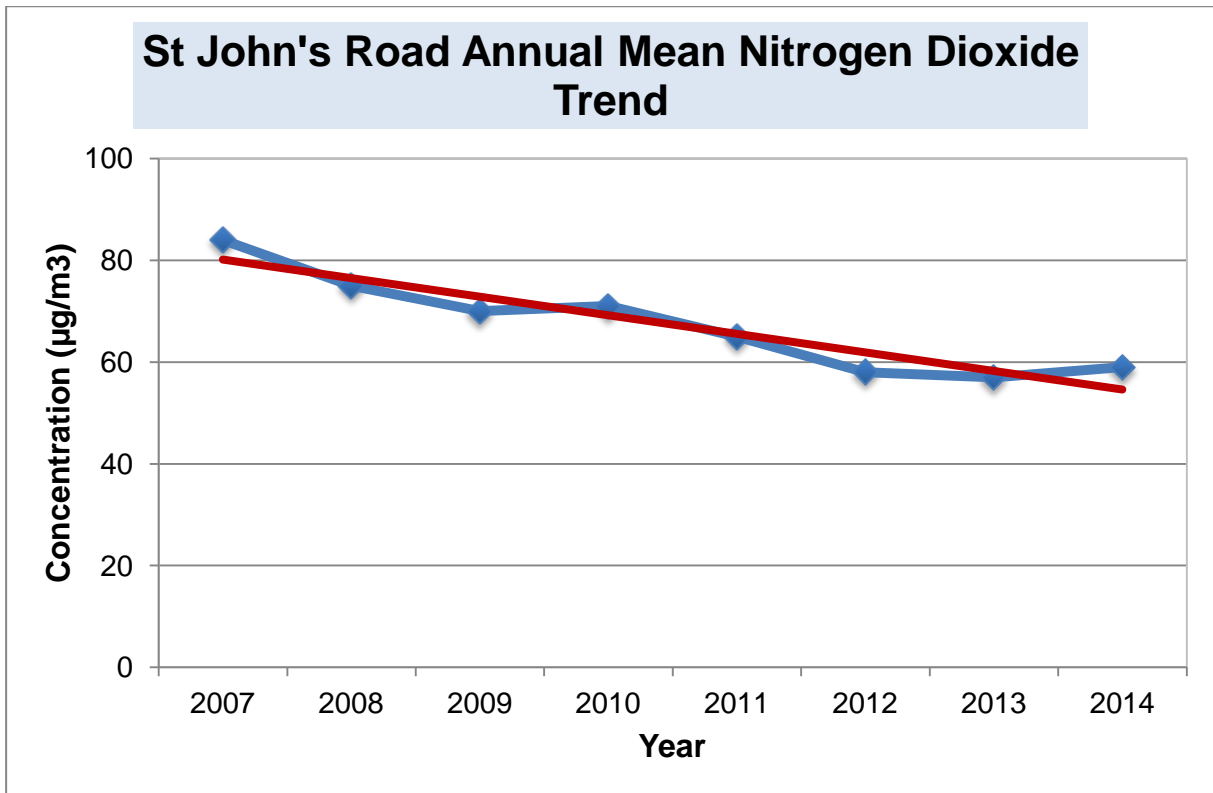
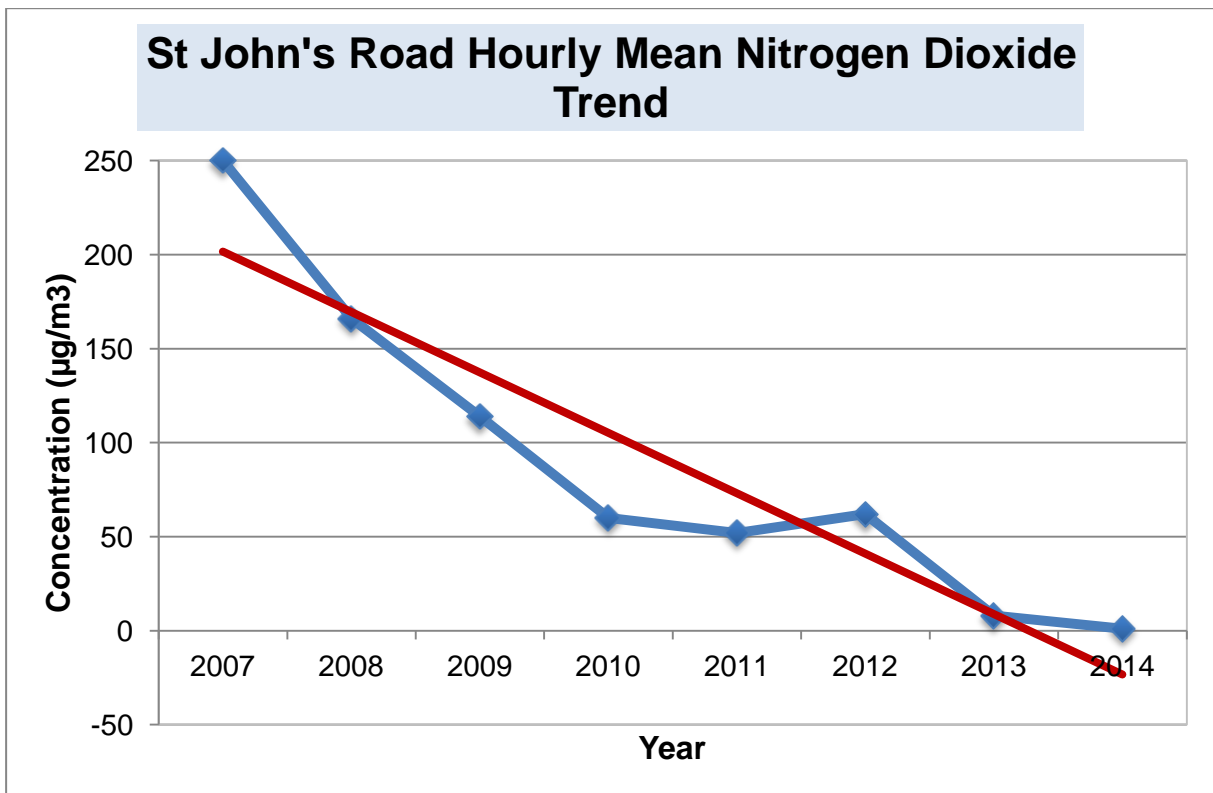


Figure 2.8b Trend in the Number of Exceedences of the Hourly Mean Objective for Nitrogen Dioxide at St John's Road



Passive Diffusion Tube (PDT) Monitoring Data

All results from Passive Diffusion Tube monitoring is shown in Table 2.5.

Exceedences

Analysis of the PDT monitoring results shows the annual mean objective continues to be exceeded in locations within all of the current AQMAs. This confirms that each of the existing AQMAs remains valid.

As in previous years, there are also locations within the individual AQMAs where the objectives are met. This reflects the fact that AQMA boundaries are designed around local features, incorporating road junctions and extended portions of the local road network, creating a wider geographical management area beyond the immediate location of individual exceedences. This is the most effective means of enabling a strategic approach to air quality action planning and for informing planning and development management processes in dense urban environments like Edinburgh. It also assists in determining action plan resource allocation³, such as where on the network to place the lowest emission vehicles e.g the targeted placement of many of Lothian Buses newer vehicles. Scottish Government also offers grant support funding to local authorities to assist implementation of improvement actions within these geographically wider areas – such as the purchase and installation of smart traffic management systems to help reduce road congestion in the designated management areas.

None of the passive diffusion tube data collected during 2014 suggests breaches of the hourly mean objective for NO₂, although annualised data from Westport (ID28b) shows that there is potential (56µg/m³).

Exceedences of the annual mean objective at monitoring locations outwith the AQMAs are identified at the following locations; Angle Park Terrace, Dundee Street/Yeamman Place, Nicolson Street, South Clerk Street and Queensferry Road. Details are shown in Table 2.6.

All of these sites, except one, are to be included in the extension to the Central AQMA 2015 which is being progressed by the Council. The exception is at Queensferry Road (ID64) which, as previously identified, continues to give anomalous results compared with adjacent data (including automatic data).

Supplementary PDT monitoring commenced in January 2015, on the facade of a residential property concurrent with the existing roadside location. It is anticipated that this will provide further insight into the localised circumstances that might be causing the higher corrected back to façade result from the roadside PDT when compared to the much lower and compliant direct façade PDT measurements. See data mapped on page 142.

Table 2.7 on page 57 onwards shows data of PDT monitoring from 2008 to 2014.

Potential exceedences

Locations which are considered borderline with respect to exceeding the annual mean objective are detailed in Table 2.8 on page 64.

A number of these sites are also included in planned extension of the Central AQMA, namely; Clerk Street, South Clerk Street, Nicolson Street and Slateford Road.

2014 data shows a potential exceedence at PDT site (ID73a) at Ramsay Institute, Portobello Road, with concentration of $36\mu\text{g}/\text{m}^3$ NO_2 . The conclusions of a Detailed Assessment (2014) found that an AQMA was not required at Portobello Road/Sir Harry Lauder Road. Monitoring is continuing at these sites.

There were also potential exceedences at Broughton Road (ID43) and at a new monitoring site at Cowgate/St Mary's Street (ID48f). Data from the former appears to be stabilising with similar concentrations over the past three years ($37\mu\text{g}/\text{m}^3$, $37\mu\text{g}/\text{m}^3$ and $35\mu\text{g}/\text{m}^3$ respectively). The new monitoring site (Cowgate/St Mary's Street) is located on the downhill carriageway of an inclined road, approximately 0.25km from the Central AQMA. Monitoring is continuing at these sites.

General notes

Other new monitoring in Kirkliston (ID146a) shows that concentrations, in a worst case location, are low ($23\mu\text{g}/\text{m}^3$). It is a similar situation at Corstorphine High Street (ID145), where the mean annual concentration result is $27\mu\text{g}/\text{m}^3$.

In the Glasgow Road AQMA, new monitoring shows the potential for exceedence of the annual mean ($34\mu\text{g}/\text{m}^3$ at ID15a and $36\mu\text{g}/\text{m}^3$ at ID16a). Both locations are on the facade of sensitive properties.

New data from monitoring in the Great Junction Street AQMA shows mixed results with breaches of the annual mean objective on the Commercial Street arm of the junction with Ocean Drive ($42\mu\text{g}/\text{m}^3$ at ID9d) and below objective levels ($30\mu\text{g}/\text{m}^3$) on the North Junction Street arm (ID9c). Site ID9d is attached to the south facing wall of a 4 storey building adjacent to a busy bus stop.

At other new monitoring locations; St Leonards (ID28e), Bruntsfield Place (ID6a) and those sites along St John's Road (SJ1, SJ2 and SJ3), concentrations are well below the annual mean objective. Within the Central AQMA at Torphichen Place (ID3b), monitoring confirms exceedences of the annual mean ($45\mu\text{g}/\text{m}^3$).

In general, concentrations of NO_2 are lower compared with 2013. However there are slight increases at Ferry Road (ID52), Hamilton Place (ID143a), Cowgate (ID48a), Nicolson Street (ID136), North Bridge (ID27), South Bridge (ID144), Queensferry Road (ID64a) AND Roseburn Terrace (ID23).

More defined increases in concentrations are recorded at Easter Road (ID25e), London Road (ID69), Westport (ID28b) and York Place (ID36). At York Place this is likely to be related to the reopening of the road network following completion of Tram construction.

All PDT data reported in the tables below are representative of relevant exposure, except four background sites at India Street (ID34), Hillview Terrace (ID41), Midmar Drive (ID42) and Baileyfield Road (ID19).

All raw (uncorrected) PDT diffusion tube monitoring data is described in Appendix C.

Appendix D shows the calculations used to estimate annual concentrations at relevant receptors using the NO_2 Fall-Off with Distance calculator (DEFRA LAQM, Tools, 2014).

Appendix A5 (Short-term to Long-term data adjustment for NO_2) shows the calculations undertaken to estimate the annual mean concentrations where data capture was poor, as per instruction in the Technical Guidance 09 and with further advice from the LAQM Helpdesk. Data from the following sites was not annualised due to poor data capture; Great Junction Street (ID30), new site Leith Street (ID74g), Princes Street (ID24), Queen Street (ID33), Grassmarket (ID37), Westport (ID28c), Station Road, Kirkliston (146a) and Gorgie Road (ID80c).

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2014

Site ID	Site Name/ Address	Site Type	In AQMA?	Result is Mean of Duplicate	Data Capture for calendar year 2014 %	2014 Annual Mean Concentration ^{i, ii} ($\mu\text{g}/\text{m}^3$) Bias Adjustment factor = 0.74
	NORTH					
29	Bernard Street/CA	Roadside	Yes	No	100	31
29a	Bernard Street/King Chamber	Roadside	Yes	Yes	92	34
29b	Bernard Street 32	Roadside	Yes	No	100	26
29c	Bernard Street/PS	Roadside	Yes	Yes	100	39
9d	Commercial Street ⁱⁱⁱ	Roadside	Yes	No	67	42
9	Commercial Street 88	Roadside	Yes	No	92	30
9a	Commercial St/Portland Place	Roadside	Yes	No	83	35
52	Ferry Road 268	Roadside	No	No	92	29
53	Ferry Road/Bowhill Terrace 6	Roadside	Yes	No	100	33
45b	Ferry Road/Maderia Street	Roadside	No	No	100	24
45	Ferry Road/North Fort Street	Roadside	No	No	83	31
45d	Ferry Rd/North Junction Street	Roadside	Yes	No	100	34
30b	Great Junction Street 137	Roadside	Yes	No	92	33
30c	Great Junction Street 14	Roadside	Yes	No	100	37
30d	Great Junction Street/WC	Roadside	Yes	No	100	34
30e	Great Junction Street/CG	Roadside	Yes	No	67	33
30	Great Junction Street/FV	Roadside	Yes	Yes	54	N/A
55	Inverleith Row/Ferry Road	Roadside	Yes	Yes	96	40
55c	Inverleith Row/Montague	Roadside	Yes	No	92	29
9c	North Junction Street ⁱⁱⁱ	Roadside	Yes	No	92	30
9b	Ocean Drive/Leith	Roadside	No	No	100	28
51c	Salamander Street/Baltic Street	Roadside	No	No	92	30

Site ID	Site Name/ Address	Site Type	In AQMA?	Result is Mean of Duplicate	Data Capture for calendar year 2014 %	2014 Annual Mean Concentration ^{i, ii} ($\mu\text{g}/\text{m}^3$) Bias Adjustment factor = 0.74
51b	Salamander Street/Bath Street	Roadside	No	No	100	32
14	Trinity Crescent	Roadside	No	No	92	25
	EAST					
19	Baileyfield Road	Background	No	No	75	19
31	Dalkeith Road 187	Roadside	No	No	92	25
25	Easter Road/CH Shop	Roadside	Yes	No	67	39
25b	Easter Road/Rossie Place	Roadside	Yes	No	67	31
25c	Easter Road 105/109	Roadside	Yes	No	100	29
25d	Easter Road/Bothwick	Roadside	Yes	No	100	30
25e	Easter Road 198	Roadside	Yes	No	75	31
25f	Easter Road 271	Roadside	No	No	83	24
25g	Easter Road 327	Roadside	No	No	100	24
46b	London Road/Brunton Place	Roadside	Yes	No	100	28
81	London Rd/East Norton Place	Roadside	Yes	No	100	43
67	London Road/Earlston Place	Roadside	Yes	No	67	39
68	Parsons Green Terrace	Roadside	Yes	No	92	28
69	London Road/Wolseley Place	Roadside	Yes	No	100	42
70	London Road/Wolseley Terrace	Roadside	Yes	No	92	38
66	London Road/Cadzow Place	Roadside	Yes	No	83	31
46	London Road/Easter Road	Roadside	Yes	No	67	38
32	Niddrie Mains Road 28	Kerbside	No	No	100	28
71	Portobello High Street 185	Roadside	No	No	67	32
73a	Portobello Road/Ramsay I	Roadside	No	No	75	36
73d	Portobello Road/Ramsay F	Roadside	No	No	100	35
73e	Portobello Road/Ramsay 2	Roadside	No	No	83	34

Site ID	Site Name/ Address	Site Type	In AQMA?	Result is Mean of Duplicate	Data Capture for calendar year 2014 %	2014 Annual Mean Concentration ^{i, ii} ($\mu\text{g}/\text{m}^3$) Bias Adjustment factor = 0.74
73f	Portobello Road /College Ct.	Roadside	No	No	83	18
73g	Portobello Rd/Inchview Terrace	Roadside	No	No	92	27
72	Seafield Road East 10	Roadside	No	No	92	33
72a	Seafield Road East 7	Roadside	No	No	100	33
	CITY CENTRE - NORTH					
43	Broughton Road	Roadside	No	No	100	35
44	Broughton Street	Roadside	No	No	92	31
13	Deanhaugh Street	Kerbside	No	No	100	28
35	Dundas Street	Kerbside	No	No	75	27
74f	George Street 112	Roadside	Yes	No	100	30
75b	Great Stuart Street 7	Roadside	Yes	No	92	27
75f	Great Stuart Street 14	Roadside	No	No	100	23
75e	Great Stuart Street 9	Roadside	No	No	100	23
143	Hamilton Place 72	Roadside	No	No	100	28
143a	Hamilton Place Library	Roadside	No	No	100	35
34	India Street	Background	Yes	No	83	20
55b	Inverleith Row/Summer Place	Roadside	Yes	No	100	27
74g	Leith Street 35 ⁱⁱⁱ	Roadside	Yes	No	42	N/A
21	Leith Walk/Brunswick Road	Roadside	Yes	No	92	33
20	Leith Walk/McDonald Road	Kerbside	Yes	No	92	32
47	Princes Street (Eastbound)	Roadside	Yes	No	100	50
24	Princes Street/Mound	Kerbside	Yes	No	33	N/A
33	Queen Street/Hanover Street	Roadside	Yes	No	50	N/A
75a	St Colme Street	Kerbside	No	No	83	29
75d	St Colme Street 4	Roadside	No	No	92	27

Site ID	Site Name/ Address	Site Type	In AQMA?	Result is Mean of Duplicate	Data Capture for calendar year 2014 %	2014 Annual Mean Concentration ^{i, ii} ($\mu\text{g}/\text{m}^3$) Bias Adjustment factor = 0.74
36	York Place	Roadside	Yes	No	100	33
	CITY CENTRE - SOUTH					
6a	Bruntsfield Place 210 ⁱⁱⁱ	Roadside	No	No	75	32
138	Clerk Street 15	Roadside	No	No	83	38
48	Cowgate/Gurthrie Street	Roadside	Yes	No	100	33
48a	Cowgate/Blair Street	Roadside	Yes	No	92	36
48f	Cowgate/50 St Mary's Street ⁱⁱⁱ	Roadside	No	No	75	37
48c	Cowgate Blackfriars	Roadside	Yes	No	67	34
48e	Cowgatehead 2	Roadside	Yes	No	75	35
79d	Dundee Street/Yeaman Place	Roadside	No	No	67	41
79a	Fountainbridge 103	Roadside	No	No	83	34
79b	Fountainbridge/Grove Street	Roadside	No	No	92	24
79	Fountainbridge/Tollcross	Roadside	No	No	100	34
37	Grassmarket/PS	Roadside	Yes	No	33	N/A
37a	Grassmarket 41	Roadside	Yes	No	75	40
37b	Grassmarket 75	Roadside	Yes	No	100	35
37c	Grassmarket/Thompsons Court	Background	No	No	100	25
10	Home Street	Roadside	No	No	58	27
17a	Hope Park Terrace/VS	Roadside	No	Yes	100	35
139	Hope Park Terrace 5	Roadside	No	No	100	29
140	Hope Park Terrace/Clerk Street	Roadside	No	No	92	32
38	Melville Drive	Roadside	No	No	100	23
42	Midmar Drive	Background	No	No	100	13
8	Morningside Road	Kerbside	No	No	58	23
49	Morrison Street	Roadside	Yes	No	83	36

Site ID	Site Name/ Address	Site Type	In AQMA?	Result is Mean of Duplicate	Data Capture for calendar year 2014 %	2014 Annual Mean Concentration ^{i, ii} ($\mu\text{g}/\text{m}^3$) Bias Adjustment factor = 0.74
135	Nicolson Street 69	Roadside	No	No	100	43
136	Nicolson Street 92	Roadside	No	No	83	39
27	North Bridge – South	Roadside	Yes	No	83	48
144	South Bridge 59	Roadside	No	No	92	47
142	South Clerk Street 41a	Roadside	No	No	92	36
141	South Clerk Street 84	Roadside	No	No	100	38
28e	St Leonards Street 145a ⁱⁱⁱ	Roadside	No	No	100	28
3	Torphichen Place	Roadside	Yes	No	100	43
3b	Torphichen Place 1 ⁱⁱⁱ	Roadside	Yes	No	100	45
3a	Torphichen Street	Roadside	Yes	No	100	31
2	West Maitland Street	Kerbside	Yes	No	75	43
28b	West Port 62	Roadside	Yes	No	50	56
28c	West Port Opp. 50	Roadside	Yes	No	58	N/A
28d	West Port 42	Roadside	Yes	No	92	51
	WEST					
145	Corstorphine High Street ⁱⁱⁱ	Roadside	No	No	100	27
56	Glasgow Road / Drumbrae	Roadside	No	No	92	29
57	Glasgow Road 158	Roadside	No	No	92	33
16	Glasgow Road 68	Roadside	Yes	No	100	40
16a	Glasgow Road 68 Facade	Roadside	Yes	No	83	36
16b	Glasgow Rd/Ratho Station 94 ⁱⁱⁱ	Roadside	Yes	No	100	32
58	Glasgow Road Newbridge	Roadside	Yes	Yes	100	45
15	Glasgow Road Newbridge	Roadside	Yes	No	92	37
15a	Glasgow Road 9 ⁱⁱⁱ	Roadside	Yes	No	100	34
40f	Hillhouse Road 118	Roadside	No	No	83	30

Site ID	Site Name/ Address	Site Type	In AQMA?	Result is Mean of Duplicate	Data Capture for calendar year 2014 %	2014 Annual Mean Concentration ^{i, ii} ($\mu\text{g}/\text{m}^3$) Bias Adjustment factor = 0.74
40c	Hillhouse Road 240	Roadside	No	No	100	26
40b	Hillhouse/Craigcrook Terrace	Roadside	No	No	100	27
40d	Hillhouse/Marisshall Place 4	Roadside	No	No	100	30
41	Hillview Terrace	Background	No	No	100	18
61	Maybury Road/Barnton	Roadside	No	No	67	23
40	Queensferry Rd/Hillhouse Rd	Roadside	No	No	100	32
63	Queensferry Road 544	Roadside	No	No	100	23
64	Queensferry Road 550	Roadside	No	No	100	47
64a	Queensferry Road 552	Roadside	No	No	100	30
62	Queensferry Road 561	Roadside	No	No	100	19
23	Roseburn Terrace	Kerbside	Yes	No	92	37
1	St John's Road SB	Kerbside	Yes	No	100	34
1b	St John's Road IR	Roadside	Yes	No	100	37
SJ1	St John's Road Kaimes Rd	Kerbside	Yes	No	75	31
SJ2	St John's Road 63	Kerbside	Yes	No	83	25
SJ3	St John's Road 81	Roadside	Yes	No	83	27
1d	St John's Road 131	Roadside	Yes	No	100	48
39	St John's Road/Victor Park	Roadside	Yes	No	100	32
146a	Station Road 2 Kirkliston ⁱⁱⁱ	Roadside	No	No	75	N/A
146	Station Road 41 Kirkliston ⁱⁱⁱ	Roadside	No	No	25	23
50a	Whitehouse Rd/Barnton Grove	Roadside	No	No	92	28
	SOUTH WEST					
76	Angle Park/Harrison Road	Roadside	No	No	83	41
76c	Angle Park Terrace 25	Roadside	No	No	92	30
76b	Angle Park Terrace 74	Roadside	No	No	92	41

Site ID	Site Name/ Address	Site Type	In AQMA?	Result is Mean of Duplicate	Data Capture for calendar year 2014 %	2014 Annual Mean Concentration ^{i, ii} ($\mu\text{g}/\text{m}^3$) Bias Adjustment factor = 0.74
76a	Ardmillan Terrace 22	Roadside	No	No	100	27
80d	Balgreen Road / School	Roadside	No	No	100	31
80e	Balgreen Road / Library	Roadside	No	No	100	32
4	Calder Road	Roadside	No	No	100	26
18	Gorgie Road 8	Roadside	Yes	Yes	96	42
80c	Gorgie Road 87	Roadside	Yes	No	50	N/A
80b	Gorgie Road 549	Roadside	Yes	No	75	31
80	Gorgie Road / Delhaig	Roadside	Yes	No	92	37
80a	Gorgie Road Glen Lea	Roadside	Yes	No	75	31
5	Gorgie Road/Murieston Road	Kerbside	Yes	No	100	35
76d	Henderson Terrace	Roadside	No	No	92	32
11	Lanark Road 610	Roadside	No	No	100	19
77a	Slateford Road 51	Roadside	No	No	100	35
77b	Slateford Road 93/95	Roadside	No	No	92	38
77	Slateford Road 97	Roadside	No	No	75	37
78	Slateford Road/The Maltings	Roadside	No	No	67	25

Notes for table;

In bold and red, exceedence of the NO₂ annual mean objective of 40 $\mu\text{g}/\text{m}^3$ and in bold black, results of 40 $\mu\text{g}/\text{m}^3$ shown.

- i. All data is representative of relevant exposure, distance corrected where necessary, except at background sites [India Street (ID34), Hillview Terrace (ID41), Midmar Drive (ID42) and Baileyfield Road (ID19)] which are not distance corrected.
- ii. Means “annualised” as in Box 3.2 of TG(09), where full calendar year data capture is less than 75%
- iii. New monitoring location 2014

Table 2.6 Locations outwith AQMAs where 2014 monitoring results shows exceedences of the Annual Mean Nitrogen Dioxide Objective

Site ID	Location	Data Capture %	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)
76	Angle Park/Harrison Road *	83	41
76B	Angle Park Terrace No 74 *	92	41
79D	Dundee Street/Yeaman Place *	67	41
135	Nicolson Street No 69 *	100	43
64	Queensferry Road No 550	100	47
144	South Clerk St No 41a *	100	47

Notes for Table;

* Site to be included in the Central AQMA extension (2015)

Bold red - exceedence of the NO_2 annual mean objective of $40\mu\text{g}/\text{m}^3$

Table 2.7 Results of Nitrogen Dioxide Diffusion Tubes (2008 to 2014)

Site ID	Site Name	Within AQMA ?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$						
			2008 Bias Adj. Factor = 0.88	2009 Bias Adj. Factor = 0.86	2010 Bias Adj. Factor = 0.85	2011 Bias Adj. Factor = 0.81	2012 Bias Adj. Factor = 0.76	2013 Bias Adj. Factor = 0.75	2014 Bias Adj. Factor = 0.74
	NORTH								
29	Bernard Street/CA	Yes	45.3	45.1	43.7	38.9	37	36	31
29a	Bernard Street/King Chambers	Yes	48.0	42.0	44.6	41.9	40	38	34
29b	Bernard Street 32	Yes	41.3	32.9	36.9	32.7	33	31	26
29c	Bernard Street/PS	Yes	53.4	48.2	49.4	44.6	44	42	39
9d	Commercial Street 3/4	Yes	-	-	-	-	-	-	42
9	Commercial Street 88	Yes	40.4	31.6	36.7	31.2	35	32	30
9a	Commercial St/Portland Place	Yes	-	-	38.1	41.0	39	36	35
52	Ferry Road 268	No	-	32.1	32.4	32.5	34	28	29
53	Ferry Road/Bowhill Terrace 6	Yes	-	36.4	34.8	32.5	35	34	33
45b	Ferry Road/Maderia Street	No	35.3	30.9	33.5	32.7	31	27	24
45	Ferry Road/North Fort Street	No	39.6	35.4	41.5	32.6	36	32	31
45d	Ferry Road/North Junction St	Yes	42.4	40.9	38.3	39.6	37	34	34
30b	Great Junction Street 137	Yes	38.4	38.5	39.9	40.0	38	36	33
30c	Great Junction Street 14	Yes	50.2	42.6	44.1	38.4	38	39	37
30d	Great Junction Street/WC	Yes	39.0	37.1	39.9	33.8	38	34	34
30e	Great Junction Street/CG	Yes	43.1	41.9	38.7	41.2	37	36	33
30	Great Junction Street/FV	Yes	44.6	44.1	41.8	39.1	38	41	N/A
55	Inverleith Row/Ferry Road	Yes	-	42.6	44.0	43.8	46	43	40
55c	Inverleith Row/Montague	Yes	-	-	-	28.2	32	31	29
9c	North Junction Street	Yes	-	-	-	-	-	-	30
9b	Ocean Drive/Leith	No	-	-	33.0	26.2	31	29	28
51c	Salamander St/Baltic St	No	-	37.1	36.2	38.5	35	33	30

Site ID	Site Name	Within AQMA ?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$						
			2008 Bias Adj. Factor = 0.88	2009 Bias Adj. Factor = 0.86	2010 Bias Adj. Factor = 0.85	2011 Bias Adj. Factor = 0.81	2012 Bias Adj. Factor = 0.76	2013 Bias Adj. Factor = 0.75	2014 Bias Adj. Factor = 0.74
51b	Salamander St/Bath Rd	No	-	37.4	40.3	37.0	38	35	32
14	Trinity Crescent	No	28.3	28.6	27.5	28.9	28	27	25
	EAST								
19	Baileyfield Road	No	24.6	22.5	27.5	24.3	22	20	19
31	Dalkeith Road 187	No	31.8	28.1	27.8	28.0	29	28	25
25	Easter Road/CH shop	Yes	58.2	50.8	49.7	43.6	45	41	39
25b	Easter Road/Rossie Place	Yes	44.9	38.8	39.1	35.8	35	34	31
25c	Easter Road 105/109	Yes	43.8	38.0	37.7	41.0	41	37	29
25d	Easter Road/Bothwick	Yes	40.8	37.3	37.1	32.7	34	30	30
25e	Easter Road 198	Yes	37.3	34.1	34.2	32.0	33	27	31
25f	Easter Road 217	No	35.0	30.1	32.5	27.9	-	24	24
25g	Easter Road 327	No	33.4	27.9	30.3	26.8	28	26	24
46b	Brunton Place	Yes	-	-	-	-	-	30	28
81	London Road/East Norton Pl	Yes	-	-	-	51.2	46	44	43
67	London Rd/Earlston Place	Yes	-	47.9	51.3	45.5	46	46	39
68	London Road /Parsons Grn Ter	Yes	-	30.4	36.6	31.5	33	29	28
69	London Road/Wolseley Place	Yes	-	56.2	50.6	50.4	42	40	42
70	London Road/Wolseley Terr	Yes	-	47.3	46.1	42.4	41	44	38
66	London Rd/Cadzow Place	Yes	-	43.0	40.5	-	36	34	31
46	London Road/Easter Road	Yes	52.3	43.4	46.2	40.4	46	38	38
32	Niddrie Mains Road 28	No	26.9	30.7	32.5	30.9	33	31	28
71	Portobello High St West 185	No	-	43.0	39.2	36.0	32	33	32
73a	Portobello Road/Ramsay Inst	No	-	-	-	41.6	37	37	36
73d	Portobello Road/Ramsay F	No	-	-	-	-	-	38	35
73e	Portobello Road/Ramsay 2	No	-	-	-	-	-	35	34

Site ID	Site Name	Within AQMA ?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$						
			2008 Bias Adj. Factor = 0.88	2009 Bias Adj. Factor = 0.86	2010 Bias Adj. Factor = 0.85	2011 Bias Adj. Factor = 0.81	2012 Bias Adj. Factor = 0.76	2013 Bias Adj. Factor = 0.75	2014 Bias Adj. Factor = 0.74
73f	Portobello Road /College Court	No	-	-	-	-	-	19	18
73g	Portobello Road/Inchview Terr	No	-	-	-	-	-	28	27
72	Seafield Road East No10	No	-	35.0	38.4	33.1	37	36	33
72a	Seafield Road East No. 7	No	-	-	-	-	-	35	33
	CITY CENTRE - NORTH								
43	Broughton Road	No	40.4	38.1	39.8	34.6	37	37	35
44	Broughton Street	No	37.7	35.1	35.3	32.8	34	31	31
13	Deanhaugh Street	No	32.3	30.1	33.0	33.5	32	31	28
35	Dundas Street	No	28.9	27.2	31.6	30.6	31	30	27
74f	George Street No 112	Yes	-	-	43.4	44.7	47	34	30
75b	Great Stuart Street 7	No	-	-	36.2	33.4	31	30	27
75f	Great Stuart Street 14	No	-	-	-	-	-	26	23
75e	Great Stuart Street 9	No	-	-	-	-	-	24	23
143	Hamilton Place No 72	No	-	-	-	-	-	31	28
143a	Hamilton Place Library	No	-	-	-	-	-	34	35
34	India Street	No	22.7	22.6	22.7	23.6	23	21	20
55b	Inverleith Row/Summer Place	No	-	-	-	33.7	32	30	27
21	Leith Walk/Brunswick Rd	Yes	37.3	35.3	35.4	34.2	36	34	33
20	Leith Walk/McDonald Rd	Yes	53.1	36.8	38.1	-	35	34	32
47	Princes Street East Bound	Yes	64	34	58	45.3	45	50	50
24	Princes Street/Mound	Yes	51.5	36.2	49.3	N/A	34	41	N/A
33	Queen Street/Hanover Street	Yes	43.7	50.8	56.3	50.0	49	33	N/A
75a	St Colme Street	No	-	-	38.5	36.5	38	34	29
75d	St Colme Street No 4	No	-	-	-	-	-	31	27
36	York Place	Yes	40.5	37.5	39.0	35.4	41	28	33

Site ID	Site Name	Within AQMA ?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$						
			2008 Bias Adj. Factor = 0.88	2009 Bias Adj. Factor = 0.86	2010 Bias Adj. Factor = 0.85	2011 Bias Adj. Factor = 0.81	2012 Bias Adj. Factor = 0.76	2013 Bias Adj. Factor = 0.75	2014 Bias Adj. Factor = 0.74
	CITY CENTRE - SOUTH								
6a	Bruntsfield Place 210	No	-	-	-	-	-	-	32
138	Clerk Street 15	No	-	-	-	-	40	38	38
48	Cowgate/Guthrie Street	Yes	46.6	39.8	46.2	40.2	40	38	33
48a	Cowgate/Blair Street	Yes	-	-	37.7	31.4	40	35	36
48f	Cowgate/50 St Mary's St	Yes	-	-	-	-	-	-	37
48c	Cowgate Blackfriars	Yes	-	-	-	-	43	42	34
48e	Cowgatehead No 2	Yes	-	-	-	-	-	39	35
79d	Dundee Street/Yeaman Place	No	-	-	-	-	-	46	41
79a	FountainbridgeNo103	No	-	-	-	-	39	37	34
79b	Fountainbridge/Grove Street	No	-	-	-	-	32	28	24
79	Fountainbridge/Tollcross	No	-	-	42.0	36.3	37	36	34
37	Grassmarket /PS	Yes	35.1	35.4	38.4	32.5	35	-	N/A
37a	Grassmarket 41	Yes	42.3	40.5	60.0	42.0	43	44	40
37b	Grassmarket 75	Yes	-	-	-	37.1	39	37	35
37c	Grassmarket/Thompsons Ct	No	-	-	-	-	-	27	25
10	Home Street/Tollcross	No	37.4	32.3	36.5	25.7	33	31	27
17a	Hope Park Terrace/VS	No	-	38.8	43.4	37.4	39	36	35
139	Hope Park Terrace 5	No	-	-	-	-	34	30	29
140	Hope Park Terrace/Clerk St	No	-	-	-	-	35	35	32
38	Melville Drive	No	26.2	25.3	27.6	27.3	29	26	23
42	Midmar Drive	No	17.4	15.2	18.4	16.1	18	15	13
8	Morningside Road	No	30.0	27.1	28.8	28.6	26	25	23
49	Morrison Street	Yes	61.4	44.6	49.3	48.5	46	42	36
135	Nicolson Street 69	No	-	-	-	-	50	45	43

Site ID	Site Name	Within AQMA ?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$						
			2008 Bias Adj. Factor = 0.88	2009 Bias Adj. Factor = 0.86	2010 Bias Adj. Factor = 0.85	2011 Bias Adj. Factor = 0.81	2012 Bias Adj. Factor = 0.76	2013 Bias Adj. Factor = 0.75	2014 Bias Adj. Factor = 0.74
136	Nicolson Street 92	No	-	-	-	-	42	39	39
27	North Bridge - South	Yes	52.3	48.4	49.4	48.7	52	47	48
144	South Bridge 69	No	-	-	-	-	-	46	47
142	South Clerk Street 41a	No	-	-	-	-	42	40	36
141	South Clerk Street 84	No	-	-	-	-	44	41	38
28e	St Leonards Street 145	No	-	-	-	-	-	-	28
3	Torphichen Place	Yes	58.2	26.3	55.6	55.1	48	43	43
3b	Torphichen Place 1	Yes	-	-	-	-	-	-	45
3a	Torphichen Street	Yes	-	-	-	-	-	32	31
2	West Maitland St/Palmerston PI	Yes	70.1	45.6	52.4	55.3	40	-	43
28b	West Port 62	Yes	72.5	66.7	62.4	57.0	61	52	56
28c	West Port Opp 50	Yes	51.5	43.5	41.5	39.0	-	39	N/A
28d	West Port 42	Yes	66.6	60.2	54.9	55.2	60	58	51
	WEST								
145	Corstorphine High Street	No	-	-	-	-	-	-	27
56	Glasgow Road/Drumbrae	No	-	28.6	30.7	29.5	31	30	29
57	Glasgow Road No 158	No	-	34.9	36.3	36.5	36	33	33
16	Glasgow Road 68	Yes	42.4	46.8	44.5	43.8	47	40	40
16a	Glasgow Road 68 facade	Yes	-	-	-	-	-	38	36
16b	Glasgow Road/Ratho Station 94	Yes	-	-	-	-	-	-	32
58	Glasgow Rd Newbridge R about	Yes	-	51.1	51.3	51.5	48	46	45
15	Glasgow Rd Newbridge R about	Yes	35.7	42.0	37.6	40.9	40	39	37
15a	Glasgow Road 9	Yes	-	-	-	-	-	-	34
40f	Hillhouse Road 118	No	-	-	-	-	35	31	30
40c	Hillhouse Road 240	No	-	-	-	-	30	28	26

Site ID	Site Name	Within AQMA ?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$						
			2008 Bias Adj. Factor = 0.88	2009 Bias Adj. Factor = 0.86	2010 Bias Adj. Factor = 0.85	2011 Bias Adj. Factor = 0.81	2012 Bias Adj. Factor = 0.76	2013 Bias Adj. Factor = 0.75	2014 Bias Adj. Factor = 0.74
40b	Hillhouse/Craigcrook Terr	No	-	-	-	-	26	27	27
40d	Hillhouse/ Marischall Pl 4	No	-	-	-	-	32	33	30
41	Hillview Terrace	No	19.6	21.2	22.4	18.4	21	18	18
61	Maybury Rd/Barnton	No	-	24.2	27.0	25.8	16	25	23
40	Queensferry Rd/Hillhouse Rd	No	44.4	37.4	42.4	34.2	40	37	32
63	Queensferry Road 544	No	-	27.6	29.4	25.2	26	26	23
64	Queensferry Road 550	No	-	46.8	47.5	43.9	50	47	47
64a	Queensferry Road 552	No	-	-	-	-	30	28	30
62	Queensferry Road 561	No	-	22.0	25.6	19.2	25	21	19
23	Roseburn Terrace	Yes	49.5	37.2	43.2	34.5	38	35	37
1	St John's Road SB	Yes	41.2	36.7	38.6	35.1	38	36	34
1b	St John's Road IR	Yes	48.8	44.2	43.5	38.4	44	41	37
SJ1	St John's Road Kaimes Rd	Yes	-	-	-	-	-	-	31
SJ2	St John's Road 63	Yes	-	-	-	-	-	-	25
SJ3	St John's Road 81	Yes	-	-	-	-	-	-	27
1d	St John's Road 131	Yes	84.9	57.8	58.8	56.3	52	52	48
39	St John's Road	Yes	31.7	28.2	31.1	30.0	32	35	32
146	Station Road 41 Kirkliston	No	-	-	-	-	-	-	23
50a	Whitehouse Rd/Barnton Grove	No	31.4	29.8	32.1	27.8	32	28	28
	SOUTH WEST								
76	Angle Park/Harrison Rd	No	-	-	52.9	44.4	48	41	41
76c	Angle Park Terrace 25	No	-	-	-	-	36	32	30
76b	Angle Park Terrace 74	No	-	-	-	-	51	46	41
76a	Ardmillan Terrace 22	No	-	-	-	-	32	30	27
80d	Balgreen Road / School	No	-	-	-	-	-	36	31

Site ID	Site Name	Within AQMA ?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$						
			2008 Bias Adj. Factor = 0.88	2009 Bias Adj. Factor = 0.86	2010 Bias Adj. Factor = 0.85	2011 Bias Adj. Factor = 0.81	2012 Bias Adj. Factor = 0.76	2013 Bias Adj. Factor = 0.75	2014 Bias Adj. Factor = 0.74
80e	Balgreen Road / Library	No	-	-	-	-	-	37	32
4	Calder Road	No	29.5	26.3	25.9	31.7	32	30	26
18	Gorgie Road 8	Yes	51.5	45.0	54.5	48.2	49	45	42
80c	Gorgie Road 87	Yes	-	-	-	-	39	40	N/A
80b	Gorgie Road 549	Yes	-	-	-	-	33	34	31
80	Gorgie Road /Delhaig	Yes	-	-	47.4	42.2	42	44	37
80a	Gorgie Road Glen Lea	Yes	-	-	-	-	-	33	31
5	Gorgie Road/Murieston Road	Yes	44.3	42.6	42.9	44.4	43	41	35
76d	Henderson Terrace	No	-	-	-	-	38	35	32
11	Lanark Road 610	No	24.8	22.3	23.5	22.5	24	22	19
77a	Slateford Road 51	No	-	-	-	-	41	37	35
77b	Slateford Road 93/95	No	-	-	-	-	46	42	38
77	Slateford Road 97	No	-	-	47.6	38.1	43	40	37
78	Slateford Rd/The Maltings	No	-	-	35.9	30.2	31	30	25

Notes for Table;

Bold and red, exceedence of the NO_2 annual mean objective of $40\mu\text{g}/\text{m}^3$

Bold black shows results of $40\mu\text{g}/\text{m}^3$.

Bold, red and underlined text show potential exceedence of the hourly mean objective with results over $60\mu\text{g}/\text{m}^3$.

Pale yellow cells indicate PDT sites that are distance corrected. Local experience has found that the DEFRA distance correction tool typically over estimates the actual façade result by around 2 to $3\mu\text{g}/\text{m}^3$ when compared to a kerbside or roadside tube corrected back to the façade.

Table 2.8 Locations outwith AQMAs where monitoring results indicate potential exceedences of the Annual Mean Nitrogen Dioxide Objective

Site ID	Site Name	Within AQMA ?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$						
			2008 Bias Adj. Factor = 0.88	2009 Bias Adj. Factor = 0.86	2010 Bias Adj. Factor = 0.85	2011 Bias Adj. Factor = 0.81	2012 Bias Adj. Factor = 0.76	2013 Bias Adj. Factor = 0.75	2014 Bias Adj. Factor = 0.74
43	Broughton Road	No	40.4	38.1	39.8	34.6	37	37	35
138	Clerk Street 15	No	-	-	-	-	40	38	38
48f	Cowgate/50 St Mary's St	No	-	-	-	-	-	-	37
136	Nicolson Street 92	No	-	-	-	-	42	39	39
73a	Portobello Road/Ramsay Inst	No	-	-	-	41.6	37	37	36
73d	Portobello Road/Ramsay F	No	-	-	-	-	-	38	35
77b	Slateford Road 93/95	No	-	-	-	-	46	42	38
77	Slateford Road 97	No	-	-	47.6	38.1	43	40	37
142	South Clerk Street 41a	No	-	-	-	-	42	40	36
141	South Clerk Street 84	No	-	-	-	-	44	41	38

Note for Table;

Bold and red, exceedence of the NO_2 annual mean objective of $40\mu\text{g}/\text{m}^3$

Bold black, shows results of $40\mu\text{g}/\text{m}^3$.

Trend Data from Nitrogen Dioxide Passive Diffusion Tubes within AQMAs

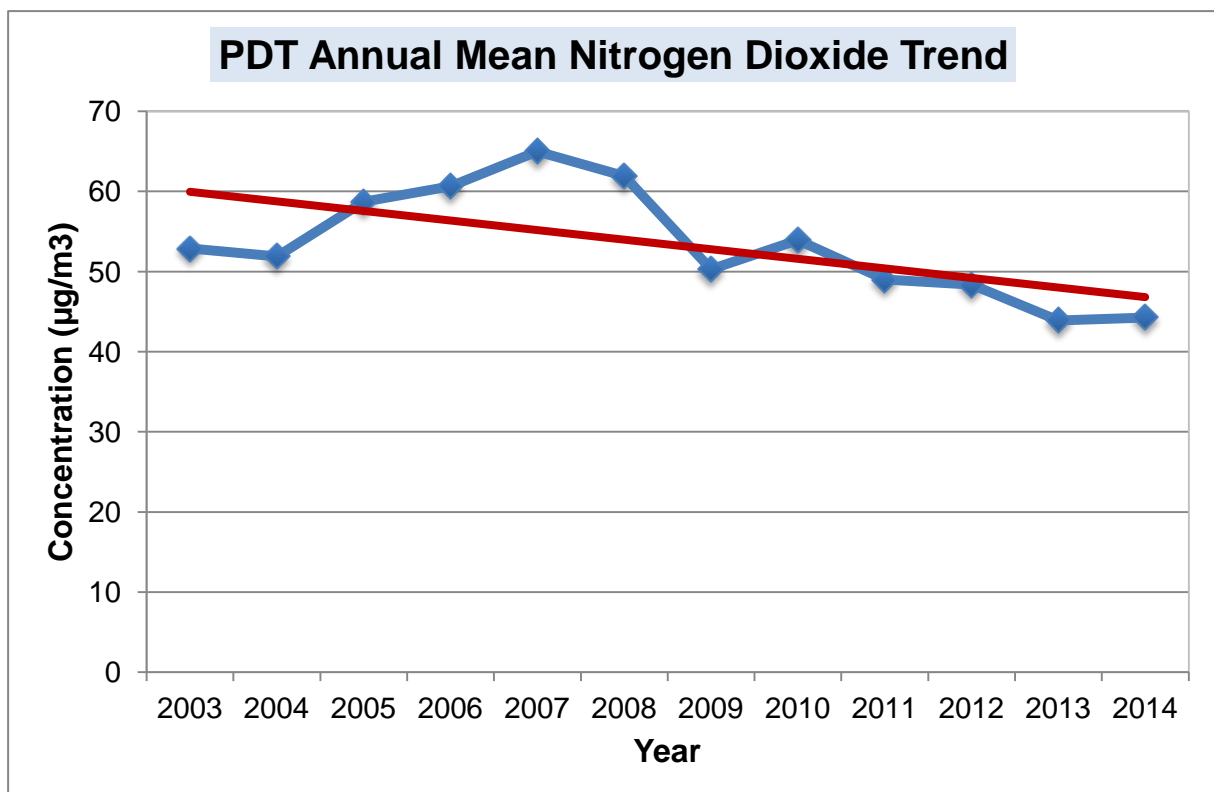
Passive diffusion tube data used in the trend assessment has been corrected for bias and taken from the point of measurement. This is to ensure consistency due to the change in methodology in 2008 for calculating nitrogen dioxide fall off with increasing distance from source. Many of Edinburgh’s historic monitoring sites within the Central AQMA were positioned at the kerbside/roadside and these locations have been retained for continuity. Trend lines have been drawn using an Excel simple regression statistical program.

Figure 2.9 shows the trend analysis. The data used is shown in Appendix E.

The trend data is based on the average mean concentrations obtained from passive diffusion tube monitoring at the following locations each year:

- St John’s Road (ID1)
- West Maitland Street (ID2)
- Roseburn Terrace (ID23)
- St John’s Road (ID1b)
- Torphichen Place (ID3)
- North Bridge (ID27)
- St John’s Road (ID1d)
- Gorgie Road (ID18)
- Westport (ID28a)
- Leith Walk (ID21)
- York Place (ID36)

Figure 2.9 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites within the AQMAs



There is a downward trend of nitrogen dioxide concentrations at passive diffusion tube sites located within Air Quality Management Areas. There has also been a downtrend of the bias adjustment factor for passive diffusion tube analysis over the same period. This is also represented across much of the UK.

Traffic flows are normalizing after completion of the Edinburgh Trams construction project. However changes and enhancements to the entire transport system are continuing in order to ensure an effective network, deal with congestion and encourage multi-mode integration. It will be sometime before confidence can be attributed to trend analysis.

The Local Authority's Further Assessment (2013) work, which followed designation of the Glasgow Road and Inverleith Row AQMAs and extension of the Central and Great Junction Street AQMAs, used DEFRA approved projection factors to estimate the earliest date when air quality objectives are likely to be achieved. The projection of roadside concentrations to future years is not an absolute and can only give indicative values.

Estimation of concentrations in the Great Junction Street AQMA suggested the annual mean objective would be achieved in 2014. This has not been the case.

It also predicted near compliance in the Central AQMA, with full compliance in 2015 and full compliance for Glasgow Road and Inverleith Row in 2016.

The Central and Glasgow Road AQMA projections are unlikely to be achieved, although planned actions to the traffic management system at Glasgow Road Newbridge roundabout could change that.

In terms of compliance of the annual mean objective in the Inverleith Row AQMA, data shows this is on-target; however it is accepted that a number of years of data well below the objective will be necessary before proceeding with a revocation of the AQMA. This will also give cognises of varying meteorological conditions and the actual improvements of vehicles in the national fleet, which is dependent on new engine technology delivering expected improvements in the 'real driving-world'.

Future Review and Assessment work will include analysis of trends within each individual AQMA.

2.2.2 PM₁₀

St Leonard's (AURN) and Queensferry Road operate a Filter Dynamics Measurement System (FDMS) unit to monitor PM₁₀. All other monitoring stations use Tapered Element Oscillating Microbalance (TEOM) instruments.

The TEOM data from Queen Street, Salamander Street, Currie and Glasgow Road has been corrected to provide a gravimetric equivalent, using the Kings College Volatile Correction Model (VCM). The data has also been gravimetrically corrected using a local derived gravimetric factor of 1.14 for comparison and continuity with historical data. The data shows that the two correction methodologies are comparable. Further details are discussed in Appendix A4.

Data are shown in Tables 2.9 and 2.10 compared with the annual and 24-hour mean objectives.

All monitoring locations are representative of relevant public exposure.

Table 2.9 Results of Automatic Monitoring for PM₁₀: Comparison with Annual Mean Objective

Site ID	Site Name Equipment Type	Within AQMA?	Valid Data Capture ^a 2014 (%)	Annual Mean Concentration (µg/m ³)						
				2008	2009	2010	2011	2012	2013	2014
1	Queen Street TEOM	Y (NO ₂)	97	19 (vcm) 19 (1.14)	18 (vcm) 18 (1.14)	18 (vcm) 19 (1.14)	16 (vcm) 16 (1.14)	16 (vcm) 16 (1.14)	17 (vcm) 17 (1.14)	17 (vcm) 16 (1.14)
6	Currie TEOM	N	98	N/A	N/A	11 (vcm) 11 (1.14)	13 (vcm) 11 (1.14)	11 (vcm) 11 (1.14)	12 (vcm) 11 (1.14)	11 (vcm) 10 (1.14)
7	St Leonard's FDMS	N	71	15	17	14	15	16	14	13
8	Salamander St TEOM	N	98	N/A	22 (vcm) 23 (1.14)	26 (vcm) 27 (1.14)	26 (vcm) 27 (1.14)	23 (vcm) 24 (1.14)	22 (vcm) 22 (1.14)	21 (vcm) 21 (1.14)
9	Queensferry Rd FDMS	N	68	N/A	N/A	N/A	21	18	19	19
10	Glasgow Road TEOM	Y (NO ₂)	98	N/A	N/A	N/A	N/A	15 (vcm) 15 (1.14)	16 (vcm) 16 (1.14)	16 (vcm) 16 (1.14)

Notes for table:

In bold and red, exceedence of the PM₁₀ annual mean objective of 18µg/m³ and in bold black, result of 18µg/m³ shown.

In *italic*, poor data capture. Data not annualised due to its sporadic nature.

^a Data capture for the full calendar year.

Table 2.10 Results of Automatic Monitoring for PM₁₀: Comparison with 24-hour Mean Objective

Site ID	Site Type	Within AQMA?	Data Capture 2014 %	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m ³						
					2008	2009	2010	2011	2012	2013	2014
1	Queen Street TEOM	Y (NO ₂)	97	Y	0	1	1	0	2	2	1
6	Currie TEOM	N	98	Y	N/A	N/A	0	0	0	0(29) ^a	0
7	St Leonards FDMS	N	71	Y	0	2	1	0	2(40) ^a	3	0(32) ^a
8	Salamander St TEOM	N	98	Y	N/A	2(44) ^a	19	22	13	5	5
9	Queensferry Rd FDMS	N	68	Y	N/A	N/A	N/A	2	3	2(41) ^a	1(38) ^a
10	Glasgow Road TEOM	Y (NO ₂)	98	Y	N/A	N/A	N/A	N/A	0(35) ^a	1	0

Notes for table;

In bold and red, exceedence of the PM₁₀ daily mean objective 50µg/m³ – not to be exceeded more than 7 times per year

^a if data capture for full calendar year is less than 90%, the 98.08th percentile of 24-hour means is in brackets (expressed in µg/m³)

PM₁₀ data from all monitoring locations in 2014 meet the UK National Objectives.

Data from the St Leonard's urban background site and Currie suburban site readily meet the Scottish air quality annual mean objective of 18µg/m³.

It should be noted that the Low Emission Strategy for Scotland, published for consultation in January 2015 by Scottish Government, proposes to change the annual mean objective for PM₁₀ to 20µg/m³ to correspond with the World Health Organisation's recommended standard.

Having regard to this, roadside monitoring at Queen Street and Glasgow Road, which marginally meet the existing Scottish objective (18µg/m³), are below the proposed objective of 20µg/m³.

At Queensferry Road and Salamander Street the existing PM₁₀ objective is exceeded in 2014, with annual means of 19µg/m³ and 21µg/m³ respectively. Queensferry Road AQMS, which is sited at a busy bus stop, meets the proposed objective, however this should be considered with caution as data capture from the station was poor. (The replacement of the drier on the FDMS unit caused the majority of issues.) The data could not be annualised due to its very sporadic nature. The marginal result does however replicate 2013 data which had reasonable data capture.

In respect to the breaches of the annual mean PM₁₀ objective at Salamander Street, air quality specialists have investigated the extent of a boundary for an AQMA, predominately considering fugitive sources. Based on the study, a recommendation was made for an appropriate zone to be designated as an Air Quality Management Area. This could potentially be carried out as a further extension to the existing Great Junction Street AQMA. Details will be reported separately in the Detailed Assessment for PM₁₀.

In general 2014 results show that the decision to proceed to Detail Assessment for PM₁₀ remain valid, the findings of which will be reported separately in 2015.

Trend in Annual Mean PM₁₀ concentrations

In 2014 there were four monitoring sites with over five years data required in order to undertake trend analysis.

Uncorrected TEOM data (non-volatile fraction) has been used to assess PM₁₀ trends at Queen Street, due to changes in gravimetric correction methodology.

The non-volatile fraction of the FDMS data for years 2008 to 2014 at St Leonard’s has also been used to ensure a consistent approach. Nevertheless this should be viewed with caution as the TEOM instrument was replaced with a FDMS unit in 2008.

At Salamander Street and Currie volatile corrected TEOM data was used for the analysis, from 2010 to 2014.

Trend lines have been drawn using an Excel simple regression statistical program.

Data trends are shown in Figures 2.10 and 2.13 and summarised below.

Table 2.11 Summary of PM₁₀ Annual Mean Trend Data

Monitoring Location / Type	Trend in annual mean PM ₁₀ (years)	Concentrations of PM ₁₀
Currie (Suburban)	(2010 to 2014) ↔	No change
Queen Street (Roadside)	(1999 to 2014) ↓	Decreasing
Salamander Street (Roadside/Fugitive)	(2010 to 2014) ↓	Decreasing
St Leonard’s (Urban background)	(2004 to 2014) ↓	Decreasing

A downward trend is noted at St Leonard’s, the urban background site. Similar conclusions can be determined at both roadside location Queens Street and Salamander Street, although the latter is also affected by fugitive sources.

At Currie, the suburban site, there is a stabilising trend with no significant changes in annual mean concentrations since monitoring began in 2010.

The city-wide detailed assessment will undertake a full assessment of trend analysis.

Figure 2.10 Trend in Uncorrected Annual Mean Non Volatile Fraction PM₁₀ Concentrations (µg/m³) measured at St Leonard's

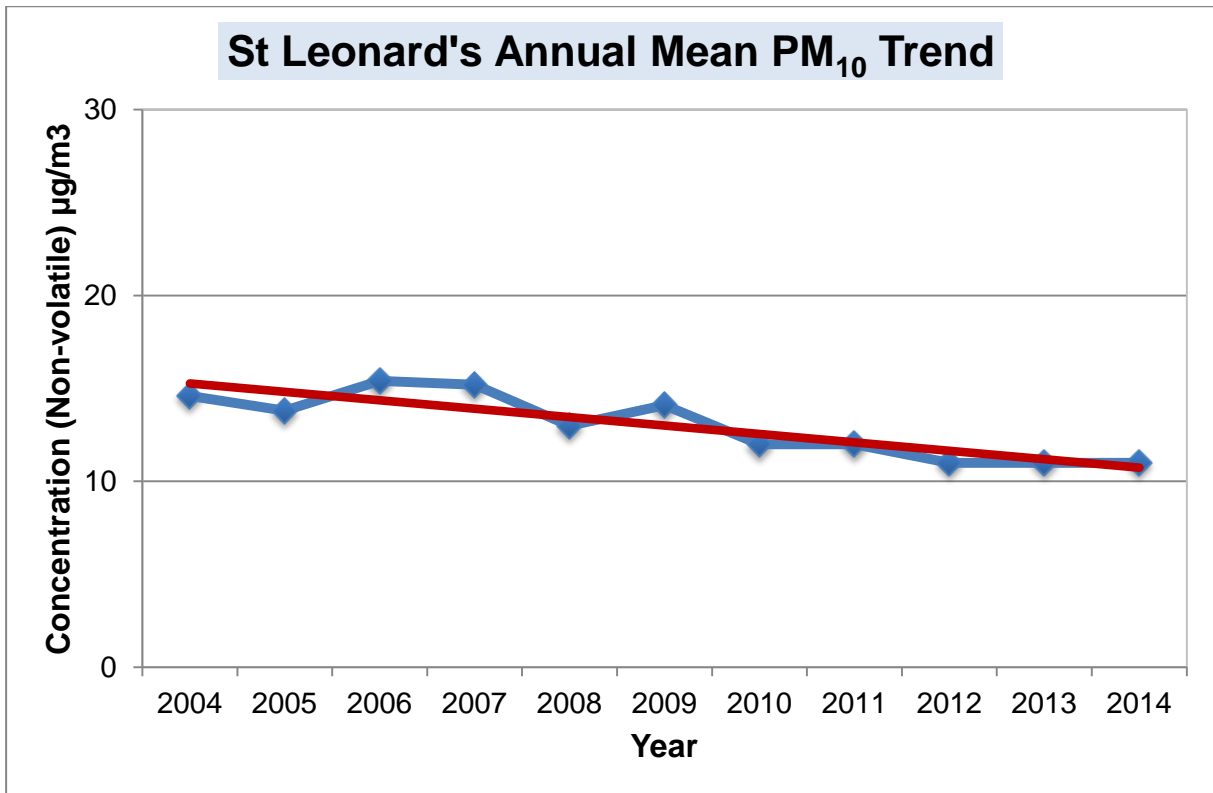


Figure 2.11 Trend in Uncorrected Annual Mean Non Volatile Fraction PM₁₀ Concentrations (µg/m³) measured at Queen Street

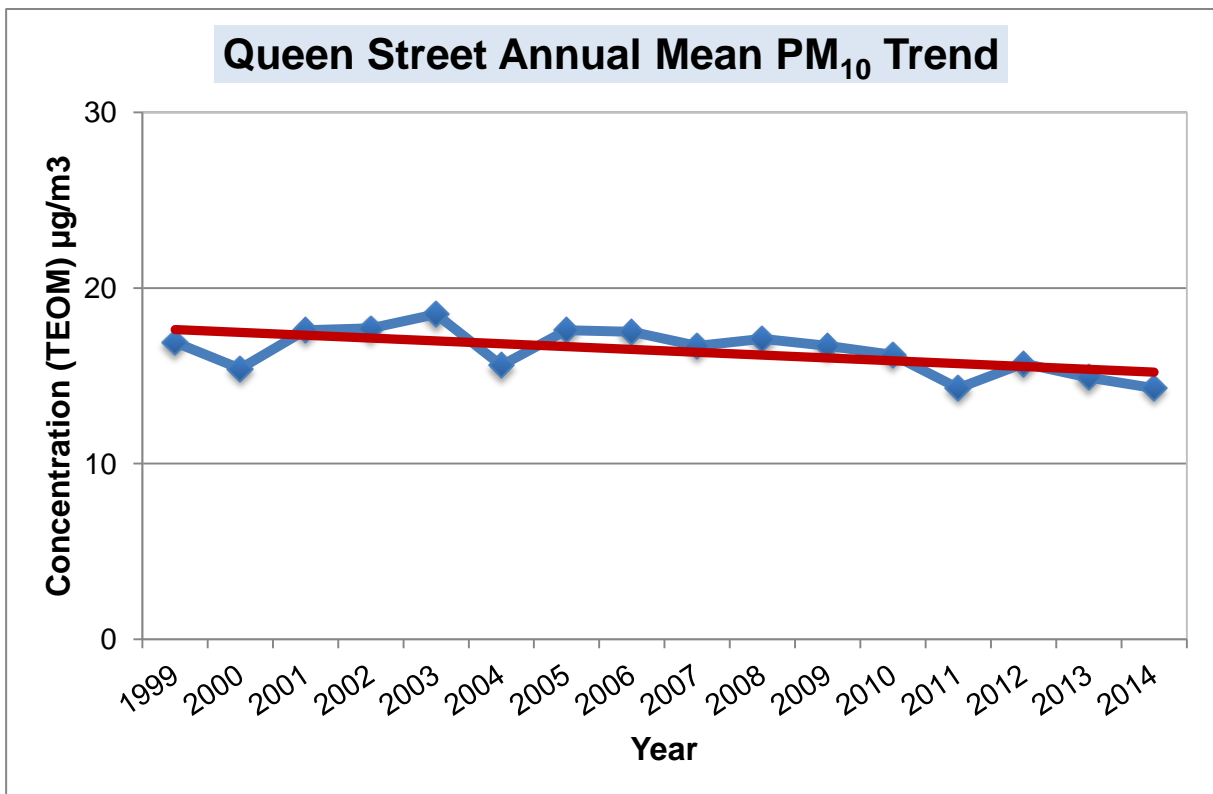


Figure 2.12 Trend in Annual Mean PM₁₀ Concentrations (µg/m³) measured at Currie

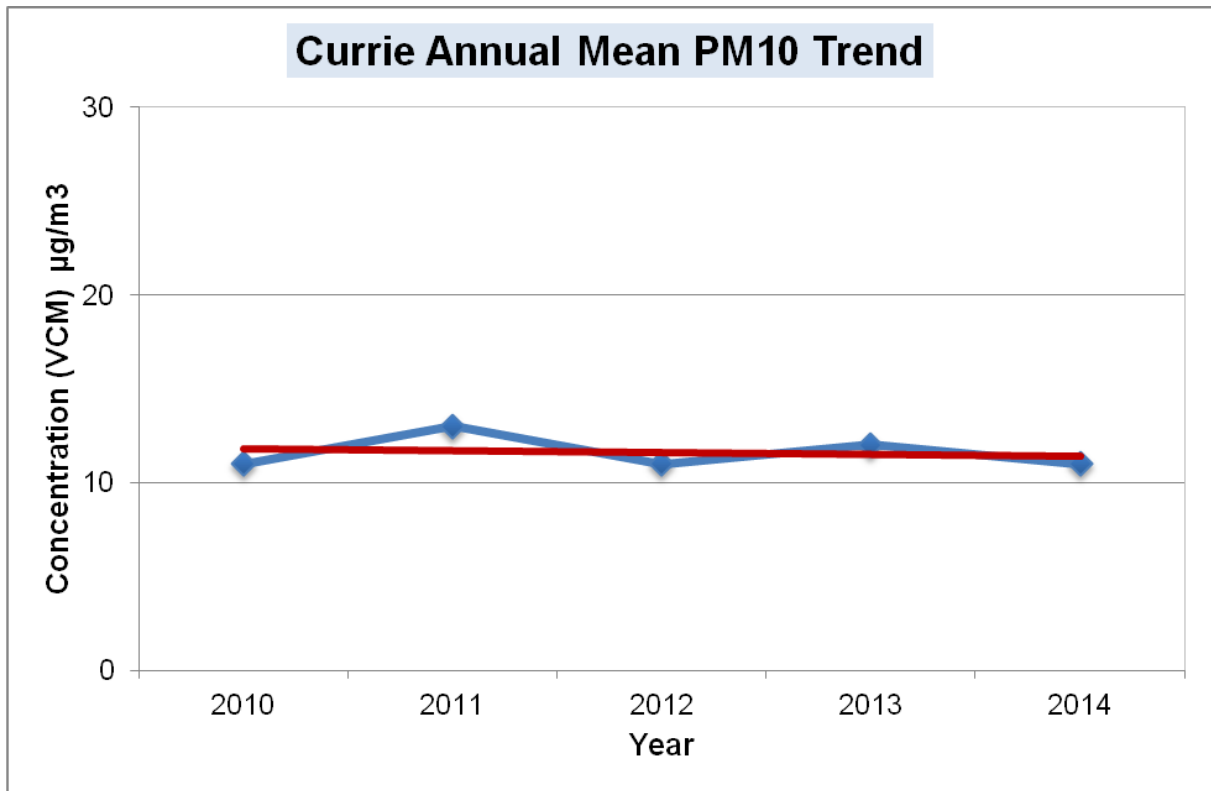
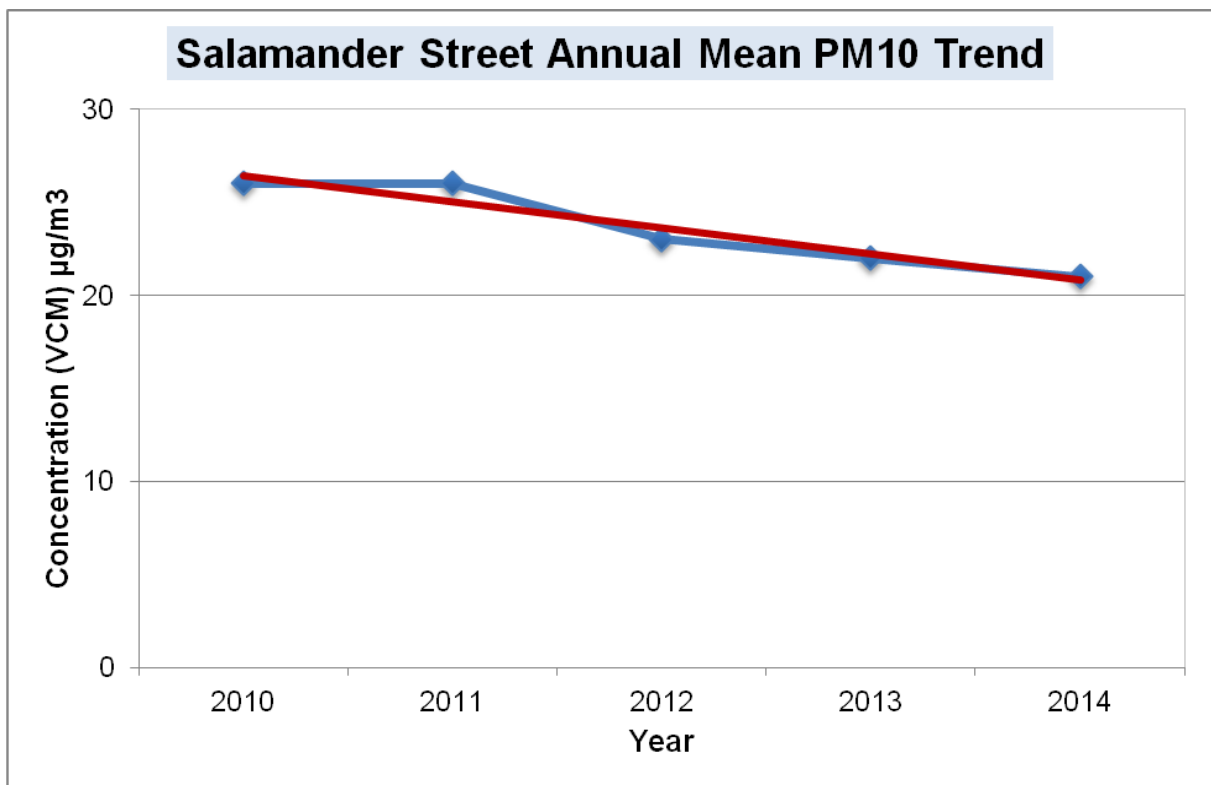


Figure 2.13 Trend in Annual Mean PM₁₀ Concentrations (µg/m³) measured at Salamander Street



2.2.3 Sulphur Dioxide

In 2014 the 15-minute, 1-hour and 24-hour Objectives for Sulphur Dioxide were met with no exceedences recorded. This has been the case since 2009. Results are shown below in Table 2.12.

Table 2.12 Results of Automatic Monitoring of SO₂: Comparison with Annual Mean Objectives

Site ID & Type	Within AQMA ?	Monitoring Year (% Data Capture)	Number of Exceedences (percentile in bracket µg/m ³)		
			15-minute Objective (266 µg/m ³)	1-hour Objective (350 µg/m ³)	24-hour Objective (125 µg/m ³)
St Leonard's Urban Background	No	2009 (95%)	0	0	0
		2010 (92%)	0	0	0
		2011 (98%)	0	0	0
		2012 (98%)	0	0	0
		2013 (97%)	0	0	0
		2014 (73%)	0	0	0

2.2.4 Other pollutants monitored

The following pollutants were monitored at the urban background AURN site at St Leonards and data is presented below; Ozone, Polycyclic Aromatic Hydrocarbons (PAHs) and PM_{2.5}. Data collection during 2014 was poor due to the refurbishment of the station. The UK Government and Devolved Administrations are responsible for the review and assessment of these pollutants.

2.2.4.1 Ozone

In 2014 there were 6 exceedences of the 8-hr running mean >100µgm⁻³ of ozone concentrations which meets the objective. Results are shown below in conjunction with historic data, which highlights exceedences between 2007 and 2009 and also again in 2012 – see Table 2.13 below. The objective is met for the past two years.

Table 2.13 Number of Ozone exceedences at St Leonard's

St Leonard's Urban Background site	2007	2008	2009	2010	2011	2012	2013	2014
No. of exceedences	11	14	12	0	0	43	9	6
<p>Ozone Objective 100µgm⁻³ not to be exceeded more than 10 times per year as an 8-hour running mean by 31st December 2005.</p> <p><i>Italic; poor data capture</i></p>								

2.2.4.2 PM_{2.5}

The Low Emission Strategy for Scotland which was published (for consultation) in January 2015 proposes a number of changes to the PM_{2.5} regime in Scotland. Local Authorities are likely to become responsible for the review and assessment of the pollutant. Additionally it is proposed that the annual mean objective is changed from 12µg/m³ to 10µg/m³ in conjunction with WHO recommendations.

2014 data from St Leonards shows that both the existing and proposed objectives are met, however this must be considered with caution due to poor data capture (72%) during this period. Table 2.14 details monitoring since 2009.

Table 2.14 PM_{2.5} Average annual concentrations at St Leonards

St Leonard's Urban Background site						
Year (Data Capture %)	2009 (95%)	2010 (94%)	2011 (98%)	2012 (72%)	2013 (98%)	2014 (65%)
Annual Concentration (µg/m ³)	8	9	12	11	8	9
PM_{2.5} Scottish Objective 12µg/m ³ annual average (limit) 2010.						

2.2.4.3 Polycyclic Aromatic Hydrocarbons (PAHs)

There are many different PAHs; however, the component, used as a marker, is benzo (a) pyrene (B(a)P). The concentration monitored at St Leonards complies with the UK objective however due to poor data capture in 2014 the result should be treated with caution. Monitoring is undertaken using a digital sampler. Concentrations since 2009 are shown in Table 2.15.

Table 2.15 PAH (B(a)P) Monitoring: Comparison with Objective

St Leonard's Urban Background site	2009	2010	2011	2012	2013	2014
Annual Concentration (ngm ⁻³)	0.131	0.129	0.099	0.109	0.084	<i>0.058</i>
BaP Objective 0.25ngm ⁻³ as an annual average by 31 December 2010. Concentrations shown are not time-weighted. <i>Italic; poor data capture</i>						

2.2.5 Summary of Compliance with AQS Objectives

The City of Edinburgh Council has examined the results from monitoring within the Local Authority area.

There are monitoring locations within each of the existing AQMA's which exceed the annual mean objective for **Nitrogen Dioxide** at relevant receptors and therefore they remain valid. There are also breaches of the objective within the proposed extension to the Central AQMA, so it remains valid that this extension is progressed. At one measurement location outwith these areas the concentration of nitrogen dioxide is above the annual mean objective (Queensferry Road ID64). Further monitoring at the facade of the nearest residential property, concurrent to the site commenced at the start of 2015. The case will be further reviewed in 2016.

St John's Road automatic monitoring data met the hourly mean objective for Nitrogen Dioxide. None of the passive diffusion tube data collected during 2014 suggests breaches of the hourly mean objective for NO₂.

2014 measured concentrations of **PM₁₀** are above the existing and proposed Scottish annual mean objective at Salamander Steet. Data for 2014 shows that an AQMA may be required to address exceedences at Salamander Street. A Detailed assessment is currently being undertaken. As part of the assessment Queensferry Road will be kept under review in conjunction with the Scottish Government's PM10 standard review.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

Local knowledge has identified that Drum Street in Gilmerton is heavily trafficked, particularly during rush hour. There are residential properties in close proximity to the road edge, including newly proposed flats at first floor level. Non-automatic monitoring commenced at the start of 2015 in a worst case location to determine if concerns of elevated pollution levels are valid.

Additional monitoring also commenced at the Howdenhall Road / Burdiehouse Road junction where an air quality impact assessment for the major residential development, Broomhills (Planning reference numbers 14/04860/FUL and 14/04880/FUL) identified a potential breach of the annual average objective. A smaller multi-storey residential development at the junction is also under construction (14/00336/FUL).

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

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

There are no new locations identified outwith the existing AQMAs where there is public exposure of 1-hour or more close to traffic.

Following works undertaken for the Leith Walk Improvement Project, monitoring will continue within the Great Junction Street AQMA. However, it is unlikely that concentrations at this location will exceed the 1-hour Objective.

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

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

A new speed limit network throughout Edinburgh has been approved by the Local Authority. Many residential roads, shopping streets as well as the city centre will be 20mph roads, although a network of 30mph and 40mph is also retained. An interactive map of the new road network can be found on the Council's website here; <http://www.edinburgh.gov.uk/20mph> . Enforcement of the city-wide 20mph network will be through road traffic signage. Experience from the Edinburgh South pilot study that followed a similar approach showed a reduction in speeds on the majority of streets. However, in certain streets speeds remained at an inappropriate level. Police Scotland recognises speed management is an important element of road safety and will continue to enforce 20, 30 and 40mph speed limits across the city road network. There is some uncertainty in research the Council has seen as to the benefit these changes will have in terms of air quality. There may be a trade off between lower nitrogen dioxide and higher CO₂ set against greater pedestrian safety. The project ethos is about changing behaviour and attitudes to make lower speeds more acceptable and ultimately encourage modal shift. The Council is currently working on developing a framework for assessment purposes which is likely to include analysis of roadside emissions. Under duties prescribed in the Local Air Quality Management regime air quality monitoring will continue throughout the City network which may assist in this process.

The Edinburgh tram project was completed in May 2014 and passenger service commenced on 31st May 2014. The service running from Edinburgh Airport to York Place connects with railway stations at Edinburgh Park, Haymarket and Waverley as well as Edinburgh bus station and integrates with existing bus services. The Local Authority has received a number of proposals for enhancements to the transport system in the light of the introduction of the new tram. A working group has therefore been set-up to consider these, the effectiveness of the bus and tram operations and how the different modes connect and interface with walking, cycling and other road users. The remit of the group is:

- To consider operational arrangements relating to the integration of tram and bus, together with interfaces with Air/Rail/Active travel, and to consider opportunities to enhance integration along the route of the tram.

- To consider air quality issues, both along the route of the tram and elsewhere in the city centre, where general traffic has been displaced.
- To consider future investment in public transport both in relation to vehicles and infrastructure, given the integration opportunities presented by Transport for Edinburgh, and consider options for improvements to the road and active travel network in the city centre adjacent to the route of the tram.

Possible future investment in trams and the options to extend the route will also be considered in 2015, taking account of integration with other major projects including the St James Quarter redevelopment and the Leith Programme.

The Local Authority is currently seeking to establish design principles and options for the future of George Street following the end of the current Experimental Traffic Regulation Order (ETRO) which included widening of footways and a one way traffic system. The focus will be based on assessing key themes including heritage, place, function and movement and will take account of the wider City Centre Vision.

Air quality monitoring will continue within the city centre and revised source apportionment work will be undertaken for the Central AQMA, in respect to the various changes to the road network once traffic has stabilised.

City of Edinburgh Council confirms that there are no new/newly identified roads with high flows of buses/H DVs.

3.4 Junctions

The Local Authority is considering exploratory design options in respect to the Picardy Place junction, as part of the St James' Quarter redevelopment, which is located within the Central AQMA. A Masterplan for the site allows the development of a hotel on the existing roundabout area.

City of Edinburgh Council has assessed new/newly identified junctions meeting the criteria in Section A.4 of Box 5.3 in TG(09), and concluded that it will not be necessary to proceed to a Detailed Assessment at this time.

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

The new road across the Forth estuary – the Queensferry Crossing – is due to open in 2016. The bridge is a centre-piece in a major upgrade to the Cross Forth Transport corridor which includes major motorway upgrades to the north and south of the bridges and the first ever use in Scotland of variable mandatory speed limits to smooth traffic congestion via an Intelligent Transport System. This system also controls dedicated bus lanes within the motorway hard shoulder. When the new crossing opens, the existing Froth Road Bridge will become dedicated for public transport use, cycling and walking. A refreshed Public Transport Strategy⁴ details further interventions and measures to support this aspiration. The construction of the Halbeath Park and Choose (Ride) is an important component because of the potential to provide a concentration of passengers to develop new bus services. Additional interventions in the Strategy include the development of an Orbital Bus Rapid Transit system, real time information improvements work, feasibility work to consider additional park and ride sites (e.g. Newbridge) and work to assess the feasibility of improving bus movements between Gogar Roundabout through to the Maybury Junction and Hillhouse Road in Edinburgh.

City of Edinburgh Council confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

Midlothian Council are currently considering a planning application for the erection of up to 650 houses, a primary school and ancillary mixed uses (shops and offices etc) and infrastructure at a site adjacent to City of Edinburgh Council boundary, where it is estimated that most vehicle trips will be made. The planning reference number for the application is 14/00910/PPP. The City of Edinburgh Council did not raise objection to the application but asked Midlothian Council to ensure that the applicant makes provision for the introduction of robust air quality mitigation measures to address emissions from space heating within the proposed development (in order to keep background concentrations to a minimum), and to ensure that journeys by private car are reduced by providing good access to public transport.

Reducing the need to travel and promoting use of sustainable modes of transport are key principles underpinning the (Second) Proposed Local Development Plan Strategy 2014⁵. It states,

‘Future growth of the city based on excessive car use and dependency would have serious consequences in terms of congestion and deteriorating air quality. This will have a knock on effect on the economy and environment and would also disadvantage people who do not have access to a car. An improved transport system based on sustainable alternatives to the car is therefore a high priority for Edinburgh. This is the central objective of the Council’s Local Transport Strategy, which proposed continued investment in public transport (including trams), walking and cycling.’

The strategy also directs major travel generating developments to occur in locations well served by public transport, walking and cycling networks, and says there will be resistance to development in non-central locations with limited sustainable travel options. The LDP helps reduce car dependency by encouraging higher densities in accessible locations and mixed use developments which bring homes, shops and work places closer together, and by paying careful attention to the design of development and to the supply and quality of car and cycle parking provision.

The South East Scotland Strategic Development Planning Authority, SESplan, is a partnership of six member authorities comprising of Edinburgh, East Lothian, Midlothian, Fife, Scottish Borders and West Lothian, working together on strategic development planning matters. Currently the organisation is preparing the next Strategic Development Plan which will replace the current plan in 2018 - a consultation on the Main Issues Report will begin in July 2015. This will assess main issues in the region with options on how the next plan could address these. The consultation will run until 15 September 2015.

SEStran (South East Scotland Transport Partnership) released a draft Regional Transport Strategy on 5 August 2014 and sought comments from the partner authorities. The draft refreshed Regional Transport Strategy contains policies, at a regional level, that are similar to those in the Council’s own Local Transport Strategy. They include regional policies to improve public transport, achieve local air quality

targets, reduce road traffic accidents and support “soft” measures, such as travel plans and marketing.

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

3.7 Bus and Coach Stations

Edinburgh Bus Station at St Andrew Square is within the Central AQMA. The majority of buses which use the station pass through the St John’s Road and Central AQMAs. Table 3.1 shows the number of bus movements reported previously and in 2014.

Table 3.1 Comparison of daily mean bus movements since 2006

Day	Daily Mean Bus Movements			
	2006	2008	2011	2014
Monday to Friday	560	702	776	796
Saturday	470	642	666	702
Sunday	242	346	410	440

There has been a slight increase in the number of movements of buses since the last Updating and Screening Assessment. However, this is still below the review and assessment criteria that would require further assessment.

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

4 Other Transport Sources

4.1 Airports

Previous rounds of Review and Assessment work did not identify likely exceedences from aircraft emissions at Edinburgh Airport.

The number of airline passengers has increased since the previous round in 2009 from 9.385 to 10.160 million passengers per annum (mppa). Freight handling data has not been finalised for 2014.

Table 4.1 Comparison of annual airline passengers and freight between 2002 and 2014 at Edinburgh Airport

Edinburgh Airport	2002	2005	2009	2011	2014
Passenger throughput (mppa*)	5.6	8.48	9.047	9.385	10.160
Freight (tonnes)	18,280	31,868	53,161	45,627	#
Total mppa (including equivalent freight)	5.78	8.79	9.58	9.84	N/A

*mppa million passengers per annum

data not available

Edinburgh Airport Limited commissioned Ricardo-AEA by to undertake a 6-month air quality survey investigating whether the Air Quality Strategy (AQS) objectives of NO₂ concentrations at Edinburgh Airport are being met during 2013⁶. The survey followed on from similar studies carried out during 1999, 2003/2004, 2006/2007 and 2010/2011. Data was annualised and corrected using the national bias adjustment factor (0.80) to assess against air quality objectives. Annual mean NO₂ concentrations close to or above the objective level of 40µg/m³ were measured at four sites (see Table 4.2 below).

Table 4.2. Nitrogen dioxide concentrations greater than 40µg/m³ monitored at Edinburgh Airport 2010 and 2013.

Location	2010	2013
Head of Stand 9	61	54
Coach park entrance	52	53
Taxi area	50	44
Eastfield Road East	50	40

As with 2010 data, 2013 data shows highest concentrations of NO₂ at Head of Stand 9, followed by coach park entrance, taxi area and Eastfield Road. Fortunately the sites are not considered relevant exposure when comparing to the annual mean objective and therefore, this objective was not likely to have been breached at any location during 2013. Similarly the hourly NO₂ objective of no more than 18 exceedences in a year of 200 µg/m³ is not likely to have been exceeded at any location in terms of public exposure.

Overall, set against an increase in passenger numbers and flights, a decrease in annual average NO₂ concentrations was seen when compared to the 2010 survey.

City of Edinburgh Council confirms that there are no relevant airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

The new domestic, Scottish Government-funded, Borders Railway will re-establish passenger services for the first time in over 40 years from Edinburgh through Midlothian to Tweedbank. With construction due to be completed in the summer and the line to enter service in September 2015, the new railway will offer a fast and efficient alternative to the local road network allowing passengers to travel from Tweedbank to South and East Edinburgh.

4.2.1 Stationary Trains

Virgin Trains East Coast, Craightinny Service Delivery/Maintenance Depot is situated adjacent to residential properties. Although previous Review and Assessment work did not identify operations on this site which would adversely impact meeting the sulphur dioxide 15-minute objective, the company has been advised on appropriate methodology for carrying out a short-term study with automatic monitoring (for various averaging periods) for this pollutant.

The company is currently monitoring dust on-site, which is linked to a management system to identify alerts for workplace and contractors incidents. Proposals have been made to undertake monitoring of PM₁₀ with the Osiris monitoring device. The Local Authority has provided advice in terms of equivalent techniques.

On the site, technical issues continue to prevent plans to fully operate shore supply which would allow stationary vehicles to be linked to electricity during servicing and maintenance to avoid use of generators or idling of train engines.

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

4.2.2 Moving Trains

A summary of the Detailed Assessment work carried out in respect of to potential exceedences of nitrogen dioxide objectives associated with the movement of diesel trains at Haymarket Station can be found in the following report – 2010 Air Quality Progress Report for City of Edinburgh Council⁷. The assessment concluded that moving trains will not result in exceedences of nitrogen dioxide objectives.

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

4.3 Ports (Shipping)

Previous rounds of Review and Assessment did not identify shipping in Leith Docks to be a significant source of sulphur dioxide. In 2014 there were 481 vessel calls to the port, which equates to 962 vessel movements. This is well below the assessment criteria.

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

5 Industrial Sources

5.1 Industrial Installations

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

A detailed planning application for the Millerhill Recycling and Energy Recovery Centre (RERC) development is currently being considered by neighbouring Midlothian Local Authority. The site is located in close proximity to the City of Edinburgh boundary, approximately 6km southeast of the City Centre.

The centre will burn up to 195,000 tonnes per annum of residual non-hazardous waste, generated by households and businesses from within the City of Edinburgh and Midlothian Councils, as part of a commitment to reduce the amount of waste being sent to landfill. Recycling will also be carried out at the centre and there will also be an anaerobic digestion facility with a mechanical biological treatment plant. The heat treated waste will generate up to 11MW of electricity and up to 20MW of thermal heat. A 75m high chimney is proposed in line with the Waste Incineration Directive. It is estimated that there will be approximately 68 daily HGV movements.

This is an additional facility which does not replace any other waste transfer station.

An air quality impact assessment has been submitted in support of the application.

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

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

There is potential for coal handling operations at Leith Docks to cease, particularly following the closure of Cockenzie coal-fired power station. However the PPC permit issued by SEPA continues to be valid for operation. Port operations are being considered in full as part of the PM₁₀ Detailed Assessment.

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

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

Aggregate Industries LTD has obtained a permit from the SEPA to operate a concrete industrial process at Port of Leith, Leith Docks. The ready mixed concrete plant which is currently located adjacent to the Leith Dock on Bath Road would relocate. The Local Authority is currently considering whether there are any implications under the terms of the Planning regime.

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

5.2 Major Fuel (Petrol) Storage Depots

There are no major fuel (petrol) storage depots in the Local Authority area. Previous reports have assessed the crude oil storage tanks at Dalmeny and the fuel transfer facility at Hound Point in the Firth of Forth, for potential exceedences of benzene. However, no exceedences were identified. The Local Authority no longer monitors Benzene.

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

5.3 Petrol Stations

There was one application for a petrol filling station in 2013-14 (Planning Reference number 13/01259/PPP) which was refused by the Planning Authority. The development, located 30m to residential property, included an electric vehicle charging station.

City of Edinburgh Council confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

Further work is necessary in conjunction with the Scottish Government and the Scottish Environmental Protection Agency (SEPA) to consider a number of poultry

City of Edinburgh Council

farms in the west of the city. Based on an updated screening calculation which takes into account background levels of PM₁₀, there is potential for a number of poultry farms to breach the daily mean PM₁₀ objective. In conjunction with SEPA, monitoring at a sensitive receptor adjacent to one of the poultry farms is expected to commence in 2015, in order to establish actual PM₁₀ levels. Details will be included in the city-wide PM₁₀ Detailed Assessment.

City of Edinburgh Council has identified poultry farms meeting the specified criteria, and **will need to proceed to a Detailed Assessment for PM₁₀.**

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

The City of Edinburgh Council continues to actively discouraged new biomass installations (less than 20Mwe) through planning policy. However each case is considered on its own merits.

At Dundas Castle, South Queensferry an 800kW biomass boiler installation was deemed acceptable. It is currently under construction and due to be operational in May/June 2015. The boiler is located away from the main building (residential exposure) and will include a ceramic filter. The system will also provide hot water. The PM₁₀ and NO₂ background levels in the area are low (1km grid; PM₁₀ and NO₂ in 2014 was 12.5µg/m³) and with the site being located off the gas-grid appropriate justification could be made for the installation.

The findings and conclusions of the city-wide Detailed Assessment for PM₁₀ will provide a steer on future policy in respect to biomass installations.

City of Edinburgh Council has assessed biomass combustion plant, and concluded that **it will be necessary to consider details within the city-wide Detailed Assessment for PM₁₀.**

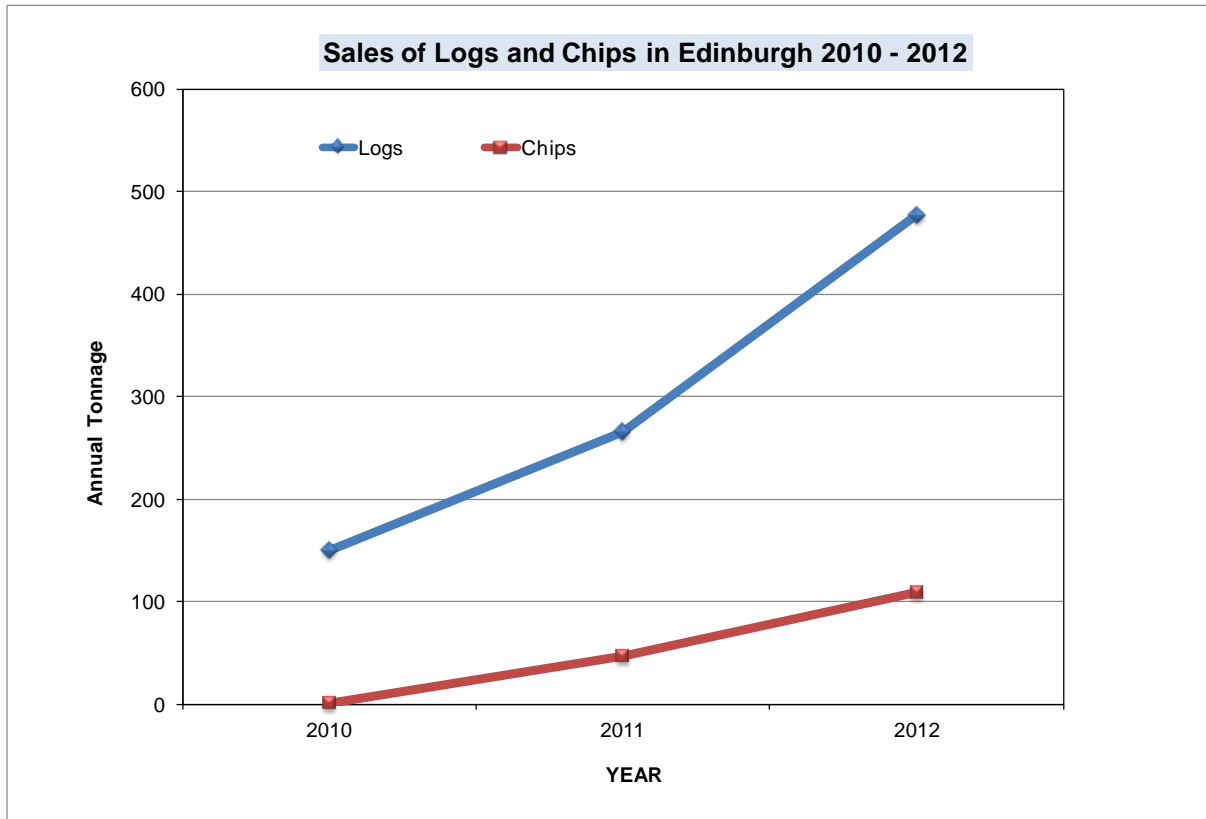
6.2 Biomass Combustion – Combined Impacts

The Local Authority has noted an increased number of complaints about smoke and smell from wood or solid fuel burning stoves or boilers. In 2014 a total of 137 enquiries and complaints about potential/existing installations were received, which was a 20% increase on the previous year. A database is being compiled of all domestic solid-fuel appliances that have been identified through local knowledge, enforcement activity, local area inspection and Planning and Building Control processes. Currently there are 138 solid fuel appliances registered within the City boundary.

A survey was carried out by the Council of various suppliers of logs and wood chip which found that sales have increased between 2010 and 2012 in the Edinburgh

area (see Figure 6.1). Details of these findings will be considered in more detail within the PM₁₀ City-wide Detailed Assessment.

Figure 6.1 Sales of Logs and Chips (in annual tonnage) in the Edinburgh area from various suppliers between 2010 and 2012.



The Council’s Interim Planning Policy (2010) to discourage the installation of commercial biomass combustion in the City will be reviewed in conclusion to the city-wide Detailed Assessment for PM₁₀.

City of Edinburgh Council has assessed biomass combustion plant, and concluded that **it will be necessary** to consider the details within the city-wide Detailed Assessment for PM₁₀.

6.3 Domestic Solid-Fuel Burning

Smoke Control Orders are operational across the entire Local Authority area. There are no areas where significant levels of coal burning take place. However, the increasing trend in small scale domestic solid-fuel burning as mentioned above, will need to be kept under review.

It is recognised that the use of open fires is occasional and not likely to lead to exceedences of the sulphur dioxide objectives.

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

6.4 Combined Heat and Power Plants

A number of significantly sized Combined Heat and Power (CHP) systems have been proposed within the city centre.

Edinburgh University has commenced development of a 15.6MW natural gas Combined Heat and Power (CHP) system to supply energy to several university buildings including the Pleasance Sports Facilities, Holyrood North/South residential complexes and the Climate Change Centre at High School Yards.

In the Central AQMA a 6.6MW (heat input) natural gas CHP system is proposed for the St James redevelopment following outline planning permission in 2009. Although the energy centre will replace a number of existing energy generating units the potential for an increase of emissions from a point source in a sensitive location is of some concern. A current planning application for the plant and chimney has yet to be determined.

Outwith the city centre the Royal Edinburgh Hospital development includes a dedicated energy centre for electrical and heating supply with three dual fuel boilers (3.2MW), three diesel generators (2MW) and a gas fired CHP (0.6MW). Overall the development is predicted to result in air quality improvements at some receptor locations and slight increases in pollutant concentrations at other locations. Although there will be no exceedences of any air quality objectives or limit values. The site is located 5km south east of the city centre where background levels are low.

In relation to the requirements of the Clean Air Act, the Local Authority requests that any plant with an output capacity above 366kW undertakes an appropriate chimney height calculation.

7 Fugitive or Uncontrolled Sources

Levels of airborne particulate matter (PM₁₀) at Salamander Street have been measured to be above the Scottish annual mean air quality objective. Possible contributors to the airborne PM₁₀ levels include local traffic on Salamander Street and Baltic Street, and dust-generating activity at the nearby Leith Docks.

City of Edinburgh Council commissioned Ricardo-AEA to carry out a study to investigate the potential extent of the area affected by elevated PM₁₀ levels above the air quality objectives. The study used published methods and data to estimate emissions of dust from local road traffic and industrial activities at Leith Docks. A computer dispersion model was then used to forecast airborne levels of PM₁₀.

The modelling study found that levels of PM₁₀ may be above the air quality standard in the immediate vicinity of Salamander Street and Baltic Street and some adjacent local streets. Levels of PM₁₀ could also be above the standard due to emissions from dust-generating activities at Leith Docks over a wider area.

If the Council decided that an PM₁₀ AQMA was required the report contained options for the boundary of an appropriate zone to be designated. One option may be to extend the existing Great Junction Street AQMA to include Salamander Street.

The city-wide Detailed Assessment for PM₁₀ will be reported in 2015.

City of Edinburgh Council has identified potential sources of fugitive particulate matter that meet specified criteria, and **will need to consider the details as a part of the City-wide Detailed Assessment for PM₁₀.**

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

8.1.1 Nitrogen Dioxide

The City of Edinburgh Council has examined the results from monitoring within the Local Authority area.

There are monitoring locations within each of the existing AQMAs which exceed the annual mean objective for **nitrogen dioxide** at relevant receptors and therefore they remain valid. There are also breaches of the objective within the proposed extensions to the AQMAs, so it remains valid that these extensions are made.

St John's Road automatic monitoring data shows that the hourly mean objective for Nitrogen Dioxide is exceeded. Analysis of passive diffusion tube data suggests that no other sites are likely to have exceeded this objective in 2014.

In 2014 there were a number of monitoring locations outwith the AQMAs where the annual objective was exceeded, however all but one of these are to be included in the extension to the Central AQMA. The remaining site at Queensferry Road (ID64) has been previously identified as an anomaly compared with adjacent façade monitoring data and automatic site located across the road. Supplementary monitoring commenced January 2015, concurrent with the existing roadside location, on the facade of the residential property. It is anticipated that this will provide further insight into the localised circumstances.

A summary of all locations where monitoring results are at or above the annual mean nitrogen dioxide objective is shown in Table 9.1 (overleaf).

Table 9.1 Summary of the locations where 2014 monitoring results are at or exceed the annual mean Nitrogen Dioxide Objective

Site ID	Area / Site Name	In AQMA?	Data Capture 2014 %	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$) 2014 Bias Adjustment factor = 0.74
	NORTH			
9d	Commercial Street ⁱ	Y Gt Junction St	67	42
55	Inverleith Row/Ferry Road	Y Gt Junction St	96	40
	EAST			
81	London Rd/East Norton PI	Y Central	100	43
67	London Road/Earlston PI	Y Central	67	40
69	London Road/Wolseley PI	Y Central	100	42
	CITY CENTRE - NORTH			
47	Princes Street Eastbound	Y Central	100	50
	CITY CENTRE - SOUTH			
79d	Dundee Street/Yeaman PI	No ⁱⁱ	67	41
37a	Grassmarket No 41	Y Central	75	40
135	Nicolson Street No 69	No ⁱⁱ	100	43
27	North Bridge – South	Y Central	83	48
144	South Bridge No 59	No ⁱⁱ	92	47
3	Torphichen Place	Y Central	83	43
3b	Torphichen Place 1 ⁱ	Y Central	100	45
2	West Maitland Street	Y Central	75	43
28b	West Port No 62	Y Central	50	56
28d	West Port No 42	Y Central	92	51
	WEST			
16	Glasgow Road No 68	Y Glasgow Rd	100	40
58	Glasgow Road Newbridge	Y Glasgow Rd	100	45
64	Queensferry Road No 550	No	100	47
1d	St John's Road No 131	Y St John's Rd	100	48
-	St John's Road (Automatic Data)	Y St John's Rd	93	59
	SOUTH WEST			
76	Angle Park/Harrison Road	No ⁱⁱ	83	41
76b	Angle Park Terrace No 74	No ⁱⁱ	92	41
18	Gorgie Road No 8	Y Central	96	42

Notes for Table;

ⁱ New monitoring location

ⁱⁱ Site to be included in the extension to the Central AQMA 2015

8.1.2 Particulate Matter (PM₁₀)

PM₁₀ data from all monitoring locations in 2014 meet the UK National Objectives. Data from the St Leonard's urban background site and Currie suburban site readily meet the Scottish air quality annual mean objective of 18µg/m³.

The Low Emission Strategy for Scotland, published for consultation in January 2015 by Scottish Government proposes to change the annual mean objective for PM₁₀ to 20µg/m³, to correspond with the World Health Organisation's standards.

Queen Street and Glasgow Road, which marginally meet the existing Scottish objective are well below the proposed objective of 20µg/m³. Queensferry Road marginally fails the existing Scottish objective but meets the proposed one.

Monitoring data from Salamander Street shows exceedences of the existing and proposed objective.

Overall the results show that the decision to proceed to Detail Assessment for PM₁₀ remain valid, the findings of which will be reported separately in 2015.

8.1.3 Trends

There is a downward trend of annual mean **nitrogen dioxide** concentrations at all automatic monitoring stations, although for the majority it is slight, namely; St Leonards, Gorgie Road, Salamander Street and Currie High School. These sites are a combination of urban background, roadside and suburban sites. The downward trend at Queen Street and St John's Road is more defined, even though there has been a slight increase in the annual mean at St John's Road in 2014.

There is a downward trend of nitrogen dioxide concentrations at passive diffusion tube sites located within Air Quality Management Areas although there was a slight increase in the average concentration between 2013 and 2014. There has also been a downtrend of the bias adjustment factor for passive diffusion tube analysis over the same period.

Traffic flows are normalizing after completion of the Edinburgh Trams construction project. However, changes and enhancements to the entire transport system are continuing. It is anticipated these will ensure an effective network, deal with

congestion and encourage multi-mode integration. It will be some time before confidence can be attributed to trend analysis.

The Local Authority's Further Assessment (2013) work, which followed designation of the Glasgow Road and Inverleith Row AQMAs and extension of the Central and Great Junction Street AQMAs, used DEFRA approved projection factors to estimate the earliest date when air quality objectives are likely to be achieved. The projection of roadside concentrations to future years is not an absolute and can only give indicative values.

Estimation of concentrations in the Great Junction Street AQMA suggested the annual mean objective would be achieved in 2014 which apart from a new site placed at a busy bus stop in Commercial Street ($42\mu\text{g}/\text{m}^3$), this has been the case.

It also predicted near compliance in the Central AQMA, with full compliance in 2015 and full compliance for Glasgow Road and Inverleith Row in 2016.

The Central AQMA projection is unlikely to be achieved and Glasgow Road AQMA projections may be achieved if the MOVA signal system at Newbridge Roundabout delivers the promised benefits.

In terms of compliance of the annual mean objective in the Inverleith Row AQMA, data shows this is on-target and was compliant in 2014; however it is accepted that a number of years of data well below the objective will be necessary before proceeding with a revocation of the AQMA. This will also give cognises of varying meteorological conditions and the actual improvements of vehicles in the national fleet, which is dependent on new engine technology delivering expected improvements in the 'real driving-world'.

A downward trend of **PM₁₀** is noted at St Leonard's, the urban background site and roadside sites Queens Street and Salamander Street; although the latter is also affected by fugitive sources.

PM₁₀ trend analysis was carried out at the suburban site at Currie for the first time. It shows a stable trend, with no significant changes in annual mean concentrations since monitoring began in 2010.

The city-wide detailed assessment due in 2015 will undertake a full assessment of trend analysis.

8.2 Conclusions from Assessment of Sources

A new speed limit network throughout Edinburgh has been approved by the Local Authority. Many residential roads, shopping streets and the city centre will be 20mph roads the enforcement of which will be predominately by the use of signs. There is some uncertainty in research the Council has seen as to the benefit these changes will have in terms of air quality. There may be a trade off between lower nitrogen dioxide and higher CO₂ set against greater pedestrian safety. The project ethos is about changing behaviour and attitudes, to make lower speeds more acceptable and ultimately encourage modal shift. The Council is currently working on developing a framework for assessment purposes which is likely to include analysis of roadside emissions. Under the LAQM regime air quality monitoring will continue throughout the City network which may assist in this process.

The new road bridge, the Queensferry Crossing is due to open in 2016. Further feasibility work is recommended as a part of a revised Public Transport Strategy to ensure enhancement to this major Cross Forth Transport corridor. This work includes evaluating the need for additional park and ride sites (e.g. Newbridge) and assessing the feasibility of improving bus movements between Gogar Roundabout through to the Maybury Junction and Hillhouse Road in Edinburgh. Also the development of an Orbital Bus Rapid Transit system and real time information improvements are recommended in the strategy.

The additional waste incineration plant proposed at Millerhill in Midlothian Local Authority Area, near the boundary with Edinburgh will burn up to 195,000 tonnes per annum of residual non-hazardous waste, generated by households and businesses from within both Local Authorities. A current planning application is assessing the impact of the proposed development.

There is potential for coal handling operations to cease at Leith Docks, particularly following the closure of Cockenzie coal-fired power station; however the PPC permit issued by SEPA continues to be valid. Port operations are being considered as part of the PM₁₀ Detailed Assessment.

SEPA have issued a permit for operation of a cement industrial process at, Port of Leith, Leith Docks.

In assessing PM₁₀ exceedences at Salamander Street the Local Authority requested the services of an air quality specialist consultant to consider the extent of fugitive emissions from in and around the Docks, as well as road emissions. Based on the study, a recommendation was made for an appropriate zone to be designated as an Air Quality Management Area. This could potentially be carried out as a further extension to the existing Great Junction Street AQMA. Details will be reported separately in the Detailed Assessment for PM₁₀.

Further work is necessary in conjunction with the Scottish Government and the Scottish Environmental Protection Agency (SEPA) to consider a number of poultry farms in the west of the city. Based on an updated screening calculation which takes into account background levels of PM₁₀, there is potential for a number of poultry farms to breach the daily mean objective. In conjunction with SEPA, monitoring at a sensitive receptor adjacent to one of the poultry farms will commence in 2015, in order to establish actual levels. Again, details will be included in the city-wide PM₁₀ Detailed Assessment.

The Local Authority has noted an increased number of complaints about smoke and smell from wood or solid fuel burning stoves or boilers. A survey of various suppliers of logs and wood chip found that sales have increased between 2010 and 2012 in the Edinburgh area. A database is being compiled of all domestic solid-fuel appliances that have been identified.

A number of significantly sized Combined Heat and Power (CHP) systems have been proposed within the City centre. Edinburgh University have commenced development of a 15.6MW facility in close proximity to the Central AQMA. Within the said AQMA a 6.6MW system is proposed for the James development. The Local Authority will continue to keep a log of all installations.

8.3 Proposed Actions

The Local Authority will carry out the following actions;

- Complete the legal process to extend the Central AQMA as required by findings of the Progress Report 2014.
- Progress city-wide Detailed Assessment for PM₁₀ in association with proposed changes to the Scottish annual mean objective.

- Further source apportionment work will be undertaken for areas previously considered in order to take account of the latest emission factors and traffic changes in the Central and St John's Road AQMAs.
- Continue monitoring at a number of sites on Queensferry Road to assess details of the single exceedences of the annual mean Nitrogen Dioxide objective.
- Undertake analysis of trends within each individual AQMA as part of the Review and Assessment process.
- Decommission Queen Street air quality monitoring station due to impending expiry of temporary planning consent, which has been renewed once already, and re-establish the station at a suitable location..
- Consider the impact of the Low Emission Strategy for Scotland's proposed changes to the PM_{2.5} regime, particularly in respect to a monitoring network for the pollutant.
- A revised air quality actions plan is currently being drafted and will take account of the extension to the Central AQMA and associated source apportionment work.

9 References

1. NO₂ Fall Off with Distance calculator, LAQM, Tools, DEFRA website 2014
2. Technical Guidance LAQM TG09, Box 3.2, DEFRA, 2009
3. Local Air Quality Management Policy Guidance, Scottish Government, 2009
4. Forth Replacement Crossing, Refreshed Public Transport Strategy (2012), Partner organisations; Confederation of Passenger Transport – Scotland, The City of Edinburgh Council, Fife Council, First Bus Group - South East & Central Scotland, Lothian Buses, ScotRail, SEStran - South East of Scotland Transport Partnership, Stagecoach East Scotland, Transport Scotland and West Lothian Council.
5. Second Proposed Local Development Plan, City of Edinburgh Council. 2014
6. Air Quality Study, Edinburgh Airport, Nitrogen Dioxide 2013, Ricardo AEA, May 2015
7. Progress Report 2010, City of Edinburgh Council, 2010.

10 Appendices

Appendices

Appendix A: Quality Assurance / Quality Control (QA/QC) Data

- A1 Nitrogen Dioxide (NO₂) Diffusion Tube Bias Adjustment Factors
- A2 NO₂ Bias Adjustment Factor from Co-location Studies
- A3 Discussion of Choice of Factor to Use
- A4 PM Monitoring Adjustment
- A5 Short-term to Long-term Data adjustment for NO₂
- A6 QA/QC of automatic monitoring
- A7 QA/QC of Diffusion Tube Monitoring

Appendix B: Maps of Non Automatic Air Quality Monitoring (AQM) Passive Diffusion Tube Locations

Appendix C: Raw Passive Diffusion Tube Data

Appendix D: Passive diffusion tube Distance Correction Calculations

Appendix E: Passive diffusion tube data used in Trend analysis

Appendix F: Maps of Air Quality Monitoring Passive Diffusion Tube Data

Appendix A: QA/QC Data

A1 Nitrogen Dioxide (NO₂) Diffusion Tube Bias Adjustment Factors

Edinburgh Scientific Services supply and analyse the passive diffusion tubes. The tubes are made of acrylic and the laboratory uses 50% v/v Triethanolamine (TEA) in acetone for the adsorbent; the grids are dipped into this solution and allowed to dry before insertion into the tube. The tubes are exposed for 4 or 5 week periods, in accordance with the recommended calendar supplied by DEFRA. The method has remained unchanged during the monitoring periods.

The annual mean data from the historical local co-location studies always show that passive diffusion samplers over read the real time analysers by average factors from 0.85 to 0.91. See Tables A1a and A1b.

Between 2011 and 2013 the bias was calculated using a combination of local factors and the factors contained in the National Bias Database, with sites which are also analysed by Edinburgh Scientific Services. This followed a step change in the bias factor in 2011. A manual approximate orthogonal regression calculation was undertaken to combine the bias factors and represent worse-case scenario.

Table A1a Historical bias data used in previous reports 2001 - 2007

Site	Type	2001	2002	2003	2004	2005	2006	2007
Currie	Suburban	N/A	N/A	N/A	0.91	N/A	N/A	N/A
Gorgie	Roadside	N/A	N/A	N/A	N/A	0.86	N/A	0.91
Haymarket	Roadside	0.93	N/A	N/A	0.88	0.93	0.91	0.92
Leith Walk	Roadside	0.89	N/A	N/A	N/A	N/A	N/A	N/A
Queen St	Roadside	0.91	0.91	0.91	0.90	0.84	0.83	0.85
Roseburn	Roadside	N/A	N/A	N/A	N/A	0.92	N/A	N/A
St John's Road	Kerbside	N/A	N/A	N/A	N/A	N/A	N/A	0.93
Mean		0.91	0.91	0.91	0.89	0.89	0.87	0.90

Table A1b Historical bias data used in previous reports 2007 - 2013

Site	Type	2008	2009	2010	2011	2012	2013
Glasgow Road	Roadside	N/A	N/A	N/A	N/A	N/A	0.64
Gorgie	Roadside	0.94	N/A	N/A	0.87	0.86	0.87
Haymarket	Roadside	0.87	N/A	N/A	N/A	N/A	N/A
Queensferry Road	Roadside	N/A	N/A	N/A	0.66	0.71	0.71
Queen Street	Roadside	0.81	0.83	0.84	0.69	0.65	0.7
Salamander St	Roadside	N/A	N/A	0.79	0.77	0.80	0.78
Roseburn	Roadside	0.91	0.82	0.85	N/A	N/A	N/A
St. John's Road	Kerbside	0.86	0.92	0.92	0.79	0.74	0.77
Mean		0.88	0.86	0.85	0.76	0.75	0.75
Combined Mean*					0.81	0.76	0.75

* An approximate orthogonal regression calculation undertaken with National Bias Database data

A2 NO₂ Bias Adjustment Factor from Local Co-location Studies

Six automatic monitoring stations were considered for the co-location study during 2014. The factors for studies are shown in Table A2.

Table A2 Bias factors used for 2014 data

Site	Type	Analyser Mean	DC# %	Analyser	PDT* Mean	PDT* Precision	Period	Bias Factor A	Bias B (%)
Glasgow Road	Roadside	26	100	39	7	12	0.67	49	
Gorgie Road	Roadside	34	97	40	8	11	0.85	18	
Queensferry Rd	Roadside	46	94	66	7	11	0.69	44	
Queen Street	Roadside	25	97	39	7	11	0.64	56	
Salamander St	Roadside	27	99	35	6	12	0.77	30	
St John's Road	Kerbside	58	95	71	5	11	0.82	22	
AVERAGE								0.74	37

Notes for table; * PDT - Passive Diffusion Tube # DC - Data Capture for periods used. Date range is linked to DEFRA PDT sampling period, so does not match an exact calendar year.

A3 Discussion of Choice of Factor to Use

Edinburgh co-locates triplicate tubes on the sampler head cages of each roadside/kerbside monitoring station. The analysis has been undertaken for a number of years using Edinburgh Scientific Services Laboratory and the preparation of tubes has remained the same. Generally the passive diffusion tubes give higher concentrations than the real time analysers over an annual period.

In 2014, an annual mean bias factor of 0.73 was calculated from the local co-location studies. All studies showed that overall precision of triplicate tubes was good, as was the overall data capture. Usual checks were carried out with respect to the automated and passive diffusion tube data to assess the reliability of the bias factor. Edinburgh Scientific Services laboratory scored satisfactory in the AIR/WASP NO₂ proficiency testing scheme throughout the year.

A Marylebone Road study was available on the National Diffusion Tube Bias Adjustment Factor Spreadsheet [Version 03/15] <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html> which allowed a combined factor to be calculated

In conclusion, the Local Authority chose the combined bias adjustment factor of 0.74 as it ensures a conservative approach to the assessment.

Table A3
Manual approximate orthogonal regression calculation for 2014 bias

	Bias A 2014	Bias B 2014	Calculation as AQC Guidance Para 2.4	Bias 2014
Local Bias				
Glasgow Road	0.67	49		
Gorgie Road	0.85	18		
Queensferry Road	0.69	44		
Queen Street	0.64	56		
Salamander Street	0.77	30		
St John's Road	0.82	22		
National Bias				
Marylebone Road	0.78	29		
Mean Local Bias	0.74	37	0.37+1 = 1.37	
			1/1.37 =	0.73
Mean Combined Bias		35	0.35+1 = 1.35	
			1/1.35 =	0.74

A4 PM Monitoring Adjustment

Ricardo-AEA on behalf of the Scottish Government, provided Volatile Correction Model (VCM) corrected Tapered Element Oscillating Microbalance (TEOM) data to the Local Authority under the Scottish Air Quality Database and Website project for the following automatic monitoring stations; Queen Street, Salamander Street, Glasgow Road and Currie.

TEOM data was also corrected to provide a gravimetric equivalent using Edinburgh's local gravimetric factor 1.14, which was derived from undertaking a co-location study with a partisol unit and TEOM instrument in Detailed Assessment Report 2004.

A5 Short-term to Long-term Data adjustment for NO₂

Data from Bush Estate (Midlothian) monitoring site was used to estimate annual nitrogen dioxide concentrations from short term measurements. No other monitoring sites met the required criteria in 2014.

The site is part of the national Automatic Urban and Rural Network (AURN) and located within the required distance to Edinburgh. Data capture (DC) was also considered to be within acceptable limits.

Automatic Monitoring

Data was not collected at St Leonards between September and December 2014 due to the station refurbishment, therefore an estimation of annual mean concentration is calculated below;

St Leonard's Automatic Monitoring Station				
Measured Mean Value (M) – 19.1				
Site	Site Type	Annual Mean (AM) µg/m ³	Period Mean (PM) µg/m ³	Ratio(R) AM/PM
Bush	Rural background	8.46	7.45	1.14
Adjusted Mean (M x R) = 22µg/m ³				

Non-Automatic Monitoring (Passive Diffusion Tubes)

Where passive diffusion tubes have less than 75% data capture for the annual period, a calculation is undertaken to estimate the annual concentrations. Details are shown in the subsequent tables.

Site ID/Location 8 – Morningside Road			
Measured Mean Value (M) = 32.5 $\mu\text{g}/\text{m}^3$			
Background Site	Annual Mean $\mu\text{g}/\text{m}^3$	Period Mean $\mu\text{g}/\text{m}^3$	Ratio AM/PM (R)
Bush Estate	8.37	8.50	0.98
Adjusted Mean (M x R) = 31.9 $\mu\text{g}/\text{m}^3$			

Site ID/Location 9d - Commercial Street			
Measured Mean Value (M) = 61.6 $\mu\text{g}/\text{m}^3$			
Background Site	Annual Mean (AM) $\mu\text{g}/\text{m}^3$	Period Mean (PM) $\mu\text{g}/\text{m}^3$	Ratio AM/PM (R)
Bush Estate	8.37	9.10	0.92
Adjusted Mean (M x R) = 56.7 $\mu\text{g}/\text{m}^3$			

Site ID/Location 10 – Home Street			
Measured Mean Value (M) = 37.2 $\mu\text{g}/\text{m}^3$			
Background Site	Annual Mean $\mu\text{g}/\text{m}^3$	Period Mean $\mu\text{g}/\text{m}^3$	Ratio AM/PM (R)
Bush Estate	8.37	8.50	0.98
Adjusted Mean (M x R) = 37 $\mu\text{g}/\text{m}^3$			

Site ID/Location 25 - Easter Road/CH Shop			
Measured Mean Value (M) = 53.7 $\mu\text{g}/\text{m}^3$			
Background Site	Annual Mean $\mu\text{g}/\text{m}^3$	Period Mean $\mu\text{g}/\text{m}^3$	Ratio AM/PM (R)
Bush Estate	8.37	8.59	0.97
Adjusted Mean (M x R) = 52.1 $\mu\text{g}/\text{m}^3$			

Site ID/Location 25b - Easter Road/Rossie Place			
Measured Mean Value (M) = 42.5 $\mu\text{g}/\text{m}^3$			
Background Site	Annual Mean $\mu\text{g}/\text{m}^3$	Period Mean $\mu\text{g}/\text{m}^3$	Ratio AM/PM (R)
Bush Estate	8.37	8.46	0.99
Adjusted Mean (M x R) = 42.1 $\mu\text{g}/\text{m}^3$			

Site ID/Location 28b – Westport 62			
Measured Mean Value (M) = 77.7 $\mu\text{g}/\text{m}^3$			
Background Site	Annual Mean $\mu\text{g}/\text{m}^3$	Period Mean $\mu\text{g}/\text{m}^3$	Ratio AM/PM (R)
Bush Estate	8.37	8.66	0.97
Adjusted Mean (M x R) = 75.4 $\mu\text{g}/\text{m}^3$			

Site ID/Location 30e - Great Junction Street			
Measured Mean Value (M) = 47.4 $\mu\text{g}/\text{m}^3$			
Background Site	Annual Mean $\mu\text{g}/\text{m}^3$	Period Mean $\mu\text{g}/\text{m}^3$	Ratio AM/PM (R)
Bush Estate	8.37	9.03	0.93
Adjusted Mean (M x R) = 44.1 $\mu\text{g}/\text{m}^3$			

Site ID/Location 46 – London Road/Easter Road			
Measured Mean Value (M) = 46.3 $\mu\text{g}/\text{m}^3$			
Background Site	Annual Mean $\mu\text{g}/\text{m}^3$	Period Mean $\mu\text{g}/\text{m}^3$	Ratio AM/PM (R)
Bush Estate	8.37	7.55	1.11
Adjusted Mean (M x R) = 51.4 $\mu\text{g}/\text{m}^3$			

Site ID/Location 48c – Cowgate/Blackfriars			
Measured Mean Value (M) = 48.9 $\mu\text{g}/\text{m}^3$			
Background Site	Annual Mean $\mu\text{g}/\text{m}^3$	Period Mean $\mu\text{g}/\text{m}^3$	Ratio AM/PM (R)
Bush Estate	8.37	8.99	0.93
Adjusted Mean (M x R) = 45.5 $\mu\text{g}/\text{m}^3$			

Site ID/Location 61 – Maybury Road/Barnton			
Measured Mean Value (M) = 38.6 $\mu\text{g}/\text{m}^3$			
Background Site	Annual Mean $\mu\text{g}/\text{m}^3$	Period Mean $\mu\text{g}/\text{m}^3$	Ratio AM/PM (R)
Bush Estate	8.37	9.12	0.92
Adjusted Mean (M x R) = 35.5 $\mu\text{g}/\text{m}^3$			

Site ID/Location 67 - London Road /Earlston Place			
Measured Mean Value (M) = 54.2 $\mu\text{g}/\text{m}^3$			
Background Site	Annual Mean $\mu\text{g}/\text{m}^3$	Period Mean $\mu\text{g}/\text{m}^3$	Ratio AM/PM (R)
Bush Estate	8.37	8.50	0.98
Adjusted Mean (M x R) = 53.1 $\mu\text{g}/\text{m}^3$			

Site ID/Location 71 – Portobello High Street			
Measured Mean Value (M) = 42.4 $\mu\text{g}/\text{m}^3$			
Background Site	Annual Mean $\mu\text{g}/\text{m}^3$	Period Mean $\mu\text{g}/\text{m}^3$	Ratio AM/PM (R)
Bush Estate	8.37	8.17	1.03
Adjusted Mean (M x R) = 43.7 $\mu\text{g}/\text{m}^3$			

Site ID/Location 79d – Dundee Street/Yeamon Place			
Measured Mean Value (M) = 56.3 µg/m ³			
Background Site	Annual Mean µg/m ³	Period Mean µg/m ³	Ratio AM/PM (R)
Bush Estate	8.37	8.50	0.99
Adjusted Mean (M x R) = 55.7 µg/m ³			

Site ID/Location 78 – Slateford Road/The Maltings			
Measured Mean Value (M) = 38.6 µg/m ³			
Background Site	Annual Mean µg/m ³	Period Mean µg/m ³	Ratio AM/PM (R)
Bush Estate	8.37	9.49	0.88
Adjusted Mean (M x R) = 34 µg/m ³			

A6 QA/QC of Automatic Monitoring

All monitoring stations are subject to an independent audit and stringent QA/QC procedures which are undertaken by Ricardo-AEA on behalf of DEFRA and the Scottish Government. This agreement commenced in 2007 (2013 for Currie). Nevertheless, all data, including calibration data, is scrutinised on a daily basis by Local Authority officers (Monday to Friday) by visual examination, to see if they contained unusual measurements. Any data which was considered to be suspicious (e.g. large spikes) is flagged to undergo further checks.

Staff competence

Officers are trained as local site operators in relation to the management of the stations and undertake the necessary calibrations and basic maintenance. Training was carried out by Ricardo-AEA in February 2013.

Calibration procedures

The three ML 9841 B NO_x analysers (located at Queen Street, Glasgow Road and Salamander Street) perform an auto-calibration each day with zero air and NO gas. Warning limits are set at +/- 5 % on the software program.

All other sites including those listed above are visited fortnightly, apart from the National Network site AURN which is visited monthly, and manual calibration checks are carried out using certified NO gas at approximately 500ppb plus a zero check.

All cylinders are replaced at 12 - 18 month intervals. Nitric Oxide cylinders were supplied by Air Liquide UK prior to September 2012 and thereafter, by BOC.

Details of manual calibration checks and precision and accuracy of instruments can be made available on request.

Servicing

All instruments are serviced and recalibrated every six months by the appropriate supplier. The service contracts include a support package for software and replacement parts, plus any necessary call outs to the sites.

The TEOM heads on the automatic PM₁₀ units are cleaned monthly and filters are changed regularly - approximately every 2 weeks.

During all visits to the monitoring stations, actions taken and activities noted adjacent to the site are recorded in the site log book.

A7 QA/QC of Diffusion Tube Monitoring

Sampling staff at Scientific Services Laboratory, City of Edinburgh Council are trained to fulfil the requirements associated with passive diffusion tube samplers. The tubes are also supplied and analysed by the laboratory. It is UKAS accredited for this task and participates in the Workshop Analysis Scheme for Proficiency (WASP) inter-laboratory QC/QA. The laboratories performance was rated as being satisfactory over the rolling five rounds prior to the end of 2014, with 100% of results $\leq \pm 2$.

NO₂ diffusion tube monitoring is conducted in accordance with the quality requirements contained in the UK NO₂ Survey Instruction Manual for local/unitary authorities and Government Guidance Document LAQM.TG (09). The kerbside diffusion tubes are located within 1 metre of the kerb edge, roadside locations are greater than 1 metre from the road edge or at the façade of residential property. The tubes are attached to sign posts / lampposts using plastic spacer holders at a height of approximately 2m above ground level.

Three diffusion tubes from each monthly batch are used as blanks. These tubes are not exposed and are stored in a refrigerator during the exposure period. They are analysed along with the appropriate batch of exposed tubes. The purpose of blanks is to determine whether or not NO₂ contamination occurred during tube preparation.

All passive diffusion tube monitoring data shown in this report has been corrected for diffusion tube bias in accordance with LAQM TG (09). The monthly exposed passive diffusion tubes in Edinburgh over-read real-time analysers. Pre-2011 this was by a factor range of 0.85 to 0.91, which were derived from local co-location studies. There was then a step change in the studies and results have since ranged from 0.75 to 0.81. In 2014 the bias adjustment factor was 0.74.

Appendix B: Maps of Air Quality Monitoring (AQM) Passive Diffusion Tube Sites

Maps of passive diffusion tubes are presented in the following six geographical areas of the city. Further details are stipulated in Table 2.2 within main report.

- **North**
 - Leith
 - Inverleith / Trinity

- **East**
 - Craigmillar
 - Easter Road / London Road
 - Portobello

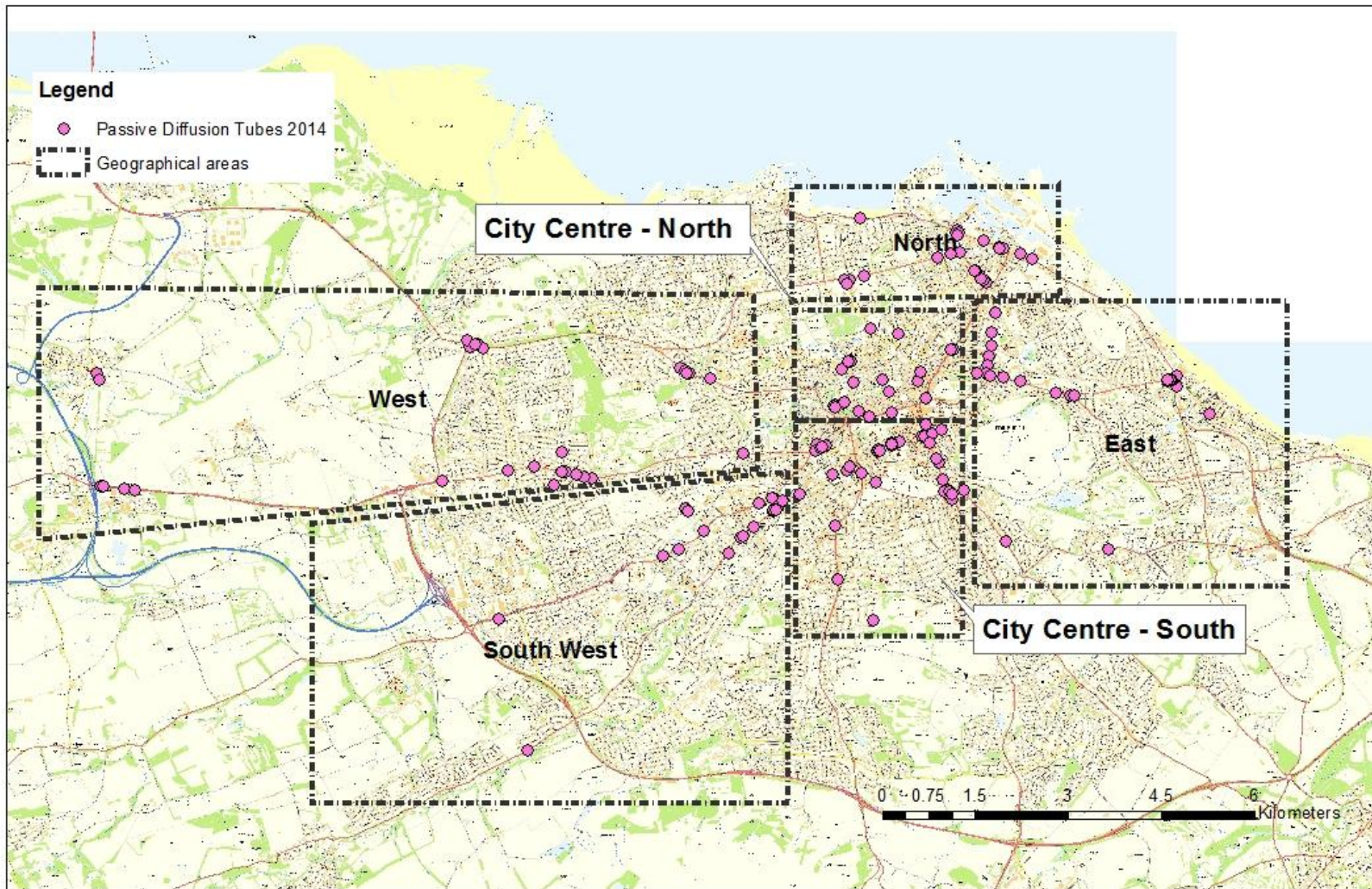
- **City Centre North**

- **City Centre South**
 - Bridges
 - Haymarket etc.
 - Morningside

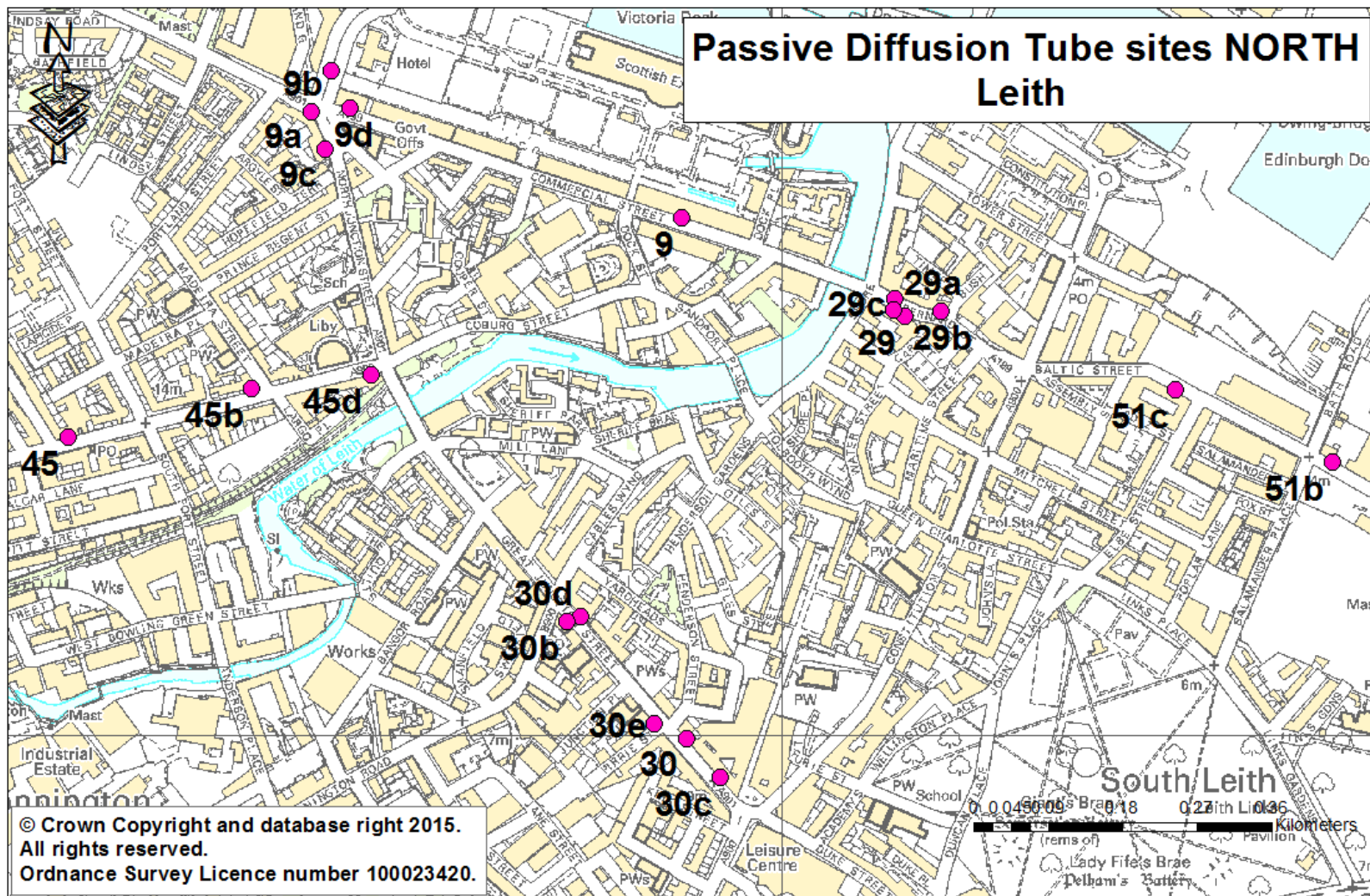
- **West**
 - Queensferry Road
 - Hillhouse Road & Roseburn
 - St John's Road
 - Newbridge & Kirkliston

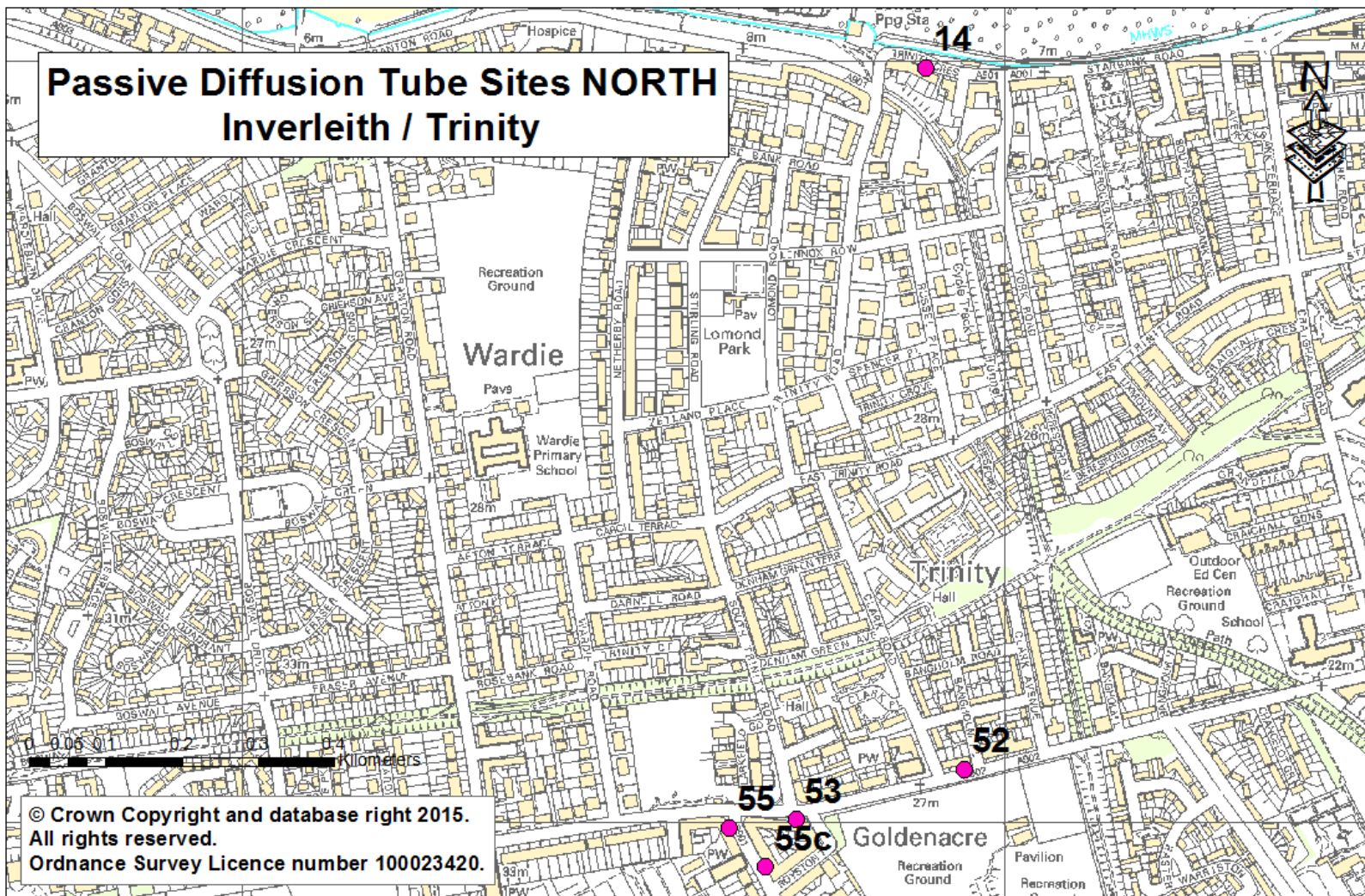
- **South West**
 - Slateford / Gorgie
 - Lanark & Calder Road

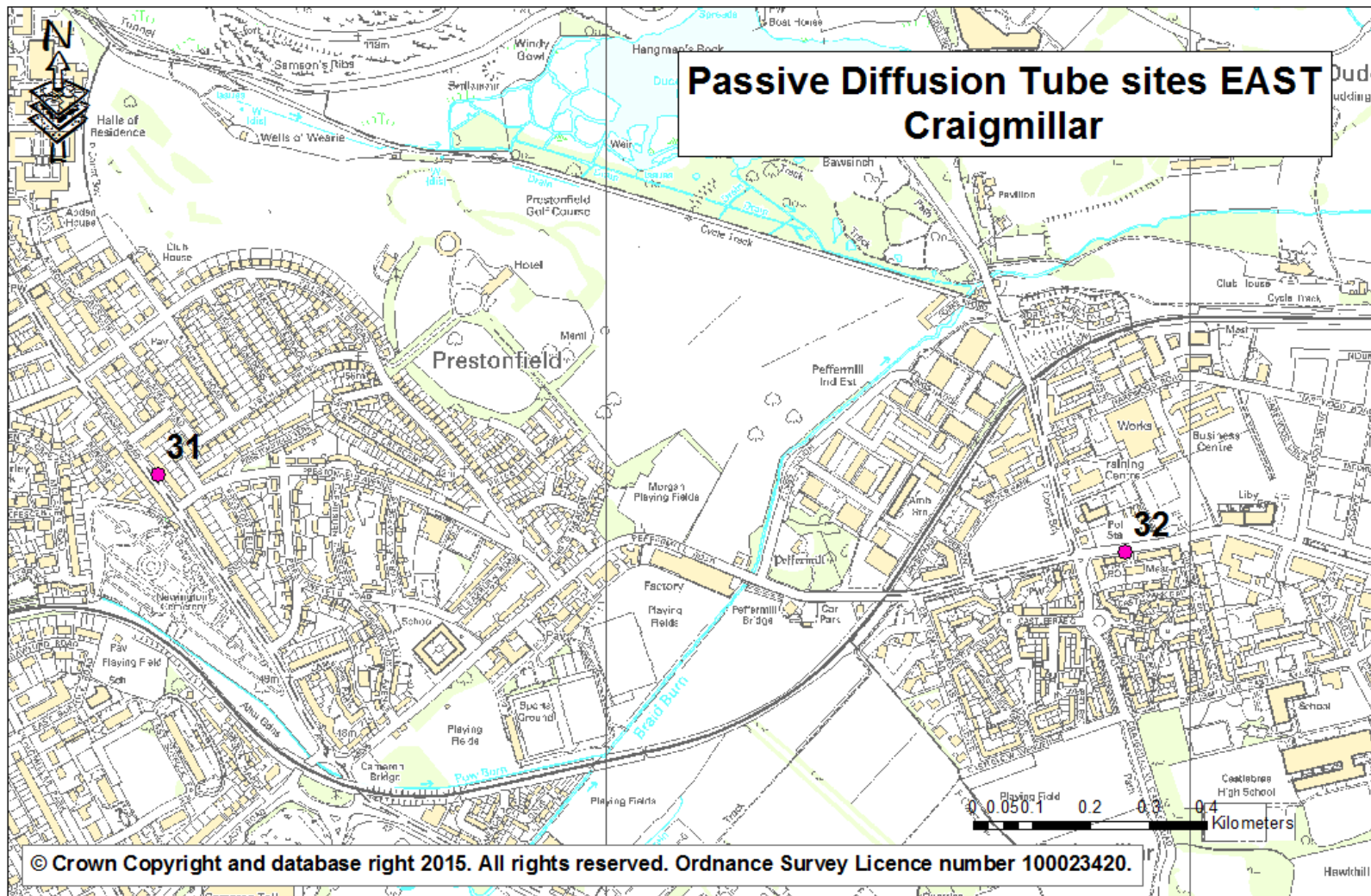
Geographical Areas of Passive Diffusion Tube Monitoring Sites 2014

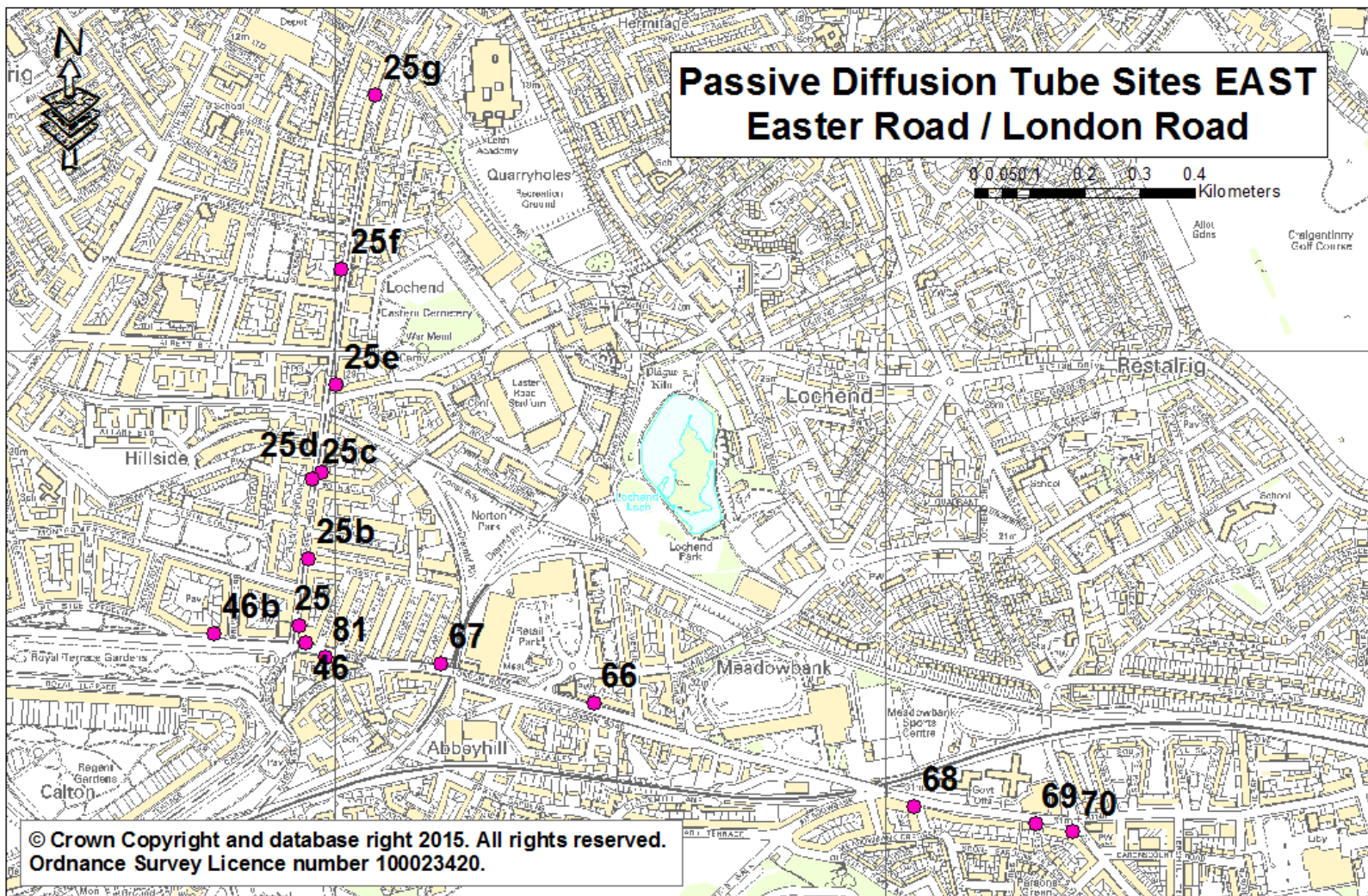


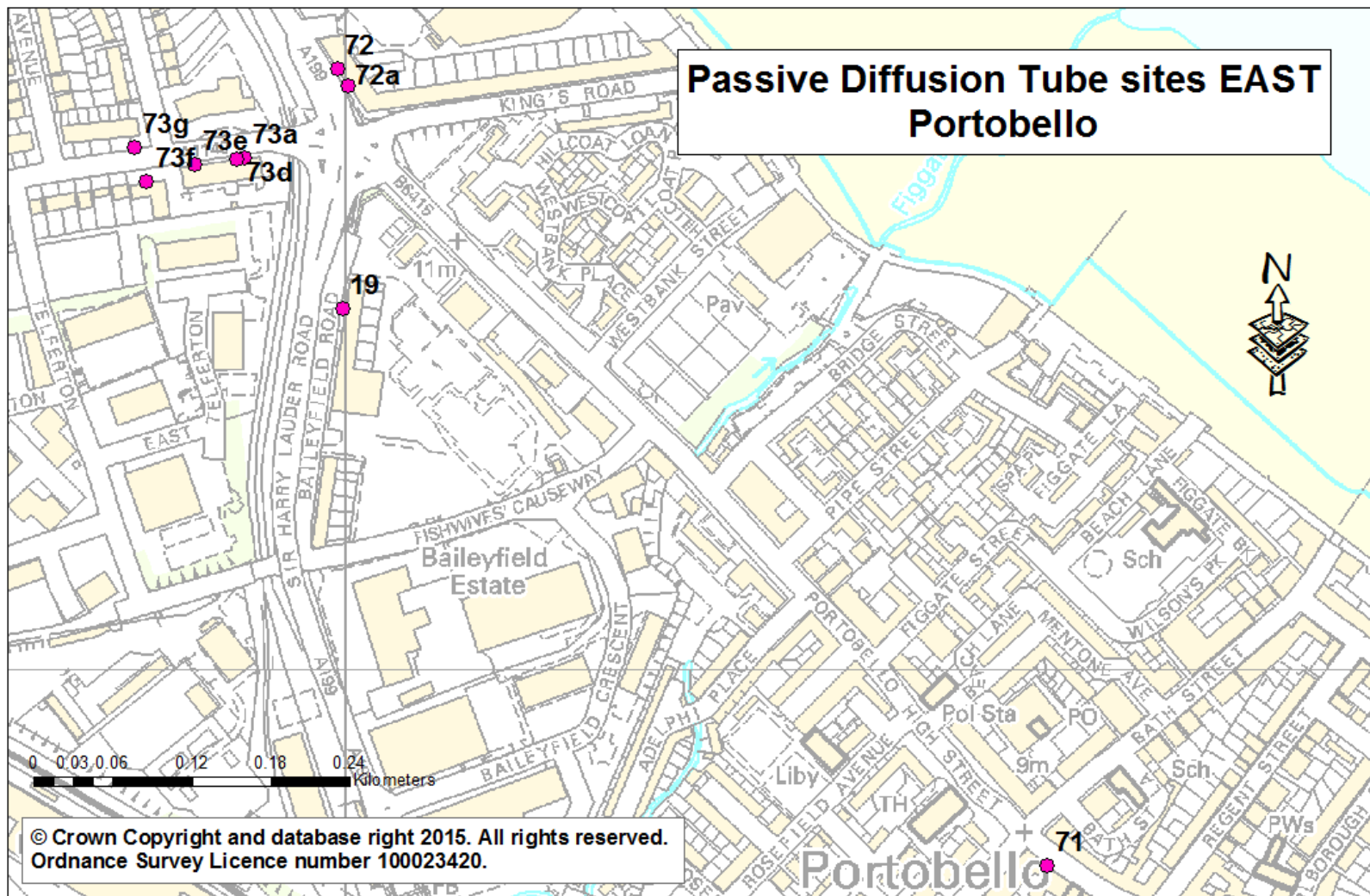
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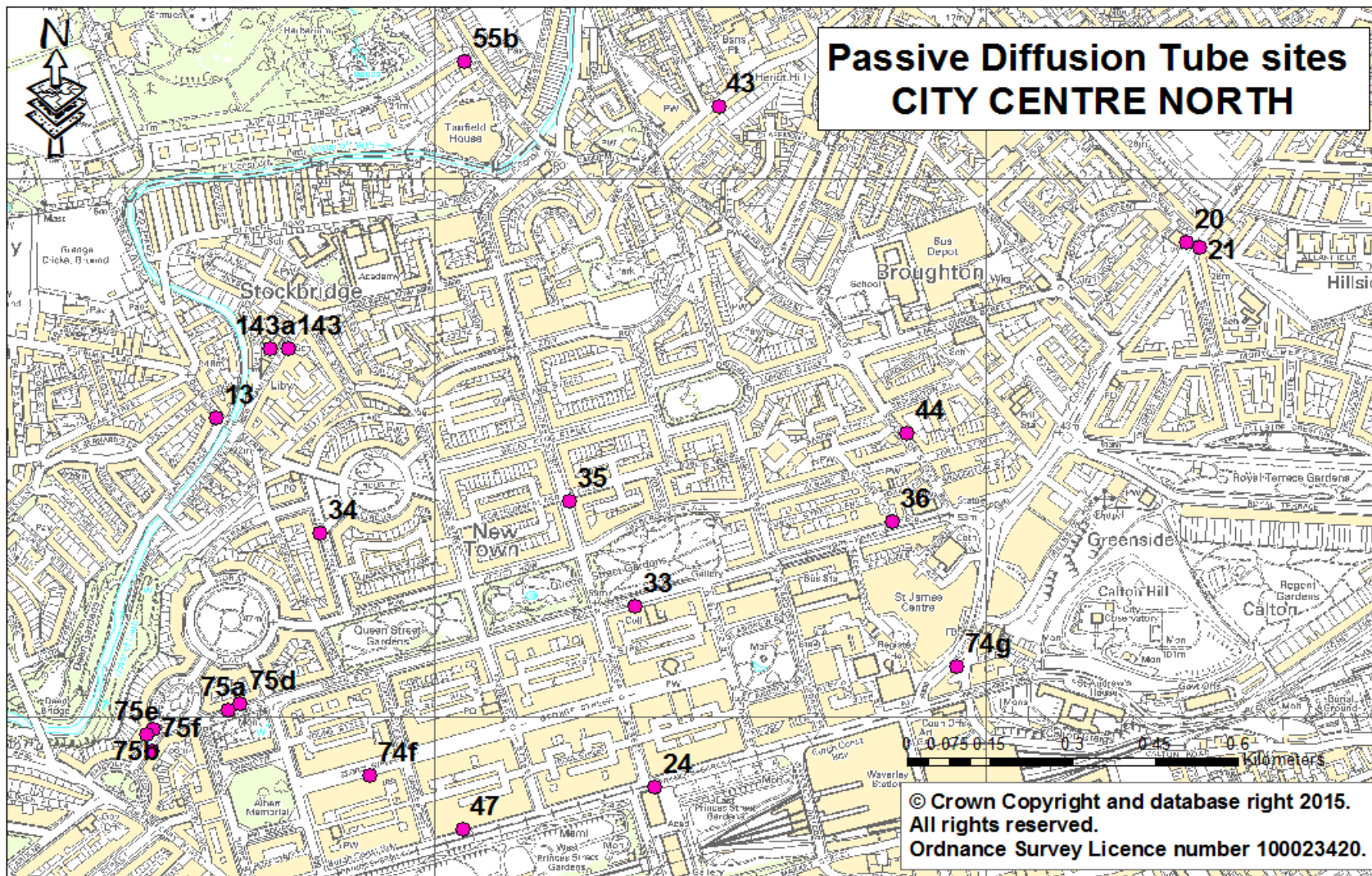


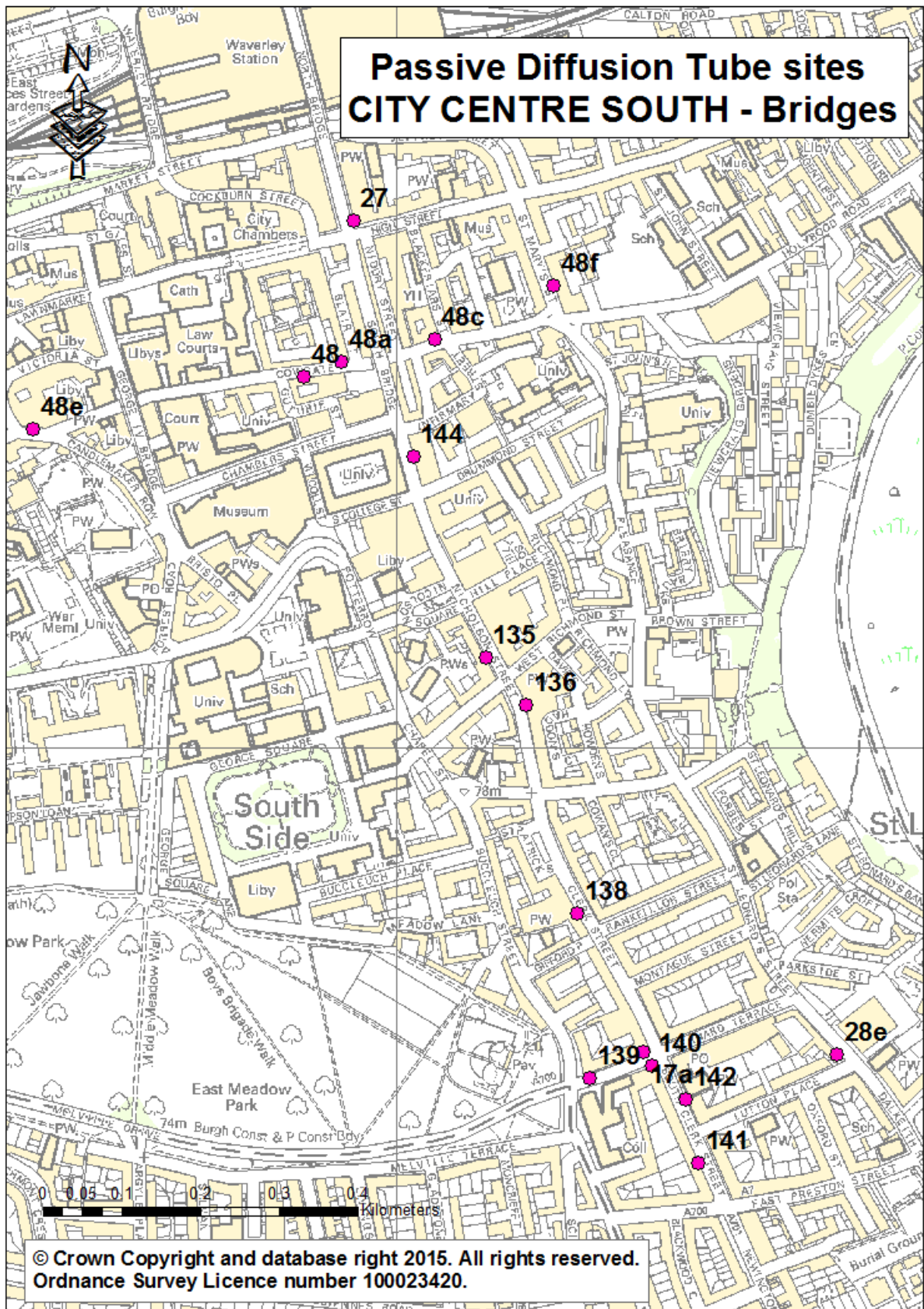


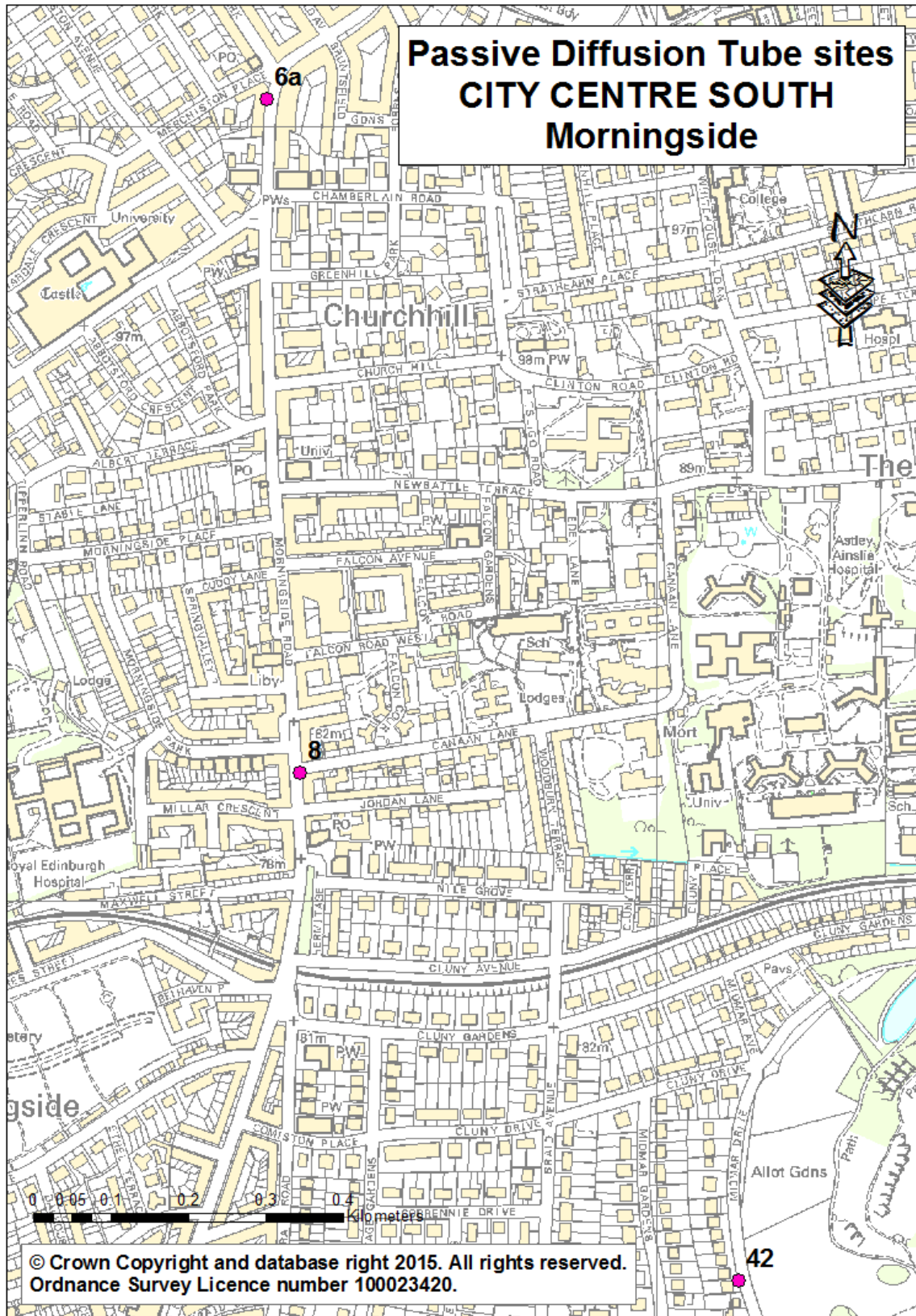


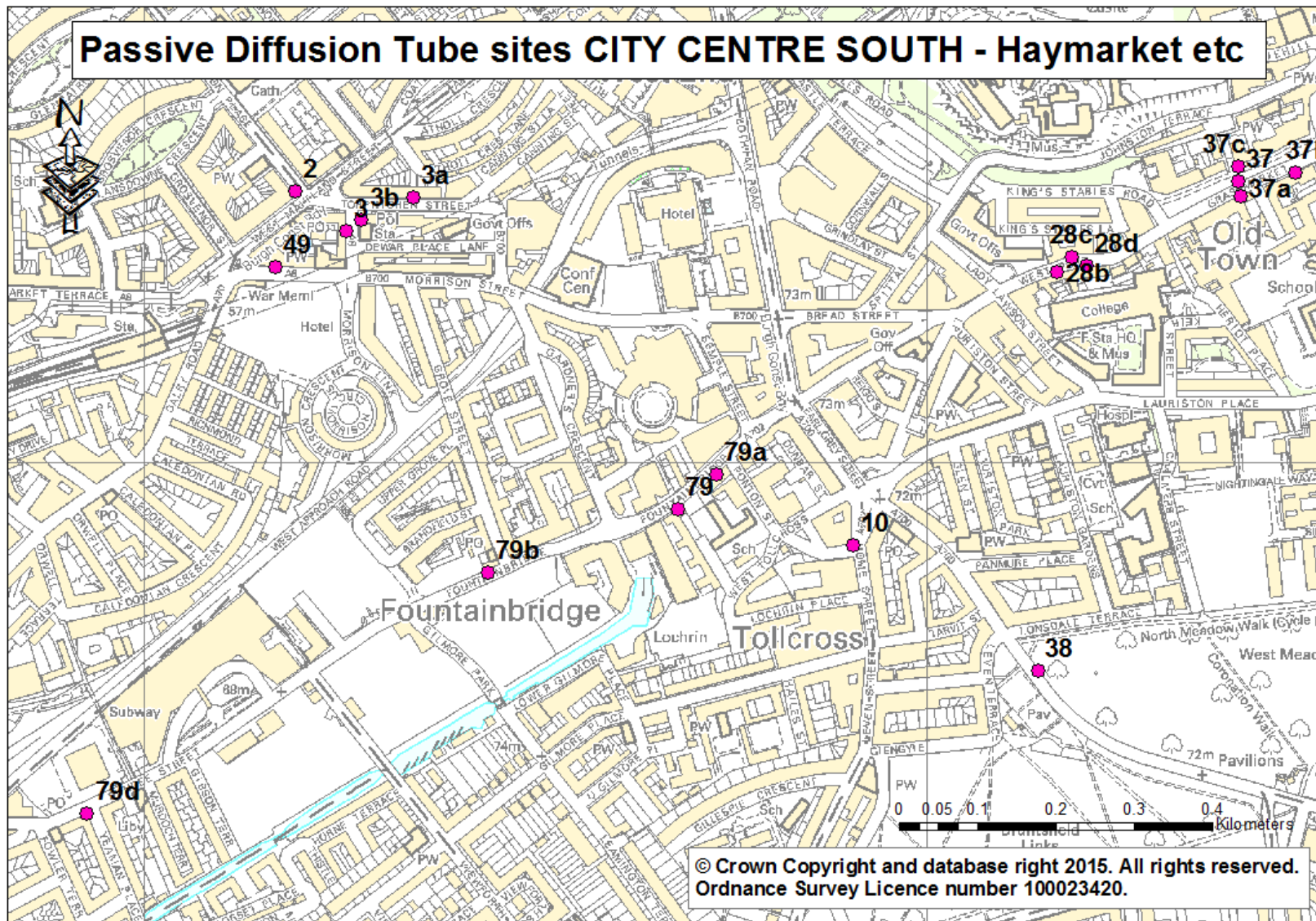


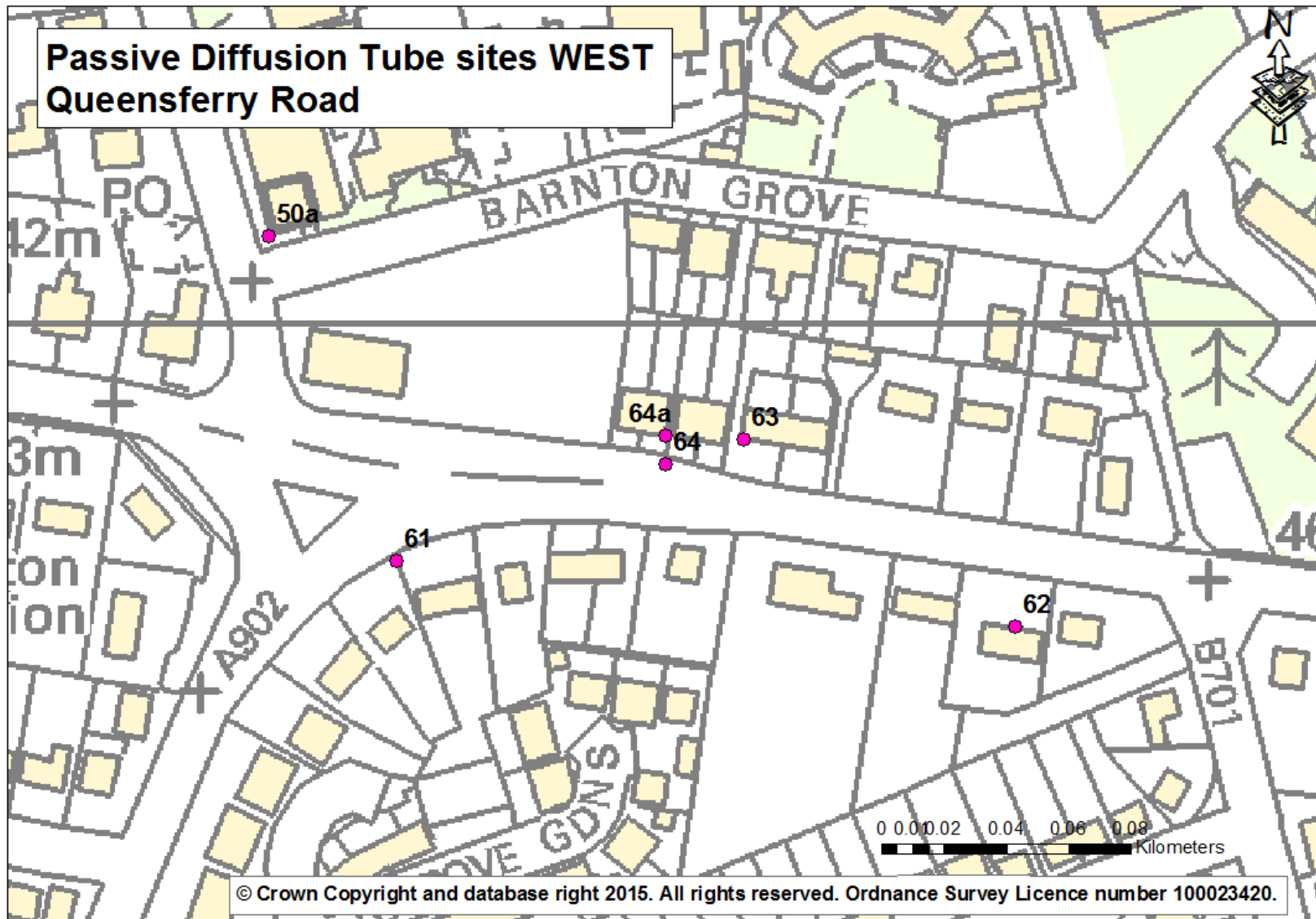


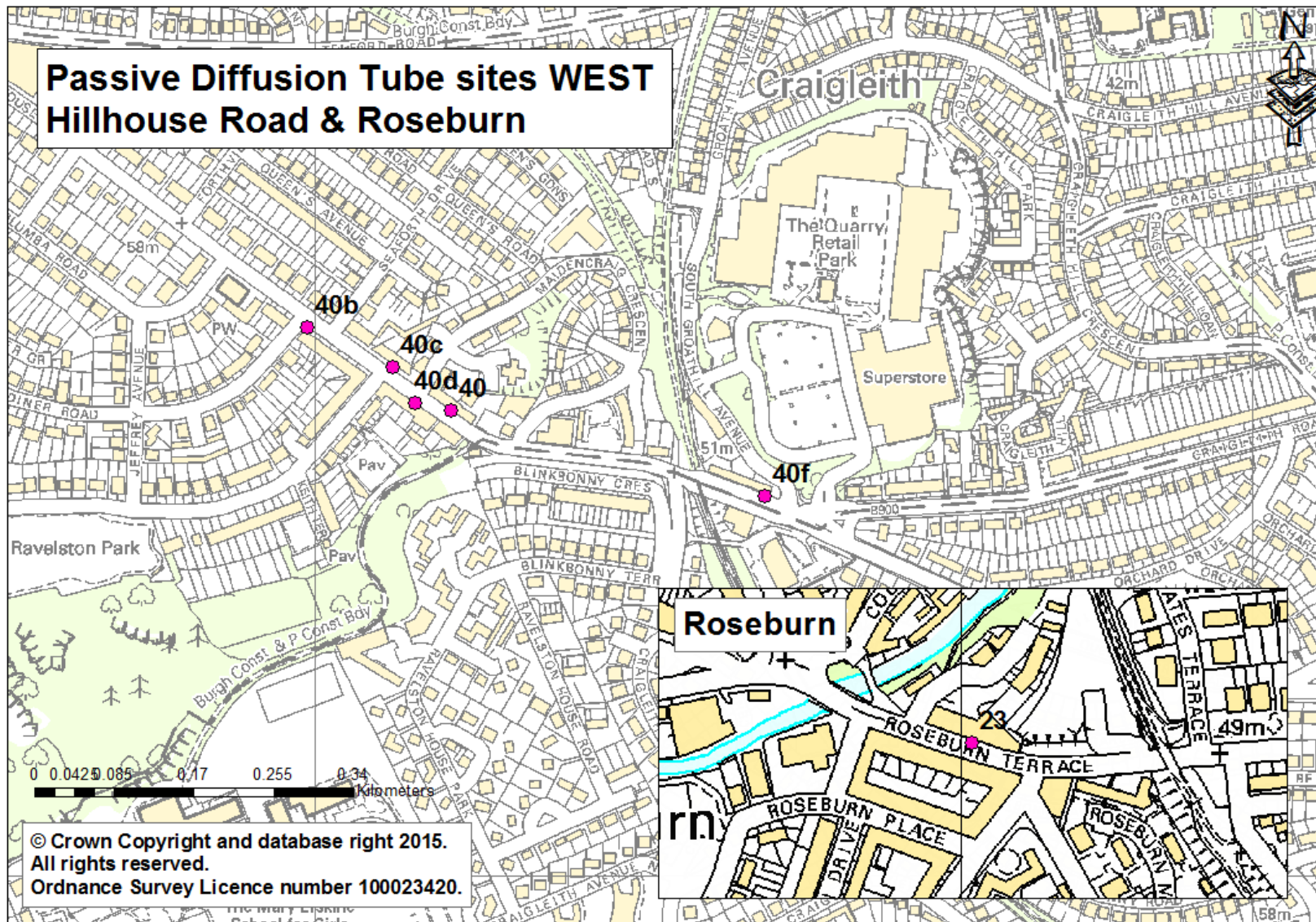


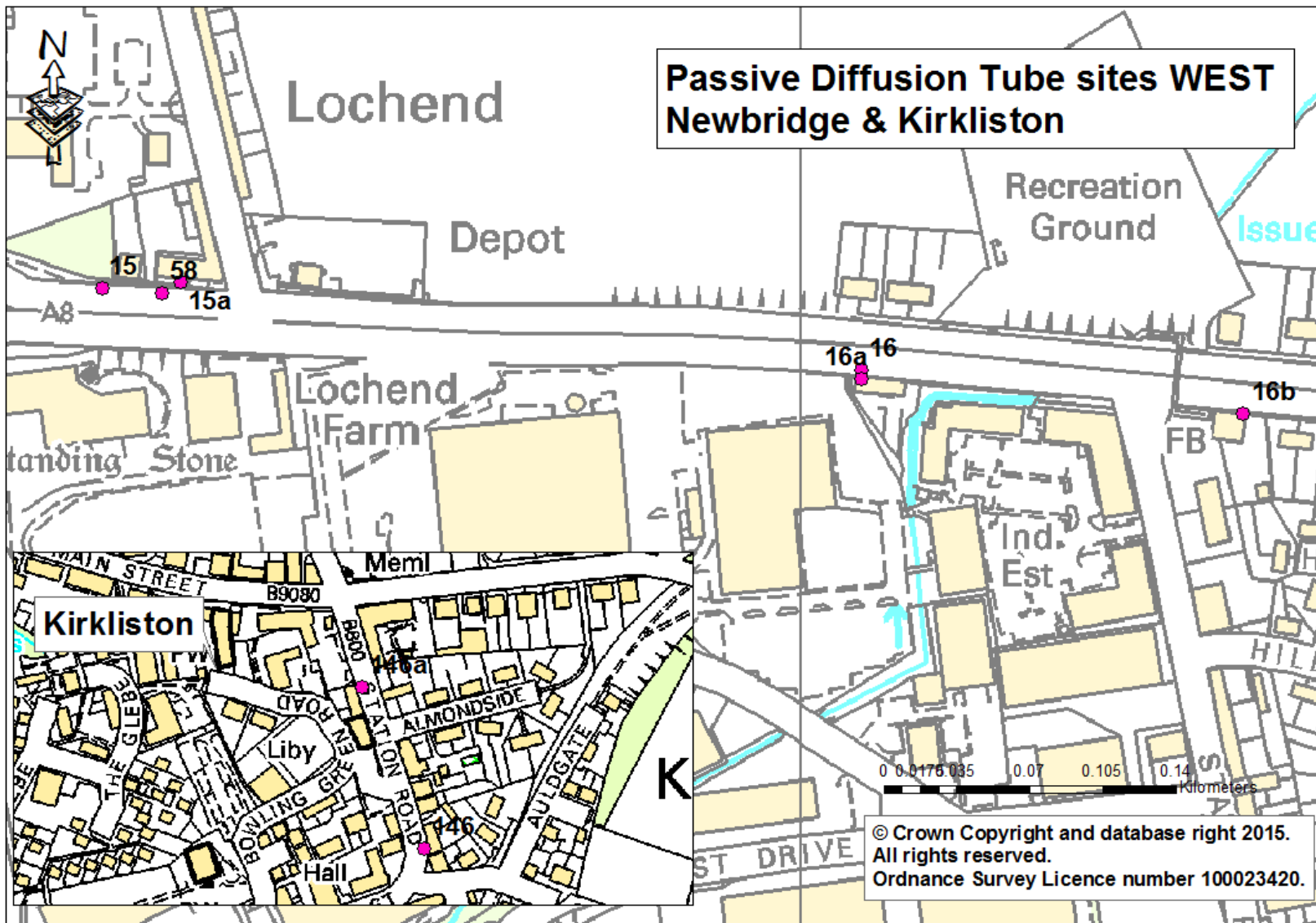


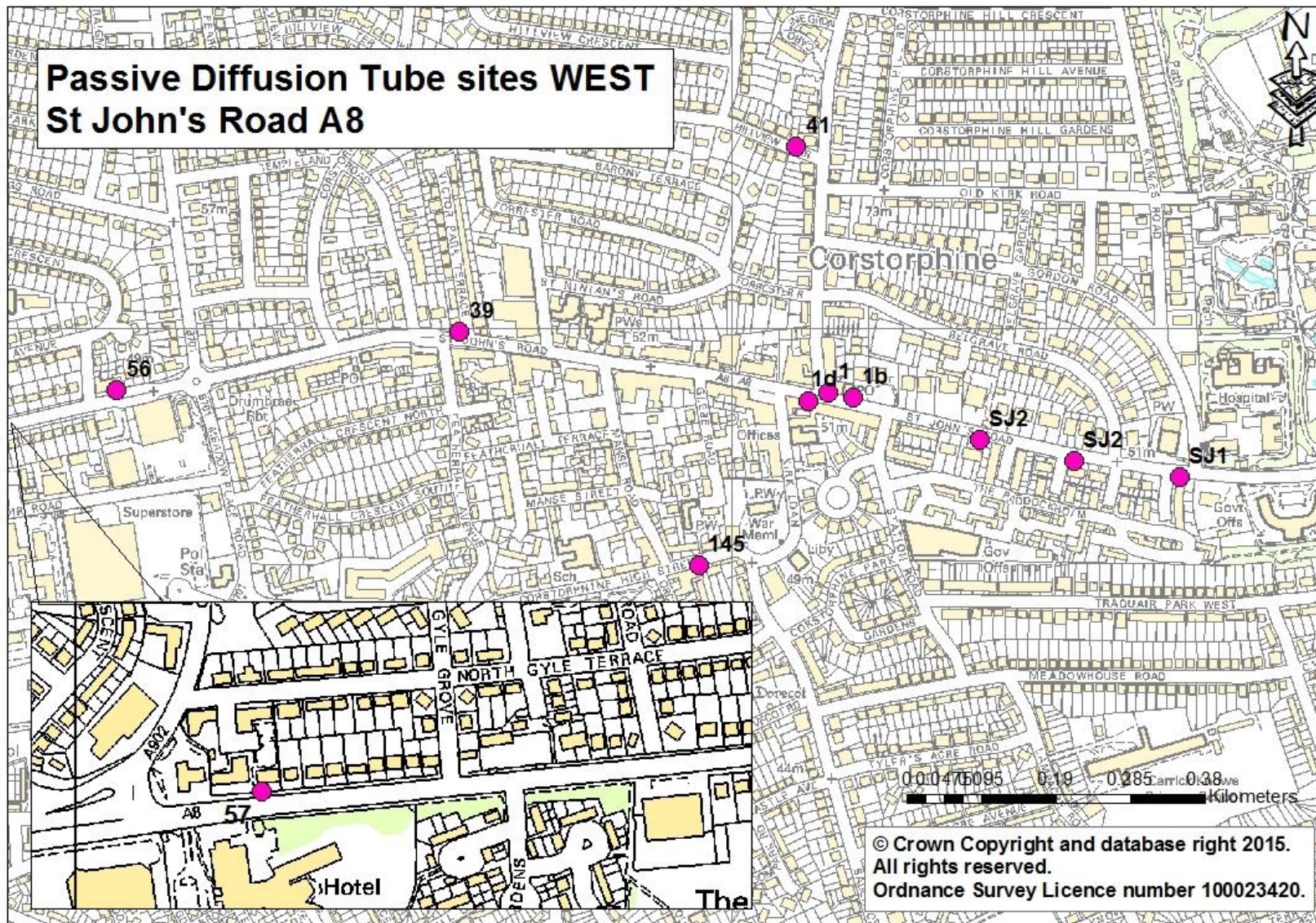


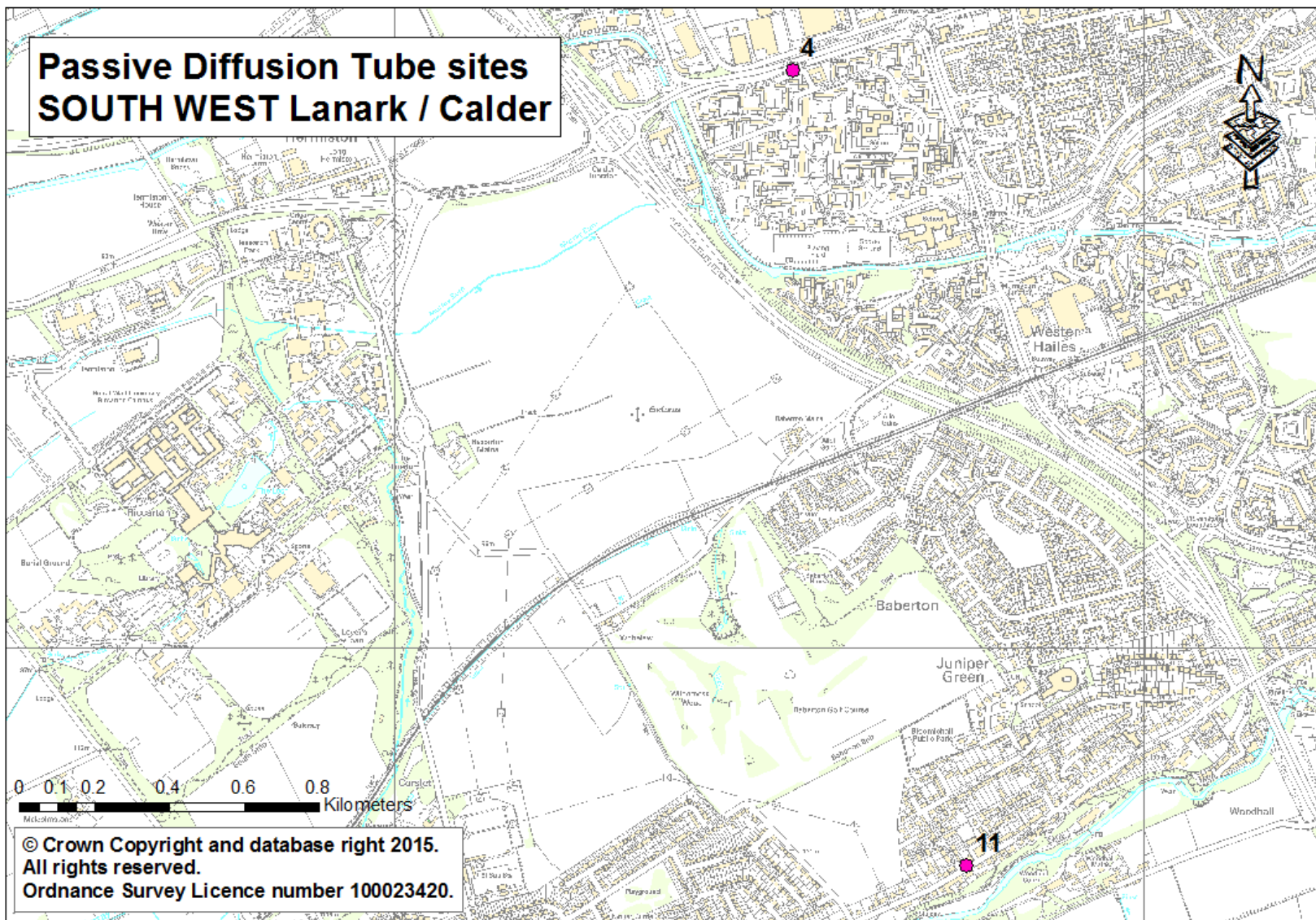


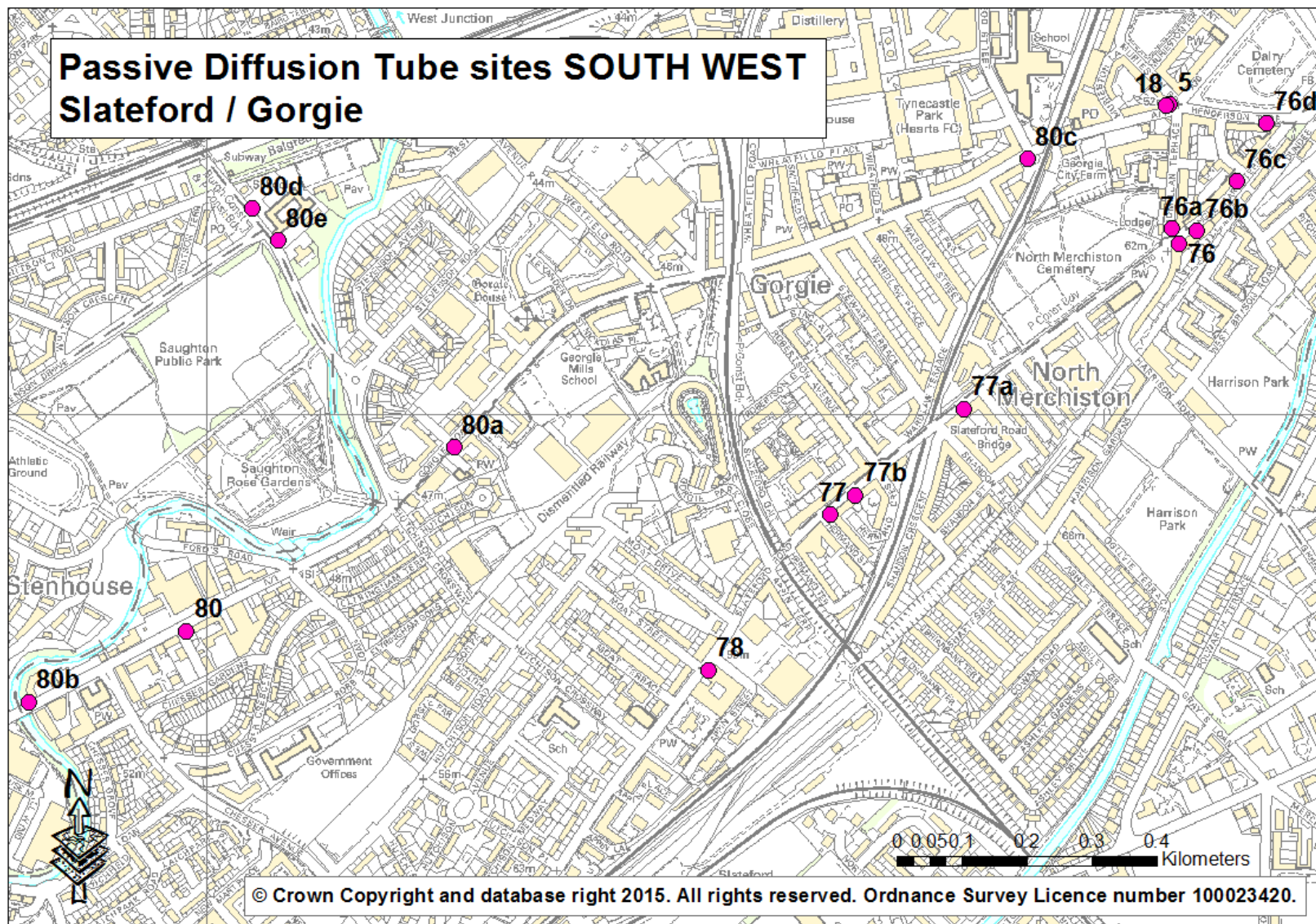












Appendix C: Raw Passive Diffusion Tube Data 2014

Data highlighted in bold and red was excluded from the annual set due to very low or extremely high values that were not in keeping with the monitoring location nor related to pollution episodes.

See notes at the end of this section for an explanation of the abbreviated letters.

	Site No.	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Mean	Corrected
NORTH															
Bernard Street/Sainsburys	29	44.5	48.0	46.2	31.7	39.0	32.7	35.0	41.7	40.3	42.9	47.9	59.9	42.5	
Bernard Street/King Chambers	29a	48.1	47.7	32.8	47.6	49.0	47.6	42.1	37.1	46.7	45.3	47.8	48.3	N/A	46.1 *
Bernard Street/King Chambers	29a	48.3	48.3	30.5	44.4	38.4	40.4	40.0	35.6	43.2	46.1	54.4	59.3	N/A	45.3 *
Bernard Street 32	29b	38.6	37.6	37.5	36.3	35.9	28.0	31.8	30.0	36.9	36.3	36.2	40.6	35.5	
Bernard Street/PS	29c	56.5	63.0	49.6	39.7	51.5	43.9	42.9	40.1	51.4	56.6	62.6	57.5	51.3	
Bernard Street/PS	29c	66.9	59.7	48.9	44.8	53.2	41.5	47.7	46.3	48.5	56.8	77.5	67.1	54.9	
Commercial Street/Job Centre	9d	49.6	55.7	M	62.9	75.5	67.9	M	M	59.8	M	66.5	54.7	N/A	56.7 #
Commercial Street 88	9	43.9	33.8	37.5	42.4	47.9	47.6	35.4	31.1	49.1	40.5	M	44.3	41.2	
Commercial Street/Portland Place	9a	57.5	65.2	51.4	M	55.3	48.7	43.5	45.5	M	56.0	59.2	65.2	54.8	
Ferry Road 268	52	50.2	47.5	43.5	M	43.5	20.7	30.7	42.2	42.7	44.6	63.8	57.3	44.2	
Ferry Road/ 6 Bowhill Terrace	53	50.4	53.1	48.0	35.7	46.1	34.2	41.4	35.7	39.9	50.2	55.7	69.2	46.6	
Ferry Road/Maderia Street	45b	25.0	34.8	33.3	32.6	34.3	34.2	25.1	28.8	33.9	32.8	37.5	41.5	32.8	
Ferry Road 128/North Fort Street	45	32.8	32.4	46.7	48.4	47.3	49.2	41.3	M	37.3	34.5	46.0	M	41.6	
Ferry Road/North Junction Street	45d	55.7	54.0	42.7	40.5	42.3	39.2	34.4	34.2	43.4	44.6	51.0	61.2	45.3	
Great Junction Street 137	30b	52.3	46.9	43.4	40.1	46.5	37.7	41.1	44.9	43.6	41.5	M	55.6	44.9	
Great Junction Street 14	30c	54.5	47.6	46.8	58.2	53.0	49.7	56.5	36.4	54.5	46.8	63.2	37.6	50.4	
Great Junction Street/WC	30d	44.4	43.7	45.5	42.1	52.3	58.0	49.4	35.2	48.9	34.4	60.1	37.0	45.9	
Great Junction Street/Pirie St	30e	M	44	M	43.4	55.8	M	46.7	35.8	46.4	44.7	62.2	M	N/A	44.1 #
Great Junction Street/FV	30	57.4	M	54.4	57.6	55.4	M	56.8	M	M	48.8	M	40.3	N/A	
Great Junction Street/FV	30	58.5	M	M	56.8	64.1	M	47.6	M	M	48.0	M	47.7	N/A	

City of Edinburgh Council

	Site No.	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Mean	Corrected
Inverleith Row/Ferry Road	55	60.6	55.9	53.6	44.5	56.9	53.2	49.3	43.2	51.4	52.9	65.5	48.5	53.0	
Inverleith Row/Ferry Road	55	52.0	56.7	52.1	53.7	61.6	52.1	42.6	21.3	48.7	51.4	68.0	54.1	N/A	53.9 *
Inverleith Row/Café Montague	55c	35.4	35.9	37.4	47.0	45.5	48.0	39.6	M	34.7	34.3	54.5	23.6	39.6	
North Junction St nr 4	9c	37.9	46.1	41.8	M	44.5	42.0	36.1	38.0	36.4	38.5	45.5	56.5	42.1	
Ocean Drive/Leith	9b	40.1	36.6	40.1	40.5	38.8	38.6	31.1	31.0	30.5	32.4	43.6	43.1	37.2	
Salamander Street/Baltic Street	51c	48.7	48.3	37.0	34.4	M	26.1	26.4	31.5	33.7	46.4	48.6	59.6	40.1	
Salamander Street/Bath Road	51b	42.7	32.4	39.8	47.2	47.0	51.7	40.9	32.9	49.5	36.2	53.4	45.6	43.3	
Trinity Crescent	14	51.6	47.0	41.3	31.9	M	27.5	24.1	20.7	33.2	34.6	41.3	42.0	35.9	
EAST															
Baileyfield Road	19	29.7	25.7	21.3	22.8	21.5	M	24.4	19.8	M	23.7	M	39.1	25.3	
Dalkeith Road 187	31	37.0	29.8	32.5	42.9	47.2	44.5	34.6	26.4	40.6	33.4	47.2	M	37.8	
Easter Road/CH shop	25	M	47.5	55.4	57.7	8.5	56.0	56.7	M	M	42.6	66.2	47.3	N/A	52.1* #
Easter Road/Rossie Place	25b	M	45.0	M	M	44.4	39.5	M	30.5	43.3	41.3	52.0	43.8	N/A	42.1 #
Easter Road 105/109	25c	43.0	42.3	36.6	38.2	35.2	34.0	32.1	37.3	42.5	40.9	47.4	44.4	39.5	
Easter Road/Bothwick	25d	50.0	35.3	37.6	44.8	43.6	38.0	37.8	29.2	39.5	37.0	49.2	47.4	40.8	
Easter Road 198	25e	40.8	35.4	M	44.0	38.9	38.7	<1.0	58.1	31.8	M	46.3	38.2	N/A	41.4 *
Easter Road 217	25f	39.3	31.6	32.1	31.9	M	26.9	26.0	26.0	31.2	M	41.3	41.9	32.8	
Easter Road 327	25g	38.0	35.7	32.8	32.3	28.6	25.6	26.0	27.6	28.2	34.8	44.9	41.9	33.0	
London Road/Brunton Pl	46b	37.9	32.2	37.3	38.0	39.8	32.6	38.8	37.3	41.7	33.1	45.7	41.9	38.0	
London Road/East Norton Place	81	70.6	69.6	54.4	54.7	46.5	43.4	51.8	49.5	55.9	64.1	59.2	75.0	57.9	
London Road/Earlston Place	67	43.5	47.4	56.4	M	M	M	63.6	48.7	M	54.7	63.0	56.2	N/A	53.1 #
London Road/Parson's Green Ter	68	34.0	33.3	39.6	42.2	35.7	M	36.0	37.9	43.3	32.4	44.2	41.8	38.2	
London Road/Wolseley Place	69	63.4	58.9	43.7	51.1	51.4	45.0	47.7	48.5	51.3	70.5	64.7	86.4	56.9	
London Road/Wolseley Terrace	70	62.4	48.9	44.0	M	48.0	39.0	45.3	53.2	48.2	57.0	43.2	75.6	51.3	
London Road/Cadzow Place	66	31.5	36.0	45.0	50.4	46.1	M	45.5	39.7	44.5	34.8	51.7	<1.0	N/A	42.5 *
London Road/junct Easter Road	46	42.2	48.6	47.6	M	55.3	M	M	42.3	45.8	37.4	M	50.8	N/A	51.4 #
Niddrie Mains Road 28	32	54.3	40.8	36.7	40.0	46.2	42.8	43.8	34.3	36.2	43.3	58.2	43.5	43.3	

City of Edinburgh Council

	Site No.	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Mean	Corrected
Portobello High Street W 185	71	52.2	53.1	39.3	37.6	39.7	M	M	37.2	39.8	40.0	M	M	N/A	43.7 #
Portobello Road/Ramsay Institute	73a	69.8	25.6	38.7	54.8	M	46.4	M	46.0	50.2	57.7	58.9	44.5	N/A	51.9 *
Portobello Rd facade Ramsay Inst	73d	59.8	55.2	41.5	49.0	44.3	23.0	43.4	36.7	49.7	53.5	58.0	53.1	47.3	
Portobello Rd Lp PJJ93	73e	59.9	47.8	M	52.8	46.6	49.7	M	34.8	46.6	42.7	61.3	47.7	49.0	
Portobello Rd/College Crt	73f	28.7	62.5	21.2	M	23.8	24.3	22.0	18.7	25.8	24.7	31.6	22.4	N/A	24.3 *
Portobello Rd/Inchview Terr	73g	37.9	34.5	36.2	47.5	40.2	41.5	38.6	30.8	M	38.7	45.5	48.8	40.0	
Seafield Road East 10	72	49.4	38.7	42.5	54.1	57.7	50.6	46.4	30.5	19.0	36.4	52.7	30.0	44.5	44.5 *
Seafield Road East 7	72a	46.7	39.4	40.0	54.8	52.3	55.3	46.2	36.2	38.9	39.1	55.7	36.8	45.1	
CITY CENTRE - NORTH															
Broughton Road	43	54.1	56.9	49.6	46.8	49.4	42.0	43.8	34.8	42.7	48.1	61.8	44.5	47.9	
Broughton Street	44	45.8	44.2	39.0	46.5	46.4	M	37.1	28.4	39.7	43.6	54.8	35.9	41.9	
Deanhaugh Street	13	50.6	41.1	46.3	44.5	40.7	36.7	29.1	32.8	36.2	39.2	50.9	43.5	41.0	
Dundas Street	35	52.6	9.0	39.4	M	38.4	30.5	26.7	M	35.6	37.4	62.8	36.8	N/A	40.0 *
George Street 112	74f	51.2	35.8	42.3	40.7	49.2	35.5	35.5	29.4	37.7	33.5	54.0	41.2	40.5	
Gt Stuart Street 7	75b	42.5	45.3	41.6	35.7	35.2	30.2	29.7	31.4	37.0	M	47.5	48.4	38.6	
Gt Stuart Street 14	75f	31.7	36.5	31.6	29.4	31.5	25.7	27.3	23.4	28.4	34.3	46.8	34.2	31.7	
Gt Stuart Street 9	75e	38.4	27.8	29.9	29.7	29.3	23.4	25.0	27.8	29.1	32.7	42.0	41.9	31.4	
Hamilton Place 72	143	47.1	46.0	38.2	36.0	36.0	26.3	25.1	23.7	34.2	39.6	58.8	35.6	37.2	
Hamilton Place/Stockbridge Libr.	143a	62.2	48.2	40.2	34.2	40.9	35.9	38.2	33.0	43.8	51.6	83.3	55.6	47.3	
India Street	34	75.2	32.9	26.6	25.0	24.0	16.7	19.4	18.1	INV	28.2	46.1	30.2	N/A	26.7 *
Inverleith Row/Summer Place	55b	47.3	36.1	37.4	34.6	30.7	26.2	31.2	32.0	35.0	40.7	57.4	37.1	37.1	
Leith Street 35	74g	69.4	M	66.1	64.3	M	M	M	57.5	M	M	62.6	M	N/A	
Leith Walk/Brunswick Road	21	54.7	57.8	48.6	44.1	47.3	38.6	M	38.1	43.3	49.8	52.8	46.7	47.4	
Leith Walk/McDonald Road	20	39.4	50.6	M	45.6	53.5	42.1	38.4	36.2	40.1	42.7	46.3	45.1	43.6	
Princes Street (Eastbound)	47	50.7	47.3	52.9	64.9	70.6	60.3	61.7	52.5	57.1	40.5	56.1	51.1	55.5	
Princes Street/Mound	24	M	M	M	M	M	M	M	84.0	M	81.2	66.4	90.6	M	N/A
Queen Street/Hanover Street	33	67.5	63.0	M	M	63.4	M	M	M	59.2	54.5	M	68.3	N/A	

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St Colme Street	75a	42.1	46.5	42.3	50.9	57.1	49.8	51.2	39.6	INV	38.6	54.5	47.8	N/A	46.6 *
St Colme Street/4	75d	35.4	33.7	35.6	36.3	41.8	36.6	39.5	30.7	42.1	28.7	65.1	37.2	N/A	36.1 *
York Place	36	45.1	45.2	41.6	42.0	49.5	42.9	42.8	35.4	46.3	47.8	55.9	58.6	46.1	
CITY CENTRE - SOUTH															
Bruntsfield Place 210	6a	41.6	M	38.0	M	49.0	45.8	M	40.5	45.7	38.4	58.4	37.1	43.8	
Clerk Street 15	138	64.4	60.0	M	41.7	M	41.1	47.2	49.4	50.0	52.2	61.2	53.1	52.0	
Cowgate/Guthrie Street	48	50.8	41.2	44.7	41.6	53.9	45.8	41.8	41.0	43.9	36.2	49.5	50.3	45.1	
Cowgate/Blair Street	48a	52.1	38.4	55.4	47.6	51.8	M	46.3	45.3	47.4	34.5	64.8	46.6	48.2	
Cowgate/ 50 St Mary's Street	48f	M	M	54.5	44.5	56.4	57.4	43.7	53.9	M	41.0	52.7	44.1	49.8	
Cowgate/Blackfriars	48c	46.8	M	46.3	43.3	M	M	50.5	M	52.8	44.4	49.1	58.0	N/A	45.5 #
Cowgatehead 2	48e	38.0	35.8	41.7	52.4	61.9	M	M	48.5	53.8	35.7	M	57.1	47.2	
Dundee Street/Yeaman Place	79d	M	56.6	57.8	M	M	58.5	M	47.7	58.4	54.9	59.9	56.4	N/A	55.7 #
Fountainbridge 103	79a	48.2	42.1	M	47.4	58.9	M	40.9	39.7	48.6	43.3	52.9	39.2	46.1	
Fountainbridge Grove Street	79b	26.0	24.2	37.4	39.6	39.6	28.4	31.1	29.1	34.5	26.1	40.2	M	32.4	
Fountainbridge/Tollcross	79	50.2	46.4	48.0	52.3	49.7	41.3	39.9	38.4	45.8	41.3	46.5	46.4	45.5	
Grassmarket/PS adjacent lpost	37	M	M	M	M	57.7	M	56.7	48.3	M	M	M	68.2	N/A	
Grassmarket 41	37a	M	68.7	37.9	53.0	59.3	42.5	M	71.8	76.9	M	INV	65.9	N/A	
Grassmarket 41	37a	68.7	83.9	43.4	56.3	49.7	45.5	M	60.0	52.0	63.1	INV	48.5	N/A	54.1 *
Grassmarket 75	37b	53.4	39.6	45.7	45.3	48.0	46.2	47.7	45.8	47.2	38.6	55.9	51.6	47.1	
Grassmarket/nrThomsons Court	37c	35.3	29.5	31.1	35.0	37.4	31.6	35.0	34.7	35.3	28.9	33.3	35.9	33.6	
Home Street/Tollcross	10	M	30.8	M	M	M	M	36.2	36.9	41.0	35.3	44.9	35.3	N/A	37 #
Hope Park Terrace/VS	17a	46.3	45.5	46.0	51.0	57.7	52.7	45.7	40.3	51.6	38.6	47.1	51.2	47.8	
Hope Park Terrace/VS	17a	47.1	42.0	44.8	52.2	53.5	50.6	43.3	44.2	48.3	33.6	54.5	43.3	46.5	
Hope Park Terrace 5	139	42.2	33.2	38.4	46.2	43.7	36.8	30.7	34.5	47.2	33.5	45.8	32.5	38.7	
Hope Park Terrace/Clerk Street	140	61.8	50.9	46.1	43.2	44.7	44.9	41.5	37.9	M	43.5	56.1	55.4	47.8	
Melville Drive	38	31.3	29.1	33.3	27.4	33.4	28.6	27.4	33.9	35.2	28.5	41.4	40.6	32.5	
Midmar Drive	42	19.0	15.4	18.2	14.0	17.2	17.2	14.6	14.8	19.1	19.0	25.7	19.9	17.8	

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Morningside Road	8	M	27.6	M	M	M	M	30.5	26.2	38.0	32.4	42.0	31.1	N/A	31.9 #
Morrison Street	49	50.0	49.7	59.4	M	71.0	56.3	61.9	44.0	54.0	M	33.9	51.1	53.1	
Nicholson Street 69	135	59.2	56.8	64.1	49.2	67.6	60.9	63.7	44.0	56.9	58.0	57.6	59.5	58.1	
Nicholson Street 92	136	56.3	48.0	43.7	47.8	63.2	57.3	52.3	72.6	51.0	M	M	35.8	52.8	
North Bridge South	27	63.2	48.1	72.2	66.3	85.5	72.6	69.6	M	59.1	51.9	63.3	M	65.2	
South Bridge 59	144	73.4	66.2	62.0	58.4	70.1	71.0	59.5	55.1	M	56.5	72.6	47.1	62.9	
South Clerk Street 41a	142	49.0	53.1	39.1	52.7	60.3	50.9	40.0	39.6	48.6	43.9	53.1	47.3	N/A	48.9 *
South Clerk Street 84	141	54.4	51.2	50.5	45.4	56.1	51.4	48.4	47.4	50.4	49.3	63.0	50.5	51.5	
St Leonards 145A	28e	38.8	41.2	38.3	34.6	25.3	32.2	31.8	42.2	39.8	38.0	44.5	55.0	38.5	
Torphichen Place/Chiropractice	3	53.4	48.3	59.2	66.6	66.4	40.7	63.1	63.5	55.3	62.5	61.5	60.0	58.4	
Torphicen Place 1	3b	58.3	57.9	53.5	63.8	59.8	54.5	59.3	50.4	62.1	59.4	82.8	62.5	60.4	
Torphichen Street	3a	39.8	39.5	43.3	45.7	46.1	39.7	36.5	36.9	39.5	42.5	45.1	45.3	41.7	
West Maitland St/Palmerston Pl	2	71.7	103.0	83.6	M	81.5	M	74.5	63.4	75.4	75.8	INV	85.7	79.4	
West Port 62	28b	M	72.0	M	M	95.5	M	52.4	M	M	70.1	88.5	87.6	N/A	75.4 #
West Port Opp 50	28c	49.4	49.0	M	52.5	68.0	M	M	M	56.3	51.5	46.7	M	N/A	
West Port 42	28d	73.3	78.1	65.7	66.4	73.9	53.2	63.5	72.2	71.5	61.5	73.8	71.6	68.9	68.9 *
WEST															
Corstorphine High Street 9	145	35.7	40.9	34.8	33.3	32.4	30.2	28.2	27.5	36.3	36.5	58.9	41.6	36.4	
Glasgow Road/Drumrae R'about	56	45.6	M	43.2	47.8	38.3	42.4	37.4	31.1	39.6	38.3	70.7	40.2	43.1	
Glasgow Road 158	57	60.4	49.1	52.1	49.7	54.0	51.1	6.1	43.2	52.7	49.0	70.3	55.0	N/A	53.3 *
Glasgow Road 68/adj	16	64.8	59.3	55.4	54.3	47.9	70.4	56.0	63.2	78.7	54.3	89.7	45.5	61.6	
Glasgow Road 68/ Facade	16a	46.3	39.5	39.7	43.9	55.9	58.4	47.0	45.2	60.8	44.5	M	M	48.1	
Glasgow Road/Ratho Station 94	16b	37.4	29.2	37.9	42.1	48.5	50.5	39.8	42.9	53.8	42.9	54.5	41.3	43.4	
Glasgow Road Newbridge RA	58	67.6	70.1	72.0	55.0	77.7	68.6	69.7	66.5	87.3	77.1	71.7	77.0	71.7	
Glasgow Road Newbridge RA	58	70.6	76.6	61.6	48.3	81.1	68.3	68.5	60.0	69.3	68.1	72.0	79.2	68.6	
Glasgow Road Newbridge RA/3	15	67.8	61.6	54.9	40.6	52.4	43.4	34.1	10.1	50.6	53.2	53.6	62.3	N/A	52.2 *
Glasgow Road Facade/9	15a	51.6	49.7	44.9	36.2	46.9	45.5	47.2	41.3	52.4	40.0	50.2	53.4	46.6	

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	Site No.	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Mean	Corrected
Hillhouse Road 118	40f	42.5	27.8	13.7	M	53.8	52.6	44.0	40.1	49.1	38.4	53.0	28.4	N/A	43.0 *
Hillhouse Road 240	40c	39.4	22.5	30.3	42.7	39.9	41.7	29.2	33.8	39.5	29.9	46.0	24.4	34.9	
Hillhouse Road/Craigcrook Terr	40b	41.3	33.3	38.9	40.4	47.1	41.9	32.7	38.1	41.4	38.5	60.6	27.5	40.1	
Hillhouse Road/Marischall Place4	40d	44.0	43.3	40.8	39.3	35.8	38.3	33.0	36.2	45.4	35.5	47.7	41.0	40.0	
Hillview Terrace	41	27.8	18.7	21.5	19.1	23.7	20.9	21.3	18.9	22.6	24.5	53.2	24.0	24.7	
Maybury Road/Barnton Junction	61	42.4	41.6	38.4	33.4	M	38.7	M	M	34.1	M	45.0	34.9	N/A	35.5 #
Queensferry Road/Hillhouse Rd	40	47.9	37.7	41.6	46.9	40.3	49.0	39.8	39.7	52.2	35.0	53.5	34.4	43.2	
Queensferry Road 544	63	32.3	28.0	29.8	22.8	22.2	28.4	27.1	36.9	30.7	29.5	39.7	41.4	30.7	
Queensferry Road 550	64	83.5	80.1	81.1	94.2	89.4	88.6	98.9	103.6	109.5	87.4	97.3	96.4	92.5	
Queensferry Road 552	64a	39.3	34.6	38.5	40.0	39.3	41.6	38.6	41.3	45.5	36.4	47.5	39.7	40.2	
Queensferry Road 561	62	25.8	19.1	24.6	31.4	28.7	27.1	23.7	26.9	28.8	22.2	34.1	19.9	26.0	
Roseburn Terrace	23	63.0	52.6	54.5	66.0	77.1	70.9	61.4	M	61.0	51.6	85.8	35.6	61.8	
St John's Road SB	1	54.7	43.4	50.2	55.1	60.8	62.6	53.1	37.9	55.3	47.1	67.8	45.5	52.8	
St John's Road IR	1b	51.2	39.7	50.4	48.9	64.4	53.9	52.6	46.1	53.6	46.6	60.6	39.6	50.6	
St John's Road Kaimes Road	SJ1	59.1	50.5	38.1	50.5	49.9	M	M	33.8	46.5	M	73.5	40.5	49.2	
St John's Road 63	SJ2	43.4	40.7	36.3	M	47.6	35.2	33.0	29.8	41.6	36.6	63.1	M	40.7	
St John's Road 81	SJ3	54.6	44.1	47.7	51.6	51.1	M	48.1	40.3	M	47.0	15.1	46.5	N/A	47.9 #
St John's Road 131	1d	78.1	69.6	64.8	60.6	65.3	55.7	56.4	55.7	65.5	61.0	77.6	63.7	64.5	
St John's Road/Victor Park Terr	39	47.5	46.3	44.1	52.8	42.0	49.1	48.8	46.5	49.4	43.5	58.9	53.5	48.5	
Station Road 41 Kirkliston	146	30.3	28.3	25.6	M	M	M	22.4	27.0	38.3	25.8	47.8	32.8	30.9	
Station Road 2 Kirkliston	146a	M	M	M	M	M	30.4	M	M	M	M	35.6	41.9	N/A	
Whitehouse Road/Barnton Grove	50a	48.3	41.1	37.0	33.6	32.8	37.2	M	29.8	42.6	38.0	55.3	38.4	39.5	
SOUTH WEST															
Angle Park Terrace/Harrison Rd	76	59.2	46.4	M	60.2	59.0	M	50.0	52.6	57.7	48.5	66.6	54.6	55.5	
Angle Park Terrace 25	76c	34.4	M	42.1	43.2	38.9	37.4	34.0	37.6	43.1	39.6	36.3	57.5	40.4	
Angle Park Terrace 74 2M East	76b	61.3	67.3	41.1	M	55.2	52.1	49.5	52.1	57.6	58.1	67.4	54.3	56.0	
Ardmillan Terrace 22	76a	41.4	36.4	38.0	38.2	36.2	39.1	30.5	29.3	37.5	33.4	50.1	34.2	37.0	

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Balgreen Rd/School	80d	42.8	50.4	45.7	39.3	42.4	34.4	37.6	30.1	36.7	41.3	51.1	45.1	41.4	
Balgreen Rd/Library	80e	40.1	42.3	45.7	33.8	45.5	40.3	43.4	38.0	49.5	42.8	57.7	47.2	43.9	
Calder Road	4	44.3	36.2	45.4	55.9	47.5	52.7	38.1	42.9	60.9	38.6	59.3	37.1	46.6	
Gorgie Road 87	80c	51.7	M	51.0	M	47.7	M	M	37.8	46.3	M	61.7	M	N/A	
Gorgie Road 549	80b	2.0	28.3	40.5	45.6	M	45.0	42.0	33.4	45.4	40.4	61.0	M	N/A	42.4 *
Gorgie Road/Glen Lea	80a	39.5	33.4	40.3	M	49.3	M	40.9	30.6	M	39.6	63.3	36.7	41.5	
Gorgie Road 8	18	51.6	51.0	52.6	64.1	63.0	60.6	56.4	49.3	57.4	50.4	68.7	57.1	56.9	
Gorgie Road 8	18	44.6	52.9	52.3	59.9	70.4	55.4	52.2	44.4	61.6	<1.0	73.7	56.7	N/A	56.7 *
Gorgie Road - Delhaigh	80	55.1	52.3	48.9	M	52.1	47.4	46.0	40.9	57.1	47.8	65.7	42.9	50.6	
Gorgie Road/Murieston Road	5	56.1	56.6	64.4	65.1	56.5	52.2	45.0	48.3	57.0	57.1	67.1	77.9	58.6	
Henderson Terrace	76d	51.6	M	41.5	39.2	46.8	40.5	38.0	35.8	42.9	43.3	52.1	47.8	43.6	
Lanark Road 610	11	27.3	20.1	28.2	24.2	28.6	29.6	24.4	26.4	32.1	25.1	36.3	27.4	27.5	
Slateford Road 51	77a	61.2	53.4	39.6	48.4	42.6	42.2	35.6	40.7	44.7	42.0	61.8	54.4	47.2	
Slateford Road 93/95	77b	58.6	58.0	M	53.8	48.6	49.8	41.6	38.2	51.7	47.4	59.5	54.8	51.1	
Slateford Road 97	77	51.6	45.2	M	55.6	46.9	57.5	46.9	M	51.7	39.8	57.4	M	50.3	
Slateford Road/The Maltings	78	44.5	38.9	M	33.9	30.7	34.4	M	M	40.2	33.6	52.6	M	N/A	34.0 #

Notes for raw data;

* Data corrected having regard to outliers or problematic data

Data corrected - estimation of annual mean concentrations from short term monitoring

M – Tube missing on collection

N/A – Data not applicable. Mean corrected

Figures in bold red – Problematic data not used

INV – Tube inverted on collection; any data not used

Appendix D: Passive Diffusion Tube Distance Correction Calculations

SITE NO.	1	2	4	5	8	9a	9c	11	13	14
Step 1 How far from kerb was measurement made (m)	0.54	0.5	1.6	0.3	0.7	1.47	2.65	1.5	2.7	2.0
Step 2 How far from kerb is receptor in metres (m)	2.34	5.7	26.6	5.2	3.5	5.37	4.7	5.2	7.8	6.0
Step 3 Local background concentration of NO ₂	20.2	21.7*	21.6	24.6	20.1	21.8	21.8	15.6	21.7*	19.7
Step 4 Annual mean bias corrected value	39.1	58.8	34.5	43.4	23.6	40.6	31.2	20.4	30.3	26.6
Result; Predicted annual mean at receptor	34.1	42.8	26.4	34.7	22.5	35.3	29.8	19.1	28.0	24.8

SITE NO.	15	16	21	23	31	32	35	36	38	39
Step 1 How far from kerb was measurement made (m)	4.0	1.8	1.16	0.23	1.8	2.6	2.4	5.5	2.8	1.6
Step 2 How far from kerb is receptor in metres (m)	7.8	6.2	4.56	2.53	6.7	7.3	9.7	8.2	12.8	5.75
Step 3 Local background concentration of NO ₂	27.4	23.9	26.7	21.9	19.2	16.8	21.7*	21.7*	21.7	20.6
Step 4 Annual mean bias corrected value	38.6	45.6	35.1	45.7	28.0	32.0	29.6	34.1	24.1	35.9
Result; Predicted annual mean at receptor	36.5	39.5	32.7	36.8	25.4	28.1	26.9	32.6	23.2	31.5

* Measured background data used (from St Leonard's AURN monitoring station).

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SITE NO.	40b	40f	47	49	50a	52	53	55c	56	57
Step 1 How far from kerb was measurement made (m)	2.1	2.6	9.0	2.2	3.5	1.65	4.6	4.28	2.57	3.6
Step 2 How far from kerb is receptor in metres (m)	7.0	5.17	2.5	4.6	5.07	6.25	6.17	5.34	7.17	12.1
Step 3 Local background concentration of NO ₂	18.4	20.4	21.7*	21.7*	15.1	19.7	19.7	20.6	20.6	19.5
Step 4 Annual mean bias corrected value	29.7	31.8	41.1	39.3	29.2	32.7	34.5	29.3	31.9	39.4
Result; Predicted annual mean at receptor	26.5	29.8	50.1	36.2	27.8	28.8	33.2	28.8	29.0	32.8

SITE NO.	58	61	64	73a	73e	73g	75a	75b	140	SJ1
Step 1 How far from kerb was measurement made (m)	2.8	2.8	1.49	2.8	2.5	4.5	0.6	2.5	1.3	0.278
Step 2 How far from kerb is receptor in metres (m)	8.0	15.3	10.69	4.78	4.5	12.9	5.7	8.6	4.8	2.533
Step 3 Local background concentration of NO ₂	27.4	17.5	17.5	20.2	20.2	20.2	21.7*	21.7*	23.2	20.2
Step 4 Annual mean bias corrected value	51.9	26.3	68.5	38.4	36.3	29.6	34.5	28.6	35.4	36.4
Result; Predicted annual mean at receptor	45.4	22.5	46.5	35.9	34.0	26.7	29.2	26.5	32.0	30.7

* Measured background data used (from St Leonard's AURN monitoring station).

SITE NO.	SJ2	SJ3	Queensferry Road (Automatic Data)
Step 1 How far from kerb was measurement made (m)	0.371	1.148	1.7
Step 2 How far from kerb is receptor in metres (m)	9.519	15.623	8.2
Step 3 Local background concentration of NO ₂	20.2	20.2	17.5
Step 4 Annual mean bias corrected value	30.1	35.4	46
Result; Predicted annual mean at receptor	24.7	27.2	35.9

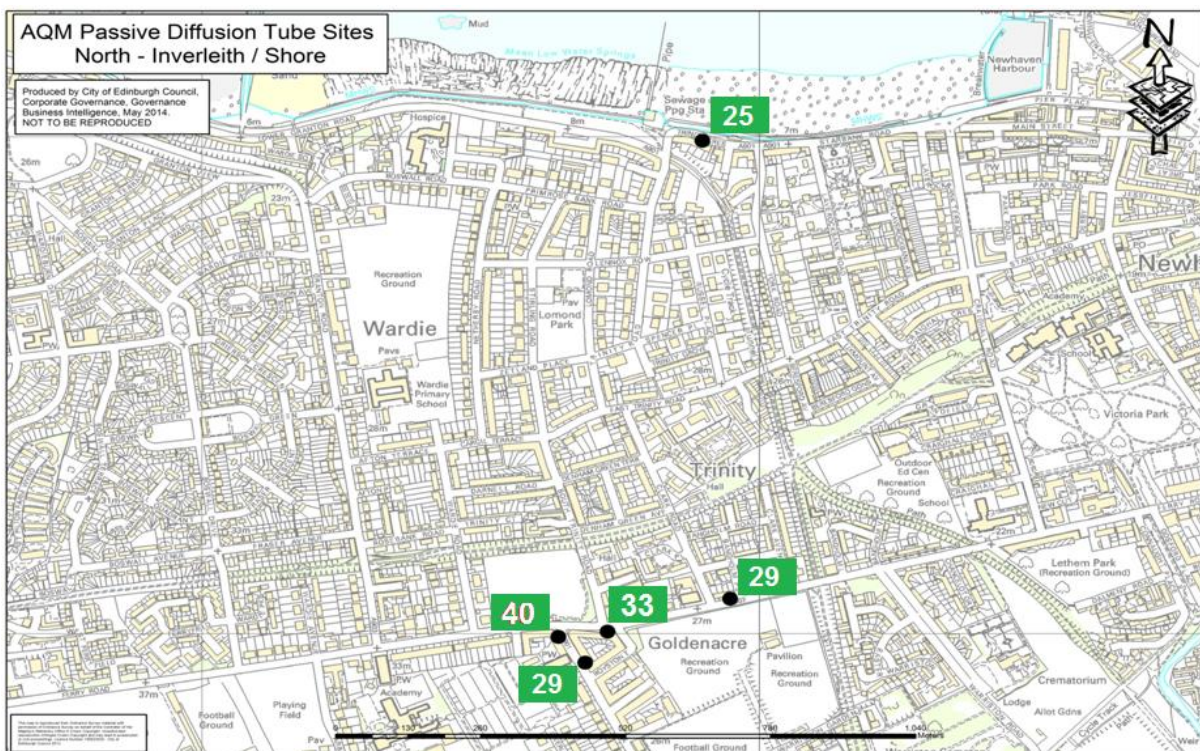
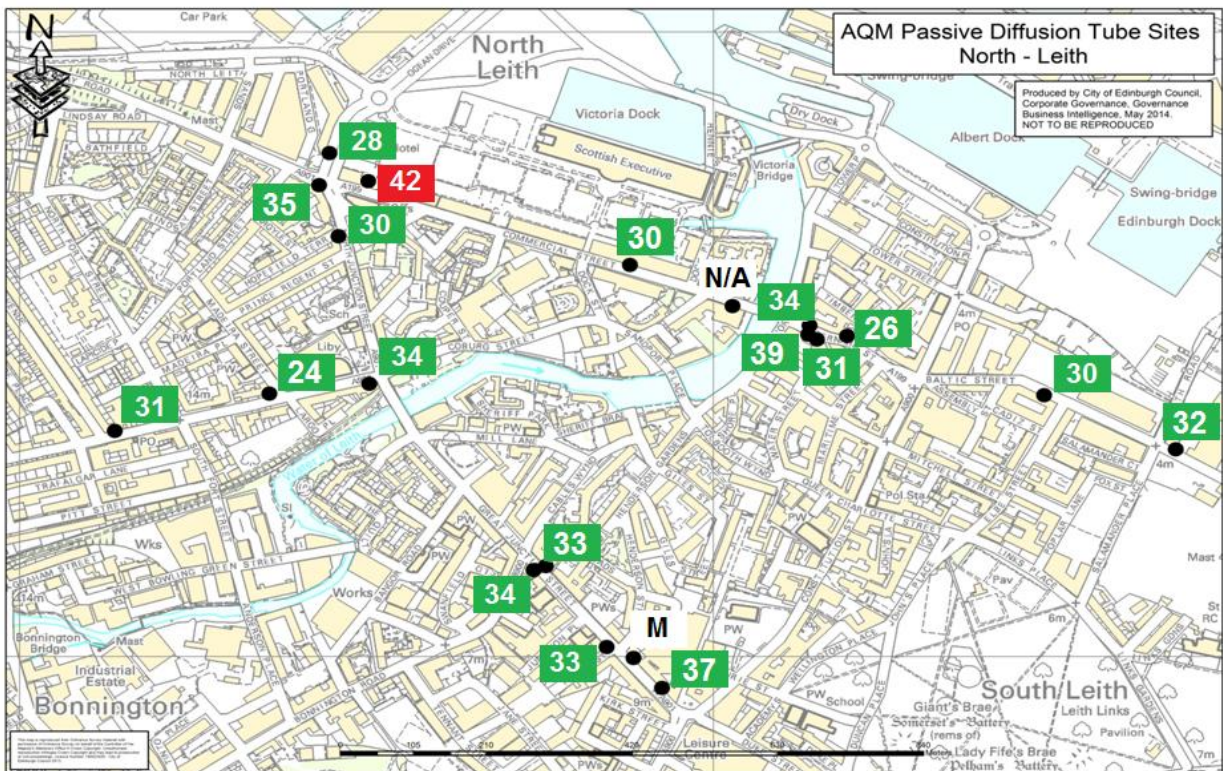
Appendix E: Passive Diffusion Tube data used in trend analysis

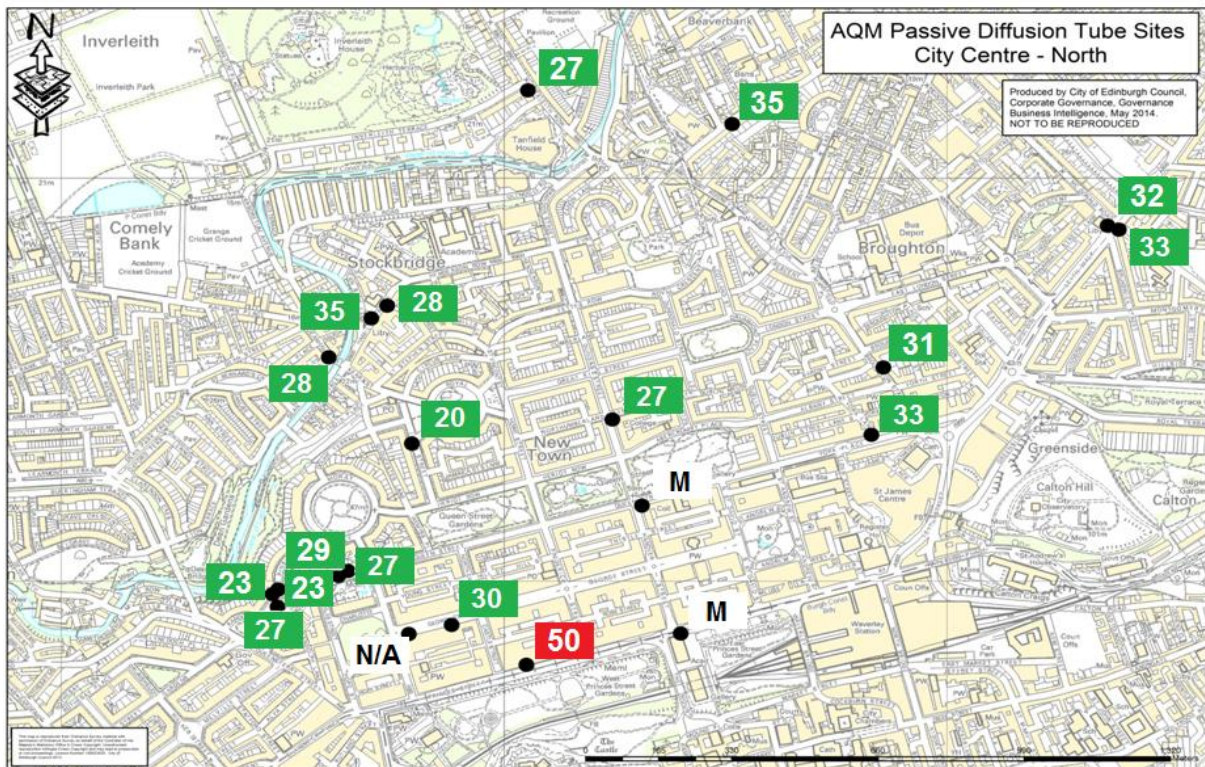
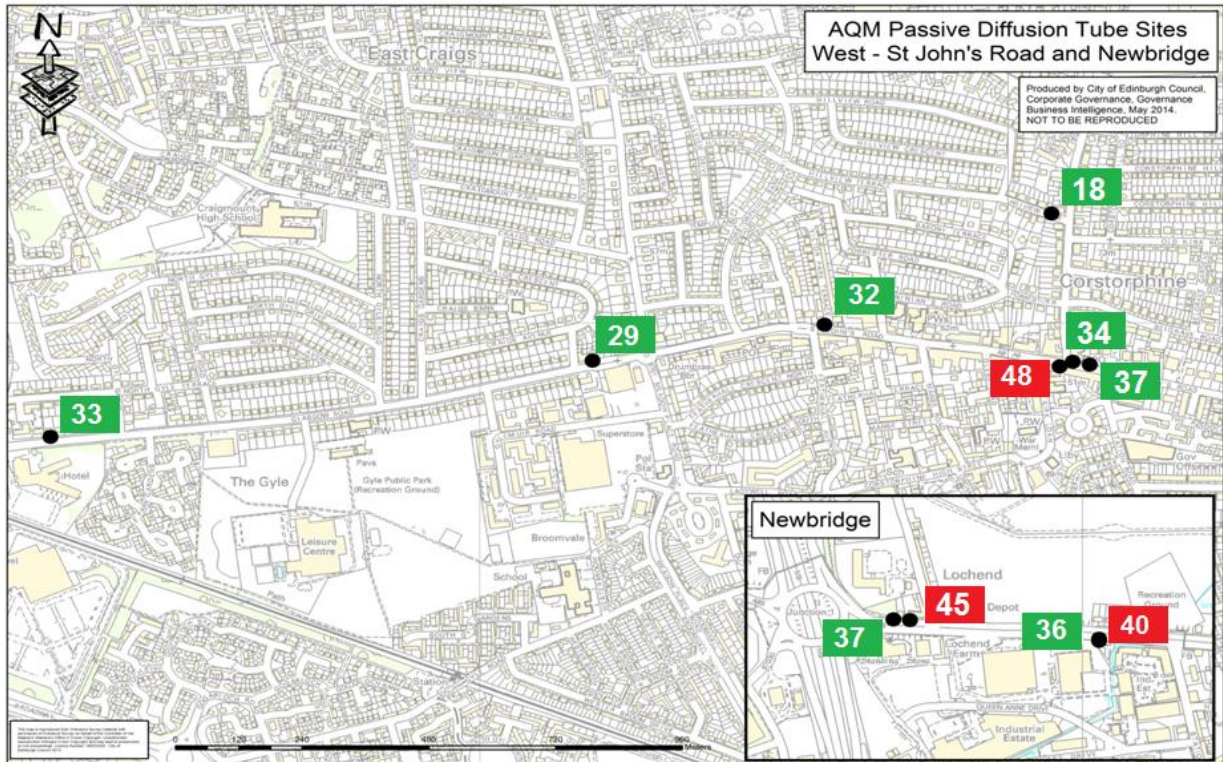
Data which was used to establish the trend of concentration of nitrogen dioxide at passive diffusion tube sites within the AQMAs.

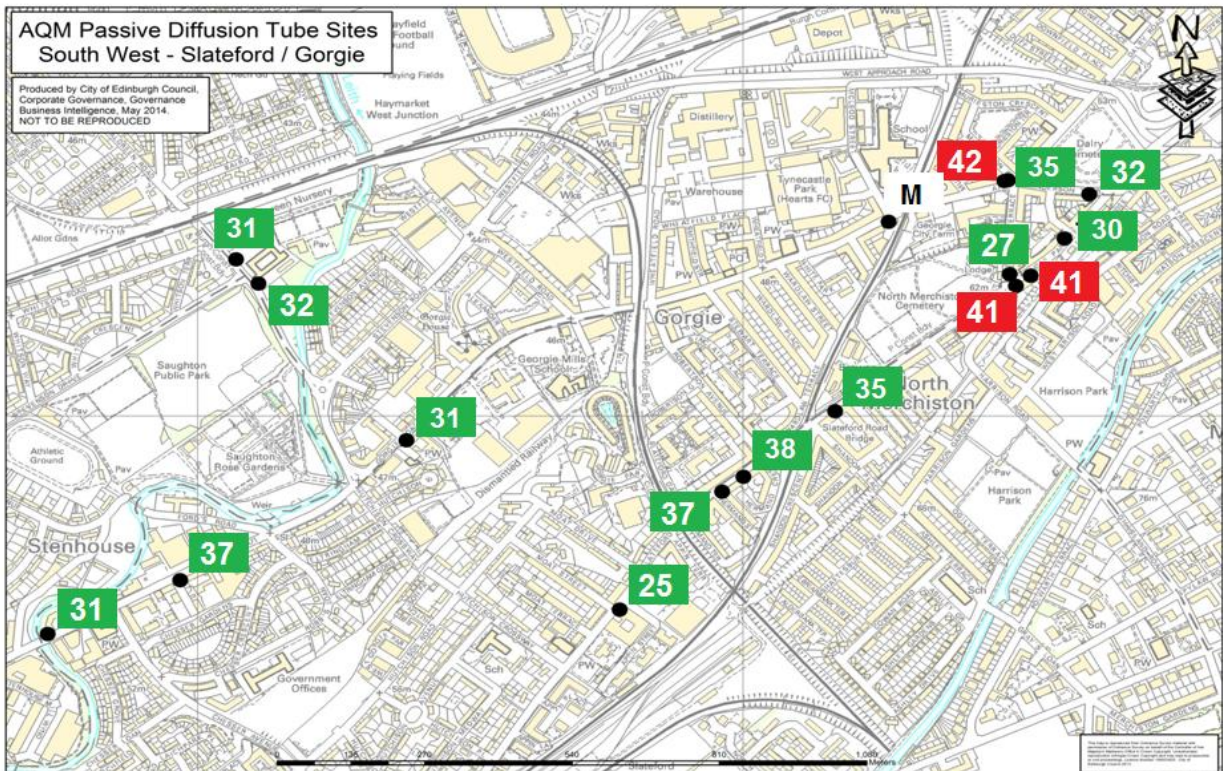
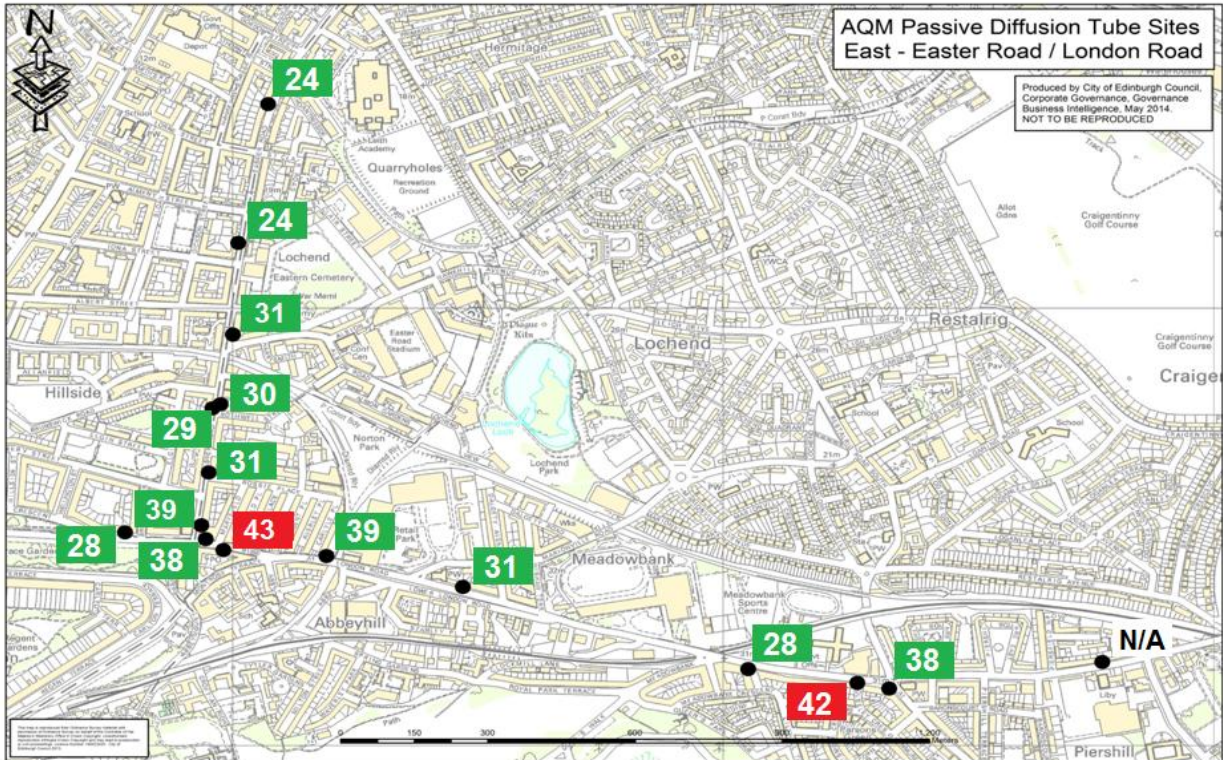
	Year	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Site ID / Name	Bias	0.91	0.89	0.89	0.87	0.9	0.88	0.86	0.85	0.81	0.76	0.75	0.74
1 St John's Rd		46	45	52	57	54	50	43	47	39	43	42	39
1b St John's Rd		-	41	59	51	51	49	44	44	38	44	41	37
1d St John's Rd		-	66	79	80	82	76	58	59	56	52	52	48
2 West Maitland St		78	77	85	96	104	97	57	73	75	50	50	59
3 Torphichen Place		63	72	87	77	87	67	65	64	63	54	48	43
18 Gorgie Road		46	43	43	48	47	52	45	55	48	49	45	42
21 Leith Walk		41	39	38	42	47	44	40	41	36	39	36	35
23 Roseburn Terrace		47	40	49	52	70	67	48	58	41	45	41	46
27 North Bridge		58	54	49	52	56	52	48	49	49	52	47	48
36 York Place		44	42	46	44	52	54	38	41	37	43	29	34
28b Westport		-	-	-	68	65	73	67	62	57	61	52	56
	Average	53	52	59	61	65	62	50	54	49	48	44	44

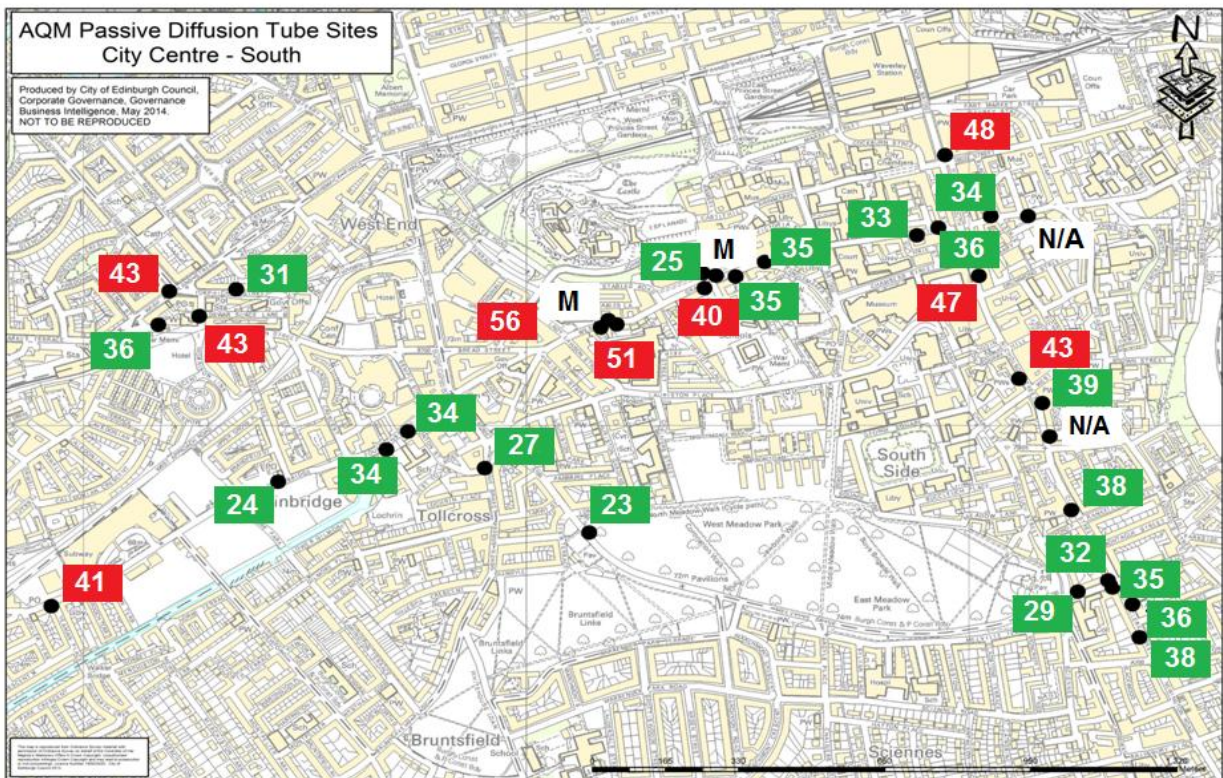
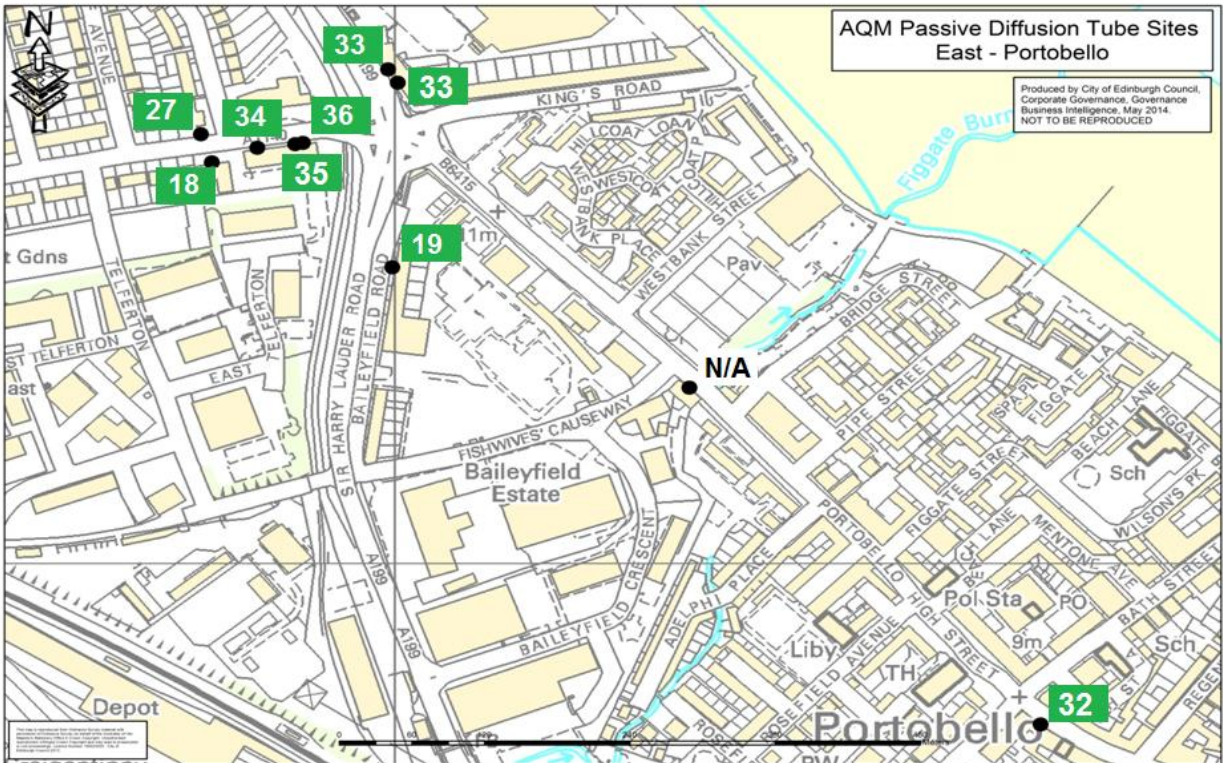
Note, from 2013 *italics* show data that had poor data capture and therefore results were annualised following Technical Guidance 09.

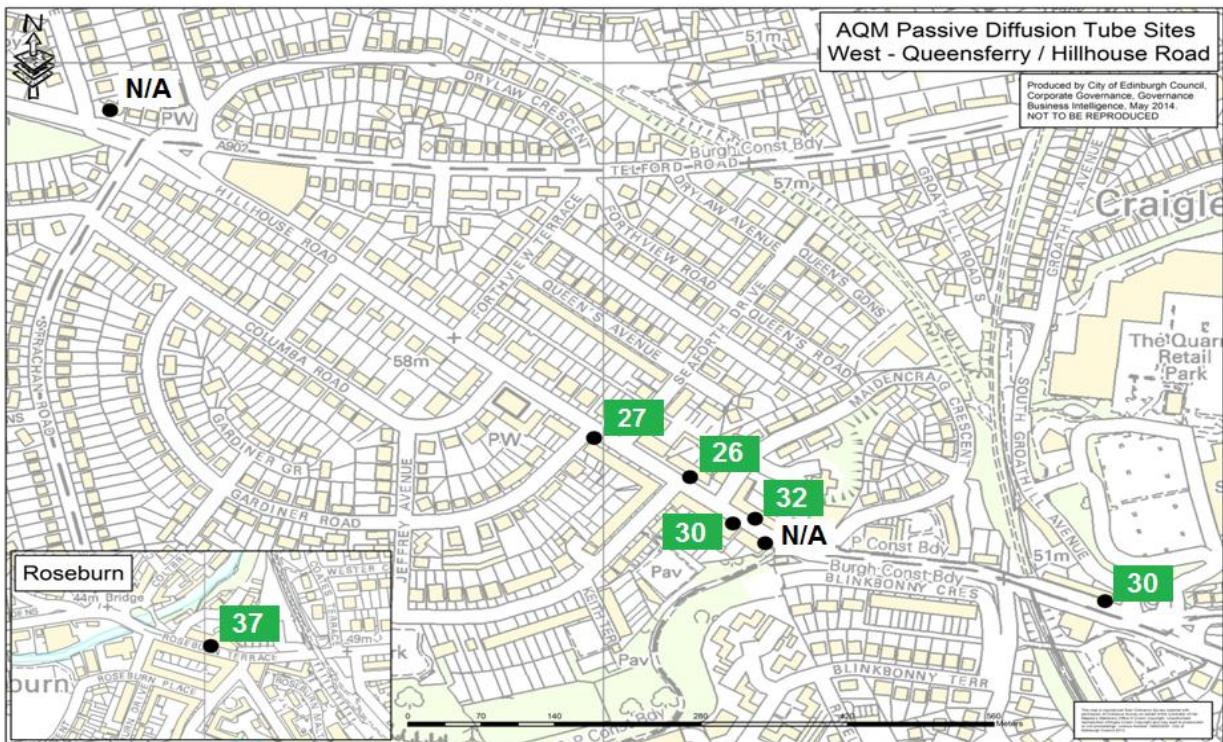
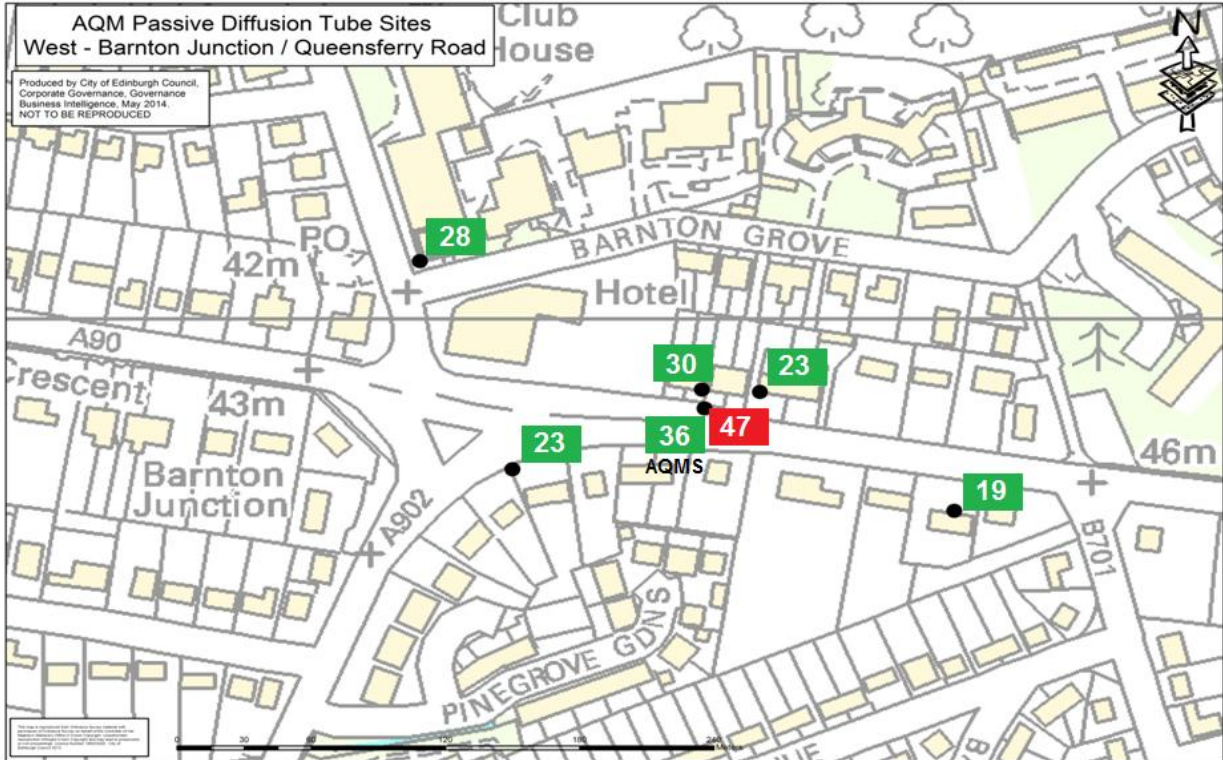
Appendix F: Maps of Air Quality Monitoring Passive Diffusion Tube Data

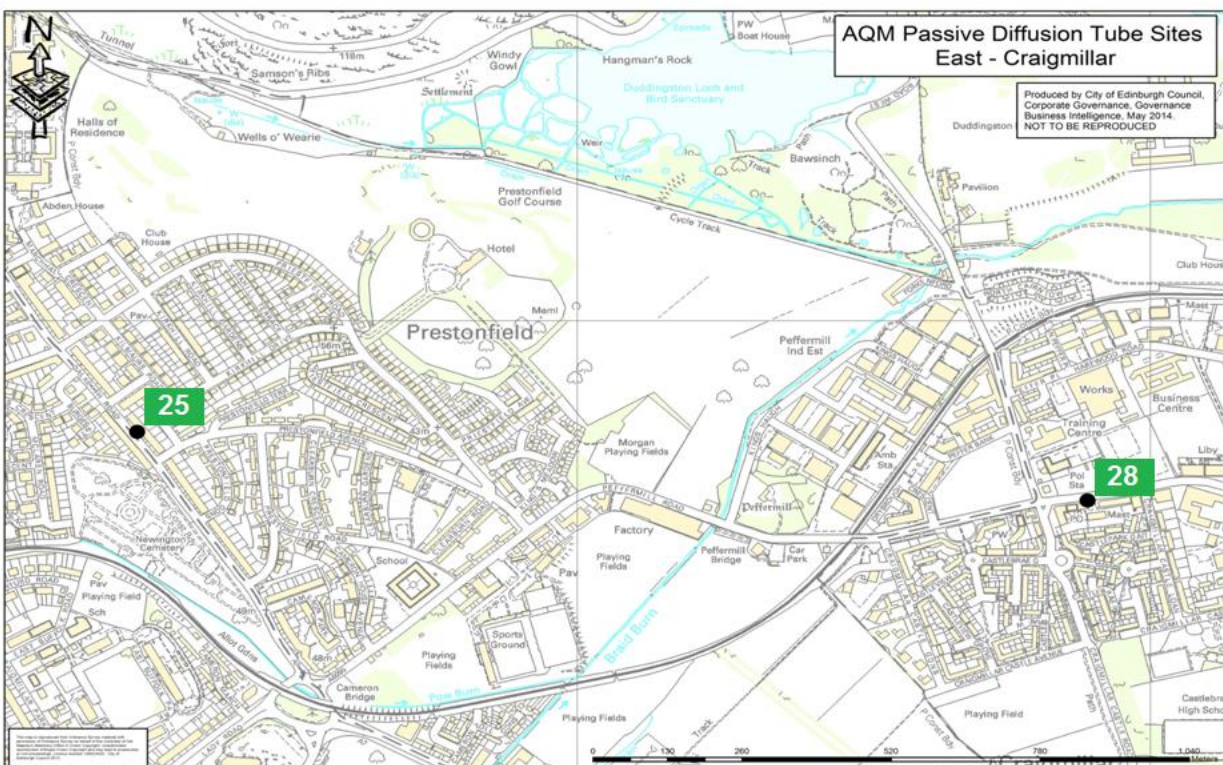
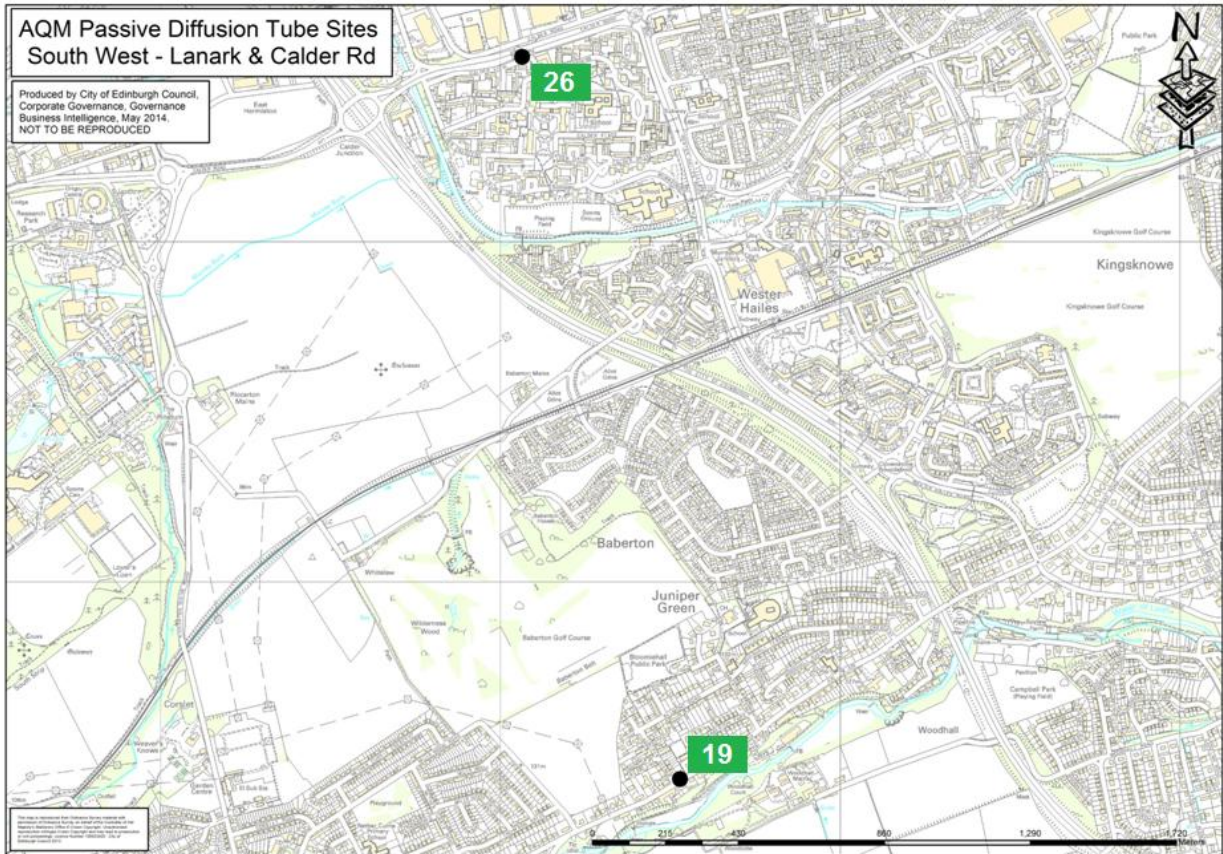












Notes

N/A = not available due to PDT being discontinued or moved elsewhere
 M = missing. PDT data for some months not available to allow calculation of annual mean