Annual Progress Report (APR)

2020 Air Quality Annual Progress Report (APR) for
Perth & Kinross Council

In fulfilment of Part IV of the
Environment Act 1995

Local Air Quality Management

September 2020

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Executive Summary: Air Quality in Our Area

Air Quality in Perth and Kinross

The air quality within Perth and Kinross is generally good; however, there are a few hotspot areas within Perth City centre and Crieff. The main pollutants of concern are Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}) from vehicle emissions, which cannot escape due to the canyoning effect of high buildings within the effected streets.

For the first year since Perth & Kinross Council (PKC) began monitoring no exceedances of NO_2 were identified within Perth and Kinross during 2019. Overall a downward trend in concentrations has been observed in all areas of Perth. Similarly, no exceedances were observed in Crieff. No new sources of emissions have been identified.

The recorded levels of PM_{10} have decreased at the Atholl Street (Perth), Crieff and Muirton (Perth) real time monitors (RTM). PM_{10} is not currently being recorded at the Perth High Street RTM. PKC also monitors for $PM_{2.5}$ at all RTMs; no exceedances of objective levels were observed in 2019. Therefore, at present there is no evidence to indicate that the AQMA orders in either Perth or Crieff require to be amended to include $PM_{2.5}$.

PKC has declared two air quality management areas (AQMA), one covering the whole of Perth City (2006) and another encompassing the high street corridor running through Crieff (2014). The decision to declare the whole of Perth City an AQMA was made so that the air quality issues could be addressed holistically throughout the city.

A review of the existing Perth Air Quality Action Plan (AQAP) is currently underway, due to be completed in 2020/21. The Crieff AQAP was approved in mid-2019 and implementation of the agreed measures will be progressed through consultation with the local community and internal and external stakeholders.

Crieff 's AQMA has the A85 trunk road running through it which Transport Scotland (TS) has adopted and BEAR Scotland maintains, therefore PKC work closely with TS and BEAR Scotland in addressing the air quality issues at this location. PKC also works in close partnership with TACTRAN (Tayside and Central Scotland Transport Partnership) and SEPA.

This year's APR includes a screening exercise to consider whether a Low Emission Zone (LEZ) may be a suitable measure to mitigate the air quality issues within the two AQMAs. This screening identified that due to its limited geographical area a LEZ would be a disproportionate measure for the Crieff AQMA. The screening for the Perth AQMA has also identified that a LEZ is not required due to the continuing downward trend in pollutants. Planned projects such as the Cross Tay Link Road (CTLR) are expected to have a positive impact upon air quality. Assessment and controls of planned development will also ensure no significant adverse effect on air quality.

Actions to Improve Air Quality

PKC has taken forward several measures during the current reporting year of 2019:

- A community engagement event in Crieff was carried out in February 2020 to gather public opinion on which Crieff AQAP improvement measures should be prioritised and how they should be carried out. The public were asked to prioritise AQAP measures as well as highlight any other key traffic issues in Crieff, assisted by a drive-through video of problem areas in the High Street. PKC will begin implementing projects and measures from the Crieff AQAP utilising the information gathered from this engagement event.

Crieff Community Engagement Event Feb 2020

- A PKC employee travel survey was carried out in July 2019 to provide baseline data for the Corporate Travel Plan. The results were then collated in a staff travel report alongside proposed improvement measures and is pending with senior management.

- Air Quality and Planning Supplementary Guidance was adopted in March 2020 as statutory guidance in line with the Local Development Plan 2: https://www.pkc.gov.uk/media/45770/Adopted-SG-2020/pdf/Air_Quality_and_Planning_SG_2020_adopted.pdf?m=637195203309200000 The launch event for the LDP2 and AQ and Planning Supplementary Guidance was postponed due to Covid-19 pandemic.

- Air quality consultants Ricardo were commissioned by PKC in 2019 to model the air quality effects of potential changes to Crieff High Street. The scenarios modelled included the removal of on street parking and introduction of

additional traffic signal controls along the High Street. Results showed that no one scenario would reduce air pollutant concentrations by a significant amount, a combination of measures would be required.

- PKC ECO Stars Scheme commenced in April 2019 and recruited 86 members from the Perth and Kinross area, all of whom have depots within the area. ECO Stars work with businesses to improve their fleet efficiency, helping to decrease fuel use and vehicle emissions. A planned scheme launch event in March 2020 was postponed due to Covid-19 pandemic.

- PKC has continued to work with SUSTRANS to employ an IBike Officer to provide sessions at primary schools throughout Perth and Kinross. These sessions cover bike maintenance, scooter & cycle skills, bike balance and Dr. Bike Checks to encourage pupils and their parents to take up sustainable and active travel.

- Considerable investment has made in the provision of attractive and secure cycle parking in Perth city centre over recent years, with the aim being to provide facilities for existing users as well as attract new cyclists to use active travel for their day to day as well as for recreational cycling.

- A free E-Bike trial session was carried out at Strathearn Community Campus as part of Clean Air Day 2019, in conjunction with educational lessons in 2 local primary schools to encourage active travel.

- Nine new electric vehicle charge points were installed in early 2020. PKC works in partnership with Transport Scotland, the Office for Low Emission Vehicles, and the Energy Saving Trust.

- Anti-Idling enforcement has been considered and report has been drafted for PKC Senior Management's consideration to establish how this measure can be taken forward.

Local Priorities and Challenges

As Perth is a major strategic hub in the Scottish transport network and has major road connections to all of Scotland's cities combined with major new proposed developments, PKC are conscious of the potential for increased traffic congestion and subsequent air quality issues and these needed to be addressed. Addressing these issues will support the long term growth of Perth as set out in the Local Development Plan (LDP) and the Perth City Plan (2015 -2035) https://www.pkc.gov.uk/smartgrowth.

Therefore, a package of measures has been developed as the Perth Transport Futures Project http://www.pkc.gov.uk/transportfutures which is focussed on the need for road infrastructure to address key congestion points in the existing road network and to provide linkages to growth areas as set out in LDP.

The measures are to be delivered over several years and are split into four phases:

- Phase 1 A9/A85 Junction Improvement and Link Road to Bertha Park
- Phase 2 Cross Tay Link Road (CTLR) – Connecting the A9 to A93 and A94
- Phase 3 Bertha Park North Link to A9 (Linking phase 1 and 2 and will be taken forward by the developer)
- Phase 4 Associated Perth city centre improvements (such as traffic management measures, new Park and Choose sites and measures to develop the cycling, walking and public transport provision in and around Perth to improve the opportunity for and encourage sustainable modes of travel i.e. the Placemaking Programme, Perth City Plan and the Perth Cycle Network Masterplan)

Phase 1 A9/A85 Junction Improvement and link road to Betha Park was completed on 1 May 2019 and is now operational.

Phase 2 Cross Tay Link Road planning application has been submitted and is pending consideration.

Phase 4 Mill Street public realm improvement development to create a 'Cultural Quarter' which includes a new streetscape and new plaza area to improve access

links to Perth Concert Hall, Theatre, Museum and Art Gallery for pedestrians has been completed. Further city centre improvements are to be undertaken such as walking and cycling infrastructure on major routes into city.

PKC aspires that Perth will be one of Europe's great small cities and to achieve this it has been identified that investment is required in public transport, walking and cycling networks. PKC recently developed an Active Travel Strategy which promotes walking and cycling across Perth & Kinross: Active Travel Strategy for Perth and Kinross.

How to Get Involved

For further information on air quality within Perth and Kinross visit the PKC air quality website at: https://www.pkc.gov.uk/airquality

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1. Local Air Quality Management

This report provides an overview of air quality in PKC during 2019. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved (Table 1.1). Where an exceedance is considered likely the local authority must declare an AQMA and prepare an AQAP setting out the measures it intends to put in place in pursuit of the objectives. This Annual Progress Report (APR) summarises the work being undertaken by PKC to improve air quality and any progress that has been made.

Table 1.1: Summary of Air Quality Objectives in Scotland

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Nitrogen dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 7 times a year	24-hour mean	31.12.2010
	18 µg/m^3	Annual mean	31.12.2010
Particulate Matter ($PM_{2.5}$)	10 µg/m^3	Annual mean	31.12.2020
Sulphur dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	3.25 µg/m^3	Running annual mean	31.12.2010
1,3 Butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon Monoxide	10.0 mg/m^3	Running 8-Hour mean	31.12.2003
Lead	0.25 µg/m^3	Annual Mean	31.12.2008

2. Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

A summary of AQMAs declared by PKC can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at:

- Perth

  https://uk-air.defra.gov.uk/images/aqma_maps/Perth.pdf

- Crieff

  https://laqm.defra.gov.uk/images/aqma_maps/1456_Perth%20No.2%20AQMA.jpg

Based on the monitoring data of the last 5 years we propose to consider revocation of Crieff AQMA.

Table 2.1: Declared Air Quality Management Areas

AQMA Name	Pollutants and Air Quality Objectives	City / Town	Description	Action Plan
Perth AQMA	• NO_2 annual mean • PM_{10} annual mean	Perth	The whole area of Perth City was designated an AQMA in 2006.	Perth and Kinross AQAP 2009 http://www.pkc.gov.uk/media/35448/2009-Air-Quality-Action-Plan/pdf/Perth_and_Kinross_Air_Quality_Action_Plan

AQMA Name	Pollutants and Air Quality Objectives	City / Town	Description	Action Plan
Crieff AQMA	• NO_2 annual mean • PM_{10} annual mean	Crieff	Follows the A85 from the Y-Junction of Dollerie Terrace/Perth Road westwards to the Y-Junction of Comrie Street/Coldwells Road. The AQMA takes in the whole of the buildings along East High Street/High Street/West High Street and Comrie Street (to Coldwells Road).	Crieff AQAP https://www.pkc.gov.uk/media/44879/2019-Crieff-Air-Quality-Action-Plan/pdf/(2)_2019_Perth___Kinross_Council_Crieff_Air_Quality_Action_Plan.pdf?m=637080263860030000

2.2 Cleaner Air for Scotland

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

2.2.1 Transport – Avoiding travel – T1

All local authorities should ensure that they have a Corporate Travel Plan (perhaps within a carbon management plan) which is consistent with any local AQAP. PKC is still undertaking the development of the Corporate Travel Plan. PKC has developed an Active Travel Strategy which promotes walking and cycling across Perth & Kinross: Active Travel Strategy for Perth and Kinross.

Further to this work, a Perth Cycle Network Masterplan was developed to investigate future potential active travel corridors to provide commuters, residents and visitors with improved accessibility and alternative green routes into the city. This will help reduce the impact of traffic and pollution, as well as improving the overall economic and environmental health of the region.

This work led to PKC, submitting a bid for Sustrans Community Links PLUS competition and successfully being awarded funding to take forward the Dunkeld Road Corridor active travel route, which will involve the reallocation of vehicular road space for active travel to encourage the shift from car to more sustainable modes.

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

Scottish Government expects any Scottish local authority which has or is currently developing a Sustainable Energy Action Plan to ensure that air quality considerations are covered. Air pollution in Perth and Kinross often originates from the same activities that contribute to climate change and in turn PKC will continue to utilise the Cleaner Air for Scotland Strategy (CAFS) to tackle both issues. CAFS aims to slow down the effects of climate change by reducing greenhouse gas emissions while utilising the co-benefits this can have on reducing air pollution.

PKC have an agreed set of sustainable development principles and aspirations that are considered throughout our organisational operations, service delivery and decision-making. These cross-cutting and interconnected principles are organised across 11 main themes, and collectively reflect the five themed objectives of the Community Plan.

PKC are at the forefront of and have signed Scotland's Climate change declaration and are participating in a carbon management programme, run by the Carbon Trust. PKC also has the second highest installed capacity for renewable energy in Scotland and in the UK.

In June 2019 PKC agreed a Motion committing the Council to lead by example in accelerating the transformational change required to address the Climate Emergency, declared by the UK and Scottish Governments. The draft Climate Change Interim Report and Action Plan sets out an initial route map to meeting the ambitions of the Council Motion, as well as highlighting the targets, challenges, and

the action the Council is already taking to address climate change. The report provides a basis to develop our engagement with partners and communities – giving an opportunity for the Council, partners and all citizens to play a part in designing and delivering a low carbon and climate resilient Perth and Kinross. The following details the next steps following the passing of the interim report:

i) Consultation:

Initially, a public consultation was to take place between February 2020 and April 2020 but due to recent circumstances related to the Covid-19 pandemic, this period has been delayed. This process will involve workshops, public events, exhibitions etc. and a new timeline will be announced in due course.

ii) Climate Change Commission:

The creation of a Perth & Kinross Climate Commission.

iii) Engagement & Awareness Raising:

Developing new ways to work with communities and businesses to further identify measures towards creating a low carbon economy.

iv) Staff Awareness Raising

Creating climate change-based staff learning tools and learning opportunities.

a) Online Based Web Resource:

The creation of a dedicated community website as a one-stop-shop for all matters related to climate change in Perth and Kinross

2.3 National Low Emission Framework (NLEF) Stage 1 Screening Appraisal for Perth & Kinross Council

The NLEF[1], which is now part of the review and assessment process for LAQM reporting in Scotland, contributes to the Cleaner Air for Scotland strategy by aiming to improve local air quality in areas where air quality objectives are exceeded, or likely to be exceeded, primarily due to emissions from transport.

The NLEF is directly linked to Air Quality Action Planning (AQAP) for local authorities with Air Quality Management Areas (AQMAs) and will help to identify actions to

[1] https://www.gov.scot/publications/national-low-emission-framework/pages/2/

improve local air quality within AQMAs. The NLEF appraisal takes the form of a two-stage process, as summarised in Table 2.2:

Table 2.2: NLEF Appraisal Process

Stage		Outcome	Actions Required
1	Screening	• decision on whether to proceed to stage two assessment	• screening process to identify actions that will benefit air quality within the AQMA • screening evidence should form part of the Annual Progress Report, with the decision agreed by Scottish Government and SEPA
2	Assessment	• decision to proceed with introduction of LEZ or identification of alternative transport-related measures required to improve air quality • Stage two assessment report agreed by Scottish Government and SEPA	• NMF approach to support assessment of sources of pollution and options • quantitative impact assessment (based on predicted change in pollutant concentrations) • consideration of consequential impacts (e.g. congestion, export of pollution)

The NLEF Stage 1 Screening Appraisal for PKC is detailed in Table 2.3.

Perth AQMA – The Perth AQMA covers the whole of Perth. As part of the screening assessment we have reviewed the monitoring data, the proposed projects which are expected to impact air quality, either positively or negatively and planned development in Perth and the surrounding area. In particular the construction of the proposed Cross Tay Link Road (CTLR) would be expected to impact positively upon traffic levels in Perth city centre, especially in the Bridgend area. Based upon this screening assessment it is considered that a low emission zone is not necessary to address the air quality problem in this area. However, it is acknowledged that due to the present Covid-19 pandemic there are a number of uncertainties including what

projects will and will not go ahead, whether there will be delays to projects and what the long-term impacts upon traffic movements are likely to be as a result of things such modal shift and changes in working arrangements. All these areas will be monitored, and the assessment can be revisited if necessary.

Crieff AQMA – The Crieff AQMA is essentially a single street, in line with the guidance provided for carrying out a NLEF assessment a low emission zone would not be a proportionate measure in this situation.

It is the opinion of PKC that proposed measures for the Perth and Crieff AQMAs are sufficient and there is therefore no need to proceed to a Stage 2 Assessment.

Table 2.3: NLEF Stage 1 Screening Appraisal

No.	NLEF Stage 1 Screening Appraisal Question	Appraisal Response
1	What is the name of the declared AQMA(s)?	Perth AQMA Crieff AQMA
2	What pollutants are the AQMA(s) declared for?	Both AQMAs are declared for nitrogen dioxide annual mean and PM_{10} annual mean. Neither AQMA is declared for $PM_{2.5}$. The recent monitoring data we have does not indicate any exceedances. Prior to monitoring, $PM_{2.5}$ levels were estimated based upon the PM_{10} levels; again this did not indicate any exceedances.
3	What are the main sources of air pollution, or other factors, contributing to the declaration of the AQMA? *(If the main source is not transport–related no further screening is required).*	In both AQMAs the main source of pollution is transport

No.	NLEF Stage 1 Screening Appraisal Question	Appraisal Response
4	Are the declared AQMA(s) (and therefore area(s) of exceedance) restricted in nature geographically to a small area for which a Low Emission Zone (LEZ) would not be appropriate or proportionate (e.g. single streets, road junctions, small town centre)?	Crieff AQMA Covers a very small area focussed around one street, High Street. Due to criteria set by Scottish Government, operating a LEZ on a single street would not be a proportionate response considering recent monitoring data indicates no exceedances. However, PKC continues to monitor air quality in Crieff to ensure it continues to improve. At this time, the Crieff AQMA will not be considered any further in this screening exercise. Perth AQMA Includes the majority of Perth, and as such it does cover a wide enough geographical area for a LEZ to be considered.
5	Do the monitored concentrations within the AQMA(s) meet the air quality objective(s)? If yes, for how long has compliance been achieved? If not, what are the extent of the exceedances?	Perth AQMA Nitrogen dioxide – 2019 was the first year since monitoring began in which there were no exceedances of the air quality objectives for NO_2. Between 2015 and 2019 there were nine locations within the Perth AQMA where exceedances of NO_2 were recorded. These locations are shown in Figure 2.1. At each of these locations the NO_2 level has fallen, with reductions of between 15% and 30% from the peak recorded level, see Table 2.4. There are five locations where the recorded value for 2019 is still within 10% of the objective level; three of these locations are on one street – Atholl Street. Although the AQMA covers the whole of Perth the locations where there have been recent exceedances are contained within a much smaller area within the city centre and it is thought that this is the main area where the air quality benefits of the CTLR will be seen. PM_{10} – There are no exceedances of the PM_{10} air quality objectives within this AQMA, this has been the case since 2017.

No.	NLEF Stage 1 Screening Appraisal Question	Appraisal Response
6	What is the current trend for pollutant concentrations within the AQMA(s) (state the trend for each pollutant declared)?	Perth AQMA Nitrogen dioxide – Data indicates there has been a general decline in NO_2 levels within the AQMA over the last few years. Table 2.4 and Figure A.1 and Figure A.2 in Appendix A show the declining trend in NO_2 levels at a number of locations across Perth. PM_{10} - Data indicates there has been a general decline in PM_{10} levels within the AQMA over the last few years. Figure A.4 and Figure A.5 in Appendix A show the declining trend in PM_{10} levels at Atholl Street and Perth High Street, although no PM_{10} monitoring has been carried out at Perth High Street since late 2017. It is recognised that the monitor at Perth High Street is not in the best location and it has been decided to relocate it to the Bridgend area of Perth. This is a location where elevated levels of NO_2 have previously been reported, and so it would be useful to gain an understanding of PM_{10} levels in this area. It is planned that this relocation will take place in 2020.
7	Are there any major planned developments which could impact air quality within or surrounding the AQMA(s)?	Perth AQMA The most recent version of the Local Development Plan for Perth and Kinross was released in 2019 and covers proposed development in the region over the next five years. There are a number of significant developments proposed in and around Perth which are summarised below. For some of these developments planning applications have already been submitted and approved while others are still at a much earlier stage. For the proposed developments which are still in these very early stages the details are included in Table 2.5: Early Stage Proposed Developments. The air quality impacts of these developments will be considered as part of the planning process. Where issues are identified appropriate measures will be required in order to mitigate negative effects, with particular attention paid to the impact on AQMAs. In order to try and highlight the importance of this and to encourage early discussion with developers PKC have recently introduced supplementary planning guidance for air quality. It is therefore

No.	NLEF Stage 1 Screening Appraisal Question	Appraisal Response
		not anticipated that any of the proposed development in and around Perth will have any significant negative impact upon the air quality. • Bertha Park is a large development to the west of Perth. The development is out with the existing AQMA however it would be expected that traffic to and from the development will impact upon Perth. In total 3000+ units are proposed over a number of phases. An air quality assessment has been completed for the development which has indicated that the impact upon air quality in Perth will be negligible. The construction of the CTLR formed part of this assessment and there is modelling which indicates without the CTLR the combined impact of this and the Almond Valley development would be to increase pollution levels within Perth. • Almond Valley is a development west of Perth, with 704-1100 housing units proposed. An air quality assessment will be carried out for this development. • There are also early plans for a Perth West development, which would be 2210 – 3453 homes plus 25+ha of employment land. A requirement for transport assessments and modelling for this development has been identified and submission of this information is pending. It is expected that there will be a park and ride site as part of this development, and that active travel will be a consideration. • Charles Street/ Scott Street – 78+ homes. Concerns were initially raised regarding particulate emissions from a biomass boiler proposed as part of the development. However suitable mitigation has been identified which has addressed these concerns. • Gannochy Road – 68-96 homes. A transport assessment has identified potential capacity issues prior to the construction of the CTLR. However, an air quality assessment carried out for an initial development of 48 houses has not identified any significant impact upon air quality.

No.	NLEF Stage 1 Screening Appraisal Question	Appraisal Response
		• Former Auction Mart – 189-293 homes. An air quality assessment has been completed for this development which has identified a negligible impact upon air quality. • Murray Royal Hospital. A transport assessment will be used to determine what level of development can take place prior to construction of CTLR due to pressure on traffic at Bridgend. However an air quality assessment has been carried out which indicated a negligible impact upon air quality, although it is acknowledged that the planned construction of the CTLR also provides reassurance regarding the air quality in the Bridgend area of Perth. It has been agreed that an embargo will be in place for housing developments greater than 10 units on the A93 and A94 corridors until construction of the CTLR is a committed project. It is intended that this will prevent further congestion and deterioration of air quality within the Bridgend area of Perth
8	What are the current trends for vehicle movements within the AQMA and surrounding areas?	Perth AQMA Traffic data from junctions within Perth city centre was collected in 2003, 2010, 2015, 2019 and 2020. This data provides a snapshot of the number of vehicle movements at five junctions in the city centre • Caledonian Road/Barrack Street • Perth Bridge/Main Street • Caledonian Road/York Place • Dundee Road/ Queens Bridge • Edinburgh Road/Marshall Place The data is recorded on one day in each year. However it is worth noting that the time of year when the surveys were carried out does vary. There is also the potential for the data to be impacted traffic incidents

No.	NLEF Stage 1 Screening Appraisal Question	Appraisal Response
		or roadworks. In 2003 and 2010 data was collected in an AM period, 06:30 – 09:30 and a PM period 15:30 – 18:30, whereas in 2015, 2019 and 2020 data was also collected in the intervening off peak period of 09:30 – 15:30. Therefore when comparing the data across the years only the 06:30 – 09:30 and 15:30 – 18:30 periods have been used. The data from 2020 has been discounted as it was taken during the lockdown period and therefore does not give an accurate representation of normal conditions. Table 2.6 summarises the total number of vehicle movements across all vehicle classes at the junctions surveyed. The data does not appear to indicate any increase in traffic volume in the city centre which could be supported by the observed downward trend in air pollutant levels in this area over the last few years.
9	Provide evidence showing how the AQAP (and associated plans, programmes and strategies) will deliver significant improvements towards achieving the air quality objective(s) in as short a timescale as possible?	Perth AQMA The Cross Tay Link Road (CTLR) is a major infrastructure project which will link the A93 and A94 with the A9 over the River Tay. This development is expected to help reduce traffic congestion in the city centre and Bridgend. It is also hoped that this reduction in traffic will provide an opportunity for a shift towards greener modes of transport. Previous modelling work carried out in 2015 of the impact of the CTLR was updated in 2019 with an assumed completion date of 2023. The modelling suggests the construction of the road would give a reduction in Perth and Scone nitrogen dioxide levels of on average 2% - 3% compared with predicted 2023 levels without the CTLR. The hotspots of Perth city centre and Bridgend would see the largest reductions in nitrogen dioxide levels, on average 4% and 13% respectively. Modelling of PM_{10} and $PM_{2.5}$ predicted a reduction in average Perth and Scone levels of around 1%, though there is uncertainty with this figure due to insufficient PM monitoring data. Planning consent for the CTLR project has not yet been granted but is currently due to be considered this year.

No.	NLEF Stage 1 Screening Appraisal Question	Appraisal Response
		Work through the Smarter Choices, Smarter Places (SCSP) programme will continue. Through the promotion of active travel it is expected that there will be a small positive impact on air quality. Uncertainties resulting from the current Covid-19 pandemic mean it is not currently possible to say which projects will be taken forward as part of this programme, and therefore it is difficult to gauge the likely scale of the impact on air quality. The Perth, People, Place project aims to deliver a new transport corridor from Luncarty into Perth city centre. This will comprise a cycle lane, improved space for buses, greenspace for communities and modal filters to remove through traffic along Balhousie Street. Once the initial concepts have been developed modelling will be carried out to identify if and where amendments to the proposals are required. The current timescale for completion of this project is 2023/24. As yet there is no information available on the expected impacts on air quality. There are also early proposals for a cycle lane in the Bridgend area of Perth. No further details or likely timescales for this work are available at present however the potential reduction in road space for vehicles has the potential to impact upon the air quality in this area. Bridgend is one of the areas where higher NO_2 levels have been recorded, however until more detail regarding the proposal is available the impact upon local air quality cannot be estimated. There are a number of temporary changes proposed due to the current Covid-19 pandemic. These changes involve providing temporary cycling and pedestrian infrastructure to allow for physical distancing. The planned measures include an improved cycle network both to access Perth and within the city itself, road closures and access restrictions and a 20mph speed limit in a number of areas within Perth, including the city centre. There is some overlap in these proposed temporary measures and the Perth, People, Place project and the proposed Bridgend cycle lane.

No.	NLEF Stage 1 Screening Appraisal Question	Appraisal Response
		Due to the immediacy of the Covid-19 pandemic these temporary measures will be put in place over a very short timescale. It is recognised that these changes may have both positive and negative impacts upon air quality. PKC will monitor these impacts, with the possibility of measures being retained longer term if they are found to be successful. Obviously given the current situation things are happening and changing quite quickly and so at this time it is difficult to be definite about what measures will be implemented. It is also difficult to predict both the short and long term changes to how people will travel over the next year, and beyond, for example will there be an increase in homeworking, will public transport use change, will there be an increase in active travel – these will all potentially impact upon the local air quality.

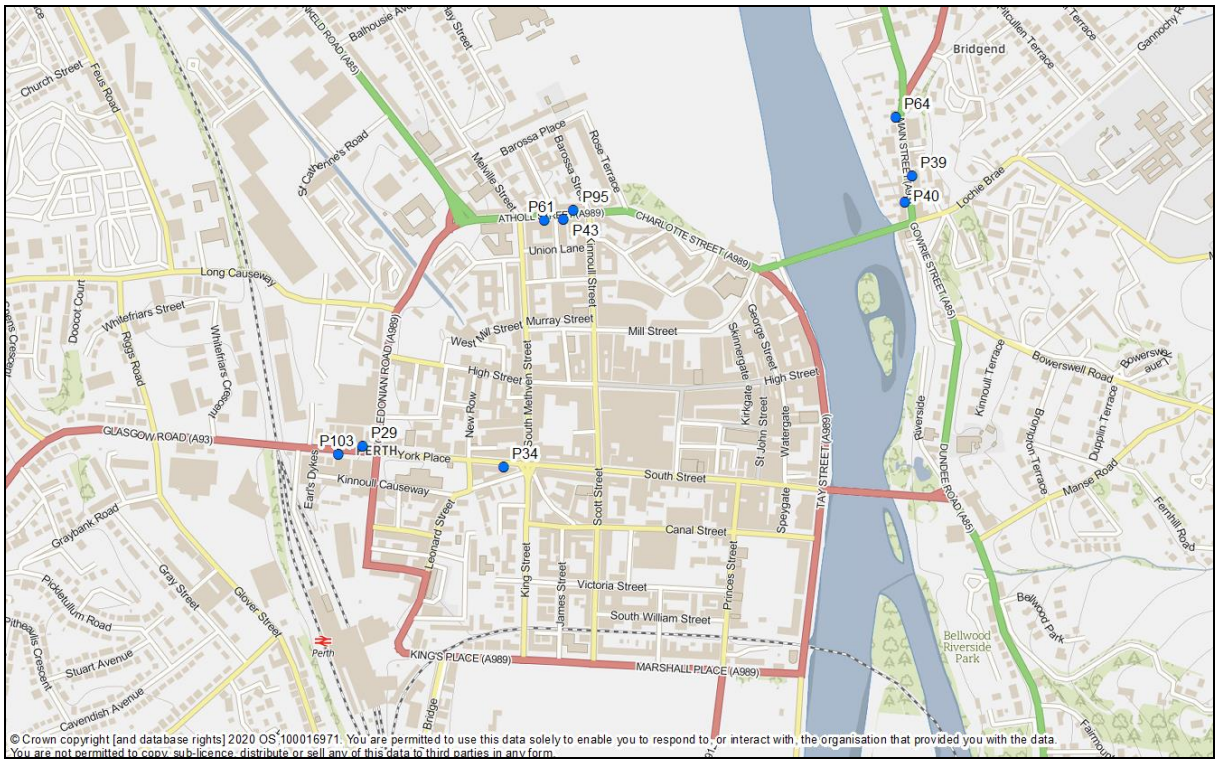


Figure 2.1: Perth NO2 Diffusion Tube Exceedance Locations

Table 2.4: Perth NO_2 Diffusion Tube Reductions 2015-2019

Tube No.	Location	NO2 Annual Mean Concentration (µg/m^3)					Percentage NO_2 reduction
		2015	2016	2017	2018	2019	
P61	Atholl St RTM	49	45	40	37	36	27
P29	37 York Place	40	33	31	29	28	30
P34	10 County Place	44	43	41	38	37	16
P39	39 Main Street	40	38	35	36	32	20
P40	18 Main Street	43	41	40	34	32	26
P43	17 Atholl Street	47	46	44	41	38	19
P64	Isla Road	46	43	42	39	36	22
P95	26-28 Atholl Street		40	43	35	36	16
P103	28 York Place		41	38	37	35	15

Table 2.5: Early Stage Proposed Developments

Proposed Development	Size of Development	Additional Comments
Newton Farm	72-110 homes	To include links to core paths and cycle routes to improve active travel links to Perth
Ruthvenfield	115-153 homes	To include active travel links to Perth
Perth Quarry (17/0023/LDP2)	112-175 homes, plus leisure and recreation and/or employment	Cycle and pedestrian routes to be created
Ruthvenfield Road	23.6ha of employment land	To include cycle and pedestrian paths to encourage active travel
Thimblerow (15/00018/PAN)	62+ homes plus retail, leisure and car park (minimum 200 spaces)	AQ and noise to be assessed
Oudenarde (16/02156/AMM)	1600 homes and 35ha employment land	Called in by Scottish Government for determination
Perth West (MU70 - 20/00001/PAN)	Mixed development to include Hydrogen fuelling/charging centre, formation of road junction, underpass and road network and footways and cycleways	Environmental Impact Assessment required, AQ & Noise to be assessed

Table 2.6: Vehicle Movements within Perth AQMA

Year	Total Traffic Turn count 6:30 – 9:30 and 15:30 – 18:30
2019	41,928
2015	45,238
2010	45,259
2003	48,012

2.4 Progress and Impact of Measures to address Air Quality in Perth & Kinross

PKC has taken forward a number of measures during the current reporting year of 2019 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.7 Perth and Table 2.8 Crieff. More detail on these measures can be found in the AQAP relating to each AQMA.

Key completed measures are:

- AQ & Planning statutory supplementary guidance adopted March 2020
- ECO Stars scheme launched, 86 new members recruited
- Bus shelter improvements made in 3 locations on the Crieff – Comrie route. A number of shelters readied for real time information monitors to be installed once funding has been acquired
- Nine new electric vehicle charge points installed in early 2020, further expanding PKC charging network
- Crieff community engagement event held in February 2020 to prioritise AQAP improvement measures
- Air quality effects of potential changes to Crieff High Street modelled by Ricardo

Progress on the following measures has been slower than expected:

- Relocation of RTM from Perth High Street to Bridgend Perth due to finding appropriate location
- The completion of the Perth AQAP Review due to change in consultant
- PKC Corporate Travel Plan

PKC expects the following measures to be completed over the course of the next reporting year:

- Continuation of EV charging point installation in Crieff and throughout the Perth and Kinross area.
- Continuation of the ECO Stars Scheme for heavy duty vehicles and a promotional launch to encourage engagement with transport providers to achieve air quality improvements within Perth city and Crieff. This is to be

supplemented by the introduction of the ECO Stars Taxi scheme in Perth and Kinross.

- Review of Perth's AQAP
- Relocation of Perth High Street RTM to Bridgend in Perth
- The continuation of work on creating the PKC Corporate Travel Plan and the actions surrounding it.

- Following the Crieff community engagement event held in February 2020, it is expected that many of the measures found within the Crieff AQAP are taken forward in the year 2020/2021 in some capacity. These measures (such as incentivising parking out with the AQMA, exploring traffic control mechanisms, redirecting traffic from problem areas and reviewing pedestrian crossings) were all discussed in great detail at the event and so it has become clearer to PKC and other stakeholders what measures may be seen as a priority to the general public.
- The creation of a Crieff traffic model by our consultants Sweco using the ADMS Roads software. This model will allow for a do-nothing scenario to be modelled coupled with other scenarios prior to the implementation of specific measures moving forward.
- The increasing of our NO_2 monitoring network at West High Street Crieff.
- Submission of anti-idling enforcement powers for senior management consideration

Table 2.7: Progress on Measures to Improve Air Quality – Perth AQAP

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in AQMA	Progress to Date	Estimated Completion Date	Comments
1.	Cross Tay Link Road (CTLR)	Transport Planning and Infrastructure	New crossing of the Tay linking the A9 to the A94 north of Scone, including package of associate bus priority, cycle and pedestrian measures 'locking in the benefits' to Perth city center.	PKC Transport Planning Planning & Development TACTRAN Transport Scotland	2009-ongoing to circa 2024			PKC Regional Modelling Predicted a (-) 16.70% reduction in NO_2 at Atholl Street hotspot	Phase 1 A85/A9 has now been completed and is open to connect with Bertha Park AQ and Noise assessment as part of EIA 18/01661/SCOP have been undertaken by consultants and peer reviewed Planning Application submitted 19/01837/FLM	Completed Completed Pending Consideration	
2.	Integrate AQ into Regional Transport Strategy (RTS)	Policy guidance and development control	Ensure that this AQAP is integrated into the delivery of the RTS.	PKC TACTRAN	2009/10	2009/10 and as RTS is delivered	We will report annually on our meetings with TACTRAN and provide a discussion as to how the AQAP is influencing delivery of the RTS.	Medium - High	AQ considerations are influencing RTS delivery, in the past 5 years PKC and TACTRAN continue to work in conjunction to ensure AQ is considered in the RTS and projects such as freight consolidation, park and ride, lift share, walking and cycling initiatives. The RTS was refreshed in 2015 Regional Transport Strategy 2015-2036.	Ongoing	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in AQMA	Progress to Date	Estimated Completion Date	Comments
3.	Integrate AQ into Local Transport Strategy (LTS)	Policy and guidance development control	Ensure that the AQAP is integrated into the delivery of the LTS.	PKC	LTS published in 2010 on going implementation of the schemes	Ongoing	We will comment on any specific air quality provisions contained in the LTS.	Medium - High	An Active Travel Strategy for Perth and Kinross has been approved at committee. Shaping Perth's Transport Future 2011 and the wider regional document published Transport Strategy for Perth Shaping Perth's Transport Future. The LTS preferred strategy is one of an integrated approach and air quality is one of the Strategy objectives: http://www.pkc.gov.uk/article/17627/Transport-planning-Policy-and-strategy To work towards meeting national air quality standards and prevent further breach and exceedances and to reduce transport emissions.	EH continue to attend meetings with PKC's transport planning team for projects such as Perth City Centre Traffic, Shaping Perth's Transport Future and Perth Public Transport Interchange Study.	Transport Colleagues have acknowledged that the LTS needs to be reviewed in line with CAFS.
4.	Park & Ride	Transport Planning and Infrastructure	Operate existing Park & Ride (PR) Schemes. Perth PR (Broxden) Scone PR Kinross PR Walnut Grove PR Planning Permission 15/01808/FLM approved. Maintain high levels of usage. We will carry out intermittent surveys to assess vehicles using the sites.	PKC	2009 - ongoing	Ongoing	Annual usage statistics A calculator of avoided NO_x /PM_{10} will be provided	Medium	An Electric Hub has been developed at the Broxden PR with the installation of 3'Rapid' DC/AC chargers 3'Fast' AC chargers servicing 12 EV parking bays. European Funding is being sought and planning permission in principle submitted for a hydrogen refuelling station South east of Broxden P&R 18/00482/IPL and a solar array for an electricity supply to support electric vehicle charging points to meet much of the energy requirements of the proposed Broxden Low Carbon Transport HUB	Ongoing	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in AQMA	Progress to Date	Estimated Completion Date	Comments
5.	Bus Quality Improvements	Transport planning and infrastructure	Bus Strategy 7 Quality Bus Partnerships	TACTRAN PKC	2009- 2040	More specific timescales are available in TACTRAN's RTS Delivery plan/capital and revenue programmes	Shift to alternative modes - this will be monitored by TACTRAN as part of the evaluation process of their RTS Delivery Plan.	Medium	Continued improvements involving PKC, TACTRAN and bus operators and improvements on bus shelter facilities and interchanges. Continued review of timetables which are amended to reflect demand and fares revised: passengers now benefit by being able to use Stagecoach network tickets (Dayrider and Megarider).	Ongoing	
6.	Freight Improvements	Freight and delivery management	Establish a TACTRAN – wide Freight Quality Partnership (FQP), in liaison with freight interests and Councils drawing upon established guidance, to help deliver cost effective packages of freight related interventions across the region	TACTRAN PKC	Ongoing to 2024	Ongoing to 2024 More specific timescales are available in TACTRAN's RTS delivery plan/capital and revenue programme	PKC will seek regular updates from TACTRAN on progress and report on these annually.	High	A TACTRAN –wide freight quality partnership has been formed including members from PKC, Scottish Enterprise and the private freight sector. PKC and Dundee's EH managers are members of the Freight Quality Partnership. AQ is integrated into the Freight Quality partnership. A freight consolidation center has been proposed as part of the Perth West Development	EH continue to attend meetings to ensure AQ is integrated into the FQP.	
7.	Travel Planning	Promoting travel alternatives	PKC Corporate Travel Plan (CTP); including encouraging Flexible working, car/lift sharing/ alternative modes, salary sacrifice bicycle scheme, pool car usage, home working.	PKC	Initiated year two of this AQAP	On going	Activity data will be collected by survey to support the working of the PKC Corporate Travel Plan (CTP). A base survey of staff travel habits will also be carried out. We will estimate vehicle km avoided in the AQMA and report emissions of NO_x and PM_{10}.	Medium	The 2010 Travel Plan is now being reviewed in line with CAFs PKC has received SG funding to produce a CTP. A working group has been set up to develop the CTP and a graduate employed to progress.	2020	PKC at present promotes the salary sacrifice scheme to staff and Walk to Work Week and lift share via staff intranet.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in AQMA	Progress to Date	Estimated Completion Date	Comments
		Promoting travel alternatives		TACTRAN (through the sustainable Travel Liaison Group) PKC.	2009	2009 then ongoing	Activity data will be sought from the main employers as to the journeys avoided from their GTPs. If this is provided, it will allow for estimates of vehicle km avoided in the AQMA and report reduction in emissions of NO_x and PM_{10}.	Medium	TACTRAN has been represented on SSE's Travel Plan Steering group and provided advice and promotional material. Perth College has also been given information and support of use of lift share. Aviva, PRI and Murray Royal Hospitals have been given advice and guidance in travel planning process and PRI provided with grants for travel planning measures, promotion of travel plan implementation software, TACTRAN travel knowhow to support businesses developing and implementing travel plans.	Ongoing	
		Promoting travel alternatives	We will continue to support schools developing Green Travel Plans (GTP) through our school co-ordinator and collect activity data to assess their use through our school co-ordinators.	PKC	2009 then ongoing	Ongoing	Survey data will be requested from PKC schools as to the journeys avoided from their GTPs. We will estimate vehicle kilometers avoided in the AQMA and report reduction in emissions of NO_x and PM_{10}.	Medium	SG grant funding allows for the continued support for green travel plans. The road network team promotes Cycling, walking (WoW) initiatives	Ongoing	Hands up survey 2019 determined that the percentage of primary pupils regularly cycling to school and pupils scooted or skated to school has increased by 4.1%

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in AQMA	Progress to Date	Estimated Completion Date	Comments
		Promoting travel alternatives	Regional/PKC car and Lift Share schemes - there is both a wider scheme, and one specific to PKC employees. We will improve use of PKC scheme through our own GTP.	TACTRAN PKC	2009 then ongoing	Ongoing	Activity data will be collected annually from both schemes and we will estimate vehicle km avoided in the AQMA and report reduction in emission of NO_x and PM_{10}.	Small-Medium	Continued promotion of Lift share including PKC and PRI, SSE and Aviva with stalls within workplaces. Participation in national Lift share week and leaflet promotion through employers.	Ongoing	
		Promoting travel alternatives	Green Travel Plans for new development. We will continue to seek travel plans from large development under existing planning arrangements	PKC	2009 then ongoing	Ongoing	Number of GTPs and estimation of specified in reporting year.	Low	This is a continual process through planning and is requested by Transport Planning Team who are internal consultees for planning.	Ongoing	GTP are requested through the planning process
8.	Traffic Management	Traffic Management	Keep "City Traffic Management Review" under continual review our traffic and environmental teams will liaise regularly to discuss the effects of component measures of City Centre Traffic Management Review (CCTMR) on Air Quality.	PKC	Ongoing as required	Ongoing	We will report annually on any changes to the CCTMR and how we anticipate this effecting air quality.	Medium	A Stratos UTM Common Database has been installed and a main link has been secured.	Ongoing	We will continue to review managing traffic within AQMA
9.	Planning and Air Quality	Policy Guidance and Development Control	Consider air quality as an issue for the Local Development Plan.	PKC	2014	2019-24	It is not possible to assign a quantitative indicator. We will report on the delivery of the Local Development Plan (LDP), and provide evidence that air quality considerations have been formalized within the LDP.	Medium	The Perth & Kinross Local Development Plan (2019) [46Mb] was adopted on 29 November 2019 and covers the whole Perth and Kinross area (apart from those areas covered by the National Parks). AQ is considered within the new plan for the whole region, not just AQMAs.	2019-24	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in AQMA	Progress to Date	Estimated Completion Date	Comments
		Policy guidance and development control	Complete the supplementary planning guidance (SPG) on Air Quality This will include results of regional air quality modelling currently being undertaken by Ricardo E&E.	PKC	2014	2020 Statutory	It is not possible to assign a qualitative indicator. We will report progress on the development of the plan	Small	PKC have produced a new statutory AQ SPG, which was adopted in March 2020 and is linked with the new revised LDP (2019)	Completed	The AQ SPG document will be reviewed in line with the LDP
		Policy guidance and development control	Consider air quality in planning decisions and formalise decision making process/interaction with Environmental Health. This can relate not only to new transportation sources, but also new biomass installations or industrial sources	PKC	Ongoing	Ongoing as required	It is not possible to assign a qualitative indicator. We will report on cases where air quality was a consideration in the reporting period, and any outcomes of any decisions made	Low	Environmental Health will continue to check the weekly planning list and comment on applications which may adversely impact on local air quality. The AEA/EPUK screening tools are used to assess applications.	Ongoing	
10.	Procurement and Air Quality	Vehicle fleet efficiency	Air Quality will be formally considered in tendering processes for new PKC vehicles. PKC currently specify stringent Euro Standards than necessary. A fleet survey will be necessary in the short term to establish the baseline for improvements	PKC	Fleet Survey in year 1 of AQAP, then ongoing as tender arises as part of the standards specification	Ongoing	If vehicles are replaced like for like, the number will be reported annually, with Euro standards and that of the vehicle replaced. This will feed into an emissions calculation and the saving in NO_x and PM_{10} will be reported annually. If additional vehicles are bought, Euro Standards will be reported and an estimation of impact of specifying a more stringent standard will be reported.	Small – Medium	PKC continue to replace Euro Standard vehicles with newer Euro 6 vehicles or electric vehicles where appropriate. PKC continue to expand electric charging point network	Ongoing	The PKC region covers is vast and the range of electric vehicles is taken into consideration when reviewing fleet vehicle replacement

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in AQMA	Progress to Date	Estimated Completion Date	Comments
11.	Eco-driver training	Vehicle fleet efficiency	PKC will seek to expand the existing provision of eco driver training utilizing the former training team to develop and add an eco-training course into existing modular training syllabus. The eco-driving module will become part of our regular driver Certificate of Professional Competence (CPC) training package which will be delivered on an ongoing basis.	PKC	Expand program me by 2011 then ongoing	2011-Ongoing	PKC intend to assess drivers after they have completed the training. The outcomes of these assessments (i.e. the fuel saving per driver) will allow simple calculations of avoided emissions of NO_x and PM_{10}	Small	The eco-module also forms part of future training for all council drivers as part of the driver assessment programme, PKC have a Qualified LGV driving instructor to deliver LGV Training to staff.	Ongoing	PKC continue to deliver CPC Programme
	Set up vehicle group MPG indicators	Vehicle fleet efficiency	MPG Key Performance Indicators (KPIs).	PKC	2016/17	2017/19	MPG KPIs	Small	Cleansing database and fuel information cultural change to ensure accurate mileages and machine hours are accurately recorded at each fueling event.	Completed	
	Better utilisation of the small vehicle fleet by installing telematics	Vehicle fleet efficiency	Small Vehicle Fleet	PKC	2016/17	2017/19	Less grey fleet mileage with better use of Council pool vehicles.	Small	As part of the Council's Vehicle Fleet Utilisation and Optimisation Review all Council fleet vehicles are to be installed with tracking systems. The telematics systems will allow PKC to analyse the usage and identify improved utilisation of pool and operational vehicle fleet.	2020	
12.	Provision of Travel Information	Public Information	Develop, promote and maintain a comprehensive Travel Information System, covering all modes and users and make this information available in on-line formats. Delivered through TACTRAN's regional Travel Information Strategy.	TACTRAN PKC	Study and develop strategy by 2011 specific measures on going to circa 2018	2018	We will liaise with TACTRAN and report annually on the findings of the feasibility work. As initiatives are implemented, we will report progress on these individually	Medium	Traveline Scotland in partnership with PKC continues to develop the website and apps to provide and enhance public transport information Scotland-wid**e.** https://www.tactran.gov.uk/index.php	Ongoing	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in AQMA	Progress to Date	Estimated Completion Date	Comments
13.	Signage	Public Information	Investigate the potential of variable message signage linked to pollution monitoring system	PKC	Feasibility work by 2011	2016/17	We will report annually the findings of any feasibility work that is carried out and develop the measure further based on the findings.	low	PKC Public Transport team carried out a feasibility study to install the provision of RTI and signage at certain locations within the Perth and Kinross area due to budgetary cuts the ongoing costs of maintaining the system after installation could not be	No further feasibility studies have been carried out	PKC in 2018 installed a RTI within our Perth City Centre offices public reception area giving bus time table information
14	Alternative Modes	Promoting Travel Alternatives	Work closely with TACTRAN to aid delivery of the Walking and Cycling Strategy for the region to ensure walking and cycling are part of an integrated transport system	TACTRAN PKC	Initial Study - 20019/10 Ongoing liaison /review	Ongoing liaison/review	We will liaise with TACTRAN annually and report progress with individual measures implemented under the Strategy.	Medium	Cycle training and bike repair training provided to staff. SG funding attained this year again for several walking/cycling initiatives including training and safety events. PKC match funds the IBike Project within schools. '*Perth/Crieff on the Go'* delivers cycle/walking route maps and bus timetables to residents and travel planning through school initiatives. Bike ability Officer employed with SG funding.	On going	
15.	Better access to public transport (note: access to service, not person access to individual buses)	Transport Planning and Infrastructure	Work with planning colleagues to assess provision of public transport at new and existing developments	PKC	2009-Ongoing	Ongoing	We will report on findings of reviews and any improvements made to the existing public transport network and new developments that have given public transport facilities.	Small	Continue to assess transport schemes through planning for new and existing developments	Ongoing	
16.	Idling Emission Reduction	Promoting Low Emission Transport	Enforce Vehicle Idling Regulations	PKC	2019/2020	2020	Number of vehicles subject to enforcement	Small	A SMT report is to be produced to establish if this measure is to be taken forward and which Service should be responsible for carrying out the enforcement	2020	
17.	Roadside Emission Testing	Roadside Emission Testing	Authorised Personnel to carry out roadside testing.	PKC and Police	Feasibility Study involving surrounding Local authorities by end 2010.	No Progress	Number of vehicles subject to enforcement	Small	No progress	No progress	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in AQMA	Progress to Date	Estimated Completion Date	Comments
18.	LAQM Marketing	Public Information	Enhance existing provisions of publicity materials and ensure they reach their target audience. Organise publicity initiatives in schools, large employers and public sector.	PKC		Commence 2009 - Ongoing	Publication of materials, events held	Small-Medium	Continue with PKC's Social Marketing Campaign '*Perth & Crieff on the Go'* promotional work within schools and businesses funding permitting. Continue to promote 'Clean Air Day' carrying out events with schools promoting active and sustainable travel.		
19.	LAQM Monitoring and Reporting	Statutory Duties LAQM	Statutory Duties LAQM	PKC	Ongoing	Ongoing	Monitoring data will be provided in the annual progress report as will the progression of measures within AQAP.	Small	PKC continue to review Monitoring network.	Ongoing	

Table 2.8: Progress on Measures to Improve Air Quality – Crieff AQAP

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in AQMA	Progress to Date	Estimated Completion Date	Comments
A.1	Liaise with the Scottish Government regarding the consideration of national measures to reduce background concentrations of PM	Policy guidance and development control.	Maintain contact with the Scottish Government regarding the adoption of national air quality measures.	PKC Scottish Government	Ongoing	Ongoing	It is not possible to assign a quantitative indicator.	Medium	No progress	Ongoing	
A.2	Improving Links with Local Transport Policies	Policy guidance and development control	Improve links with local transport policies	PKC TACTRAN Transport Scotland Transport Travel Associations	2020/2021	Ongoing	We will comment on any specific air quality provisions contained in transport policies.	Small	No progress	Ongoing	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in AQMA	Progress to Date	Estimated Completion Date	Comments
A.3	Improve Links with Regional Transport Strategy	Policy guidance and development control	Measures to ensure that AQ and climate change are considered with regards to Transport Planning for Crieff at a regional strategy level.	PKC TACTRAN Transport Scotland	Ongoing	Ongoing	We will report annually on our meetings with TACTRAN and provide a discussion as to how the AQAP is influencing delivery of the RTS.	Small	AQ considerations are influencing RTS delivery, in the past 5 years PKC and TACTRAN continue to work in conjunction to ensure AQ is considered in the RTS and projects such as freight consolidation, park and ride, lift share, walking and cycling initiatives. The RTS was refreshed in 2015 Regional Transport Strategy 20152036.	Ongoing	
A.4	Ensure Integration of Air Quality with Other Council Strategies and Policies	Policy guidance and development control	Encourage opportunities for improving local air quality and minimising negative impacts from existing and future PKC strategies and policies.	PKC	Ongoing	Ongoing	It is not possible to assign a quantitative indicator. We will report on the delivery of the Local Development Plan (LD), and provide evidence that air quality considerations have been formalized within the LDP.	Small	PKC Local Development Plan: https://www.pkc.gov.uk/article/15042/Local-Development-Plan-2019- The current LDP has been reviewed and AQ is considered within the new plan for the whole region, not just AQMAs. The review will be in line with CAFs. The reviewed LPD was completed and adopted in 2019. Air Quality is a major consideration in the PKC interim Climate Change Action Plan.	Ongoing	Supplementary air quality planning guidance was approved in 2020 and sets out how air quality will be considered when determining planning applications and detail the circumstances in which an air quality assessment may be required.
A.5	Local Development Plan – Assess Merit of further development in Crieff	Policy guidance and development control	Maintain and update air quality considerations with planning and development control. Ensure the AQ impacts from significant development proposal avoid Crieff's AQMA.	PKC	2019/2020	Ongoing	It is not possible to assign a quantitative indicator. We will report on the delivery of the Local Development Plan (LD), and provide evidence that air quality considerations have been formalized within the LDP.	Small	PKC Local Development Plan: https://www.pkc.gov.uk/article/15042/Local-Development-Plan-2019- The current LDP has been reviewed and AQ is considered within the new plan for the whole region, not just AQMAs. The review will be in line with CAFs. The reviewed LPD was completed and adopted in 2019.	2019-2024	Supplementary air quality planning guidance was approved in 2020 and sets out how air quality will be considered when determining planning applications and detail the circumstances in which an air quality assessment may be required.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in AQMA	Progress to Date	Estimated Completion Date	Comments
B.1	Redirect local road traffic movements away from A85	Traffic management	Undertake a feasibility study to examine alteration of traffic flows and movements off and onto the trunk road in relation to local roads around the AQMA.	PKC Transport Scotland	2020/2021	2020/2021	NO_2 & PM levels.	Medium	No progress	No progress	This subject was raised at the 2020 Crieff public engagement event.
B.2	Incentivise parking out with AQMA e.g. reduce/remove on street parking, increased signage)	Transport planning and infrastructure	Encourage parking of polluting vehicles away from the AQMA through (e.g.) parking charges, restrictions, signage and length of stay and incentivise parking through electric vehicles, car clubs etc.	PKC Transport Scotland	2020/2021	2020/2021	NO_2 & PM levels. Parking space occupancy on A85.	Medium	No progress	No progress	This subject was raised at the 2020 Crieff public engagement event.
C.1	Possible provision of SMART parking in Crieff	Transport planning and infrastructure	Ensure that parking behaviour does not negatively impact on local air quality by ensuring people travelling by car are able to find a parking space quickly and easily thereby reducing parking pressures and congestion.	PKC Transport Scotland	2020/2021	2020/2021	NO_2 & PM levels. Parking space occupancy on A85.	Small	No progress	No progress	This subject was raised at the 2020 Crieff public engagement event.
C.2	Urban Traffic Control Systems congestion management	Traffic management	Improve efficiency of transit through the AQMA to reduce local emissions. Review measures to minimise congestion within the existing AQMA.	PKC EH Transport Scotland BEAR Scotland	2020/2021	2020/2021	% drop in NO_2 and PM emissions following implementation.	Medium	The topic was discussed during a 2020 community engagement event and discussions with transport Scotland are ongoing.	2021/2022	
C.3	Anti-Idling Enforcement	Policy guidance and development control	Investigate potential for undertaking enforcement action with respect to idling vehicles.	PKC	2019/2020	2020	Number of vehicles subject to enforcement	Small	A SMT report is to be produced to establish if this measure is to be taken forward and which Service should be responsible for carrying out the enforcement	2020	
C.4	Undertake a review of the current locations of pedestrian crossings	Transport planning and infrastructure	Review the current pedestrian crossing locations/timings in and around the A85.	PKC Transport Scotland BEAR Scotland	2020/2021	2020/2021	It is not possible to assign a quantitative indicator.	Small	The topic was discussed during a 2020 community engagement event and discussions with Transport Scotland are ongoing.	2021/2022	
C.5	Limit or prioritise traffic turning right onto High Street	Traffic management	Review of existing junction arrangements and impact of possible changes to seek improved traffic flow.	PKC Transport Scotland	2020/2021	2020/2021	% drop in NO_2 and PM emissions following implementation.	Medium	The topic was discussed during a 2020 community engagement event and discussions with Transport Scotland are ongoing.	2021/2022	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in AQMA	Progress to Date	Estimated Completion Date	Comments
D.1	Encourage private and public operators to pursue cleaner vehicles	Vehicle fleet efficiency	Encourage a reduction in emissions of NO_2 and PM_s from companies operating vehicles in Crieff.	PKC	2020/2021	2020/2021	Number of new businesses signing up to the ECO Stars scheme. It is not possible to assign other quantitative indicators.	Small	Some businesses in the area are part of the ECO Stars fleet recognition scheme. No other progress made. Electric vehicle charging points are available in Crieff with more to be installed in 2020/2021.	Ongoing	
D.2	Maintenance of the Local/Voluntary Bus Quality Partnership	Promoting travel alternatives	Encourage good operational practices, including driving standards, which support the environmental agenda; whilst still providing high quality bus provision.	PKC TACTRAN	Ongoing	Ongoing	Shift to alternative modes - this will be monitored by TACTRAN as part of the evaluation process of their RTS Delivery Plan.	Small	No progress	Ongoing	
D.3	School Travel Plans	Promoting travel alternatives	Encourage uptake of school travel plans to promote active travel.	PKC	2020/2021 then ongoing thereafter.	2020/2021 then ongoing thereafter.	Survey data will be requested from PKC schools as to the journeys avoided from their TPs. We will estimate vehicle kilometres avoided in the AQMA and report reduction in emissions of NO_x and PM_{10}.	Small	The road network team promotes Cycling, walking (WoW) initiatives through and iBike officer and cycle/scooter storage facilities.	2020/2021	Hands up survey 2018 determine d that the percentage e of Perth primary pupils regularly cycling to school is 6.6% and 6.5% pupils scooted or skated to school.
D.4	Public transport improvements	Promoting travel alternatives	Look at opportunities to provide additional public transport options, directly linking residential areas with key traffic generators. Identification of funding sources will be key both for revenue and capital developments.	PKC TACTRAN	2020 onwards	Ongoing	Public transport usage numbers. Shift to alternative modes - this will be monitored by TACTRAN as part of the evaluation process of their RTS Delivery Plan.	Small	Bus shelter improvement in 3 locations on the Crieff – Comrie route. Specific shelters have been readied for real time information monitors to be installed once funding has been acquired.	Ongoing	
D.5	Restrict access for polluting vehicles within AQMA	Traffic management	Appraise the Crieff AQMA in line with the future NLEF and put in place scheme as recommended. Assess the possible provision of access restrictions for vehicles loading/unloading.	PKC Transport Scotland BEAR Scotland	2019/2020	N/A	% decrease in emissions.	Medium	Crieff AQMA has not been identified as a location for the introduction of a LEZ following screening assessment in 2020.	N/A	Crieff AQMA may still require a LEZ in the future.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in AQMA	Progress to Date	Estimated Completion Date	Comments
D.6	Implement ECO Stars scheme for HGV and bus operators	Vehicle fleet efficiency	Promote awareness among commercial vehicle operators of improved fleet environmental performance.	PKC TRL	2018/2019 then ongoing thereafter	Ongoing	Number of new businesses signing up to the scheme. Continuous monitoring of their star rating and progress. Progress reports from ECO Stars.	Small	88 new members were recruited in the first year of PKCs ECO Stars Scheme, across a range of industries. A launch event was planned for March 2020 for further promotion but was postponed due to the Covid-19 pandemic	Ongoing	The ECO Stars fleet recognition scheme was implemented in 2019. In 2020, PKC ECO Stars scheme will expand to include taxis
E.1	Promotion of lift sharing and developmen t of car clubs	Alternatives to private vehicle use	Continued and further promotion of this scheme.	PKC TACTRAN	2020/2021 then ongoing thereafter.	Ongoing	Activity data will be collected annually from both schemes and we will estimate vehicle km avoided in the AQMA and report reduction in emission of NO_x and PM10.	Small	Continued promotion of Lift share including PKC and PRI, SSE and Aviva with stalls within workplaces.	Ongoing	
E.2	Travel plans for large institutions and businesses	Promoting travel alternatives	To encourage and assist large organisations to develop and implement travel plans. Work with local businesses to encourage the development/implementati on of travel plans.	PKC TACTRAN	2020/2021 and then ongoing thereafter.	2020 – ongoing thereafter	Activity data will be sought from the main employers as to the journeys avoided from their TPs. If this is provided, it will allow for estimates of vehicle km avoided in the AQMA and report reduction in emissions of NO_x and PM_{10}.	Small	No progress	Ongoing	
E.3	Create and implement PKC Corporate Travel Plan	Promoting travel alternatives	PKC Corporate Travel Plan encompasses staff travelling to and from PKC workplaces and fleet operators for PKC.	PKC SUSTRANS TACTRAN Cycling Scotland Paths for All (SCSP)	2018 - 2020	2020/2021	Activity data will be collected by survey to support the working of the PKC Corporate Travel Plan (CTP). A base survey of staff travel habits was carried out in 2019. We will estimate vehicle km avoided in the AQMA and report emissions of NO_x and PM_{10}.	Small	Graduate employed to oversee the process. Base-line staff travel survey carried out in 2019.	2020/2021	Ongoing Covid-19 pandemic may alter ways of working moving forward. PKC at present promotes the salary sacrifice scheme to staff and Walk to Work Week and lift share via staff intranet.

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in AQMA	Progress to Date	Estimated Completion Date	Comments
E.4	Promotion of active travel	Promoting travel alternatives	To encourage a shift away from the use of private motor vehicles for travelling to more sustainable forms of transport or reducing the need for travel.	PKC Community Council Business Sectors TACTRAN	2020	Ongoing	It is not possible to assign a quantitative indicator.	Small	PKC match funds the IBike Project within schools. 'Perth/Crieff on the Go' delivers cycle/walking route maps and bus timetables to residents and travel planning through school initiatives. iBike officer employed through PKC funding.	Ongoing	Clean Air Day 2019 was utilised to host a free E-bike session at Strathearn community campus combined with educational lessons in 2 local primary schools.
E.5	Awareness raising and education, presentations at local schools/community meetings	Public information	Continue to encourage, promote and increase awareness of active and sustainable transport options through working with partner organisations and the community.	PKC Community Council	Ongoing	Ongoing	It is not possible to assign a quantitative indicator.	Small	A community event focussed on air quality and road safety was held in February 2020. This event contained map-based workshops and the information gathered will be utilised when taking projects forward. Around 50 residents attended the event. Clean Air Day 2019 events.	Ongoing	Clean Air Day 2019 was utilised to host a free E-bike session at Strathearn community campus combined with educational lessons in 2 local primary schools.
E.6	Cycling and walking routes to be routed to link in with the campus for sport.	Promoting travel alternatives	Undertake an audit on walking & cycling infrastructure for Crieff. Create a walking and cycling infrastructure plan.	PKC SUSTRANS Crieff Community Groups Community Council	2020/2021	2020/2021	It is not possible to assign a quantitative indicator.	Small	No progress	2020/2021	
E.7	Provision of PKC "Champions" for transportation methods	Promoting travel alternatives	Engage with local groups to promote active travel within Crieff.	PKC Local Community Groups Community Council	2020/2021	2020/2021	It is not possible to assign a quantitative indicator.	Small	No progress	2020/2021 – ongoing thereafter	
F.1	Biomass installations and other developments likely to cause pollution – review developments which may cause pollution	Policy guidance and development control	Consider all air quality in planning decisions for new biomass installations and other types of development likely to cause pollution by carrying out initial screening process to determine if an air quality assessment is required.	PKC	Ongoing	Ongoing as required	It is not possible to assign a qualitative indicator. We will report on cases where air quality was a consideration in the reporting period, and any outcomes of any decisions made	Small	Environmental Health will continue to check the weekly planning list and comment on applications which may adversely impact on local air quality. The AEA/EPUK screening tools are used to assess applications.	Ongoing	

Measure No.	Measure	Category	Focus	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in AQMA	Progress to Date	Estimated Completion Date	Comments
G.1	Increase AQ monitoring network	Policy guidance and development control	Continue to evaluate and review monitoring network. Establish $PM_{2.5}$ monitoring within AQMA. Review Real Time Monitors location.	PKC	2019/2020	2019/2020	Results of NO_2 tube analysis. Greater amount and reliability of results.	Zero	New locations for tubes have been identified.	2020	
G.2	Regional AQ modelling study	Policy guidance and development control	To establish a Crieff regional dispersion model for NO_2 PM_{10} & $PM_{2.5}$.	PKC AQ Consultants	2021/2022	2021/2022	It is not possible to assign a quantitative indicator.	Zero	No progress	2021/2022	
G.3	Cycling and walking routes to be incorporated into transport model	Public information	Incorporate walking and cycling routes into the transport model. Assess feasibility of routes and consult with the community. Progress a modal shift towards walking and cycling.	PKC	2020/2021	2020/2021	It is not possible to assign a quantitative indicator.	Small	No progress	2020/2021	
G.4	Transport assessments for developments to be required as part of planning process	Policy guidance and development control	The consideration of additional criteria requiring new development proposals to support the provision of infrastructure such as charging points for electric vehicles.	PKC	2020/2021 then Ongoing	Ongoing	Number of Travel Plans and estimation of specified in reporting year.	Small	This is a continual process through planning and is requested by Transport Planning Team who are internal consultees for planning.	ongoing	Travel plans are requested through the planning process. Supplementary air quality planning guidance was approved in 2020 and sets out how air quality will be considered when determining planning applications and detail the circumstances in which an air quality assessment may be required.

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how local concentrations of the main air pollutants compare with the objectives.

PKC undertook automatic (continuous) monitoring at four sites during 2019. Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at

http://www.scottishairquality.co.uk/latest/summary?view=la

Maps showing the location of the monitoring sites are provided at the above link. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

PKC undertook non- automatic (passive) monitoring of NO_2 at 74 sites during 2019. Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Figure 3.1 to Figure 3.4. Figure 3.1 shows the tubes within Perth City Centre, while Figure 3.2 to Figure 3.4 show tubes in the wider Perth area, Crieff, Kinross, Auchterarder, Coupar Angus and Blairgowrie. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

The laboratory used for analysing the diffusion tubes changed in April 2019. There is no indication that the change in laboratory has had any impact upon the data gathered.

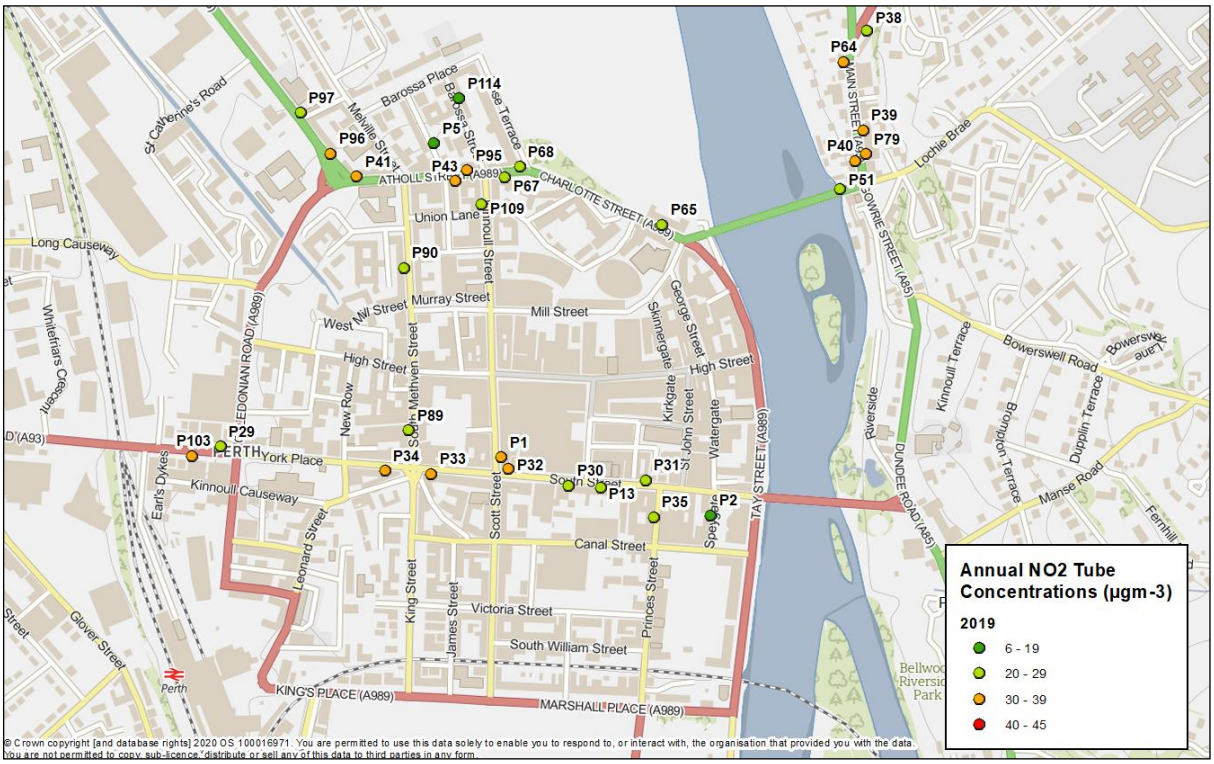


Figure 3.1: Perth City Centre NO_2 Diffusion Tube Locations

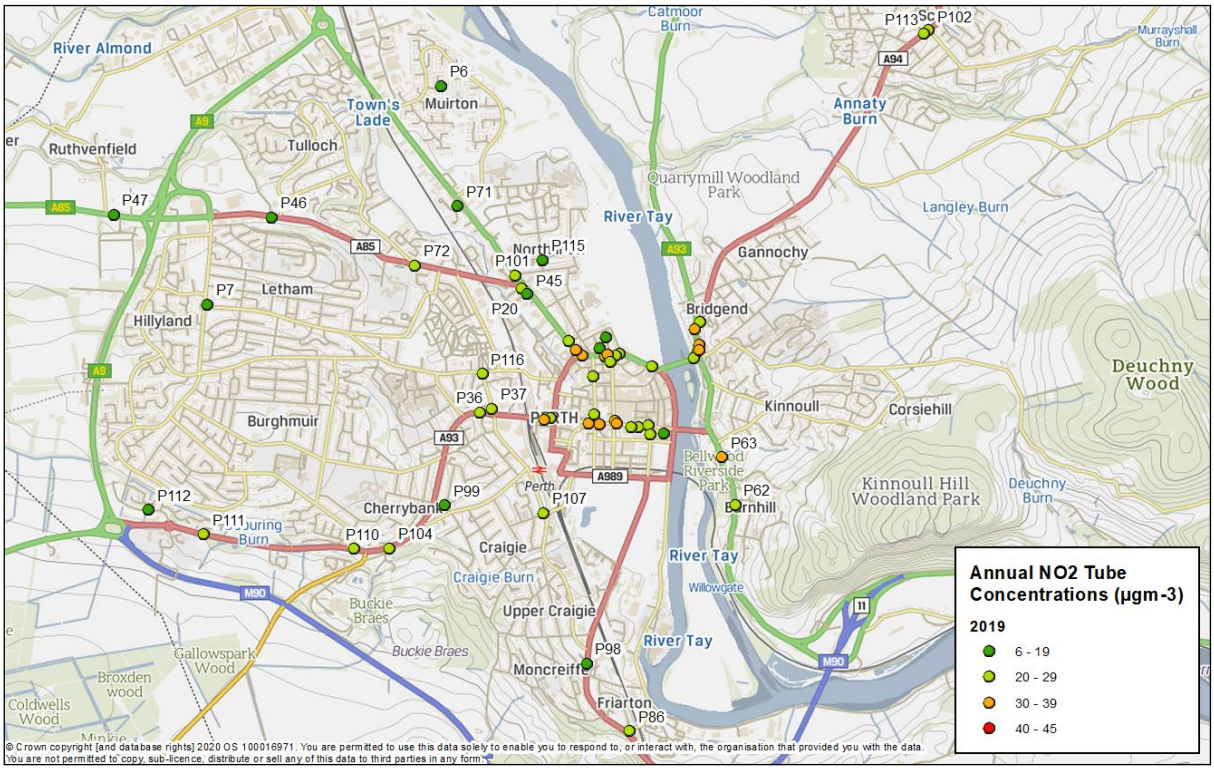


Figure 3.2: Perth Area NO_2 Diffusion Tube Locations

Figure 3.3: Crieff NO_2 Diffusion Tube Locations

Figure 3.4: Coupar Angus, Auchterarder, Blairgowrie and Kinross NO_2 Diffusion Tube Locations

3.2 Individual pollutants

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

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

For diffusion tubes, the full 2019 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

No exceedances of either the annual mean objective level or the hourly mean objective level were observed during 2019 at any of the three automatic monitoring sites where NO_2 levels are monitored. This follows on from no exceedances at these locations in 2018, and is part of an overall downward trend as shown in Figure A.1, Figure A.2 and Figure A.3 in Appendix A.

Diffusion tube monitoring also indicated no exceedances of NO_2 at any locations across the monitoirng network. This is an overall decrease from 2018 where there were exceedances at 2 locations, one within Perth (P43) and one within Crieff (P73). Although as noted in the 2019 APR the Crieff exceedance in 2018 should be treated with some caution due to two unusually high readings.

3.2.2 Particulate Matter (PM_{10})

Table A.5 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past 5 years with the air quality objective of 18µg/m^3.

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

There has been a general downward trend in Atholl Street for this pollutant as shown in Figure A.4 in Appendix A. In 2019 the annual mean was recorded as 13µg/m^3 down slightly from the 14µg/m^3 recorded in 2018, whilst in Crieff the level decreased

from 10µg/m^3 to 9µg/m^3. The Muirton background monitor also decreased slightly from to 10µg/m^3 in 2018 to 9µg/m^3 in 2019. The PM_{10} trends for Muirton and Crieff are shown in Figure A.5 and Figure A.6 respectively in Appendix A. PM_{10} levels were not recorded at the Perth High Street RTM during 2019.

In 2019 there were no exceedances for this objective at any location which indicates the possibility of a sustained drop in levels .

The PM_{10} level at Atholl Street (Perth), Muirton (Perth) and Crieff exceeded 50ug/m^3 on one occasion during 2019, 24th April. On this date the PM_{10} level recorded at Atholl Street was 69ug/m^3, Muirton was 63ug/m^3 and Crieff was 67ug/m^3. This exceedance was part of a Scotland-wide moderate air pollution event. An alert published on www.scottishairquality.scot stated that investigations into the event identified that air masses from east along with strong easterly winds blew polluted air from the continent, and that these winds also blew over smoke from large fires in Eastern Europe and Russia. The east coast of Scotland was most affected by this event.

However it should be noted that due to limited pavement space the continuous monitor is not located within the street canyon, and therefore the PM_{10} results from Crieff do not likely represent the worst case. That said the recorded levels are well below the objective level.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.7 in Appendix A compares the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past 5 years with the air quality objective of 10µg/m^3.

Monitoring of $PM_{2.5}$ began at three locations within Perth and Kinross in late 2017 – Atholl Street (Perth), Perth High Street and Crieff, monitoring at the fourth continuous monitoring site at Muirton (Perth) began in late January 2019. The data indicates no exceedances of the objective at any of these locations during 2019, however a slight increase in the level has been recorded at Perth High Street compared to 2018. Graphs indicating data trends for $PM_{2.5}$ have not been included as $PM_{2.5}$ has only been monitored for a relatively short time and therefore this type of data analysis does not provide any meaningful information.

3.2.4 Sulphur Dioxide (SO_2)

PKC do not currently monitor SO_2.

3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene

PKC do not currently monitor carbon monoxide, lead or 1,3-butadiene.

4. New Local Developments

4.1 Road Traffic Sources

Dualling works on the A9 have continued through 2019.

4.2 Other Transport Sources

No new sources within Perth and Kinross have been identified.

4.3 Industrial Sources

No new sources within Perth and Kinross have been identified.

4.4 Commercial and Domestic Sources

Table 4.1 below shows all planning applications for biomass boilers, between 50kW and 20MW. No areas of significant solid fuel burning or CHP plants were identified.

Table 4.1: Planning applications for biomass boilers 50kW – 20MW

Biomass Developments				
Planning Ref	Location	Thermal Output (kW)	In AQMA	DA Required
19/01661/FLL, 19/01662/FLL and 19/01663/FLL	Brae of Murthly, Aberfeldy		No	Yes
19/00938/FLL	Balvaird Farm, Strathmiglo	499 x 2	No	Yes
19/01103/FLL	Blairnathort Farm, Milnathort	150	No	Yes
19/01591/FLL	Mains of Duncrub Farm, Dunning	199 x 2 350 x 1 499 x 1	No	Yes

4.5 New Developments with Fugitive or Uncontrolled Sources

No new sources within Perth and Kinross have been identified.

5. Planning Applications

Kinross 19/00917/FLM (pending decision) – Erection of 169 dwellinghouse. An air quality assessment has been completed for this development and has identified that the impact of the development on air quality is expected to be negligible.

Milnathort 19/00522/FLM (refused) – Erection of 59 dwellinghouses and 8 flats. An air quality assessment has been completed for this development and has identified that the impact of the development on air quality is expected to be negligible.

Stanley 19/01130/AMM (approved) – Increase in house numbers at H30 and the revised number of proposed properties from 125 to approximately 190. A qualitative assessment of the potential impacts was carried out drawing on the conclusions of the 2017 AQA undertaken for all five land parcels and 500 dwellinghouses 17/00088/IPM.AQA concluded that the conclusions of the 2017 AQA are considered to remain valid in NO_2 considered negligible to slight adverse for annual mean for residential affect and negligible for PM_{10} and $PM_{2.5}$ concentrations; even with the increase in revised traffic data.

Almond Valley 19/01433/AMM (pending decision) EIA Addendum 19/01433/AMM Erection of 284 Dwellinghouses. The EIA Addendum considered changes to the surrounding environmental (i.e. the completion of the Western Link Road and River Almond Flood Scheme). The EIA concluded the impacts of the development as a whole will remain the same if the AMSC Application is approved and as such the conclusions reached in the 2015 ES for air quality remain valid.
EH raised concerns in relation to the EIA Air Quality Assessment submitted at the 15/01157/IPM stage which did not address the impact effect on Perth's AQMA City Centre hot spot areas this was one of the concerned raised at the time of the IPM application. This is more relevant now with regards to the cumulative effect of this development and its main route road with other new major developments and the new Western Link Road infrastructure. Therefore, EH did not agree with the conclusion of AQA.

Formation of Cross Tay Link Road 19/01837/FLM (pending decision) Environmental Health engaged the services of consultants RSK to undertake a peer review of all the Environmental Statement (chapters) associated with noise, vibration, dust and air quality for the construction and operational phases of the development.

6. Conclusions and Proposed Actions

6.1 Conclusions from New Monitoring Data

No exceedances for either NO_2 or PM_{10} were identified at any locations across Perth and Kinross. This comes after a general downward trend for both pollutants over the last few years.

Monitoring of $PM_{2.5}$ has continued in 2019, and as in 2018 there were no exceedances at any of the monitoring locations.

6.2 Conclusions relating to New Local Developments

Two proposed developments have been considered for potential impact in air quality – one in Kinross, and one in Milnathort, neither of which are in an AQMA.

Assessments carried out identified that it was unlikely that either development would have a significant impact upon local air quality. It is also worth noting that there are other developments progressing, but these have been considered in previous progress reports.

Developments assessed for air quality impacts in previous Annual Progress Reports can be found here: https://www.pkc.gov.uk/article/15307/Air-quality-reports

6.3 Proposed Actions

The monitoring data for 2019 indicates a continued downward trend in both NO_2 and PM_{10} across Perth and Kinross, with no exceedances being identified for either pollutant. In addition, no exceedances of $PM_{2.5}$ have been identified. The monitoring data is continually reviewed to identify where changes may be required. It has been decided to relocate the RTM currently at Perth High Street to Bridgend. Although the diffusion tube network does not currently indicate any exceedance of NO_2 at Bridgend it is an area where we have some of our highest levels and as such additional monitoring in this area would be beneficial. It is expected that this

relocation will be carried out in the second half of 2020. In addition, some diffusion tube locations have been removed from the monitoring network which has allowed new monitoring locations to be set up. These new locations have been selected based on new and proposed developments and to monitor the impact of change to the road network.

Based on the information we have no changes are currently recommended to either the Perth or the Crieff AQMA. However, the data collected from Crieff indicates that over the last five years, with the exception of one location in 2018, there have been no exceedances of either NO_2 or PM_{10}. The one exceedance in 2018 is believed to be an outlier result, and therefore PKC will consider the evidence for revocation of this AQMA.

A review of the Perth AQAP is currently underway, due to be completed in 2020. Once this is complete and a new Action Plan is in place PKC will work towards implementation of the agreed measures.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
Perth 1	High Street	Roadside	311687	723626	NO_2 $PM_{2.5}$	Y	Chemiluminescent; TEOM/FIDAS	20.4	4.8	1.5
Perth 2	Atholl Street	Roadside	311575	723917	NO_2 PM_{10} $PM_{2.5}$ PM_1	Y	Chemiluminescent TEOM/FIDAS	22.3	2.3	1.5
Perth 3	Muirton	Background	310658	725658	PM_{10} $PM_{2.5}$ PM_1	Y	FDMS	N/A	N/A	2
Crieff 1	James Sq	Roadside	286363	721614	NO_2 PM_{10} $PM_{2.5}$ PM_1	Y	Chemiluminescent FDMS/FIDAS	9.5	5.3	1.5

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

(2) N/A if not applicable.

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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?
P1	42 Scott St Perth	R	311690	723500	NO_2	Y	0.57	2.26	N
P2	17 Speygate Perth	R	312020	723411	NO_2	Y	3.82	1.23	N
P5	8 Stormont Street	UC	311586	723993	NO_2	Y		1.32	N
P6	41 Mull Place	UB	310510	725767	NO_2	Y	6.55	1.62	N
P7	257 Rannoch Road	UC	308925	724287	NO_2	Y	8.1	2.24	N
P13	86 South Street	R	311847	723453	NO_2	Y	0	2.6	N
P20	2 Crieff Road	R	311057	724395	NO_2	Y	0.3	4.43	N
P29	37 York Place	R	311253	723517	NO_2	Y	2.8	4.9	N
P30	104 South Street	R	311798	723457	NO_2	Y	0	2.53	N
P31	45-47 South Street	R	311917	723466	NO_2	Y	0	3.58	N
P32	135 South Street	R	311698	723483	NO_2	Y	0	5.25	N
P33	216 South Street	R	311582	723475	NO_2	Y	0	2.16	N
P34	10 County Place	R	311510	723480	NO_2	Y	0	2.70	N

P35	17 Princes Street	R	311932	723422	NO_2	Y	0	2.1	N
P36	51 Glasgow Road	R	310776	723556	NO_2	Y	7.24	1.46	N
P37	Riggs Road	R	310856	723581	NO_2	Y	12.40	1.62	N
P38	93 Main Street	R	312263	724167	NO_2	Y	0	7.6	N
P39	39 Main Street	R	312253	724019	NO_2	Y	2.02	2.55	N
P40	18 Main Street	R	312244	723965	NO_2	Y	0.1	2.15	N
P41	76 Atholl Street	R	311465	723941	NO_2	Y	0.47	2.18	N
P43	17 Atholl Street	R	311635	723950	NO_2	Y	0	2.28	N
P45	Ballantine Place	UC	311097	724358	NO_2	Y	3.72	1.75	N
P46	204 Crieff Road	R	309328	724878	NO_2	Y	11.65	4	N
P47	5 East Huntingtower	R	308274	724895	NO_2	N	5.3	1.89	N
P51	2 West Bridge St	R	312235	723927	NO_2	Y	2.46	1.94	N
P54	RTM, 176 High Street, Perth	R	311687	723626	NO_2	Y	5.30	5.2	Y
P55	7 West High Street, Crieff, PH7 3AF	UC	286332	721638	NO_2	Y	1.8	0.42	N
P56	39 High Street, Crieff, PH7 3HT	UC	286505	721555	NO_2	Y	0	1.28	N

P57	62 High Street, Crieff, PH7 3HT	UC	286550	721562	NO_2	Y	0.57	1.6	N
P58	9 East High Street, Crieff, PH7 3AF	UC	286577	721554	NO_2	Y	0.49	1.17	N
P61	RTM, Atholl Street	R	311584	723931	NO_2	Y	0.63	2.2	Y
P62	84 Dundee Road	R	312504	722929	NO_2	Y	0.81	1.58	N
P63	30 Dundee Road	R	312413	723252	NO_2	Y	1.19	1.22	N
P64	Isla Road	R	312228	724118	NO_2	Y	0.18	2.59	N
P65	5 Charlotte Street	R	311943	723865	NO_2	Y	2.35	1.95	N
P67	1 Atholl Street	R	311691	723939	NO_2	Y	0.3	2.44	N
P68	2 Atholl Street	R	311720	723955	NO_2	Y	6.55	1.33	N
P71	134 Dunkeld Road	R	310615	724958	NO_2	Y	4.34	1.8	N
P72	82 Crieff Road	R	310331	724552	NO_2	Y	11.13	2.35	N
P73	19 West High Street, Crieff, PH7 4AU	UC	286302	721651	NO_2	Y	0	1.63	N
P74	43 High Street, Crieff, PH7 3HT	UC	286517	721553	NO_2	Y	2.37	1.47	N
P75	RTM, Crieff	R	286360	721619	NO_2	Y	5.1	3.72	Y
P76	10/12 West High Street, Crieff, PH7 4DL	UC	286324	721632	NO_2	Y	0	1.42	N

P78	1 Lodge Street, Crieff, PH7 4AX	UC	286195	721691	NO_2	Y	0	1.72	N
P79	17 Main Street	R	312262	723976	NO_2	Y	0	3.04	N
P81	76 High Street, Kinross, KY13 8JA	R	311936	702187	NO_2	N	0	1.44	N
P82	66 High Street, Auchterarder, PH3 1BN	R	294569	712888	NO_2	N	1.74	0.49	N
P83	176 High Street, Auchterarder, PH3 1BN	R	294268	712730	NO_2	N	2.40	0.86	N
P86	2 Friarton Road	R	311790	721398	NO_2	Y	3.7	1.17	N
P87	Hollybush Road	BG	287028	721485	NO_2	N	N/A	6.95	N
P89	59 South Methven St	R	311547	723544	NO_2	Y	0	2.98	N
P90	22 North Methven St	R	311539	723797	NO_2	Y	0	2.96	N
P94	Queen Street, Coupar Angus	UC	322232	739915	NO_2	N	0.42	1.17	N
P95	26-28 Atholl Street	K	311635	723950	NO_2	Y	1.73	0.91	N
P96	22 Barrack St	K	311422	723950	NO_2	Y	2.99	0.47	N
P97	St Ninians School,	R	311370	724050	NO_2	Y	7	1.91	N

P98	30 Edinburgh Road	R	311496	721862	NO_2	Y	7.16	2.81	N
P99	15 Murray Cr Perth	UB	310534	722926	NO_2	Y	6.81	1.62	N
P100	9 Comrie Street, Crieff, PH7 4AX	UC	286271	721553	NO_2	Y	0	1.97	N
P101	28 Dunkeld Road	R	311010	724484	NO_2	Y	4.13	3.11	N
P102	30 Perth Road, Scone	R	313811	726146	NO_2	N	3	2	N
P103	28 York Place	R	311186	723506	NO_2	Y	8	2.05	N
P104	202 Glasgow Road	R	310158	722635	NO_2	Y	5.55	1.47	N
P106	Victoria Terrace, Crieff	R	286480	721913	NO_2	N	2.85	1.54	N
P107	1 Glover Street Perth	R	311201	722871	NO_2	Y	3.46	1.01	N
P108	Balmoral Road, Blairgowrie	R	318292	745414	NO_2	N	0.17	1.83	N
P109	44 Kinnoull Street, Perth	R	311660	723893	NO_2	Y	2.79	2.35	N
P110	231 Glasgow Road, Perth	R	309922	722633	NO_2	Y	2.79	2.43	N
P111	Glasgow Road nr Lamberkine Road Roundabout, Perth	R	308904	722731	NO_2	Y	0.85	0.96	N

P112	Lamberkine Drive, Perth	R	308528	722895	NO_2	Y	N/A	1.81	N
P113	38 Perth Road, Scone	R	313781	726119	NO_2	N	4.74	1.77	N
P114	Barossa Street, Perth	R	311625	724063	NO_2	Y	0	1.3	N
P115	Balhousie Street, Perth	R	311197	724857	NO_2	Y	4.95	3.24	N
P116	Jeanfield Road, Perth	R	310791	723817	NO_2	Y	6.04	1.73	N

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 Monitoring Results

Site ID	Site Location	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration (µg/m^3) (3)				
						2015	2016	2017	2018	2019
P1	42 Scott St Perth	R	Diffusion	N/A	83	36	37	35	33	33
P2	17 Speygate Perth	R	Diffusion	N/A	92	22	22	22	18	18
P5	8 Stormont Street	UC	Diffusion	N/A	100	21	20	20	18	18
P6	41 Mull Place	UB	Diffusion	N/A	100	12	11	11	10	10
P7	257 Rannoch Road	UC	Diffusion	N/A	92	15	19	16	21	14
P13	86 South Street	R	Diffusion	N/A	92	32	31	31	27	26
P20	2 Crieff Road	R	Diffusion	N/A	100	26	27	26	25	23
P29	37 York Place	R	Diffusion	N/A	100	40	33	31	29	28
P30	104 South Street	R	Diffusion	N/A	100	35	33	35	30	29
P31	45-47 South Street	R	Diffusion	N/A	92	27	27	25	23	22
P32	135 South Street	R	Diffusion	N/A	100	33	33	32	29	30
P33	216 South Street	R	Diffusion	N/A	100	35	35	31	30	32

Site ID	Site Location	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2019 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
						2015	2016	2017	2018	2019
P34	10 County Place	R	Diffusion	N/A	100	44	43	41	38	37
P35	17 Princes Street	R	Diffusion	N/A	100	26	26	23	21	20
P36	51 Glasgow Road	R	Diffusion	N/A	100	28	29	28	27	26
P37	Riggs Road	R	Diffusion	N/A	100	26	26	25	23	22
P38	93 Main Street	R	Diffusion	N/A	100	27	28	27	27	22
P39	39 Main Street	R	Diffusion	N/A	92	40	38	35	36	32
P40	18 Main Street	R	Diffusion	N/A	100	**43**	**41**	40	34	32
P41	76 Atholl Street	R	Diffusion	N/A	100	37	39	37	34	31
P43	17 Atholl Street	R	Diffusion	N/A	100	**47**	**46**	**44**	**41**	38
P45	Ballantine Place	UC	Diffusion	N/A	100	19	21	20	17	18
P46	204 Crieff Road	R	Diffusion	N/A	100	29	31	25	25	19
P47	5 East Huntingtower	R	Diffusion	N/A	100	23	25	22	21	19
P51	2 West Bridge St	R	Diffusion	N/A	100	27	27	27	24	23

Site ID	Site Location	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2019 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
						2015	2016	2017	2018	2019
P54	High Street RTM, Perth	R	Automatic	N/A	64	22	23	17	21	21
P55	7 West High Street, Crieff, PH7 3AF	UC	Diffusion	N/A	100	40	42	38	37	35
P56	39 High Street, Crieff, PH7 3HT	UC	Diffusion	N/A	100	25	26	24	25	22
P57	62 High Street, Crieff, PH7 3HT	UC	Diffusion	N/A	100	25	27	25	24	24
P58	9 East High Street, Crieff, PH7 3AF	UC	Diffusion	N/A	100	36	34	34	31	29
P61	Atholl Street RTM, Perth	R	Automatic	N/A	97	49	45	40	37	36
P62	84 Dundee Road	R	Diffusion	N/A	100	28	30	28	25	23
P63	30 Dundee Road	R	Diffusion	N/A	100	**40**	39	37	31	30

Site ID	Site Location	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2019 (%) [2]	NO_2 Annual Mean Concentration (µg/m^3) [3]				
						2015	2016	2017	2018	2019
P64	Isla Road	R	Diffusion	N/A	100	**46**	**43**	**42**	39	36
P65	5 Charlotte Street	R	Diffusion	N/A	92	30	30	28	26	24
P67	1 Atholl Street	R	Diffusion	N/A	92	35	33	34	30	28
P68	2 Atholl Street	R	Diffusion	N/A	92	30	29	28	23	26
P71	134 Dunkeld Road	R	Diffusion	N/A	100	18	16	15	14	13
P72	82 Crieff Road	R	Diffusion	N/A	75	37	34*	33	28	28
P73	19 West High Street, Crieff, PH7 4AU	UC	Diffusion	N/A	100	38	39	39	**47**	34
P74	43 High Street, Crieff, PH7 3HT	UC	Diffusion	N/A	92	28	29	29	25	21
P75	James Square RTM, Crieff	R	Automatic	N/A	96	23	26	25	17	16
P76	10/12 West High Street, Crieff, PH7	UC	Diffusion	N/A	100	35	34	33	31	28

Site ID	Site Location	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2019 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
						2015	2016	2017	2018	2019
	4DL									
P78	1 Lodge Street, Crieff, PH7 4AX	UC	Diffusion	N/A	100	21	23	21	20	19
P79	17 Main Street	R	Diffusion	N/A	100	36	37	34	32	30
P81	76 High Street, Kinross, KY13 8JA	R	Diffusion	N/A	100	23	23	22	18	19
P82	66 High Street, Auchterarder, PH3 1BN	R	Diffusion	N/A	100	29	26	24	22	20
P83	176 High Street, Auchterarder, PH3 1BN	R	Diffusion	N/A	92	20	19	15	15	15
P86	2 Friarton Road	R	Diffusion	N/A	100	26	25	25	23	20
P87	Hollybush Road	BG	Diffusion	N/A	100	6	6	7	6	6
P89	59 South Methven St	R	Diffusion	N/A	100	37	37	34	28	29
P90	22 North Methven St	R	Diffusion	N/A	100	30	30	30	26	25

Site ID	Site Location	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2019 (%) [2]	NO_2 Annual Mean Concentration ($\mu g/m^3$) [3]				
						2015	2016	2017	2018	2019
P94	Queen Street, Coupar Angus	UC	Diffusion	N/A	100	26*	24	21	19	19
P95	26-28 Atholl Street	K	Diffusion	N/A	92	N/A	40*	43	35	36
P96	22 Barrack St	K	Diffusion	N/A	92	N/A	35*	33	33	30
P97	St Ninians School,	R	Diffusion	N/A	58.3	N/A	33*	31	33	27
P98	30 Edinburgh Road	R	Diffusion	N/A	92	N/A	22*	20	22	18
P99	15 Murray Cr Perth	UB	Diffusion	N/A	92	N/A	18*	17	15	14
P100	9 Comrie Street, Crieff, PH7 4AX	UC	Diffusion	N/A	100	N/A	21*	19	18	19
P101	28 Dunkeld Road	R	Diffusion	N/A	100	N/A	28*	26	23	24
P102	30 Perth Road, Scone	R	Diffusion	N/A	50	N/A	24*	24	22	21
P103	28 York Place	R	Diffusion	N/A	100	N/A	41*	38	37	35

Site ID	Site Location	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
						2015	2016	2017	2018	2019
P104	202 Glasgow Road	R	Diffusion	N/A	100	N/A	31*	30	27	26
P106	Victoria Terrace, Crieff	R	Diffusion	N/A	100	N/A	N/A	9	9	9
P107	1 Glover Street Perth	R	Diffusion	N/A	100	N/A	N/A	29	29	25
P108	Balmoral Road, Blairgowrie	R	Diffusion	N/A	83	N/A	N/A	N/A	23	24
P109	44 Kinnoull Street, Perth	R	Diffusion	N/A	92	N/A	N/A	N/A	26	25
P110	231 Glasgow Road, Perth	R	Diffusion	N/A	83	N/A	N/A	N/A	N/A	23
P111	Glasgow Road nr Lamberkine Road Roundabout, Perth	R	Diffusion	N/A	83	N/A	N/A	N/A	N/A	24
P112	Lamberkine Drive, Perth	R	Diffusion	N/A	83	N/A	N/A	N/A	N/A	19
P113	38 Perth Road, Scone	R	Diffusion	N/A	33	N/A	N/A	N/A	N/A	21

Site ID	Site Location	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
						2015	2016	2017	2018	2019
P114	Barossa Street, Perth	R	Diffusion	N/A	33	N/A	N/A	N/A	N/A	16
P115	Balhousie Street, Perth	R	Diffusion	N/A	33	N/A	N/A	N/A	N/A	18
P116	Jeanfield Road, Perth	R	Diffusion	N/A	33	N/A	N/A	N/A	N/A	26

Notes: Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

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

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

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

Table A.4 – 1-Hour Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
					2015	2016	2017	2018	2019
Perth 1 (High Street)	Roadside	Automatic	64	64	0	0	0	0	0 (88)
Perth 2 (Atholl Street)	Roadside	Automatic	97	97	0	0	**1**	0	0
Crieff (James Square)	Roadside	Automatic	96	96	0	**4**	0	0	0

Notes: Exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold.**

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

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

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

Figure A.1: Annual Mean Trend for NO_2 at Atholl Street

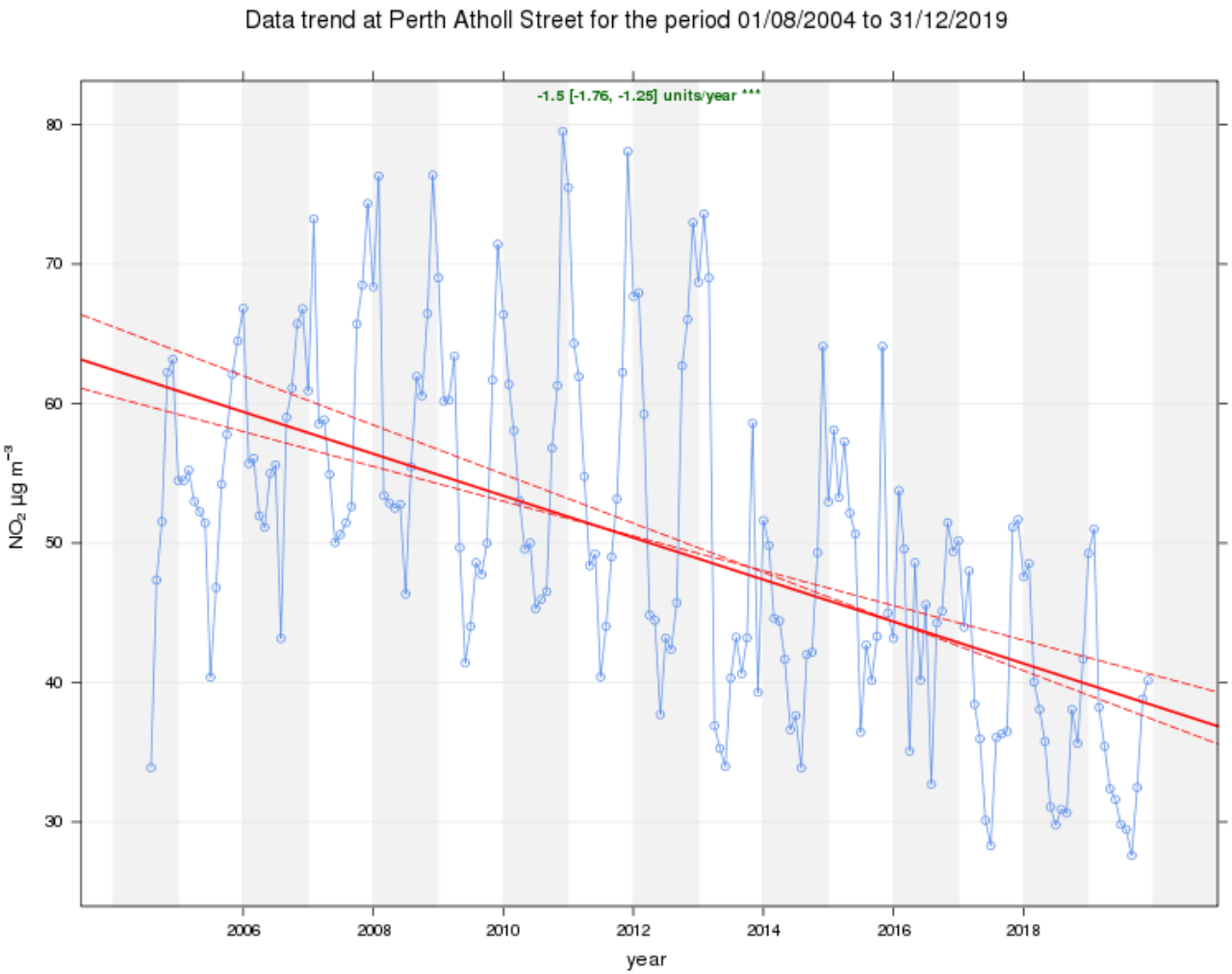


Figure A.2: Annual Mean Trend for NO_2 at Perth High Street

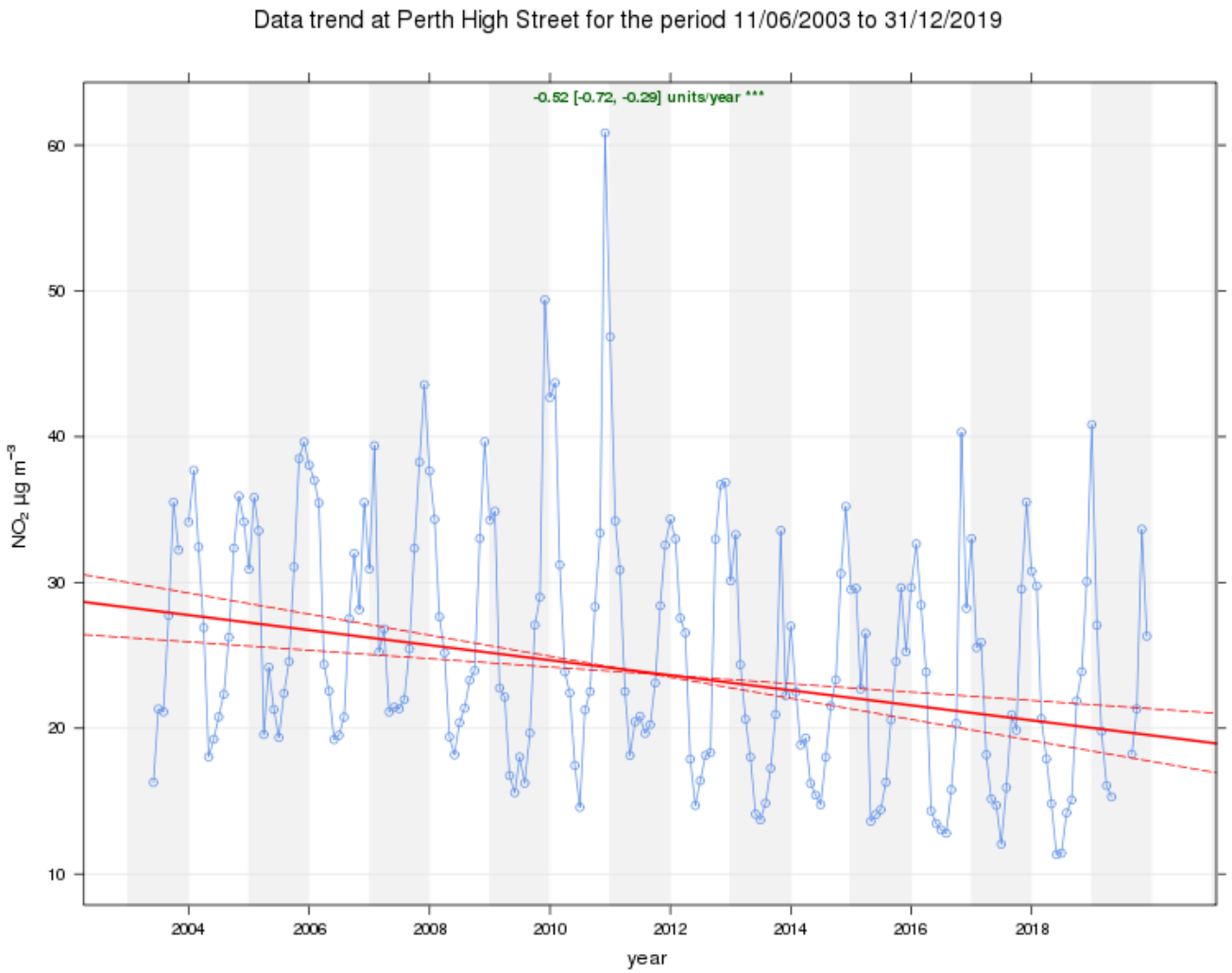


Figure A.3: Annual Mean Trend for NO_2 at Crieff

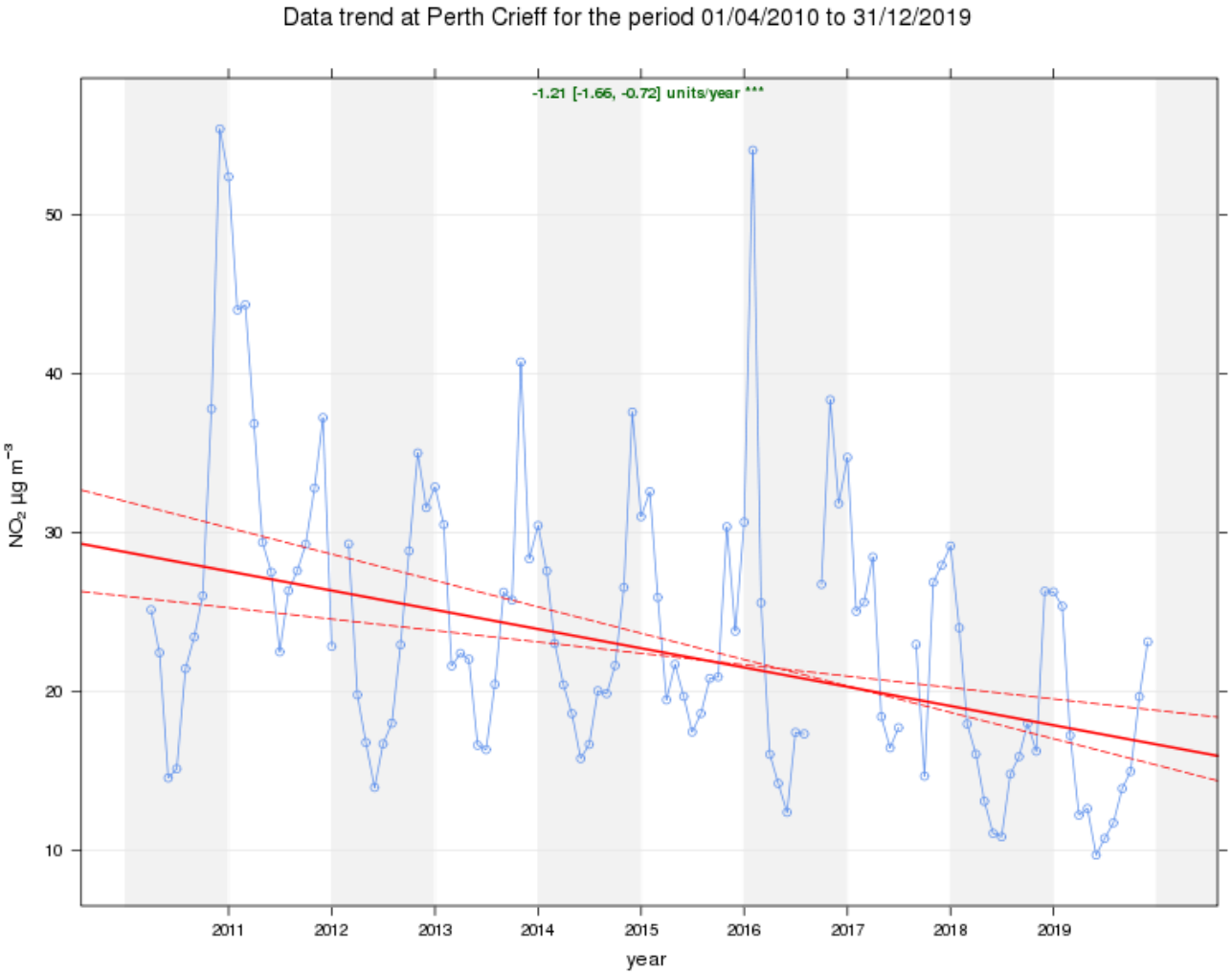


Table A.5 – Annual Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	PM_{10} Annual Mean Concentration ($\mu g/m^3$) (3)				
				2015	2016	2017	2018	2019
Perth 2 (Atholl Street)	Roadside	N/A	98	**18**	**18**	17	14	13
Perth 3 (Muirton)	Background	N/A	99	9	10	9	10	9
Crieff (James Square)	Roadside	N/A	83	14	16	11	10	9

Notes: Exceedances of the PM_{10} annual mean objective of $18\mu g/m^3$ are shown in **bold.**

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

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

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

Figure A.4: PM_{10} Trend for Atholl Street

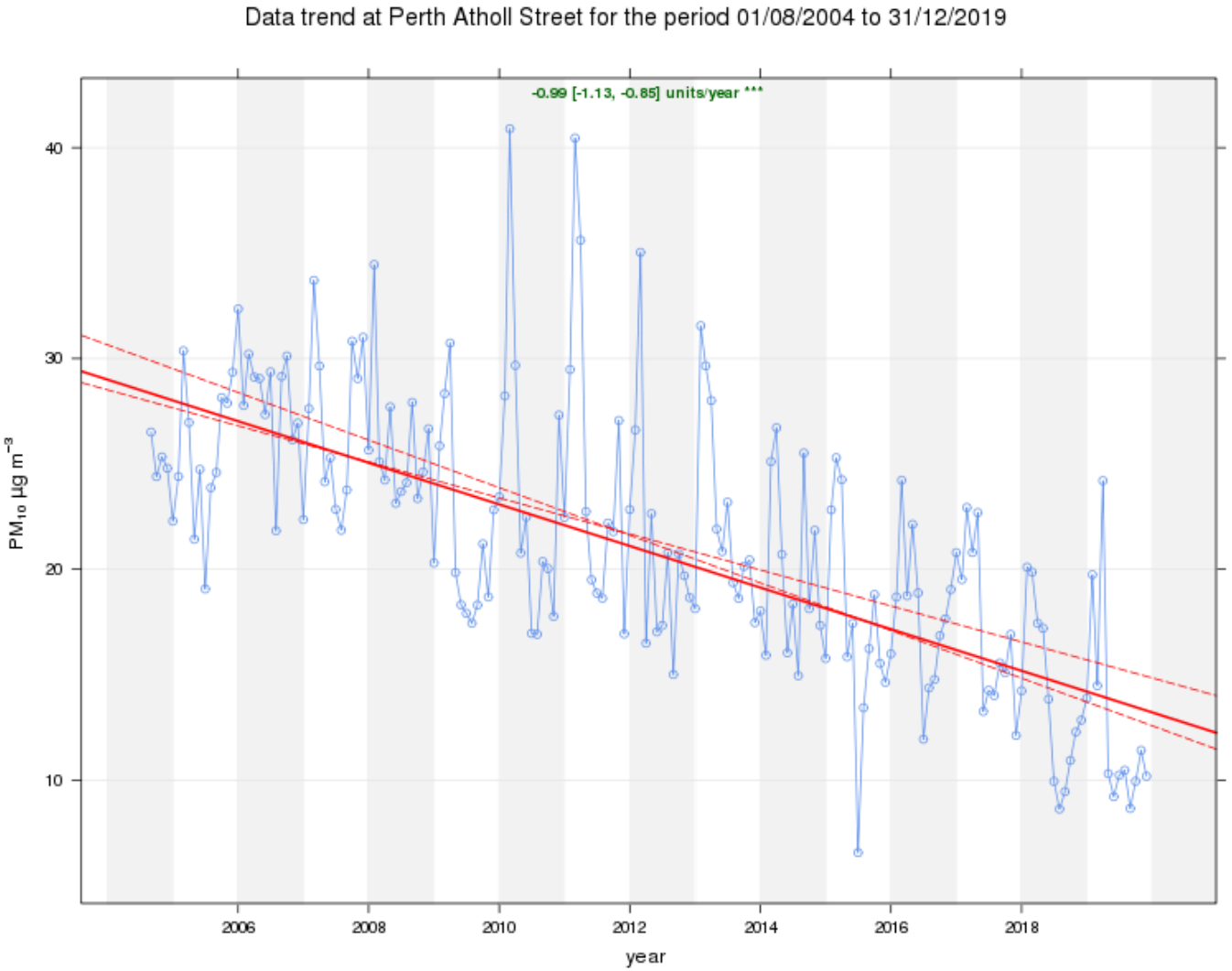


Figure A.5: PM_{10} Trend for Perth High Street

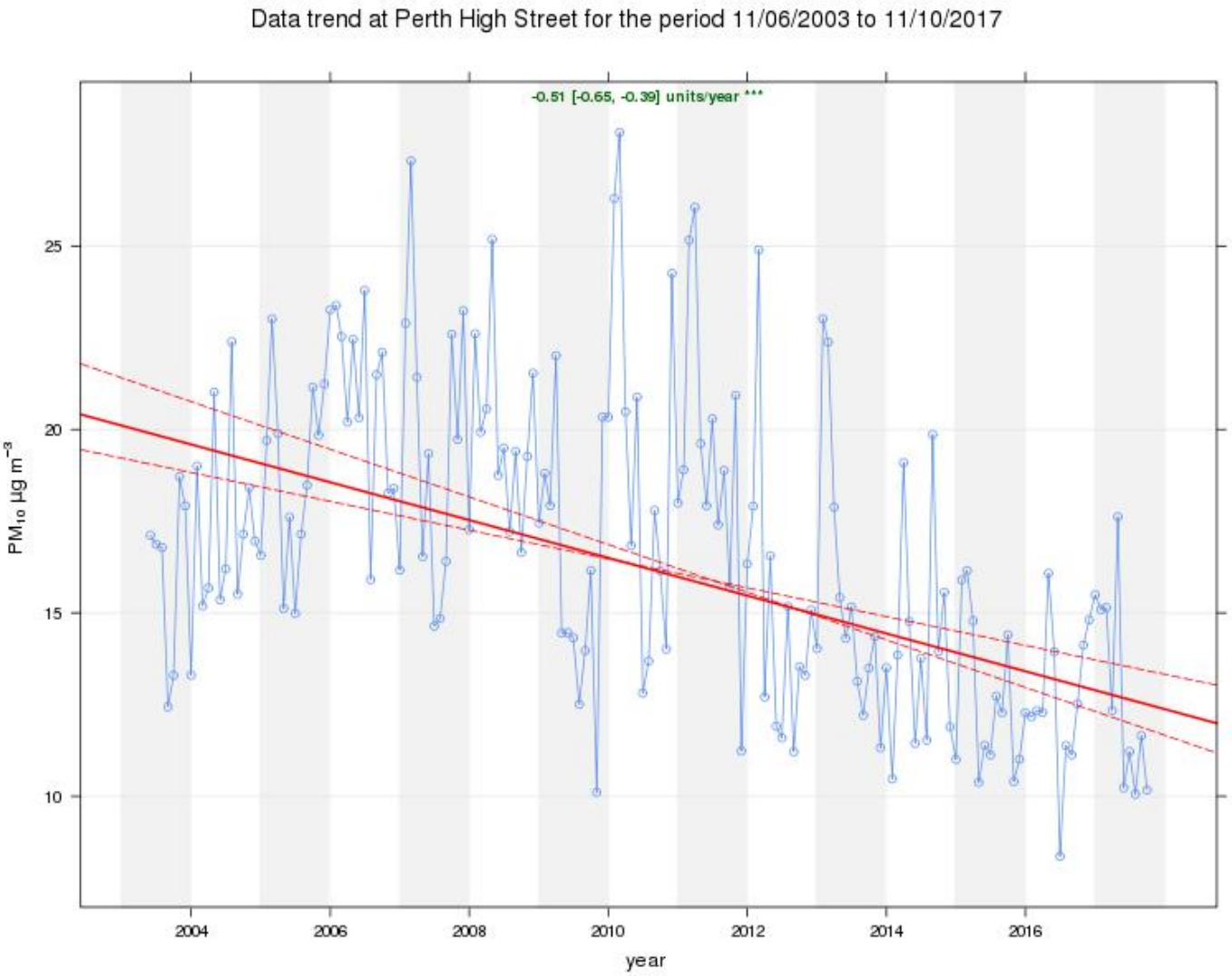


Figure A.6: PM_{10} Trend for Muirton

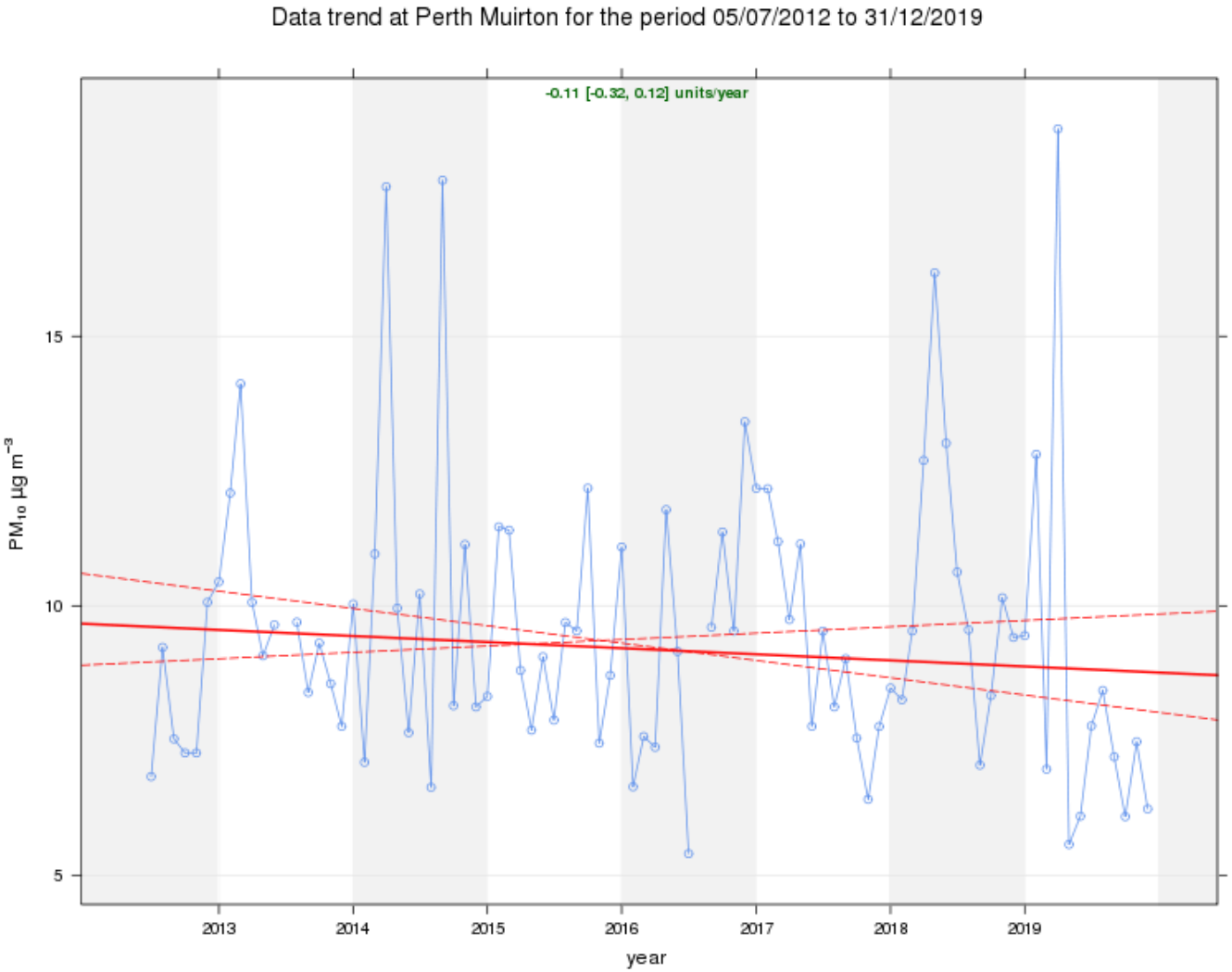


Figure A.7: PM_{10} Trend for Crieff

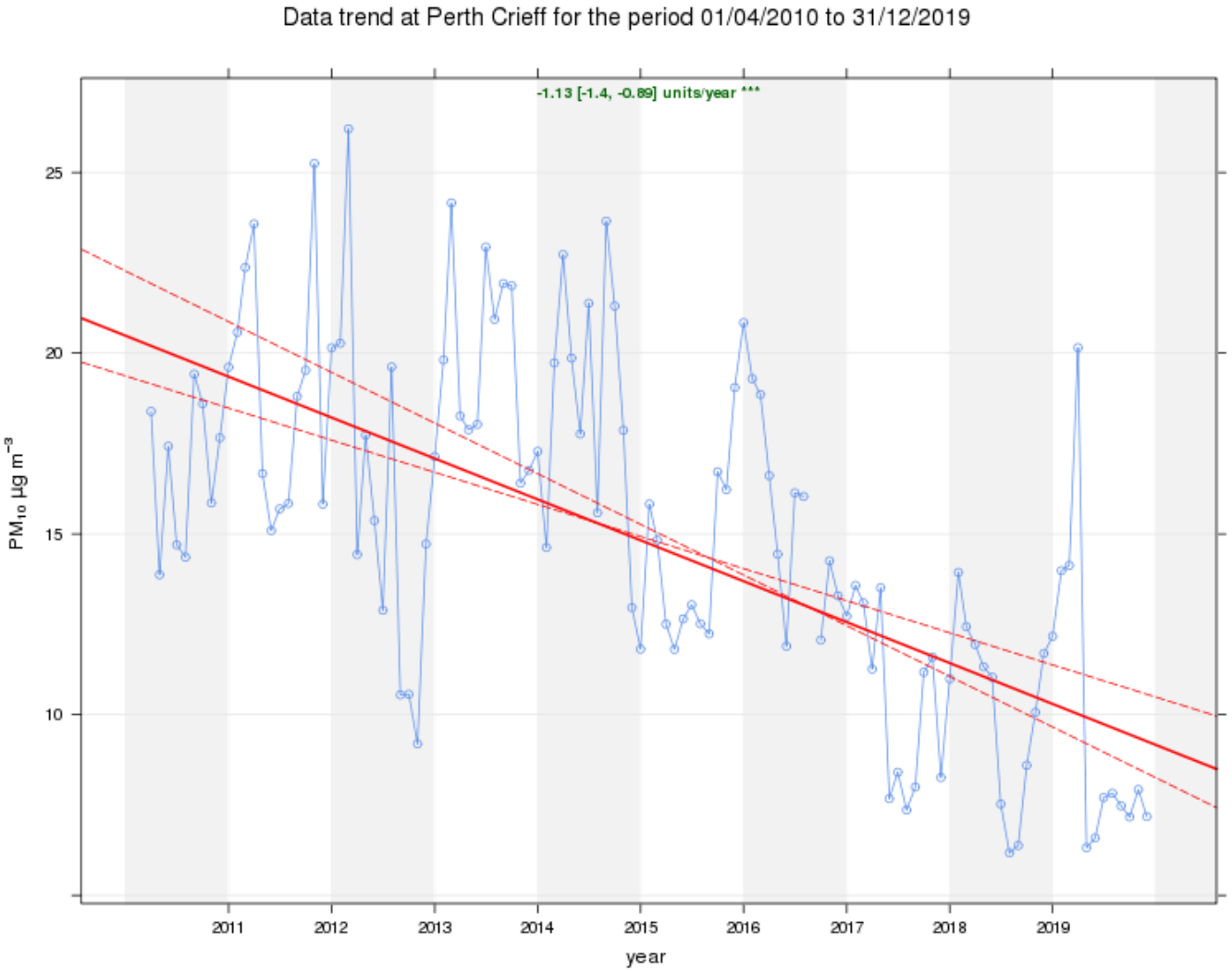


Table A.6 – 24-Hour Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	PM_{10} 24-Hour Means > 50µg/m^3 (3)				
				2015	2016	2017	2018	2019
Perth 2 (Atholl Street)	Roadside	N/A	98	**6**	0	**4**	0	**1**
Perth 3 (Muirton)	Background	N/A	99	0	0	0	0	**1**
Crieff (James Square)	Roadside	N/A	83	0	0	0	0	1

Notes: Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 7 times/year) are shown in **bold.**

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

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

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

Table A.7 – Annual Mean $PM_{2.5}$ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	$PM_{2.5}$ Annual Mean Concentration (µg/m^3) (3)				
				2015	2016	2017	2018	2019
Perth 1 (High Street)	Roadside	N/A	79	N/A	N/A	N/A	7	8
Perth 2 (Atholl Street)	Roadside	N/A	98	N/A	N/A	N/A	7	7
Perth 3 (Muirton)	Background	N/A	92	N/A	N/A	N/A	N/A	5
Crieff (James Square)	Roadside	N/A	83	N/A	N/A	N/A	6	5

Notes: Exceedances of the PM_{10} annual mean objective of 10µg/m^3 are shown in **bold.**

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2019

Table B.1 – NO_2 Monthly Diffusion Tube Results for 2019

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (1)	Distance Adjusted
Perth															
P1 – 42 Scott St	50.3	43.8	39.3	50.2	40.0	34.5	X	30.4	35.9	X	49.8	40.4	41	33	
P2 – 17 Speygate	37.8	26.1	25.6	20	17.3	13.1	X	17.8	18.1	23.3	29.5	25.2	23	18	
P5 – 8 Stormont St	32.7	30.6	21.4	17.3	15.9	13.8	16.1	20.2	21.3	20.9	24.1	29	22	18	
P6 – 41 Mull Pl	22.4	17.8	11.6	7.9	6.4	5.4	6.2	8.4	10.3	13.1	18.3	15.8	12	10	
P7 – 257 Rannoch Rd	24	19.3	15.1	18.5	X	12.1	11.4	11.5	16	18.3	28.2	20	18	14	
P13 – 86 South St	43.7	41.3	34.4	X	24.6	25.3	25.9	26.5	29.3	32.4	37	37.2	33	26	
P20 – 2 Crieff Rd	39.5	39.2	24.8	29.8	20.1	19.3	19.4	21.4	25	29.4	36.1	36.8	28	23	
P29 – 37 York Pl	48.5	45.8	34.4	37	30.7	26.4	24.5	25.4	31.4	29	44.1	36.1	34	28	
P30 – 104 South St	45.8	43.4	42.0	32.0	30.1	28.1	30.1	32.5	31.7	32.8	38.9	40.2	36	29	
P31 – 45-47 South St	35.9	29.7	27.4	31.3	X	23	19.8	19	23.7	30.9	60.4	29.1	30	24	
P32 – 135 South St	52.2	42.7	40.9	37.2	34.7	29.1	28.9	30.3	32.9	39.7	44.8	37	38	30	
P33 – 216 South St	47.3	45.5	38.7	41.5	32.5	29.1	30.1	29.2	31.5	39.3	66	45	40	32	
P34 – 10 County Pl	52.3	56.3	48.7	49.8	43.7	40.3	41.4	38.1	41.4	35	48.6	51.9	46	37	37
P35 – 17 Princes St	39.5	31.6	27	20.9	19.6	16.3	17	18.5	21	25.2	33.7	28.8	25	20	
P36 – 51 Glasgow Rd	44.4	39	28.4	33.3	28.1	24	25.2	26.2	27.7	34	40.2	37.9	32	26	
P37 – Riggs Rd	40	33.9	23.1	29	22.1	19.3	20.3	21.4	25.1	30.2	36.6	X	27	22	

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (1)	Distance Adjusted
P38 – 93 Main St	34.1	31.1	21.5	37.7	24.2	23	22.5	21.7	23.2	27.2	31.7	29.6	27	22	
P39 – 39 Main St	43.5	46.9	33.6	X	X	37.7	35.6	30.3	39.6	41	46.4	40.4	40	32	
P40 – 18 Main St	54.6	46.7	44.4	34.8	38.1	34.1	35.9	38.5	38.5	37.1	40	41.4	40	32	
P41 – 76 Atholl St	48.1	44.7	36.8	51.1	37.7	35.1	34.3	29.5	31.5	35.9	52	33.6	39	31	
P43 – 17 Atholl St	57.5	44.6	53.2	56.2	42.2	43.3	41.4	41.0	42.7	40.3	47.5	52.8	47	38	38
P45 – Ballantine Pl	34.3	29.8	17.2	24.6	17.4	15	14.4	14.2	17.5	24.8	33.8	23.5	22	18	
P46 – 204 Crieff Rd	X	X	19.8	33.5	23	21	18.3	17.4	21	23.5	33.6	24.1	24	19	
P47 – 5 East Huntingtower	31.9	27.8	X	30.6	21.1	21.4	15.7	19.4	20.5	22.7	33.8	15.9	24	19	
P51 – 2 West Bridge St	41.6	31.4	26.6	27.2	27.4	22.4	19.4	19.7	23.6	29.7	42	29.9	28	23	
P54	39	31	27	22	22	19	19	19	22	25	34	29	26	21	
P61	55	56	51	47	40	39	39	43	37	38	40	48	44	36	35
P62 – 84 Dundee Rd	39	32	24.6	34.6	26.8	26.1	22.7	21.4	25.5	28.7	37.3	26.6	29	23	
P63 – 30 Dundee Rd	42.6	40.9	34.3	42.6	37.3	36.1	32.5	29.4	33.4	40.3	43.5	34.1	37	30	
P64 – Isla Rd	57	53.6	44.9	42.3	46.9	38.9	39.8	42.4	39.9	44	47.8	43.2	45	36	36
P65 – 5 Charlotte St	40.8	32.8	28	40.5	X	22.2	22.3	24.8	22.3	26.1	36.8	29	30	24	
P67 – 1 Atholl St	45.4	48.6	42	26	X	29.3	27	31.7	29.1	28.9	31.5	41.9	35	28	
P68 – 2 Atholl St	43.5	37.6	35.1	25.5	X	23.9	26.1	27.9	30.4	31.9	36.2	42.7	33	26	
P71 – 134 Dunkeld Rd	26.7	23.7	11.3	15.9	12.3	10.6	9.6	10.3	12.5	18.5	26.7	17.8	16	13	
P72 – 82 Crieff Rd	48.9	X	37.8	37	X	32.7	26.4	X	24.9	33	38.2	35.8	35	28	

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (1)	Distance Adjusted
P79 – 17 Main St	44.7	38.8	32.0	48.8	37.1	35.3	32.1	29.2	34.9	38.4	45.0	33.0	37	30	
P86 – 2 Friarton Rd	34.3	27.4	22	28	22.5	20.2	19.3	21.6	24.1	27.9	33.5	26.6	26	20	
P89 – 59 South Methven St	44.7	45.9	40.7	30.7	32.4	27.5	26.6	32.5	31.9	37.9	41.5	41.7	36	29	
P90 – 22 North Methven St	42.5	40.4	31.4	27.8	26.8	24.2	23.9	27	27.7	31.2	37.7	36.4	31	25	
P95 – 26-28 Atholl St	56.3	51	45.6	54.4	X	38.4	30.4	34	37.7	42.2	54.5	45.6	45	36	
P96 – 22 Barrack St	44.6	43	32.3	45.6	X	31.8	31.3	30.8	34.4	36.1	50.9	38.2	38	30	
P97 – St Ninians School	X	X	X	X	X	22.1	24.7	27.8	29.1	27.8	39.6	40.4	34	27	
P98 – 30 Edinburgh Rd	27.9	30.9	16.5	X	17	17.8	17	16.8	19.8	26.6	36.8	22.6	23	18	
P99 – 15 Murray Cr	30.7	23.6	15.1	17.2	11.6	9.7	10.2	10.7	15.3	21.1	33.4	X	18	14	
P101 – 28 Dunkeld Rd	42.3	31.5	29.9	24.8	25.6	18.7	20.9	24.5	30.5	31.6	41.5	36.1	30	24	
P103 – 28 York Pl	54.3	56.5	43	48.6	38	37.6	35.8	40.6	39.3	45.3	47.1	32.5	43	35	
P104 – 202 Glasgow Rd	45.2	38	26.3	33.6	27.9	23.7	22.3	23.2	27.8	34.2	47.2	42.8	33	26	
P107 – 1 Glover St	45.6	43.3	31	33.4	29.2	29.7	23.9	24.2	30.7	32.8	43.8	14.8	32	25	
P109 – 44 Kinnoull St	45.5	39	34.3	26.1	X	23.8	23.2	25.5	27.6	31.9	39.6	33	32	25	
P110 – 231 Glasgow Rd	X	X	27.8	33.2	26.7	20	20.8	21.7	26.7	33.5	41.4	34	29	23	

Site ID	NO_2 Mean Concentrations (µg/m^3)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (1)	Distance Adjusted
P111 – Glasgow Rd	X	X	28.4	28.4	26.9	21.2	23.9	26	28.3	35.7	48.4	28.9	30	24	
P112 – Lamberkine Dr	X	X	18.7	27.4	17	16.2	18	20.3	22.1	23.5	35.4	36.8	24	19	
P114 – Barossa St	X	X	X	X	X	X	X	X	18.1	18.9	26.7	24.8	20	16	
P115 – Balhousie St	X	X	X	X	X	X	X	X	20.8	24	29	27.5	23	18	
P116 – Jeanfield Rd	X	X	X	X	X	X	X	X	31.3	34.1	45.6	37.2	33	26	
Crieff															
P55 – 7 West High St	52.9	44.1	34.8	57	43.5	38.4	36.4	45.9	40.8	50.9	50.9	36.8	44	35	
P56 – 39 High St	33.1	29.4	23.1	29.9	24.4	21.7	22	21.1	24.8	29	38	28.1	27	22	
P57 – 62 High St	39.5	35.3	21.7	33.8	29.9	24.6	23.5	26.5	24.7	27.8	35.6	31.2	30	24	
P58 – 9 East High St	46.2	39	32.5	42.1	34.7	39.8	32.6	31.8	34.9	33	39.4	32.5	37	29	
P73 – 19 West high St	48.2	43.7	32.6	49.1	40.2	34.9	37.9	30.1	38.3	42.4	67	42.7	42	34	
P74 – 43 High St	34.5	29	24.2	29.7	24.3	19.7	21.5	X	22.9	22.3	31.9	27.4	26	21	
P75	29	29	24	17	18	14	14	17	18	20	25	27	21	17	
P76 – 10/12 West High St	42.4	39.4	33.9	39.4	33.6	33.8	30.6	29.5	32.7	33.5	37.1	31.3	35	28	
P78 – 1 Lodge St	28	24.9	18.7	33.9	23.7	21	19.2	13.3	21.5	26.2	33.2	25.4	24	19	
P87 – Hollybush Rd	11.9	8.1	6.6	7.5	4.8	3.8	3.5	5.2	5.8	8.1	10.6	9.6	7	6	
P100 – 9 Comrie St	24.6	27.6	15.7	31.9	20.1	19.5	17	13.9	18.8	24.7	29.5	36.1	23	19	
P106 – Victoria Terr	16.2	12	9.1	9.4	7.4	6.1	5	6.3	7.2	10	15.3	33.1	11	9	

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (1)	Distance Adjusted
Kinross															
P81 – 76 High St	34.7	29.8	23.9	19.9	20.2	17.3	15	18.6	20.6	24.7	32.6	24.3	23	19	
Auchterarder															
P82 – 66 High St	35.4	33.3	20.8	25.2	22.6	19.3	17.9	20.3	23.4	24.6	35.1	22.9	25	20	
P83 – 176 High St	23.3	19.7	17.1	23.3	16.4	13	12.6	X	16	17.4	30.3	14	18	15	
Coupar Angus															
P94 – Queen St	29.5	26.7	18.9	26.6	23.7	20.7	18	19	24.5	26.7	30.7	21.7	24	19	
Scone															
P102 – 30 Perth Rd	X	30.7	19.5	23.5	21	18.7	15.3	X	X	X	X	X	26	21	
P113 – 38 Perth Rd	X	X	X	X	X	X	X	X	28.2	28.2	35.7	26.1	26	21	
Blairgowrie															
P108 – Balmoral Rd	31.5	36.9	24.6	X	X	24.4	21.6	26.1	23.2	29.4	35	48.7	30	24	

(1) See Appendix C for details on bias adjustment

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

Bias Adjustment of data

The data for Perth and Kinross has been adjusted using a local adjustment factor. The adjustment factor has been calculated for two of the roadside monitoring stations and then an average of these values has been taken. Data from the Perth High Street monitor was not included in the calculation due to the low data capture for the year. Please see below for the spreadsheets showing the calculations for the two sites.

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	08/01/2019	05/02/2019	58	50	56.3	55	4.2	8	10.5	49	100	Good	Good
2	05/02/2019	05/03/2019	50.7	60.2	57.9	56	5.0	9	12.3	51	100	Good	Good
3	05/03/2019	02/04/2019	52.3	50.6	50.5	51	1.0	2	2.5	38	99	Good	Good
4	02/04/2019	30/04/2019	45.1	49	46.5	47	2.0	4	4.9	35	100	Good	Good
5	30/04/2019	04/06/2019	39.4	39.3	40.8	40	0.8	2	2.1	32	100	Good	Good
6	04/06/2019	02/07/2019	40	39.8	36.7	39	1.9	5	4.6	32	85	Good	Good
7	02/07/2019	06/08/2019	40	39.1	37.2	39	1.4	4	3.6	30	83	Good	Good
8	06/08/2019	03/09/2019	43.2	44.8	41.3	43	1.8	4	4.4	29	100	Good	Good
9	03/09/2019	01/10/2019	36.2	34.1	39.5	37	2.7	7	6.8	28	99	Good	Good
10	01/10/2019	05/11/2019	38.4	38.6	38.2	38	0.2	1	0.5	32	99	Good	Good
11	05/11/2019	03/12/2019	42.5	38.1	39.7	40	2.2	6	5.5	39	100	Good	Good
12	03/12/2019	07/01/2020	48.5	47.4	47.9	48	0.6	1	1.4	40	100	Good	Good
13													
											Overall survey -->	Good precision	Good Overall DC

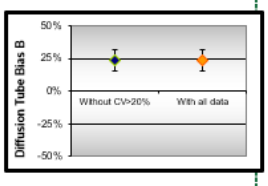
It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	P61 - Atholl Street RTM
Precision	12 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 12 periods of data	
Bias factor A	0.82 (0.77 - 0.87)
Bias B	22% (14% - 30%)
Diffusion Tubes Mean:	44 μgm^{-3}
Mean CV (Precision):	4
Automatic Mean:	36 μgm^{-3}
Data Capture for periods used:	97%
Adjusted Tubes Mean:	36 (34 - 39) μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 12 periods of data	
Bias factor A	0.82 (0.77 - 0.87)
Bias B	22% (14% - 30%)
Diffusion Tubes Mean:	44 μgm^{-3}
Mean CV (Precision):	4
Automatic Mean:	36 μgm^{-3}
Data Capture for periods used:	97%
Adjusted Tubes Mean:	36 (34 - 39) μgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

If you have any enquiries about this spreadsheet please contact the LAQM Helpdesk at: LAQMHelpdesk@uk.bureauveritas.com

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	08/01/2019	05/02/2019	29	28.5	29.9	29	0.7	2	1.8
2	05/02/2019	05/03/2019	29.4	28.5	29.5	29	0.6	2	1.4
3	05/03/2019	02/04/2019	24.3	23.9	23.5	24	0.4	2	1.0
4	02/04/2019	30/04/2019	16.3	17.1	17	17	0.4	3	1.1
5	30/04/2019	04/06/2019	17.9	17	17.6	18	0.5	3	1.1
6	04/06/2019	02/07/2019	14	12.6	14.2	14	0.9	6	2.2
7	02/07/2019	06/08/2019	13.4	14.3	14.4	14	0.6	4	1.4
8	06/08/2019	03/09/2019	16.1	17.3	17.3	17	0.7	4	1.7
9	03/09/2019	01/10/2019	18.2	18.3	18.5	18	0.2	1	0.4
10	01/10/2019	05/11/2019	19.3	19.5	21	20	0.9	5	2.3
11	05/11/2019	03/12/2019	26.1	25.3	23.2	25	1.5	6	3.7
12	03/12/2019	07/01/2020	27.7	26.4	27	27	0.7	2	1.6
13									

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
26	98	Good	Good
25	74	Good	or Data Capture
17	96	Good	Good
12	99	Good	Good
13	93	Good	Good
10	99	Good	Good
11	99	Good	Good
12	99	Good	Good
14	98	Good	Good
15	99	Good	Good
20	100	Good	Good
23	99	Good	Good
Overall survey -->		Good precision	Good Overall DC

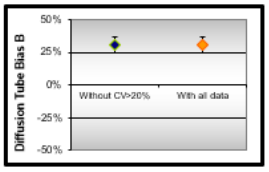
(Check average CV & DC from Accuracy calculations)

Site Name/ ID: P75 - Crieff RTM

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

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 11 periods of data
Bias factor A 0.78 (0.74 - 0.82)
Bias B 28% (22% - 35%)
Diffusion Tubes Mean: 20 µgm^{-3}
Mean CV (Precision): 3
Automatic Mean: 16 µgm^{-3}
Data Capture for periods used: 98%
Adjusted Tubes Mean: 16 (15 - 17) µgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 11 periods of data
Bias factor A 0.78 (0.74 - 0.82)
Bias B 28% (22% - 35%)
Diffusion Tubes Mean: 20 µgm^{-3}
Mean CV (Precision): 3
Automatic Mean: 16 µgm^{-3}
Data Capture for periods used: 98%
Adjusted Tubes Mean: 16 (15 - 17) µgm^{-3}



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Version 04 - February 2011

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The average of these two locations has been derived from the bias B values for both sites. This has given a value of 0.8. The decision to use a local adjustment factor is consistent with our approach in previous years and is also more conservative than using the national adjustment factor of 0.76.

Annualisation

Where less than 75% data capture for the diffusion tubes has been achieved the data has been annualised using the procedure laid out in LAQM TG.16. The data has been annualised using two continuous background monitors located within 50 miles of Perth and Kinross. Annualisation has been carried out for the following locations

- P97
- P102
- P113
- P114
- P115
- P116

Copies of the spreadsheets below show the calculations which have been completed for these locations.

Site ID - P97									
Dundee Mains Loan Urban Background					Grangemouth Moray Urban Background				
Month	B1	D1	B1 when D1 available		Month	B1	D1	B1 when D1 available	
Jan	19				Jan	30			
Feb	15				Feb	21			
Mar	9				Mar	10			
Apr	12				Apr	16			
May	8				May	11			
Jun	7	22.1	7		Jun	9	22.1	9	
Jul	6	24.7	6		Jul	7	24.7	7	
Aug	7	27.8	7		Aug	9	27.8	9	
Sep	8	29.1	8		Sep	10	29.1	10	
Oct	11	27.8	11		Oct	15	27.8	15	
Nov	16	39.6	16		Nov	28	39.6	28	
Dec	15	40.4	15		Dec	14	40.4	14	
Average	11.08333	30.21429	10.00		Average	15.00	30.21429	13.14	
B1 Annual Mean				11.08333	B1 Annual Mean				15.00
B1 Period Mean				10.00	B1 Period Mean				13.14
Ratio Annual Mean: Period Mean				1.11	Ratio Annual Mean: Period Mean				1.14
Average Ratio		1.12							
Annualised Average for P102			**34**						

Site ID - P102

Dundee Mains Loan Urban Background					Grangemouth Moray Urban Background				
Month	B1	D1	B1 when D1 available		Month	B1	D1	B1 when D1 available	
Jan	19				Jan	30			
Feb	15	30.7	15		Feb	21	30.7	21	
Mar	9	19.5	9		Mar	10	19.5	10	
Apr	12	23.5	12		Apr	16	23.5	16	
May	8	21	8		May	11	21	11	
Jun	7	18.7	7		Jun	9	18.7	9	
Jul	6	15.3	6		Jul	7	15.3	7	
Aug	7				Aug	9			
Sep	8				Sep	10			
Oct	11				Oct	15			
Nov	16				Nov	28			
Dec	15				Dec	14			
Average	11.08333	21.45	9.50		Average	15.00	21.45	12.33	
B1 Annual Mean				11.08333	B1 Annual Mean				15.00
B1 Period Mean				9.50	B1 Period Mean				12.33
Ratio Annual Mean: Period Mean				1.17	Ratio Annual Mean: Period Mean				1.22
Average Ratio		1.19							
Annualised Average for P102			**26**						

Site ID - P113

Dundee Mains Loan Urban Background					Grangemouth Moray Urban Background				
Month	B1	D1	B1 when D1 available		Month	B1	D1	B1 when D1 available	
Jan	19				Jan	30			
Feb	15				Feb	21			
Mar	9				Mar	10			
Apr	12				Apr	16			
May	8				May	11			
Jun	7				Jun	9			
Jul	6				Jul	7			
Aug	7				Aug	9			
Sep	8	28.2	8		Sep	10	28.2	10	
Oct	11	28.2	11		Oct	15	28.2	15	
Nov	16	35.7	16		Nov	28	35.7	28	
Dec	15	26.1	15		Dec	14	26.1	14	
Average	11.08333	29.55	12.5		Average	15.00	29.55	16.75	
B1 Annual Mean				11.08333	B1 Annual Mean				15.00
B1 Period Mean				12.5	B1 Period Mean				16.75
Ratio Annual Mean: Period Mean				0.886667	Ratio Annual Mean: Period Mean				0.90
Average Ratio		0.89							
Annualised Average for P113			**26**						

Site ID - P114

Dundee Mains Loan Urban Background			
Month	B1	D1	B1 when D1 available
Jan	19		
Feb	15		
Mar	9		
Apr	12		
May	8		
Jun	7		
Jul	6		
Aug	7		
Sep	8	18.1	8
Oct	11	18.9	11
Nov	16	26.7	16
Dec	15	24.8	15
Average	11.08333	22.13	12.50
B1 Annual Mean			11.08333
B1 Period Mean			12.50
Ratio Annual Mean: Period Mean			0.89
Average Ratio		0.89	
Annualised Average for P114			**20**

Grangemouth Moray Urban Background			
Month	B1	D1	B1 when D1 available
Jan	30		
Feb	21		
Mar	10		
Apr	16		
May	11		
Jun	9		
Jul	7		
Aug	9		
Sep	10	18.1	10
Oct	15	18.9	15
Nov	28	26.7	28
Dec	14	24.8	14
Average	15.00	22.13	16.75
B1 Annual Mean			15.00
B1 Period Mean			16.75
Ratio Annual Mean: Period Mean			0.90

Site ID - P115

Dundee Mains Loan Urban Background			
Month	B1	D1	B1 when D1 available
Jan	19		
Feb	15		
Mar	9		
Apr	12		
May	8		
Jun	7		
Jul	6		
Aug	7		
Sep	8	20.8	8
Oct	11	24	11
Nov	16	29	16
Dec	15	27.5	15
Average	11.08333	25.33	12.5
B1 Annual Mean			11.08333
B1 Period Mean			12.50
Ratio Annual Mean: Period Mean			0.89
Average Ratio		0.89	
Annualised Average for P115			**23**

Grangemouth Moray Urban Background			
Month	B1	D1	B1 when D1 available
Jan	30		
Feb	21		
Mar	10		
Apr	16		
May	11		
Jun	9		
Jul	7		
Aug	9		
Sep	10	20.8	10
Oct	15	24	15
Nov	28	29	28
Dec	14	27.5	14
Average	15.00	25.33	16.75
B1 Annual Mean			15.00
B1 Period Mean			16.75
Ratio Annual Mean: Period Mean			0.90

Site ID - P116										
Dundee Mains Loan Urban Background					Grangemouth Moray Urban Background				
Month	B1	D1	B1 when D1 available		Month	B1	D1	B1 when D1 available	
Jan	19				Jan	30			
Feb	15				Feb	21			
Mar	9				Mar	10			
Apr	12				Apr	16			
May	8				May	11			
Jun	7				Jun	9			
Jul	6				Jul	7			
Aug	7				Aug	9			
Sep	8	31.3	8		Sep	10	31.3	10	
Oct	11	34.1	11		Oct	15	34.1	15	
Nov	16	45.6	16		Nov	28	45.6	28	
Dec	15	37.2	15		Dec	14	37.2	14	
Average	11.08333	37.05	12.5		Average	15.00	37.05	16.75	
B1 Annual Mean				11.08333	B1 Annual Mean				15.00
B1 Period Mean				12.50	B1 Period Mean				16.75
Ratio Annual Mean: Period Mean				0.89	Ratio Annual Mean: Period Mean				0.90
Average Ratio		0.89							
Annualised Average for P116			**33**						

Distance Correction

Enter data into the pink cells

Site Name/ID	Distance (m)		NO_2 Annual Mean Concentration ($\mu g/m^3$)			Comment
	Monitoring Site to Kerb	Receptor to Kerb	Background	Monitored at Site	Predicted at Receptor	
P34 - 10 County Place	2.7	2.7	11.1	37.0	*37.0*	Predicted concentration at Receptor within 10% the AQS objective.
P43 - 17 Atholl St	2.3	2.3	11.1	38.0	*38.0*	Predicted concentration at Receptor within 10% the AQS objective.
P61 -	2.2	2.8	11.1	36.0	34.5	
P64 - Isla Road	2.6	2.8	11.1	36.0	35.6	

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide

References

Smart Growth for Perth http://www.pkc.gov.uk/smartgrowth

Perth Transport Futures http://www.pkc.gov.uk/transportfutures

Active Travel Strategy for Perth and Kinross Active Travel Strategy for Perth and Kinross

Active Travel Strategy Action Plan Active Travel Strategy Action Plan

Regional Transport Strategy http://www.tactran.gov.uk/documents/TACTRANRTS-FinalNov2008.pdf

Perth & Kinross Council Local Development Plan adopted 2014 http://www.pkc.gov.uk/media/23633/Local-Development-Plan/pdf/Adopted_LDP_Web_Version.pdf?m=636099646768900000

Perth & Kinross Council Local Development Plan Review (2018 -2023) http://www.pkc.gov.uk/article/15042/Local-Development-Plan-Review-2018-2023-

Mains Issue Report http://www.pkc.gov.uk/article/15073/Main-Issues-Report

Scotland's Climate Change Declaration (SCCD) Perth & Kinross Council's first annual progress report http://www.keepscotlandbeautiful.org/sustainability-climate-change/sustainable-scotland-network/climate-change-reporting/201415-submitted-reports/?cid=15383

Renewable energy installation capacity Perth and Kinross http://www.pkc.gov.uk/media/13053/Renewables-Installed-Capacity-/pdf/RenewableInstalledCapacity.pdf?m=636118891999370000

Sustainable Design and Zero Carbon Development Supplementary Guidance

http://www.pkc.gov.uk/media/24773/Sustainable-Design-SPG/pdf/P_K_Sustainable_Design_SPG_Corrected_Version

Renewables and Low Carbon Energy
http://www.pkc.gov.uk/media/39833/PKCRenewableSG-Draft/pdf/PKCRenewableSG-Draftv1-31

Perth and Kinross Local Climate Impacts Profile (LCLIP)
http://www.pkc.gov.uk/NR/rdonlyres/E590425C-2665-4D13-B8DD-B70C659B3080/0/PerthandKinrossLocalClimateImpactProfile2008_w.pdf

Cleaner Air for Scotland Strategy
https://www.gov.scot/news/cleaner-air-for-scotland-1/