Annual Progress Report (APR)

2024 Air Quality Annual Progress Report (APR) for Perth and Kinross Council

In fulfilment of Part IV of the Environment Act 1995, as amended by the Environment Act 2021

Local Air Quality Management

August 2024

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Executive Summary: Air Quality in Our Area

Air Quality in Perth and Kinross

This annual progress report covers the period from 1 January 2023 to 31 December 2023.

The air quality within Perth and Kinross is generally good; however, there are a few known hotspots within Perth city centre, and previously in Crieff. The main pollutants of concern are Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}/$PM_{2.5}$) from vehicle emissions, which cannot escape due to the canyoning effect of high buildings within the effected streets.

Perth & Kinross Council (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). Due to consistent low levels of air pollution within the Crieff in recent years, PKC is in the process of revoking the Crieff AQMA

Once again there were no exceedances of NO_2 identified within Perth and Kinross during the reporting year, making this the fifth year without an exceedance. While the overall trend at the Atholl Street Real Time Monitor (RTM) over recent years still shows a gradual decrease in NO_2 (Figure A.1), in 2023 levels rose to their highest point since 2019, further justifying the need for close monitoring of Perth's air quality while levels continue to fluxuate post Covid-19. Elsewhere in Perth and Kinross, both the Bridgend and Crieff RTMs saw a continued decrease in NO_2. Across the region the majority of NO_2 diffusion tube levels decreased compared to those recorded in 2022, with 48 tubes decreasing, 5 remaining at the same levels as 2022 and 21 seeing an increase in NO_2. The most notable increases in NO_2 concentrations were seen in Atholl Street, South Street, Riggs Road and Glasgow Road as well as West High Street in Crieff, though none of the increases resulted in levels close to an exceedance of objectives. Maps showing the increases and decreases in diffusion tube levels are shown in 3.1.2. The bias adjustment factor for our 2023 diffusion tubes was slightly less than in 2022: 0.8 compared to the prevous year's 0.79.

No new sources of NO_2 emissions have been identified within Perth & Kinross.

PM_{10} levels have remained reasonably steady across the region, with the exception being Atholl Street. As has been the case for several years, the ongoing building works directly behind the Atholl Street monitor is thought to be the main source of the unusually high PM_{10} concentrations recorded at the location. The Atholl Street RTM recorded an increase from 15.9 µg/m^3 in 2022 to 21.3 µg/m^3 in 2023. With the Fidas-100 correction, this rises to 23.4 µg/m^3. This is the highest level recorded within Perth & Kinross since 2011, however it is not thought to be caused by vehicle emissions. At the time of writing the building works thought responsible for high PM_{10} concentrations were recently concluded, and PM_{10} levels have reduced significantly. However, it will take some time for the real PM_{10} trend to reemerge at Atholl Street.

Construction surrounding Atholl Street RTM

There were no exceedances of the annual mean PM_{10} objective and no exceedance of the overall PM_{10} 24-Hour Mean national objective during the reporting year. There was one exceedances of the 50 µg/m^3 24-Hour Mean at Crieff in 2023, and 15 exceedances of the 50 µg/m3 24-Hour Mean at Atholl St, above the objective of 7 exceedances per year. With the Fidas-100 correction, this rises significantly to 25 exceedances. As above, these high levels were believed to be caused by ongoing building works near the monitor.

PKC also monitors for $PM_{2.5}$ at all RTMs; no exceedances of objective levels were observed in 2023. 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 works in close partnership with a number of agencies to manage local air quality, including TACTRAN (Tayside and Central Scotland Transport Partnership) and SEPA. As Crieff 's AQMA has the A85 trunk road running through it which Transport Scotland (TS) has adopted, and BEAR Scotland maintains, PKC also work closely with TS and BEAR Scotland in addressing the air quality issues at this location.

Actions to Improve Air Quality

- **Cross Tay Link Road** - Work progressed significantly on the Cross Tay Link Road in 2023/24, with the project nearing completion at the time of writing with the expected opening date of Spring 2025. The works are split into three areas – the link road from Scone (A94) to the River Tay (now named the "New Kingsway"), the construction of the bridge over the River Tay (now named "The Destiny Bridge") and the realignment of the A9 and construction of tie-ins with the CTLR.

At the time of writing, current progress on these three areas of work are as follows:

  - New Kingsway – A section of the Kingsway opened in September 2023 between Stormontfield and the A93. Roundabouts at Stormontfield, A93 and A94 were also all opened to traffic in 2023, while works on surfacing, signage, street lighting and landscaping all nearing completion, expected in late 2024. The Green Bridge at Highfield is also near completion with only final touches to landscaping, fencing and pathways needed.

  - Destiny Bridge – Both east and west piers of the bridge were completed in 2023, with abutment piling and foundations also complete/nearing completion. The completion of the initial superstructure (hammerhead) in early 2024 has allowed for work on the fifty-six deck segments to begin and at the time of writing is well underway with thirty-eight of the fifty-six segments completed. The bridge is currently forecast to be completed in 2024.

  - A9 – The new A9 alignment to the west is now fully established, with ancillary works such as bus bays, footpaths etc. all completed. The A9 overbridge superstructure, kerbing, hard landscaping and surfacing works on adjacent roundabouts are also

complete. The next phase of works is also underway for the new Park and Choose area, with drainage now complete.

Destiny Bridge Progress May 2024

A94 Roundabout and New Kingsway Progress May 2024

- **Perth AQAP** - The review and update of the existing Perth Air Quality Action Plan (AQAP) has now been completed and a final draft is currently awaiting approval from Senior Management at Perth & Kinross Council before going out to public consultation. This consultation will run for a minimum of 6 weeks, after which the final Perth AQAP will be completed and presented to Elected Members before being published. Once published, PKC will begin delivering the new measures within the updated AQAP.

- **Crieff AQMA Revocation** - Sweco UK Ltd on behalf of PKC carried out a detailed assessment of Crieff's current and future air quality in 2023 to determine whether the AQMA could be revoked. This work assessed the last five years of monitoring data, 2018 and 2023 traffic data, source apportionment analysis and assessment of potential future concentrations sensitivity of 5 years of meteorological conditions as well as the increase in traffic volume required to result in exceedances of annual objectives. The results from this assessment concluded that future exceedances were not likely, and that PKC should progress with the revocation of Crieff's AQMA. The revocation process is now almost complete, with completion expected Summer 2024.

- **Anti Idling Enforcement** - Enforcement began in Perth and Kinross in early 2023, following a comms campaign spanning radio, press and social media. PKC parking attendants carried out enforcement on an intelligence-led basis following a '4 E's' approach – Engage, Explain, Encourage, Enforce. Only if after following the first three E's there is continued refusal by the offender to stop idling unnecessarily will the final sanction of Enforcement be carried out: issuing a fixed penalty notice. Though no fixed penalty notices were issued in the first year of enforcement, parking attendants regularly ask motorists to switch off their engines while on patrol, and hotspots for idling have been identified and will be targeted in 2024.

- **Clean Air Day** - PKC once again took part in Clean Air Day in June 2023. Alongside social media content, education activities were delivered at six primary schools across Perth and Kinross, designed to help pupils understand key issues around air pollution and climate change. This year there was a focus on vehicle idling within the class activities to tie in with PKC's first year of anti-idling enforcement and the promotional campaign "Ease Our Wheeze". Elected Members also took part in Clean Air Day by

making pledges to reduce their emissions, with their photos being taken and printed in the local press.

St. Madoes PS Pupils designed their own facemasks and poster for CAD 2023

PKC Elected Members and their CAD Pledges

- **ECO Stars** - PKC ECO Stars Scheme commenced in April 2019 and has since recruited over 208 members, covering over 7,228 vehicles. ECO Stars is a scheme aimed to reduce emissions from businesses with large vehicle fleets, with ECO Stars staff working on PKC's behalf to recruit members who operate within P&K, assess their fleet vehicles/operations, and give a roadmap on reducing their emissions and fuel usage. In 2023, 16 new members were recruited to PKCs ECO Stars Scheme, covering 400 new vehicles. A further 30 members were reassessed during 2023, alongside an average of 69 invitations to new members sent each month.

- **IBike** - PKC has continued to work with SUSTRANS to employ an IBike Officer to provide sessions at schools throughout Perth and Kinross. In 2023 these sessions included Bikeability cycle training, bike maintenance etc across 10 schools to encourage pupils and their parents to take up sustainable and active travel. 64 activities were carried out in total, with 2764 pupils engaged with.

- **Cycle Infrastructure** - Investment continues to be made in the provision of attractive and secure cycle parking in Perth city centre, 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. In 2022, 2 new "Bike Nests" were procured and installed in Perth City Centre.

- **Active Travel** - PKC's Safer Communities team worked to encourage active travel this year by engaging with over 1000 people in 2023 through activities such as Climate Cafés, led bike rides, all ability bike lessons, Bikeability etc. Various events were carried out as well, with over 130 people signing up for the Canny Cycle and an event space at the Gran Fondo with Dr Bike stand and 3 free cycling sessions per day over the course of 5 days. A cycle hub was also set up at Balhousie Primary School in 2023 due to growth in interest in active travel, consisting of fully kitted out containers with eco-friendly power generators to charge .

April 2024 Perth Canny Cycle

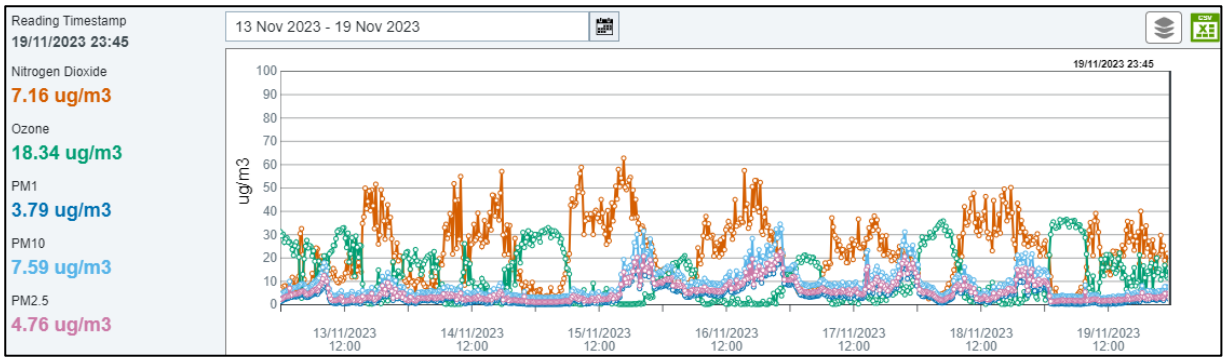
- **Bus Infrastructure** - PKC continues to upgrade the bus stop infrastructure throughout the region with new shelters and Real Time Passenger Information Displays (RTPI) to encourage the move to public transport. In 2023/2024 12 new RTPI displays were installed in Perth City with the majority being installed alongside refurbishment of existing bus shelters, while two of the RTPI's were installed inside buildings – one in Perth Bus Station and another in Strathmore Community Hub, Coupar Angus. Alongside their usual function of showing bus times, these RTPI displays have been utilised to advertise public transport related sites such as PK On The Go and Traveline Scotland. Furthermore, various improvements to Broxden Park and Ride were carried out to better cater for increased express coach and passenger usage at the site, including accessibility improvements and two more bus/coach bays.

- **EV Chargers** - 6 new 7kW electric vehicle chargers were installed at Victoria Street, Perth to support residents who do not have access to private parking, a garage or driveway to install a home charge point for overnight use. As well as encouraging uptake of electric vehicles by residents, these chargers will also be available for use by commuters and visitors to Perth. A further five charge points were installed or repaired

across Perth and Kinross in 2023, including charge points at Kinross and Scone Park & Rides.

New EV Charger in Mill Street, Perth

- **AQ Traffic Signal Trial** - Two Zephyr monitors were installed at either end of Bridgend, Perth in 2023 as part of a trial to link air quality monitoring data to the Perth traffic signalling system. The aim of the trial was to use air quality data as a trigger for traffic signals to clear frequent congestion in both Atholl Street and Bridgend, with the trial beginning in Bridgend first before moving to the move congested Atholl Street. A period of baseline data gathering was carried out before any changes to the traffic signalling could be attempted.



Example Data Captured by Bridgend Zephyr Monitor

Unfortunately, general communication issues with our traffic signalling system across Perth prevented the linking of the Zephyr monitors and traffic signalling, with a permanent solution expected in Autumn 2024. Due to this being close to the opening of the Cross Tay Link Road and substantial traffic changes expected within the Zephyr trial area as a result, the linking with traffic signals will be postponed until traffic has stabilised following CTLR opening. The Zephyr sensors will continue to gather data until the trial resumes, giving us a large catalogue of data to reference for both the Zephyr project and the impact of the CTLR.

- **Staff Travel** - Employee commuting and homeworking emissions were included within the Council's annual Public Bodies Climate Change Duties Reporting (PPCCDR) submission for the first time in 2023, calculated from staff travel survey data gathered in mid-2023. This survey will be carried out annually from now on and will help inform future measures to reduce staff emissions. In 2023, the travel breakdown was 60% by car, less than 10% by walking/cycling and less than 5% by car, producing an estimated 5,369 tonnes CO_2e annually.

- **Public Transport** - Public transport provision has improved in Perth & Kinross over 2023 with the Ember intercity electric coach network growing in the area, providing low-cost intercity journeys along the corridors of Dundee, Perth, Glasgow and Edinburgh. The Flix intercity coach service also commenced in Perth in 2023, further enhancing the choice of sustainable intercity travel from Perth. Furthermore, the Glenfarg Community Transport Group entered into a Public Social Partnership with PKC in April 2023, operating a local service between Glenfarg and Kinross as well as local school contracts. Their passenger numbers have steadily grown, and the service route has expanded to serve Perth.

PKC with support from Smarter Choices Smarter Places, offered free bus journeys within Perth and Kinross on four Saturdays in December 2023 to encourage the uptake of sustainable transport. Almost 22,000 people took advantage of the free bus travel, more than twice as many as took advantage of the same offer last year, saving around £54,000 in fares and potentially 3,500 car journeys. From June 2024 a similar offer of free bus travel will be available on the first Saturday of every month to continue this positive increase in public transport use within the local authority.

December 2023 Free PKC Bus Travel Poster

Local Priorities and Challenges

PKC will seek to complete the updated Perth AQAP by mid-2024 following the upcoming public consultation and approval by Elected Members. Following publication of the AQAP, work will begin planning the delivery of the many new measures within the updated plan, alongside promotion of the plan both internally and externally.

The revocation of the Crieff AQMA is also expected to be completed by late-2024. Following revocation, PKC will continue the delivery of Crieff AQAP measures as well as consider the implementation of a PKC Air Quality Strategy as recommended in LAQM PG.24.

PKC will continue to deliver the Perth Transport Futures Project in order to address key congestion points in the existing road network and provide linkages to growth areas set out in the Local Development Plan.

This project is split into four phases and will be delivered over several years. Progress is as follows:

- **Phase 1 A9/A85 Junction Improvement and Link Road to Bertha Park** – Completed in 2019

- **Phase 2 Cross Tay Link Road (CTLR)** – Connecting the A9 to A93 and A94 – Work well underway, with an expected completion before PKC's next Annual Progress Report.

- **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** – Mill Street public realm improvement development to create a 'Cultural Quarter' linking Perth Concert Hall, Theatre, Museum and Art Gallery completed. Further city centre improvements are to be undertaken such as walking and cycling infrastructure on major routes into the city.

More information on the Perth Transport Futures Project can be found at https://www.perthtransportfutures.co.uk/

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 Perth and Kinross during 2023. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Progress Report (APR) summarises the work being undertaken by Perth and Kinross 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 Concentration	Air Quality Objective Measured as	Date to be Achieved by
Nitrogen dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
Nitrogen dioxide (NO_2)	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
Particulate Matter (PM_{10})	18 µg/m^3	Annual mean	31.12.2010
Particulate Matter ($PM_{2.5}$)	10 µg/m^3	Annual mean	31.12.2021
Sulphur dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
Sulphur dioxide (SO_2)	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
Sulphur dioxide (SO_2)	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

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 publish and implement an Air Quality Action Plan (AQAP) within the shortest possible time and no later than 12 months of the date of AQMA Designation Order. The AQAP must set out measures the local authority intends to put in place in pursuit of the objectives within the shortest possible time Measures should be provided with milestones and a final date for completion. The action plan itself should have a timescale for completion and for revocation of the AQMA. Where measures to reduce air pollution may require a longer timescale an action plan shall be reviewed and republished within five years of initial publication and then five-yearly thereafter.

A summary of AQMAs declared by PKC can be found in Table 2.1 . Further information related to declared AQMAs, including maps of AQMA boundaries are available in Figure 2.1 and Figure 2.2 below as well as online at PKC's Air Quality webpage.

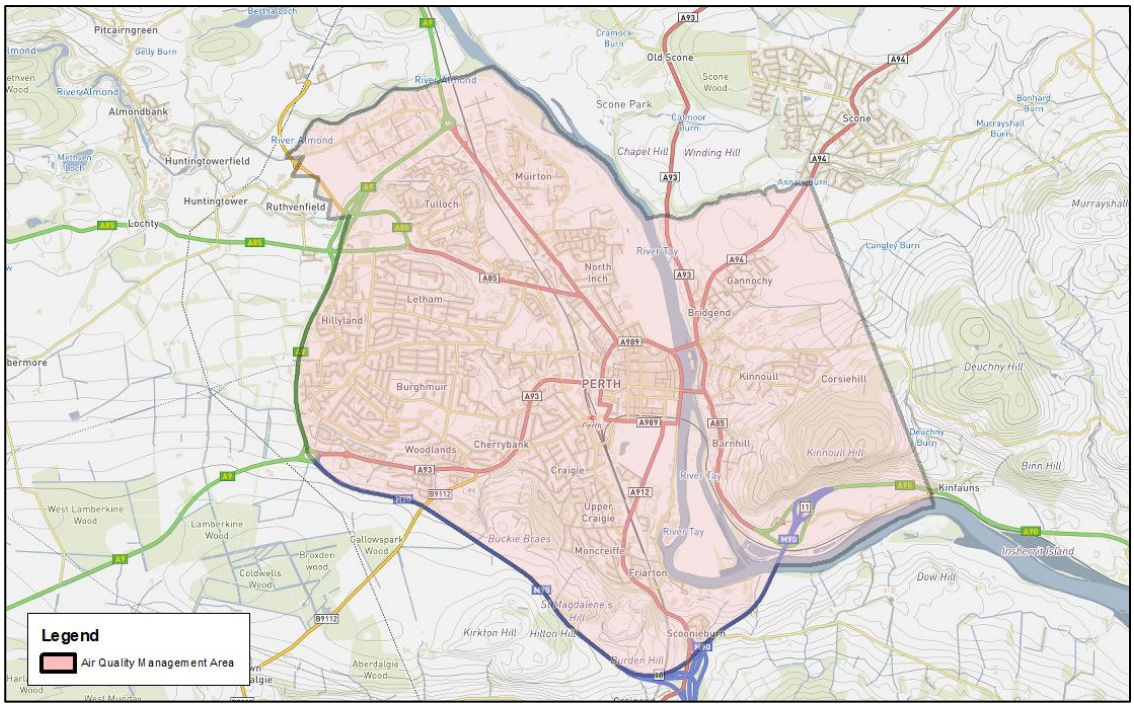


Figure 2.1: Perth AQMA Boundary

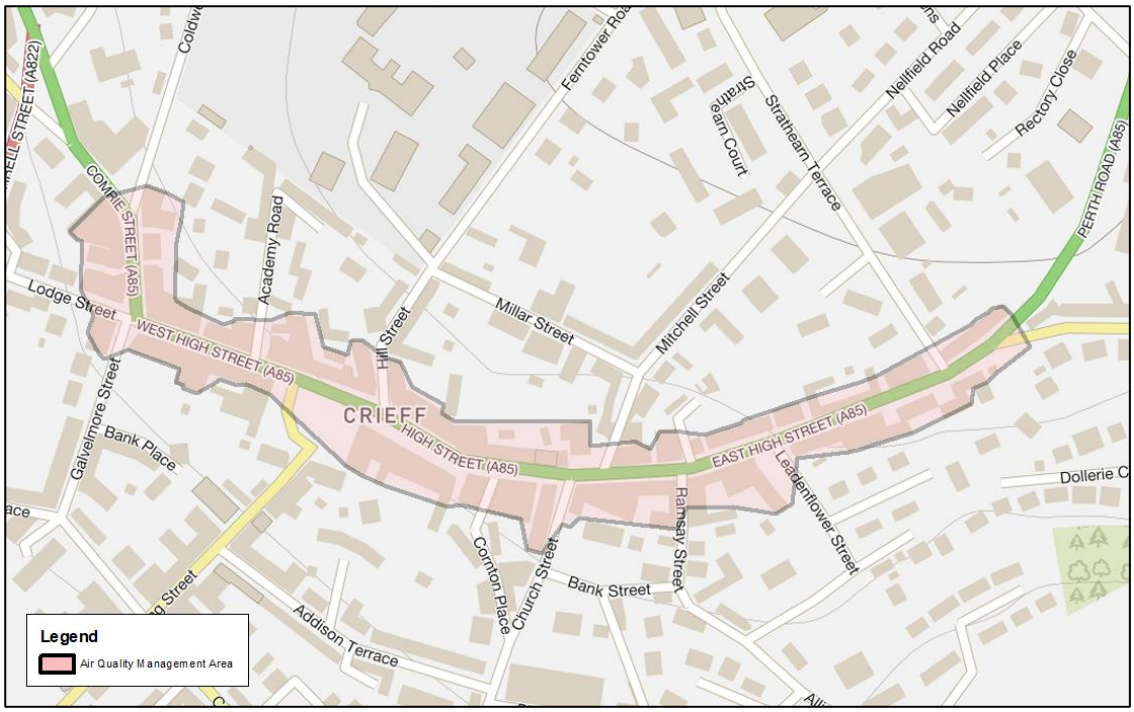


Figure 2.2: Crieff AQMA Boundary

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} 24-hour 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_
Crieff AQMA	• NO_2 annual mean • PM_{10} 24-hour mean	Crieff	Follows the A85 from the Y-Junction of Dollerie Terrace/Perth Road westwards to the Y-Junction of Comrie St/Coldwells Rd. The AQMA takes in the whole of the buildings along East High St/High St/West High St and Comrie St (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 2

Cleaner Air for Scotland 2 – Towards a Better Place for Everyone (CAFS2) is Scotland's second air quality strategy. CAFS2 sets out how the Scottish Government and its partner organisations propose to further reduce air pollution to protect human health and fulfil Scotland's legal responsibilities over the period 2021 – 2026. CAFS2 was published in July 2021 and replaces Cleaner Air for Scotland – The Road to a Healthier Future (CAFS), which was published in 2015. CAFS2 aims to achieve the ambitious vision for Scotland "to have the best air quality in Europe". A series of actions across a range of policy areas are outlined, a summary of which is available on the Scottish Government's website.

Progress by Perth and Kinross Council against relevant actions for which local authorities are the lead delivery bodies within this strategy is demonstrated below.

2.2.1 Placemaking – Plans and Policies

Local authorities with support from the Scottish Government will assess how effectively air quality is embedded in plans, policies, City Deals and other initiatives, and more generally in cross departmental working, identifying and addressing evidence, skills, awareness and operational gaps.

Perth & Kinross Council has worked hard over recent years to ensure air quality is a consideration through all relevant plans and policies across the council, and has a number of cross departmental groups in place to co-ordinate best practices across all services:

- The Perth & Kinross Local Development Plan (2019 - 2024) was adopted on 29 November 2019 and covers the whole Perth and Kinross area (apart from those areas covered by the National Parks). Air Quality is considered within the new plan for the whole region, not just AQMAs. 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.

- PKC released a Placemaking Guide in 2020 to help achieve the policy requirements within the Local Development Plan and ensure high quality development within the Perth & Kinross Council area that responds to our unique setting. Air quality is a key consideration within this document, providing guidance to developers on how to avoid

exacerbation of pollution during construction or resident exposure to pollutant sources such as busy roads.

- In addition to the above Placemaking Guide and the supplementary air quality planning guidance, Officers of Environmental Health review all planning applications received by PKC to assess potential air quality impacts caused both directly by the development and through increased traffic on the existing road network. All planning applications containing a wood burning or biomass appliance are also assessed and documented to keep record of the continually growing number of domestic burning appliances in the council area.

- PKC and TACTRAN continue to work in conjunction to ensure air quality is considered within the Regional Transport Strategy and projects such as freight consolidation, park and ride, lift share, walking and cycling initiatives. The Regional Transport Strategy is currently under review, to be adopted late 2022, and PKC are involved in the review consultation process.

- A TACTRAN–wide freight quality partnership (FQP) was formed a number of years ago, including members from PKC, Scottish Enterprise, and the private freight sector. PKC and Dundee Council Environmental Health teams continue to attend meetings to ensure air quality is integrated into the FQP.

- To work towards the delivery of Perth and Kinross Council's climate change plans and targets, a Climate Change Working Group (CCWG) has been set up. The CCWG consists of representatives from relevant teams which allows for collaborative working across Council services. The CCWG is divided into thematic subgroups (Energy & Buildings, Transport, Climate Resilience, Waste & Circular Economy, Education & Engagement, Business & Industry, and Land use) and although air quality is a recurring theme across all subgroups, air quality related issues fall within the remit of the Transport subgroup, where it is a standing item on the agenda.

2.2.2 Transport – Low Emission Zones

Local authorities working with Transport Scotland and SEPA will look at opportunities to promote zero-carbon city centres within the existing LEZs structure.

Perth and Kinross Council has no Low Emission Zones established within the Local Authority area. A National Low Emission Framework (NLEF) Stage 1 Screening Appraisal was carried out by PKC for both the Perth and Crieff AQMAs as part of the 2020 APR. The screening appraisal results suggested that a low emission zone was not necessary to address air quality issues in Perth as proposed projects were expected to impact positively on the AQ. Similarly, due to the Crieff AQMA covering essentially a single street, in line with the guidance provided for carrying out the NLEF assessment a low emission zone was not thought to be a proportionate measure in this situation.

As there has been no significant change to the air quality in Perth and Crieff, it has not been necessary to revisit and update the 2020 NLEF appraisal. Results from the original 2020 NLEF Stage 1 Screening Appraisal can be seen in Appendix D.

2.3 Implementation of Air Quality Action Plan(s) and/or measures to address air quality

In order to ensure that local authorities implement the measures within an action plan by the timescales stated within that plan, the Scottish Government expects authorities to submit updates on progress through the APR process. Perth and Kinross Council has taken forward a number of measures within the action plan during the current reporting year of 2023 in pursuit of improving local air quality and meeting the air quality objectives within the shortest possible time. Details of all measures completed, in progress or planned are set out in Table 2.2. More detail on these measures can be found in the air quality Action Plan relating to each AQMA.

Key completed measures for this reporting year are:

- Main construction works of the Cross Tay Link Road progressed significantly in 2023, with the realigned A9 opening in August 2023 and a section of the link road (now named the New Kingsway) opened in 2023. The traveller system for the new River Tay Crossing (Destiny Bridge) is now operational with the segments for the balanced cantilever structure now being poured. Completion of the programme is expected Spring 2025.

- Perth AQAP Review and Update completed, awaiting public consultation before final publication expected in late 2024.

- A detailed assessment of Crieff's current and future air quality was carried out in 2023 to determine whether the AQMA could be revoked, with the conclusion that future exceedances were not likely and that PKC should progress with the revocation of Crieff's AQMA. The revocation process is now almost complete, with completion expected late 2024.

- Anti Idling enforcement began within Perth & Kinross in April 2023 following the "4 E's" approach (Engage, Explain, Encourage, Enforce), with no fines issued at the time of writing but key hotspots have been identified for focused enforcement in 2024.

- ECO Stars scheme continuation, recruiting a further 16 new members covering 400 new vehicles.

- Clean Air Day event delivered with social media and school participation at six primary schools across P&K

- iBike Officer continued to provide cycle activities and training at schools across Perth & Kinross.

- 2 new "Bike Nests" procured to further increase cycle parking in Perth City.

- PKC continued to improve bus infrastructure in 2023 with the installation of a further 12 Real Time Passenger Information boards within Perth City, along with various improvements to Broxden P&R for improved capacity and accessibility for both buses/coaches and passengers.

- 11 electric vehicle charge points installed and/or repaired in 2023, further expanding PKC charging network.

- PKC's Safer Communities team engaged with over 1000 people in 2023 encouraging active travel through activities such as Climate Cafés, led bike rides, Bikeability etc. with larger events such as the Canny Cycle and the Gran Fondo also carried out/attended. A cycle hub was also set up at Balhousie Primary School in 2023.

- A PKC staff travel survey was carried out in 2023 to calculate employee commuting and homeworking emissions for the Council's annual Public Bodies Climate Change Duties Reporting (PPCCDR) submission for the first time. This survey will be carried out annually from now on and will help inform future measures to reduce staff emissions.

- Smarter Choices Smarter Places funding was utilised to further encourage sustainable travel within Perth and Kinross through a variety of avenues such as community engagement work with Bikeability and active travel coordinators, public transport improvements like new real time information board screens and marketing and promotion of the PK on the Go project.

- Free bus travel was provided in Perth & Kinross on four Saturdays in December to encourage sustainable travel. 22,000 passengers took advantage of this saving almost £54,000 in fares, twice the number of passengers than the previous year.

Progress on the following measures has been slower than expected due to:

- Zephyr Monitor & Traffic Management Trial – The trial to link air quality sensors with the traffic signalling network has been delayed due to ongoing communication issues with the signalling system across Perth, making overall operation unreliable and preventing the linking of the Zephyr monitors and traffic signalling. A permanent solution will not be in place until Autumn 2024, however due to the Cross Tay Link Road opening soon after the trial will be delayed until traffic levels have stabilised once more

Perth and Kinross Council expects the following measures to be completed over the course of the next reporting year:

- The updated Perth AQAP will be completed and published in 24/25, and work will begin to deliver the new measures within the plan.

- The Crieff AQMA will be revoked in 24/25 as per SG recommendations.

- Cross Tay Link Road is expected to open in Spring 2025, with the initial impact being reported in next year's APR.

- Clean Air Day – PKC has once again taken part in Clean Air Day for 2024, and will be carrying out further educational activities in Autumn 2024. Further details will be included as part of next year's APR

- Anti Idling enforcement will be refined following lessons learned in the first year of enforcement. Hotspots have been identified and signage and increased officer presence will be deployed at these locations.

- The 2024 PKC staff travel survey is underway and will now be an annual project, with the results being used to inform future measures for reducing staff emissions.

- PKC Fleet are trialling the use of Hydrotreated Vegetable Oil (HVT) in 2024 in six refuse vehicles for Perth city as an alternative to diesel. Should the trial prove successful, HVO fuel use will be extended across the fleet to reduce emissions.

- Funding has been granted to once again allow the iBike Officer to provide cycle activities and training at schools across Perth & Kinross.

- From June 2024 free bus travel will be available on the first year of every month within Perth & Kinross to encourage uptake of sustainable travel. Data on the effectiveness of this offer will be reported in the 2025 APR.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Expected/Actual Completion year	Measure Status	Funding Status	Key Milestones	Progress	Barriers to implementation
1.	**Cross Tay Link Road (CTLR)** - New crossing of the Tay linking the A9 to the A94 north of Scone, including package of associate bus priority, cycle, and pedestrian measures	Transport Planning and Infrastructure	2025/26	In Progress	**Fully Funded** PKC Capital Funding & SG Funding (£110.5M PKC + £40M SG)	2019 - Phase 1 A85/A9 completed and is open to connect with Bertha Park 2019 - AQ and Noise assessment as part of EIA 18/01661/SCOP undertaken by consultants and peer reviewed 2021 - Contract for the CTLR design and construction was awarded on 23 June 2021. 2022 – Groundworks on CTLR began 2023 – Realigned A9 opened in August, part of link road opened in October, construction of the Destiny Bridge underway	Main construction works are well underway and on programme for completion in Spring 2025. The realigned A9 opened in August 2023 and a section of the link road (now named the New Kingsway) opened in 2023. The traveller system for the new River Tay Crossing (Destiny Bridge) is now operational with the segments for the balanced cantilever structure now being poured. Completion of the programme is expected Spring 2025.	Lengthy timescale, potential delays may arise in the future
2.	**Integrate AQ into Regional Transport Strategy (RTS)** - Ensure that this AQAP is integrated	Policy guidance and development control	N/A	In Progress	N/A	2023 – Public consultation on the new TACTRAN Regional Transport strategy carried out between July	PKC and TACTRAN continue to work in conjunction to ensure AQ is	No barriers predicted

	into the delivery of the RTS.					and November 2023, and a final draft is now ready to submit to the Minister of Transport for approval	considered in the RTS. Regional Transport Strategy has recently undergone review and update, and TACTRAN liaised with PKC re air quality as part of the review process. The updated strategy is intended to run from 2024-2034	
3.	**Integrate AQ into Local Transport Strategy (LTS)** - Ensure that the AQAP is integrated into the delivery of the LTS.	Policy guidance and development control	N/A	In Progress	N/A	LTS published in 2010. Mobility Strategy to replace LTS in development, main issues report public consultation underway	PKC is currently developing a Mobility Strategy encompassing all travel within the local authority area, due 2024. As part of the updated Perth AQAP, a new measure is proposed ensuring this mobility strategy is created in line with CAFS2 and air quality considerations. The draft Mobility Strategy is out for public consultation at the time of writing, due to conclude at the end of July 2024.	No barriers predicted
4.	**Park & Ride** - Operate existing Park & Ride (PR) Schemes and maintain high levels of usage	Transport Planning and Infrastructure	N/A	In Progress	**Fully Funded** Annual funding source, Smarter Choices Smarter Places (RTPI Boards)	2021 - Emtec Energy awarded a contract to design & build the Broxden P&R low carbon transport	In 2023 various site improvements to the value of approximately £80k were carried out at Broxden	Walnut Grove P&R progress reliant on developer collaboration. Further P&R improvement

					Local Authority Investment Programme (Scone EV Charger) Tay Cities Deal (Low Carbon Transport Hub)	hub on PKC's behalf 2022 – Fast EV Charger installed at Scone P&R, additional RTPI board installed at Broxden P&R 2023 – Various site improvements to Broxden P&R including accessibility improvements and two more bus/coach bays	P&R to account for increased express coach & passenger usage. This included bus/coach & passenger accessibility improvements along with provision of 2x bus/coach bays. No further progress regarding the proposed Walnut Grove P&R, discussion between PKC and the developer/landowner re the Section 75 legal agreement are ongoing	reliant on sourcing funding
5.	**Bus Quality Improvements** – Bus Strategy and Quality Bus Partnerships	Transport Planning and Infrastructure	N/A	In Progress	N/A	N/A	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	No barriers predicted
6.	**Freight Improvements** - Establish a TACTRAN –wide Freight Quality Partnership (FQP) to help deliver cost	Freight and Delivery Management		Completed	N/A	A TACTRAN – wide freight quality partnership was formed including members from PKC, Scottish Enterprise, and the	PKC and Dundee's EH managers are members of the Freight Quality Partnership. AQ is integrated into the	No barriers predicted

	effective packages of freight related interventions across the region					private freight sector.	Freight Quality partnership. A freight consolidation centre has been proposed as part of the Perth West Development	
7.	**Travel Planning** – PKC Corporate Travel Plan	Promoting Travel Alternatives	Unknown	In Progress	N/A	2019 - Base-line staff travel survey carried out. 2021 - Staff travel report went to Senior Management with recommendations of focus for the Corporate Travel plan. Travel Plan was to be integrated into Council Remobilisation strategy post Covid-19 2023 – Yearly staff travel surveys began as part of Climate Change yearly report	Employee commuting and homeworking emissions were included within the Council's annual Public Bodies Climate Change Duties Reporting (PPCCDR) submission for the first time in 2023, calculated from staff travel survey data gathered in mid-2023. This survey will be carried out annually from now on and will help inform future measures to reduce staff emissions. In 2023, the travel breakdown was 60% by car, less than 10% by walking/cycling and less than 5% by car, producing an estimated 5,369 tonnes CO_2e annually. PKC currently promotes a car	No barriers predicted

							hire salary sacrifice scheme (Tusker) to staff which only provides LEV or ULEVs to encourage a reduction in staff vehicle emissions.	
	Encourage development and employee use of Green Travel Plans in our large employers.		N/A	In Progress	N/A	N/A	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.	No barriers predicted
	Continue to support schools		N/A	In Progress	N/A	2023/24 – Funding applied for in	School exclusion zones are being	Limited school staff resource may

	developing Green Travel Plans (GTP)					partnership with Living Streets for the creation/update of school travel plans	considered for further schools, dependant on suitability of the school's adjacent street network. A review of all school travel plans is proposed as a measure for inclusion within the updated Perth AQAP. Awaiting outcome of a funding application in partnership with Living Streets to carry out the creation and/or update to Perth and Kinross school travel plans	result in longer timescales
	Regional/PKC car and Lift Share schemes		N/A	Completed	N/A	2021 - PKCs Liftshare platform no longer has the engagement or membership to make the licence cost economically viable moving forward. PKC Liftshare members have been transferred to the Perth & Kinross regional Liftshare platform, which is paid for by TACTRAN.	Continued promotion of Lift share including PKC and PRI, SSE and Aviva with stalls within workplaces Proposed measure within the updated Perth AQAP will focus more on development of car share scheme than liftshare	No barriers predicted
	Continue to seek GTPs from large development		N/A	In Progress	N/A	N/A	This is a continual process through planning and is	No barriers predicted

	under existing planning arrangements						requested by Transport Planning Team who are internal consultees for planning.	
8.	**Traffic Management** – Keep City Traffic Management under constant review	Traffic Management	N/A	In Progress	**Fully Funded** Annual funding source, SG AQ Grant funding (Zephyr Trial) PKC funding source, School Road Safety Measures Capital Budget (School traffic signals)	21/22 - Reviewed and Validated the traffic signal operation, phasing and timings of the Dunkeld Road/Atholl Street Corridor and Bridgend/Perth Bridge Corridor to try and improve traffic flow through the corridors. 2022 – Two new signal sites installed to support school active travel 2023 – T&N Zephyr monitor trial began, but has been postponed until 2025 due to communication issues with traffic signals and the upcoming CTLR completion	Traffic & Network Zephyr monitor trial began in early 2023 with the aim to link AQ sensor data with traffic signalling in Atholl St and Bridgend to try reducing pollution peaks resulting from congestion. Two Zephyr units were installed within Bridgend to gather baseline data before attempting to link with traffic signalling. Unfortunately PKC have been experiencing issues with general communication with our traffic signals making operation unreliable. The project has therefore been postponed until late 2025, and the Zephyrs will continue gathering data in the interlude	No barriers predicted
9.	**Planning and Air Quality** - Consider air quality as an	Policy Guidance and Development Control	2019	Complete	N/A	Air Quality a key consideration in the 2019 Local Development Plan	The Perth & Kinross Local Development Plan (2019) was	No barriers predicted

	issue for the Local Development Plan.					Statutory AQ Supplementary Planning Guidance, adopted in March 2020 and is linked with the new revised LDP	adopted on 29 November 2019 and covers the whole Perth and Kinross area. AQ is considered within the new plan for the whole region, not just AQMAs. PKC produced a statutory AQ SPG, which was adopted in March 2020 and is linked with the new revised LDP	
	Complete the supplementary planning guidance (SPG) on Air Quality		2020	Completed	N/A	2020 – Supplementary planning guidance approved & implemented	Supplementary air quality planning guidance was approved in 2020 and sets out how air quality will be considered when determining planning applications and details the circumstances in which an air quality assessment may be required	N/A
	Consider air quality in planning decisions and formalise decision making process/interaction with Environmental Health		N/A	In Progress	N/A	N/A	Environmental Health 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.	No barriers predicted

10.	**Procurement and Air Quality** – Formally consider air quality in tendering process for now PKC vehicles	Vehicle Fleet Efficiency	N/A	In Progress	**Fully Funded** Annual Funding Source, Switched On Fleet	2022 - Chargers installed at Loch Leven and Strathearn Community Campuses, with charger installation at North Inch and Breadalbane Community Campuses in progressed or scheduled 2023 - 17 EVs in PKC Fleet, chargers at 15 locations available for Fleet use	PKC continue to replace Euro Standard vehicles with newer Euro 6 vehicles or EVs where appropriate. Currently PKC has a total of 17 EVs in its fleet. PKC continue to expand electric charging point network to accommodate a more electric fleet. PKC Fleet now have EV charge points installed at 15 locations across P&K A Fleet EV Strategy is near completion which will cover all council Depots (Friarton, Crieff, Kinross, Blairgowrie and Pitlochry)	No barriers predicted
11.	**Eco-Driver Training** - lower fuel use in our fleet to reduce emissions in the AQMA	Vehicle Fleet Efficiency	Unknown	Delayed	Not Funded	N/A	PKC Fleet currently does not have the resources to deliver this training. Alternative resources or eco driver training will be reviewed as part of the updated Perth AQAP	Lack of available Fleet staff resource to pursue
12.	**Provision of Travel Information** -	Public Information	N/A	In Progress	N/A	N/A	Traveline Scotland in partnership with PKC continues to	No barriers predicted

	Develop, promote and maintain a comprehensive Travel Information System						develop the website and apps to provide and enhance public transport information Scotland-wide.	
13.	**Signage** - Investigate the potential of variable message signage linked to pollution monitoring system	Public Information	Unknown	Planned	Not Funded	2023 - Committee proposal prepared; decision expected mid/late 2023	Traffic & Network have proposed 5 new Variable Messaging Signs (VMS) around Perth City to provide live information about the road network. Air Quality information is being considered as one of the items shown on these signs. Funding has not yet been sourced for this project, however a number of VMS will be installed in 2024 as part of the CTLR project, giving us more information on the sign's capabilities.	Sourcing funding for the project, multiple sources may be required.
14.	**Alternative Modes of Transport** - Work closely with Tactran to aid delivery of the Walking and Cycling Strategy for the region	Promoting Travel Alternatives	N/A	In Progress	**Fully Funded** 50% SG AQ Grant funding 50% Sustrans funding (iBike Officer)	2023/24 – 64 iBike activities carried out in 23/24 and 2764 pupils engaged with	SG funding was attained again this year to match fund the IBike Officer. Various activities such as bikeability training, bike maintenance sessions etc. were carried out at over 10 locations across P&K over	Both Sustrans and SG AQ Grant funding has been cut from 2024 onwards, which may restrict future iBike project work

							the course of the year.	
15.	**Improve Access to Public Transport -** Work with planning colleagues to assess provision of public transport at new and existing developments	Transport Planning and Infrastructure	N/A	In Progress	N/A	N/A	Continue to assess transport schemes through planning for new and existing developments.	No barriers predicted
16.	**Idling Emission Reduction** - Enforce Vehicle Idling Regulations	Promoting Low Emission Transport	2023	Completed	**Partially Funded** Annual funding source, SG AQ Grant funding (used for comms campaign in 2022 only, enforcement carried out using PKC resource. No further SG funding requested in 2023)	2022 - Anti-Idling enforcement approved by Committee 2023 – Anti Idling Enforcement Began	Anti-Idling enforcement began in April 2023 following a comms campaign. At the time of writing, no fixed penalty notices have been issued for idling, however hotspot areas have been identified for more concentrated enforcement moving forward	No barriers predicted
17.	**Roadside Emission Testing -** Authorised Personnel to carry out roadside testing	Roadside Emission Testing	Unknown	Delayed	**Not Funded**	N/A	No Progress	Lack of staff capacity and funding to pursue, ANPR surveys used as an alternative for local vehicle emission knowledge
18.	**LAQM Marketing -** Enhance existing provisions of publicity materials. Organise publicity initiatives in schools, large employers and public sector.	Public Information	N/A	In Progress	**Fully Funded** Annual funding source, SG AQ Grant funding (Clean Air Day) Annual funding source, Smarter Choices Smarter Places (Perth & Crieff on the Go)	2023 – Social media and school activities carried out on Clean Air Day 2023 – PKC AQ Website updated	'PK on the Go' continued to spread positive messages on sustainable transport choices through social media and the website www.pkonthego.co.uk. Leaflets, banners etc	No barriers predicted

							advertising PK on the Go were also distributed at various events throughout the year. PKC collaborates with TACTRAN's Get On The Go, Perth & Kinross Countryside Trust, Liftshare and other partners to promote active travel across the region. Alongside social media content, Clean Air Day activities were carried out at six Perth and Kinross primary schools in 2023, promoting active and sustainable travel as well as informing the public on AQ issues. PKC AQ website was updated in early 2023 to improve provision of information for the public, and will be continually updated moving forward	
19.	**LAQM Monitoring and Reporting -** Continue to monitor and report	Statutory Duties LAQM	N/A	In Progress	**Fully Funded** Annual Funding, SG AQ Grant	2021 - High St. RTM was relocated to Bridgend to assess	PKC continue to review monitoring network.	No barriers predicted

	air pollution within Perth and Kinross					potential exceedances of NO_2. 2022 - Three diffusion tubes relocated. 2022 -Zephyr monitor installed in Bridgend in April 2022 for a 12-month study 2023 – Muirton RTM relocated to Glasgow Road, changed from background PM monitor to a roadside RTM	In mid-2023 the Muirton Background PM RTM was relocated to a roadside site on Glasgow Road. The site was identified as a potential hotspot in the 2022 Perth modelling exercise and will also measure the effects of the future planned Perth West development. The RTM will be upgraded with an NO_2 analyser in 2024.	

Table 2.3 - Progress on Crieff AQAP Measures to Improve Air Quality

Measure No.	Measure	Category	Expected/ Actual Completion year	Measure Status	Funding Status	Key Milestones	Progress	Barriers to implementation
A.1	**Liaise with the Scottish Government re. the consideration of national measures to reduce background concentrations of PM**	Policy guidance and development control	N/A	Delayed	N/A	N/A	Information awaited from SG to progress further	Awaiting direction from Scottish Government
A.2	**Improving Links with Local Transport Policies**	Policy guidance and development control	N/A	In Progress	N/A	2023 – PKC Mobility Strategy drafted, Air Quality a key consideration	PKC is in the process of developing a Mobility Strategy encompassing all transport within the local authority area, due 2024. Air Quality will be a key consideration within this document	No barriers predicted
A.3	**Improve Links with Regional Transport Strategy**	Policy guidance and development control	N/A	Complete	N/A	2023 – Public consultation on the new TACTRAN Regional Transport strategy carried out between July and November 2023, and a final draft is now ready to submit to the Minister of Transport for approval	PKC and TACTRAN continue to work in conjunction to ensure AQ is considered in the RTS. Regional Transport Strategy has recently undergone review and update, and TACTRAN liaised with PKC re air quality as part of the review process. The updated strategy is intended to run from 2024-2034	No barriers predicted
A.4	**Ensure Integration of Air Quality with Other Council Strategies and Policies**	Policy guidance and development control	N/A	In Progress	N/A	2019 - LDP considered AQ within the plan for the whole region, not just AQMAs, and was in line with CAFS. 2021 - Air Quality a key consideration	AQ will be a key factor in the upcoming PKC Mobility Strategy. The draft strategy is out for public consultation at the time of writing, concluding in late July 2024. The final strategy will be completed in late 2024.	No barriers predicted

						within the PKC Climate Action Plan 2023 – PKC Mobility Strategy drafted, Air Quality a key consideration	EH is regularly consulted on upcoming Council plans and strategies regarding Air Quality integration	
A.5	**LDP – Assess Merit of further development in Crieff**	Policy guidance and development control	2019	Completed	N/A	2019 - Further development in Crieff considered in 2019 LDP, no increases beyond existing proposals until 2024	The Local Development Plan was reviewed and a new LDP was adopted in 2019. During the review, the environmental impacts of directing future development towards or away from Crieff was assessed. The outcome was that the plan should not propose an increase in development – beyond existing proposals – in Crieff for the next five-year plan period (2019-24).	N/A
B.1	**Redirect local road traffic movements away from A85**	Traffic management	N/A	Delayed	**Not Funded**	N/A	Limited alternatives without significant investment	Lack of resource available to progress
B.2	**Incentivise parking out with AQMA**	Transport planning and infrastructure	Unknown	Delayed	**Not Funded**	N/A	EH is working with PKCs Transport & Network team to remove 6 parking spaces on West High Street responsible for significant narrowing of road space at this point, causing congesting and increased vehicle emissions. Due to Traffic & Network's high workload across P&K, there is currently no predicted timescale for this project	Lack of available Traffic & Network staff resource due to increased demand on the service
C.1	**Possible provision of SMART parking in Crieff**	Transport planning and infrastructure	Unknown	Delayed	**Not Funded**	N/A	No Progress	Reduced officer capacity & ongoing/annual projects

C.2	**Urban Traffic Control Systems congestion management**	Traffic management	Unknown	Delayed	**Not Funded**	N/A	No Progress	Reduced officer capacity & ongoing/annual projects
C.3	**Anti-Idling Enforcement**	Policy guidance and development control	2023	Completed	**Partially Funded** Annual funding source, SG AQ Grant funding (used for comms campaign in 2022 only, enforcement carried out using PKC resource)	2022 - Anti-Idling enforcement approved by Committee 2023 – Anti Idling Enforcement Began	Anti-Idling enforcement began in April 2023 following a comms campaign. At the time of writing, no fixed penalty notices have been issued for idling, however hotspot areas have been identified for more concentrated enforcement moving forward	No barriers predicted
C.4	**Undertake a review of the current locations of pedestrian crossings**	Transport planning and infrastructure	Unknown	Delayed	**Not Funded**	N/A	No Progress	Reduced officer capacity & ongoing/annual projects
C.5	**Limit or prioritise traffic turning right onto High Street**	Traffic management	Unknown	Delayed	**Not Funded**	N/A	No Progress	Reduced officer capacity & ongoing/annual projects
D.1	**Encourage private and public operators to pursue cleaner vehicles**	Vehicle fleet efficiency	N/A	In Progress	**Fully Funded** Annual funding source, SG AQ Grant funding (ECO Stars, James Sq. Chargers) Annual Funding Source, Switched On Fleet (other chargers)	2019 – PKC ECO Stars Scheme launched 2022 – EV chargers now installed in all Crieff PKC car parks & Community Campus	PKC ECO Stars works with operators in the area to improve fleet efficiency, supporting their move to more efficient vehicles. 16 new members were recruited in 2023 to PKCs ECO Stars Scheme, covering 400 new vehicles. EV Charger installed at Strathearn Community Campus in 2022. Chargers now available at all PKC car parks (Strathearn CC, Leadenflower, James Square and King St). Chargers also available at Broich Road recycling centre for council use only.	No barriers predicted
D.2	**Maintenance of the Local/Voluntary Bus Quality Partnership -**	Promoting travel alternatives	Unknown	Delayed	N/A	N/A	No Progress	Lack of PKC Public Transport staff resource to pursue

D.3	**School Travel Plans**	Promoting travel alternatives	N/A	In Progress	N/A	2023/24 – Funding applied for in partnership with Living Streets for the creation/update of school travel plans	School exclusion zones are being considered for further schools, dependant on suitability of the school's adjacent street network. A review of all school travel plans is proposed as a measure for inclusion within the updated Perth AQAP. Awaiting outcome of a funding application in partnership with Living Streets to carry out the creation and/or update to Perth and Kinross school travel plans	Limited school staff resource may result in longer timescales
D.4	**Public transport improvements**	Promoting travel alternatives	N/A	In Progress	**Fully Funded** Annual funding source, SG AQ Grant funding (RTPI Screens) Annual funding source, Smarter Choices Smarter Places (Ticket Machines, RTPI)	2021 - RTPI screens installed in two locations within Methven in 20/21, & power supply installed at a bus shelter in Comrie in preparation for a RTPI. 2022 - Two electronic ticket machines with contactless payment facilities installed at Sweeneys Garage in Muthill, who operate in the Crieff area	No further improvements to public transport within Crieff during 2023	No barriers predicted
D.5	**Restrict access for polluting vehicles within AQMA**	Traffic management	2020	Completed	N/A	2020 - NLEF Stage 1 Screening complete and LEZ found not necessary in Crieff	NLEF Stage 1 Screening Appraisal was carried out by PKC for both the Perth and Crieff AQMAs as part of the 2020 APR. Due to the Crieff AQMA covering	N/A

							essentially a single street, in line with the guidance provided for carrying out the NLEF assessment a low emission zone was not thought to be a proportionate measure in this situation.	
D.6	**Implement ECO Stars scheme for HGV and bus operators**	Vehicle fleet efficiency	2019	Completed	**Fully Funded** Annual funding source, SG AQ Grant funding	2019 – PKC ECO Stars Scheme Launched	16 new members were recruited to PKCs ECO Stars Scheme in 2023, across a range of industries, covering a further 400 new vehicles.	No barriers predicted
E.1	**Promotion of lift sharing and development of car clubs**	Alternatives to private vehicle use	N/A	In Progress	**Not Funded**	2022 - PKCs Liftshare platform no longer has the engagement or membership to make the licence cost economically viable moving forward. PKC Liftshare members have been transferred to the Perth & Kinross regional Liftshare platform, which is paid for by TACTRAN.	Continued promotion of Lift share including PKC and PRI, SSE and Aviva with stalls within workplaces Proposed measure within the updated Perth AQAP will focus more on development of car share scheme than liftshare (this will be PKC wide and will include Crieff)	No barriers predicted
E.2	**Travel plans for large institutions and businesses**	Promoting travel alternatives	N/A	In Progress	N/A	N/A	TACTRAN utilises Transport Scotland funding to provide travel planning advice for businesses across Scotland under the guises of the TravelKnowHow programme. This is through both online tools and direct 1-1 support	No barriers predicted
E.3	**Create and implement PKC Corporate Travel Plan**	Promoting travel alternatives	Unknown	In Progress	N/A	2019 - Base-line staff travel survey carried out.	Employee commuting and homeworking emissions were included within the Council's annual Public Bodies Climate Change	No barriers predicted

						2021 - Staff travel report went to Senior Management with recommendations of focus for the Corporate Travel plan. Travel Plan was to be integrated into Council Remobilisation strategy post Covid-19 2023 – Yearly staff travel surveys began as part of Climate Change yearly report	Duties Reporting (PPCCDR) submission for the first time in 2023, calculated from staff travel survey data gathered in mid-2023. This survey will be carried out annually from now on and will help inform future measures to reduce staff emissions. In 2023, the travel breakdown was 60% by car, less than 10% by walking/cycling and less than 5% by car, producing an estimated 5,369 tonnes CO_2e annually. PKC currently promotes a car hire salary sacrifice scheme (Tusker) to staff which only provides LEV or ULEVs to encourage a reduction in staff vehicle emissions.	
E.4	**Promotion of active travel**	Promoting travel alternatives	N/A	In Progress	**Fully Funded** Annual funding source, 50% SG AQ Grant funding 50% Sustrans funding (iBike Officer) Annual funding source, Smarter Choices Smarter Places (PK on the Go)	2023/24 – 64 iBike activities carried out in 23/24 and 2764 pupils engaged with	SG funding was attained again this year to match fund the IBike Officer. Various activities such as bikeability training, bike maintenance sessions etc. were carried out at over 10 locations across P&K over the course of the year. 'PK on the Go' continued to spread positive messages on sustainable transport choices through social media and the website www.pkonthego.co.uk. Leaflets, banners etc advertising PK on the Go were also distributed at	Both Sustrans and SG AQ Grant funding has been cut from 2024 onwards, which may restrict future iBike project work

							various events throughout the year. PKC collaborates with TACTRAN's Get On The Go, Perth & Kinross Countryside Trust, Liftshare and other partners to promote active travel across the region.	
E.5	**Awareness raising and education, presentations at local schools/community meetings**	Public information	N/A	In Progress	**Fully Funded** Annual funding source, SG AQ Grant funding (Clean Air Day)	2020 - A community event focussed on air quality and road safety was held in February 2020 2020 - Clean Air Day 2020 activities were carried out at two schools in Perth and one in Crieff 2023- Clean Air Day 2023 activities carried out as six schools in P&K including St Dominics RC Primary in Crieff	Alongside social media content, Clean Air Day activities were carried out at six Perth and Kinross primary schools in 2023 including St Dominics RC Primary School, promoting active and sustainable travel as well as informing the public on AQ issues. In 2023 our educational material had a focus on vehicle idling to coincide with the launch of anti-idling enforcement within P&K	Reduced officer capacity & ongoing/annual projects
E.6	**Cycling and walking routes to be routed to link in with the campus for sport.**	Promoting travel alternatives	N/A	In Progress	N/A	N/A	Planning proposals for upcoming major developments along south side of Broich Road, Crieff will be required to include a multi-user path to link the sites to the Strathearn Community Campus	No barriers predicted
E.7	**Provision of PKC "Champions" for transportation methods**	Promoting travel alternatives	Unknown	Delayed	N/A	N/A	No Progress	Reduced officer capacity & ongoing/annual projects
F.1	**Biomass installations and other developments likely to cause pollution –**	Policy guidance and	N/A	In Progress	N/A	N/A	Environmental Health continue to check the weekly planning list and comment on applications	No barriers predicted

	review developments which may cause pollution	development control					which may adversely impact on local air quality. The AEA/EPUK screening tools are used to assess applications	
G.1	**Increase AQ monitoring network**	Policy guidance and development control	N/A	Completed	**Fully Funded** Annual Funding, SG AQ Grant	2022/23 – Zephyr monitoring study carried out in West High Street	NO_2 tube network increased since AQAP was published to increase reliability of results. A Zephyr monitor was installed in West High St in April 2022 for a 12-month study to assess whether RTM readings are representative of street canyon pollution levels, both for NO_2 and PM_{10}. Study results confirmed that the Crieff RTM is representative of High Street NO_2 and PM_{10} concentrations and that levels are well below objectives, allowing PKC to progress with the revocation of the Crieff AQMA	No barriers predicted
G.2	**Regional AQ modelling study**	Policy guidance and development control	2020	Completed	**Fully Funded** Annual Funding, SG AQ Grant	2020 - Crieff baseline dispersion model completed	Crieff baseline dispersion model was completed in 2020 by Sweco UK Ltd	N/A
G.3	**Cycling and walking routes to be incorporated into transport model**	Public information	Unknown	Delayed	N/A	N/A	No Progress	It is not possible to add cycling and walking routes to the current Microsimulation model
G.4	**Transport assessments for developments to be required as part of planning process**	Policy guidance and development control	N/A	In Progress	N/A	N/A	This is a continual process through planning and is requested by Transport Planning Team who are internal consultees for planning.	No barriers predicted

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.

Perth and Kinross Council undertook automatic (continuous) monitoring at 4 sites during 2023. Table A.1 in Appendix A shows the details of the sites. National monitoring results are available at https://www.scottishairquality.scot/latest.

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

Perth and Kinross Council undertook non- automatic (passive) monitoring of NO_2 at 76 sites during 2023. Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in https://www.scottishairquality.scot/latest as well as in Figure 3.1, Figure 3.2, Figure 3.3 and Figure 3.4.

Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

Note: In Figure 3.1, 3.2, 3.3 and 3.4 below, diffusion tubes which 2023 levels are lower than those in 2022 are shown in green, the same as 2022 in orange and those with levels higher than 2022 are shown in red.

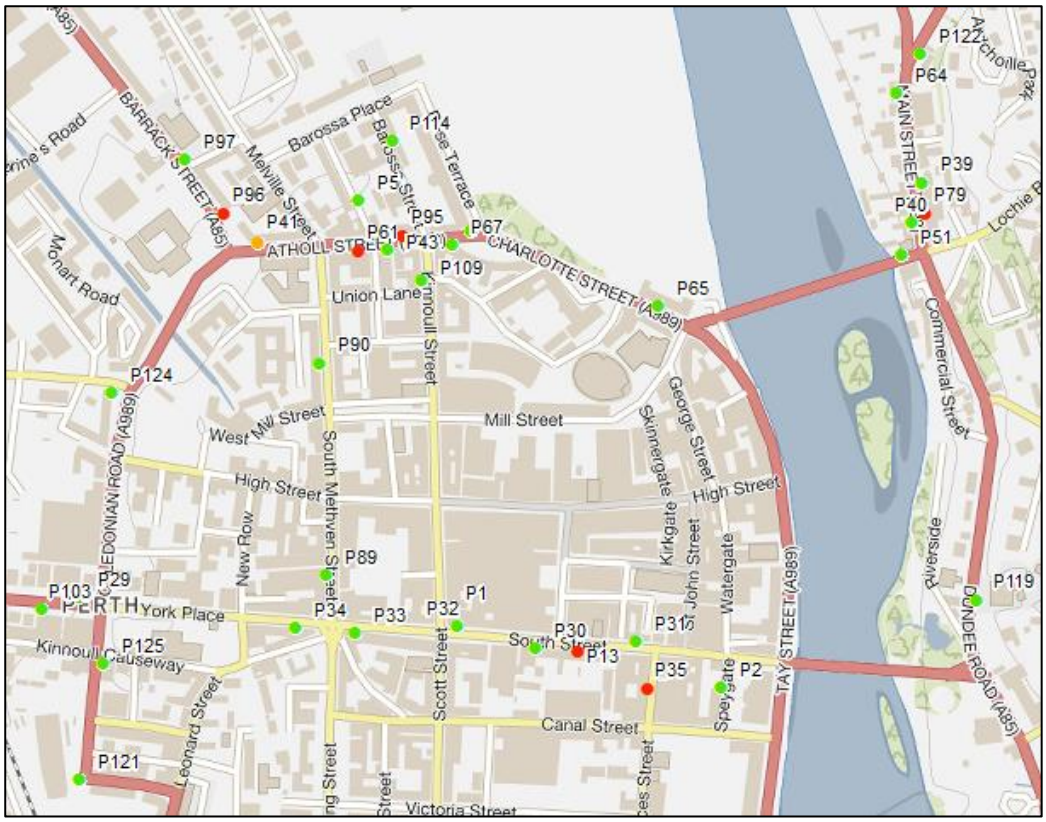


Figure 3.1: Perth City Centre NO_2 Diffusion Tube Locations

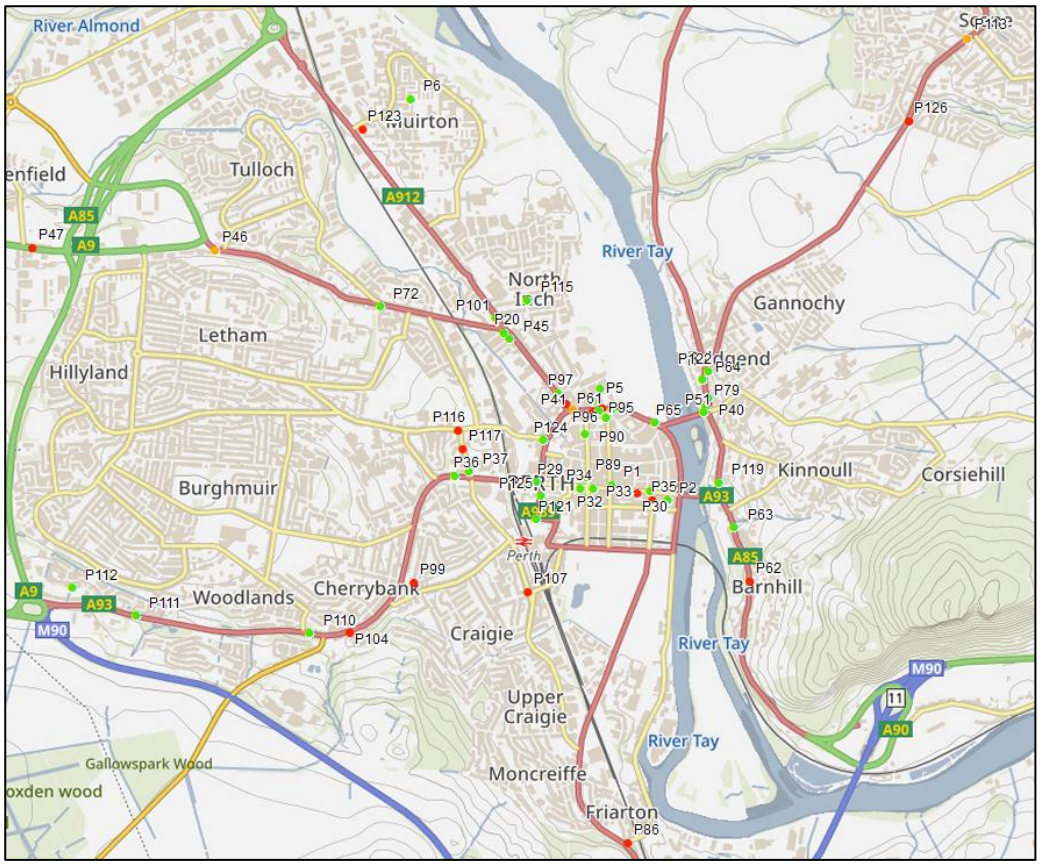


Figure 3.2: Perth Area NO_2 Diffusion Tube Locations

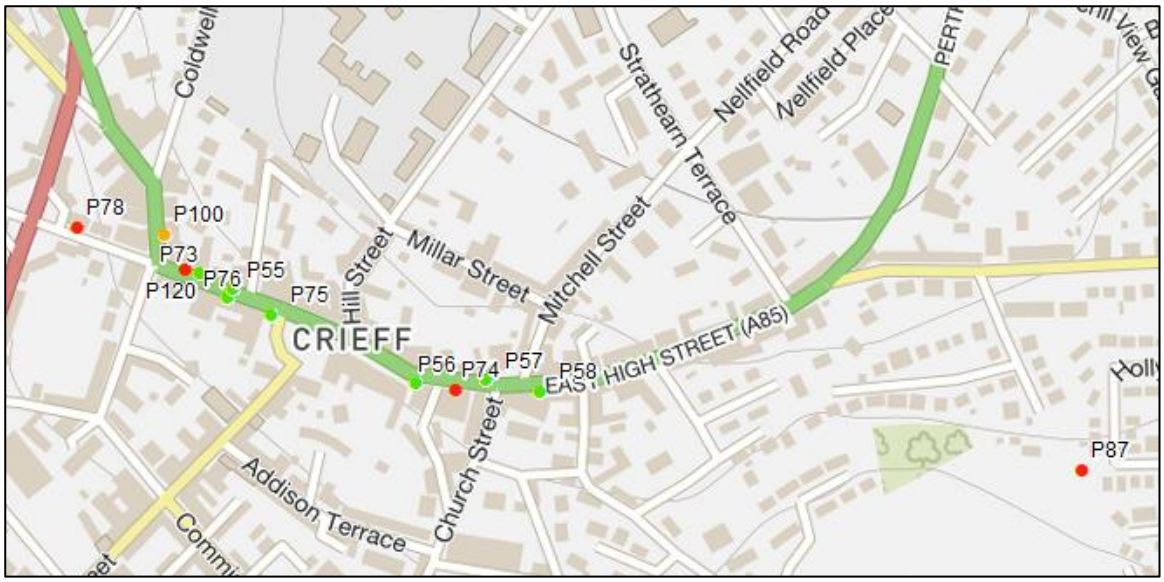


Figure 3.3: Crieff NO_2 Diffusion Tube Locations

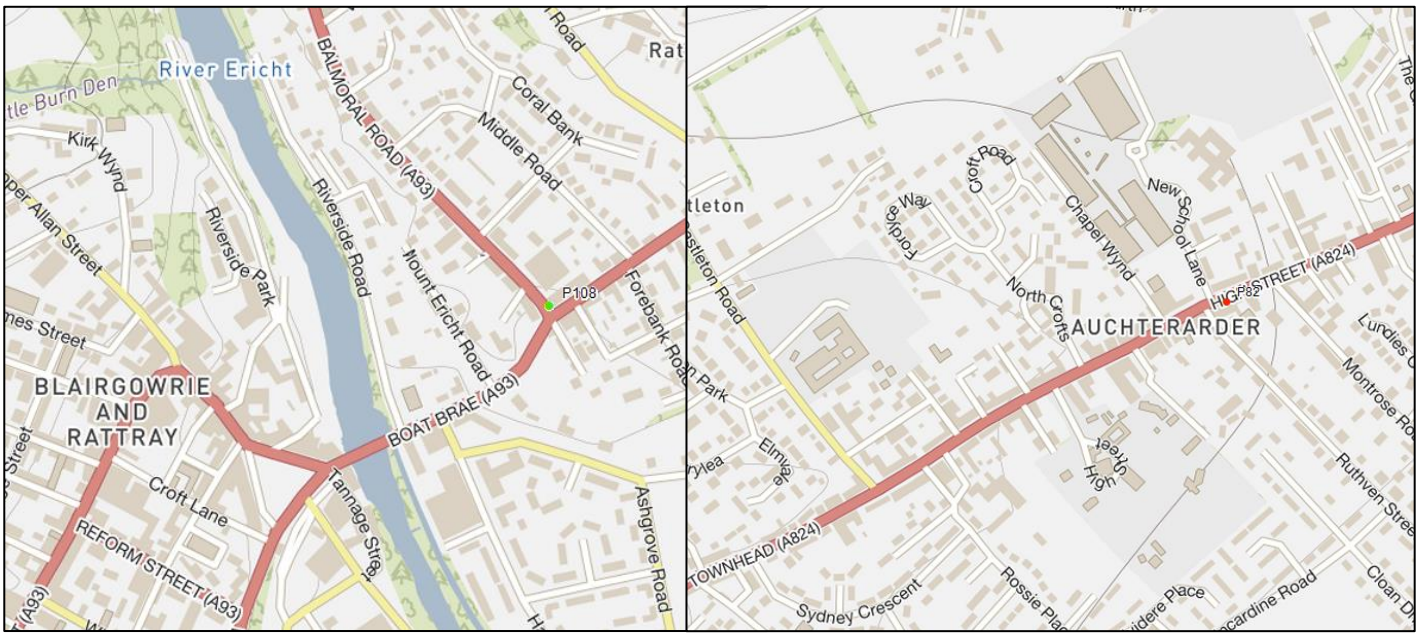


Figure 3.4: Blairgowrie and Auchterarder NO_2 Diffusion Tube Locations

3.1.3 Other Monitoring Activities

In May 2023, two Zephyr monitors were installed at either end of Bridgend, Perth as part of a trial carried out in collaboration with the PKC Traffic and Network team. The aim of this trial was to link the sensors to the Perth traffic signalling system and use the live air quality monitoring data as a trigger for traffic signals to clear frequent congestion in both

Atholl Street and Bridgend. This would be trialled in Bridgend first, before moving to the more congested Atholl Street.

A period of baseline data gathering was required before any changes to the traffic signalling could be attempted, with the gathered raw data presented in

Table 3.1,

Table 3.2 and Table 3.3.

Figure 3.5: Bridgend Zephyr Locations

Table 3.1: Raw NO_2 Zephyr Data

Site	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Annual Mean(µg/m^3)
Main St/ Strathmore St	11.2	12.5	11.4	12.5	14.2	14.4	17.8	16.0	13.7
Perth Bridge	11.8	11.0	12.1	13.3	14.7	15.2	23.2	18.8	15.0

Table 3.2: Raw PM_{10} Zephyr Data

Site	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Annual Mean(µg/m^3)
Main St/ Strathmore St	8.3	8.2	5.5	5.5	7.7	6.2	10.8	8.2	7.5
Perth Bridge	8.0	7.8	4.9	4.6	6.4	4.9	9.2	6.7	6.6

Table 3.3: Raw $PM_{2.5}$ Zephyr Data

Site	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Annual Mean(µg/m^3)
Main St/ Strathmore St	5.8	5.9	3.7	3.7	4.9	3.4	6.6	4.8	4.8
Perth Bridge	6.0	6.0	3.6	3.4	4.4	3.0	6.1	4.6	4.6

Unfortunately, PKC has been experiencing communication issues with our traffic signalling system across Perth, making overall operation unreliable and preventing the linking of the Zephyr monitors and traffic signalling. While improvements have been made in recent months with trialled solutions, a permanent solution will not be in place until Autumn 2024.

Furthermore, the opening of the Cross Tay Link Road is scheduled for Spring 2025 and will have a substantial impact on traffic volumes within the Zephyr trial area. The trial has therefore been delayed until the change in traffic resulting from the CTLR has stabilised. The Zephyr sensors will continue to gather data until the trial resumes, giving us a large catalogue of data to reference for both the Zephyr project and the impact of the CTLR.

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 monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40 µg/m^3 at automatic monitoring sites.

Table A.4 in Appendix A compares the adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40 µg/m^3 at non automatic monitoring sites.

For diffusion tubes, the full 2023 dataset of monthly mean values is provided in Appendix B.

Table A.5 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past five 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 2023 at any of the three automatic monitoring sites where NO_2 levels are monitored. This follows on from no exceedances at these locations since 2017. NO_2 levels at the Atholl Street Real Time Monitor (RTM) rose to their highest levels since 2019 but the overall trend at Atholl Street still shows a gradual decrease in NO_2 (Figure A.1). Elsewhere in Perth and Kinross, both the Bridgend and Crieff RTMs saw a continued decrease in NO_2 shown in Figure A.2 and Figure A.3 in Appendix A for the Crieff and Bridgend automatic monitoring sites.

Diffusion tube monitoring also indicated no exceedances of NO_2 at any locations across the monitoring network. Across the region diffusion tube levels decreased in general compared to those recorded in 2022, with 48 tubes decreasing, 5 remaining at the same levels as 2022 and 21 seeing an increase in NO_2. The most notable increases in NO_2 concentrations were seen in Atholl Street, South Street, Riggs Road and Glasgow Road as well as West High Street in Crieff. Maps showing the increases and decreases in diffusion tube levels are shown in 3.1.2.

The bias adjustment factor for our 2023 diffusion tubes was slightly less than in 2022: 0.8 compared to the prevous year's 0.79. The use of the local adjustment factor is consistent with our approach in previous years and is also more conservative than the relevant national adjustment factor (0.75, SOCOTEC Didcot, 20% TEA in water).

3.2.2 Particulate Matter (PM_{10})

Table A.6 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past five years with the air quality objective of 18µg/m^3.

Table A.8 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past five years with the air quality objective of 50µg/m^3, not to be exceeded more than seven times per year.

PM_{10} levels have remained reasonably steady across the region, with the exception being Atholl Street. The Atholl Street RTM recorded an increase from 15.9 µg/m^3 in 2022 to 21.3 µg/m^3 in 2023. With the Fidas-100 correction, this rises to 23.4 µg/m^3. This is the highest level recorded within Perth & Kinross since 2011, however it is not thought to be caused by vehicle emissions.

As has been the case for several years, the ongoing building works directly behind the Atholl Street monitor (18 North William Street) is thought to be the main source of the unusually high PM_{10} concentrations recorded. As was indicated in our previous two APRs, it was expected that the building works would continue to affect RTM readings in 2023 however these levels are not expected to remain once the works are concluded. Officers of Environmental Health work closely with Planning colleagues to ensure the strict implementation of a Construction Environmental Management Plan (CEMP) by the developer to keep future pollutants to a minimum during the construction.

At the time of writing these building works were recently concluded, and PM_{10} levels have reduced significantly. It will take some time for the real PM_{10} trend to reemerge at Atholl Street. PM_{10} trends for Atholl Street, Muriton and Crieff can be seen in Figure A.4 - Figure A.6in Appendix A.

The RTM relocated from High St to Bridgend was upgraded from TEOM to FIDAS in 2021, allowing PM_{10} levels to be monitored as well as $PM_{2.5}$, however a trend has yet to be established due to the short monitoring period so far. Similarly the Muirton RTM was relocated to Glasgow Road in late 2023 and it will take several years to establish a new PM_{10} trend at the new location.

In 2023 there were no exceedances of the annual mean level and no exceedance of the overall PM_{10} 24-Hour Mean national objective. There was one exceedance of the 50 µg/m^3 24-Hour Mean at Crieff in 2023, and 15 exceedances of the 50 µg/m^3 24-Hour Mean at

Atholl St, above the objective of 7 exceedances per year. As above, these high levels were believed to be caused by ongoing building works near the monitor.

FIDAS 200 PM_{10} Correction

Following the Scottish Government Pilot Research Study to investigate Particulate Matter Monitoring Techniques in Scotland, Scottish Government recommended PM_{10} and $PM_{2.5}$ data recorded on Fidas 200 analysers require a correction be applied. In the case of PM_{10} data, all data should be divided by 0.909.

The results of this correction can be seen in Table A.7 and Table A.9. The correction factor caused an increase in recorded PM_{10} levels, though not enough to result in an exceedance of the annual mean. However, the corrected results show Atholl Street's number of exceedances of the 50 µg/m^3 24-Hour Mean increased from 15 to 25 after the correction.

The correction resulted in no changes to exceedances of the 50 µg/m^3 24-Hour Mean in Crieff, Bridgend, Muirton or Glasgow Road.

3.2.3 Particulate Matter ($PM_{2.5}$)

Table A.8 in Appendix A compares the ratified and adjusted monitored $PM_{2.5}$ annual mean concentrations for the past five 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. Perth High Street RTM was moved to Bridgend in 2021, where $PM_{2.5}$ monitoring has continued. The Muirton RTM was moved to Glasgow Road (Perth) in 2023 where $PM_{2.5}$ monitoring has also continued.

The data indicates no exceedances of the objective at any of these locations during 2023, with levels remaining at similar levels to 2022 across the region with the exception of Bridgend which saw a slight decrease.

$PM_{2.5}$ trends for Atholl Street, Muirton and Crieff can be seen in Figure A.7- Figure A.9 in Appendix A. Levels have continued to remained fairly steady since monitoring began, no clear increasing or decreasing trend.

FIDAS 200 $PM_{2.5}$ Correction

As set out above, Scottish Government recommended $PM_{2.5}$ data recorded on Fidas 200 analysers require a correction be applied. In the case of $PM_{2.5}$ data, all data should be multiplied by 1.06.

The results of this correction can be seen in Table A.11. The correction factor caused an increase in recorded $PM_{2.5}$ levels, though there is still no exceedance of the annual mean.

3.2.4 Sulphur Dioxide (SO_2)

PKC do not currently monitor SO_2 as there are no significant sources within Perth & Kinross

3.2.5 Carbon Monoxide, Lead and 1,3-Butadiene

PKC do not currently monitor carbon monoxide, lead or 1,3-butadiene as there are no significant sources within Perth & Kinross

4 New Local Developments

4.1 Road Traffic Sources

No new sources within Perth and Kinross have been identified.

4.2 Other Transport Sources

No new sources within Perth and Kinross have been identified

4.3 Industrial Sources

23/00068/FLL - Erection of Pyrolysis Processing Plant (processing waste straw pellets) 400m South of West Bungalow, Binn Farm, Glenfarg. (Application Approved 25/7/2023).

Air Quality Assessment submitted “Air Quality Assessment -Binn Farm” document reference SOL_22_PO98_ALE dated December 2022 undertaken by Sol Environment Ltd.

Detailed ADMS despersion modelling was undertaken to determine the potential air quality impacts arising from the development. Maximum predicted concentrations are compared with the relevant Air Quality Assessment Levels (AQALs) for the protection of health. The significance of the impacts have been assessment using SEPA H1 guidance and Environment agency guidance.

The Proposed Development is considered to be a negligible risk of dust impacts and human health effects from particulate matter concentrations at nearby receptors during the construction and operational phase.

The modelling predicted that the impacts associated with emissions NO_2, CO, SO_2, PM_{10} and $PM_{2.5}$ arising from the operation of the pyrolysis plant are insignificant and pollutant concentrations are predicted to meet the relevant AQALs.

23/00346/FLL Hydrogen Production Facility 200m Southeast of Orchard Bungalow, Binn Farm, Glenfarg. (Application Approved 17/8/2023).

Supporting Statement submitted with application Section 8 Air Quality stated no adverse effects on air quality due to emissions, and development would not cause a significant increase in light or heavy-duty vehicles. Screening showed that the Institute of Air Quality Management criteria of >500 or 100AADT would not be exceeded so a detailed Air Quality Assessment was not required.

Perth & Kinross Industrial Sites Permitted by SEPA 2023

Authorisation Level	Authorisation No.	Application Type	Authorisation Activity	Auth Status Date	Site
PPC Part B	PPC/E/0030112	Substantial Variation	PPC(B) -Other Food and Drink	13/11/2023	Shed 4 & 1B, The Harbour, Shore Road, Perth, PH2 8BD
PPC Part B	PPC/B/5006522	New licence	PPC(B)- Combustion of Fuels	21/11/2023	MCP, Johnstons Workwear Perth, Inveralmond Ind Est, Ruthvenfield Rd PH1 3SW
PPC Part B	PPC/B/1009470	Substantial Variation	PPC(B)- Petrol vapour Recovery	11/04/2023	Moto Kinross, Kinross Service Area, Kinross KY130NQ
PPC Part B	PPC/B/5005587	New Licence	PPC(B)- Combustion Fuels	22/11/2023	MCP, Aberfeldy Distillery, Aberfeldy, PH15 2EB

WML	WML/E/0220286	Substantial Variation	Waste-Other waste Management Activities	26/05/2023	Area of land at Binn Farm, Glenfarg, PH2 9PX
WML	WML/E/0000317	Substantial Variation	Waste-Other Waste Storage and Treatment Sites	08/08/2023	Perth Royal Infirmary, Taymount Terrace, Perth, PH1 1NX

4.4 Commercial and Domestic Sources

22/01495/FLL - Change of use and alterations to agricultural buildings to form distillery and installation of 200kW biomass boiler, 90m North of Hills of Bendochy House, Bendochy. (Application Approved 8/6/2023).

Following a screening assessment, it was determined that a detailed air quality impact assessment (AQIA) was required to be submitted.

AQIA “Kythe Distillery, Hills of Bendochy, Coupar Angus” document reference 6293 V1.0, dated 3 April 2023 was undertaken by ITPEnergised consultants.

Air dispersion model ADMS- 5v5.2.4.0 (2023) predicted that the biomass boiler was considered to have an overall negligible impact on air quality at nearby sensitive receptors and the significance of effects for the biomass boiler operation as not significant.

23/00323/FLL - Siting of combined heat and power unit (CHP), erection of steam boiler enclosure, transformer and compound radiator, low temperature hot water enclosure. Todd and Duncan Ltd, Lochleven Mills, high Street, Kinross KY13 8DH. (Application Approved 13/11/2023).

An AQIA was submitted “Air Quality Assessment : Todd & Duncan” document reference 312279 v1 dated 9 January 2023 undertaken by Mabbett consultants.

The assessment determined that the CHP plant complied with the Medium Plant directive emission limit values for NOx and NO_2 annual mean and 1 hour mean.

Air dispersion modelling ADMS-5v5.2.4.0 (2023) was undertaken for the three x 13m high stacks for the CHP, Steam Boiler and LTHW boiler. The modelling predicted that the development was considered acceptable in accordance with environmental permitting requirements and NO_2 concentrations for annual mean and hourly mean was an insignificant affect at human receptors.

23/01293/FLL - Erection of boarding kennels, installation of biomass boiler and associated works, Foresters Croft, Strathallan, Auchterarder PH3 1NL (Application Approved 5/12/2023)

Further information request on the biomass boiler for the undertaking of the individual screening assessment using the Biomass Calculator Tool.

The applicant submitted information for a GSi 21kW Biomass Gasification Wood and Logs Pyrolyzer Boiler with a flue height of 5.5 metres.

Given that the boiler is 21kWs it is out with the range that is required to be assessed and the closest sensitive receptor Foresters Croft is out with 5x flue height radius (5.5 x5=27.5m). No adverse comments made with regards to air quality, biomass informative attached to the consent.

4.5 New Developments with Fugitive or Uncontrolled Sources

23/01980/FLL - Importation of inert waste material, associated storage, processing and screening to produce secondary aggregates and exportation, Balado Quarry, Balado. (Application Approved 30/4/2024)

The application for importation of construction and demolition waste, road-stone and road planingd to the existing quarry to be stored, processed and screened to create recycled aggregrate materials. Imported material would be in the region of 15 to 20,000 tonnes per annum.

Supporting statement dated 27 November 2023 undertaken by Dalgleish Associates Ltd stated that the process would use the same processing and screening plant that is currently located on site and the recycling operations will be undertaken during periods when the plant is not being used for the existing operation to process the sand and gravel at the quarry.

The existing dust Management Plan under approval 17/01441/MWM would still be applicable, with an update on recycling operations.

5 Planning Applications

23/00610/AMM - Erection of 60 dwellinghouses and 34 garages, formation of SUDS basin, service/access road, parking areas and associated infrastructure (Phases 4 to 6) (Approval matters specified in conditions 16/01595/IPM), Former Golf Course, Alyth. (Pending Decision)

A condition was applied to the in-principal permission requiring an updated air quality assessment be submitted at each phase of the development, and an updated report undertaken by Vibrock (reference R23.9851/AF/Let2, dated 25 April 2023) was submitted.

The report noted that since the original assessment in 2018 (reference R18.9851/1/AF and supplementary latter dated September 2018), the number of residential and commercial units has decreased and that a hotel is no longer proposed for the site, subsequently reducing the projected daily traffic trips. It is also no longer proposed that the energy centre will provide power for this phase of the development, with it being used only in relation to the care home. From the table in relation to 2018, included, this effectively reduces the gas boilers by 13 and biomass boilers by 3, which was anticipated for Phases 4, 5 and 6. Domestic biomass systems are no longer proposed for the individual dwellings.

In relation to traffic, the original assessment concluded that at the four representative receptors where the greatest change in traffic volumes were anticipated, in the worst-case scenario, the impact would be slight and that there was no significant effect. The updated AQA included data showing a slight improvement in air quality between the 2019 annual mean and the 2023 annual mean and a reduction in baseline and proposed traffic, and concluded the air quality from traffic will be no worse than the original 2018 assessment.

Insignificant impacts from traffic and the removal of biomass installations within the development and overall impacts from development deemed not significant.

23/00592/IPM - Residential development 110 dwellinghouses with associated works (MU27), land 170m Southwest of 8 Tayside Luncarty. (Application Pending Decision)

The Environmental Impact Assessment Report Volume 1-Mains Report dated 2023 Chapter 7 Air Quality Assessment was undertaken by Sweco UK Ltd.

AQIA assessed the construction and operational phases of the development. A dust risk assessment in line with IAQM guidance 2014 was undertaken for the key construction impacts and the proximity to receptors. The risk was deemed medium to low and a negligible risk for all activities assessed. With best practice methods and site specific the impact at human receptors would not be significant. Dust Management Plan conditioned on consent.

The significance of impact for predicted concentrations for NO_2, PM_{10} and $PM_{2.5}$ are negligible and deemed not significant at all receptors assessed in AQA.

23/02025/FLL - Erection of retail unit (Class 1), formation of vehicular access, parking area, landscaping and associated works, land 75m North of 288 Strathtay Road Perth for Lidil GB Ltd. (Application Pending Consideration) (Previous application 22/00816/FLL was withdrawn).

Air Quality Impact Assessment(AQIA), “Proposed Lidl Store, Crieff Road, Perth,” document reference 5064 V1.0 dated 26 July 2022 was undertaken by ITPEnergised.

Detailed air dispersion modelling study was carried out using ADMS-Roads5 to predict the future pollutant concentrations, for Nitrogen Oxides (NO_x), Nitrogen Dioxide(NO_2) and Particulate Matter (PM_{10} & $PM_{2.5}$), due to road traffic associated with the proposed development on exisitng and future sensitive receptors.

A construction dust risk assessment was also undertaken as part of the AQIA to assess the potential risk of dust on nearby receptors due to the construction phase of the development.

The predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations at receptors are negligible and the effects on air quality is assessed as not significant. Dust management Plan conditioned for construction phase.

23/00315/FLL Installation of Flue Queen’s Hotel 105 Leonard Street Perth Ph2 8HB (Application Approved 13/6/2023)

This application was for the installation of a Twin Wall LTC insulated flue for the exhaust of Hamsworthy PV180 condensing gas boilers, within Perth’s Air Quality Management Area.

As the flue was to service a gas boiler, no adverse comments made as the flue height was adequate terminating a roof height and LAQM (TG 22) states that it is not expected that emissions from the combustion of gaseous fuels need to be evaluated in detail.

23/00504/FLM - Mixed use development comprising erection of 3 café/restaurant units (Class3) with drive thru facilities, business units (Class4), electric vehicle charging hub and formation of vehicular access, parking areas, landscaping and associated works, land 90m South of 5 Broxden Avenue, Perth. (Application Approved 8/5/2024)

The AQIA ‘ Broxden, Perth Air Quality Assessment’ document reference number 10286 dated May 2023 was undertaken by EnviroCentre Ltd.

The air despersion modelling ADMS-Roads assessment predicted no significant change in concentrations of the pollutant assessed and concluded that in relation to NO_2, PM_{10} & $PM_{2.5}$ the impact of the development is considered Negligible for all the assessed and will not have a significant impact on air quality..

23/00193/FLL - Erection of office building (Class4) and two café/restaurant units (Class 3) with drive through facilities, car parking, landscaping and associated works, land 100m Southwest of 5 Broxden Avenue Perth. (Application Approved 8/5/2024)

Air Quality Assessment ‘Proposed Mixed Development, land adjacent to Broxden Roundabout, Perth – Fairhurst’ document reference R24.12052/1/JH dated 26 February 2024 was undertaken by Vibrock.

Modelling was undertaken using the Design Manual for Roads and Bridges (DMRB) screening method version 1.03c.

The applicant was advised of the need to consider the cumulative affect with regards to the 23/00504/FLM application.

All predicted levels of pollutants were well below the air quality objective levels and in line with EPUK/IAQM guidance document. The impacts for NO_2, PM_{10} & $PM_{2.5}$ are all negligible and it was concluded that there will be no significant effect at the receptor locations, which are representative worst cases.

23/00833/IPM - Mixed use development comprising spa and leisure facilities including food and drink, holiday accommodation including lodges luxury units and timeshare/vacation ownership properties, extension to hotel central delivery hub for deliveries, staff facilities and relocated greenkeeping services, outdoor pursuits, small scale residential conversion of existing greenkeepers compound and associated works including photovoltaic array, servicing access drainage and landscaping. Murrayshall House Hotel, Murrayshall, Perth. (Application approved 13/12/2023)

Condition on consent for the requirement at the detailed planning stage for an AQIA to be undertaken by a qualified consultant and submitted to the Planning Authority.

23/01451/FLL - Renewal of permission 20/00333/FLL, Erection of 6 flats and parking area (21 parking spaces), land 40m North of 16 High Street, Millar Street, Crieff. (Application Approved 3/10/2023)

Air Quality Assessment report number VA _ 288 version A dated 15 July was undertaken by Viridian-Air BRSUK Limited.

The AQA concluded that the overall impacts from disamenity dust and PM_{10} were considered to be 'not significant' with the appropriate mitigation measures, which were presented in Section 6 of the AQA, based on the the outcomes of the dust risk assessment.

The operational impacts due to traffic generation associated with the proposed development are considered to be 'negligible'.

The AQA assessment carried out ADMS -Roads dispersion modelling to assess the new development with regards to existing pollution levels due to traffic emissions on the proposed new residential receptors. The modelling indicated that the air quality objectives for all pollutants NO_2, PM_{10} & $PM_{2.5}$ at all proposed residential properties would not be exceeded and no further mitigation measures required.

23/01338/FLL - Erection of 23 dwellinghouses and associated works, land 100m Southeast of Currie View Broich Road, Crieff (Application Pending Consideration).

The application is for erection of dwellinghouses on the former D&D dairies yard which was accessed in The Environmental Impact Assessment 15/012237/IPM which also

assessed the cumulative effect of existing Ogilvie development for 246 dwellinghouses approved 19/01165/AMM and the Persimmons Homes development for 222 dwellinghouses sites, and the cumulative affect of this and the other developments has already been considered.

Conditions recommended for construction dust management plan and an Air Quality Mitigation Scheme for the development shall be submitted which shall include mitigation measures to ameliorate the impact of Air Quality in Crieff for the operational and construction stages.

23/01684/FLL - Alterations to industrial unit,formation of parking area and erection of fence and gate, Jewson, Bute House, Arran Road,Perth (Application Approved 15/5/2023)

Application within Perth's AQMA provision for an additional 6 parking spaces and there was no increase to the floorspace of the development, the impact on Perth's AQMA was considered negligible and a detailed AQIA not required.

23/00157/PREAPL - Demolition of former care home and development of c40 units of affordable housing, Beechgrove House, Hillend Road, Perth

Within Perth's Air Quality Management Area advised that an AQIA for operational phase and a dust risk assessment for construction phase should be submitted with any further full planning application.

23/00021/PREAPM - Erection of 46 dwellinghouses, 80m North of Benton Road, Auchterarder

Advised Planning an Air Quality Screening Assessment (AQSA) required to determine if detailed AQIA needed.

23/00027/PREAPM - Proposed housing, cemetery and open space development, land 350m south of Perth Road Milnathort

Advised Planning an AQSA required to determine if detailed AQIA needed.

23/00005/PREAPM - **Proposed sustainable visitors attraction**, **Scone Palace, Queens Drive, Old Scone, Perth**

Advised Planning the development includes a 1000MWh biomass and as such this will need to be regulated under the Pollution Prevention and Control (Scotland) Regulations 2012. Given the size of the biomass, this will fall under SEPA PPC Part A and not under PKC.

As the development includes a 282-space car park the applicant should undertake a Screening Assessment to determine if the traffic associated with the development significantly alters the traffic composition on local roads, especially at Bridgend and adversely impacts on local air quality within Perth's AQMA. This would be especially relevant if the CTLR is not in operation prior to this development being operational.

23/00022/PREAPM - Mixed development comprising dwellings, land 120m east of the Village Hall, Station Road, Crook of Devon, Kinross

Advised Planning an AQSA required to determine if detailed AQIA needed.

23/00032/PREAPL - Redevelopment of site to erect 2 drive thru restaurant units and EV car charging zone, ABP Scotland Ltd, Strathtay Road, Perth

Advised Planning site is within Perth's AQMA and an AQIA is required.

23/00018/PREAPM - Erection of 60 No. residential care units including a community hub and staff facilities, land at Bertha Park Perth

Advised Planning this Service made comments at the principal stage of the wider Bertha Park development and the AQ assessment undertaken as part of the Environmental Statement in which the effect of the development on AQ and Perth's AQMA was negligible and therefore no objections. There is no information at this stage of the proposed heating for the development, an AQ screening/assessment will be required if a biomass boiler or CHP is proposed.

23/00033/PREAPM - Formation of holiday park of up to 40 lodges, woodland trails and formation of new access, land 200m Northwest of Station House, Gleneagles, Auchterarder

Advised Planning if the applicant intends to install wood burning stoves full details of the stoves to be installed and the cumulative effect on air quality at the closest existing dwellinghouses. Also, traffic emissions generated from the development should also be considered with regards Air Quality at existing residential properties, AQSA.

6 Conclusions and Proposed Actions

6.1 Conclusions from New Monitoring Data

No exceedances for NO_2 objectives were identified at any location across Perth and Kinross, and in general levels decreased in 2023, with the exception of several diffusion tubes and Atholl Street which saw an increase to its highest level since 2019 – though not enough to have an exceedance. No exceedances for PM_{10} or $PM_{2.5}$ annual mean objectives were identified in Perth & Kinross; however, the objective of no more than 7 exceedances of the PM_{10} 50 µg/m3 24-Hour Mean was exceeded once again at Atholl Street (15 times in 2023). This however could be attributed to the building works as detailed in 4.2.2 as with previous years. When PM data from Fidas 200 Analysers were corrected as per Scottish Government guidelines, PM_{10} and $PM_{2.5}$ levels were further increased, increasing the number of exceedances of the 50 µg/m^3 24-Hour Mean at Atholl Street to 25.

Though no exceedances have been recorded for NO_2 in the Perth AQMA, levels have increased at a number of sites within the AQMA this year, most notably the significant increase at Atholl Street. Furthermore though the PM_{10} exceedances at Atholl Street in 2023 are once again likely attributed to the now concluded building works by the RTM, true roadside PM_{10} levels at Atholl street remain unclear and a trend will take several years to reestablish as the last three years of monitoring data have been influenced by the building works. Due to these uncertainties, PKC would therefore not seek to revoke the Perth AQMA this year.

NO_2, PM_{10} and $PM_{2.5}$ levels within the Crieff AQMA continue to remain well below objective levels, and PKC will conclude the revocation of the Crieff AQMA in 2024 as per Scottish Government recommendation.

6.2 Conclusions relating to New Local Developments

Seventeen proposed new development were consulted on for the potential impacts on air quality in 2023. Three of these were within Perth's AQMA, with no exceedances predicted to the air quality objectives due to these new proposed developments. Two of the applications within

Perth's AQMA are at the Perth West / Glasgow Road area were modelling was undertaken, as part of Perth's AQAP review, predicted potentially high levels of NO_2 and PM_{10} in the future due to the M90 Broxden Roundabout. PKC therefore relocated one of our RTM to this area to monitor AQ and will continue to consult on any new planning applications that have the potential to affect AQ, individually or cumulatively.

Two of the developments assessed for air quality were within Crieff. One was out with Crieff's AQMA and the AQ Assessment undertaken as part of an EIA determined the overall development cumulative effects were not significant on the air quality within the AQMA. The one development within the AQMA was a renewal of consent for residential flats and the air quality objectives would not be exceeded.

The revocation of Crieff's AQMA will be concluded in 2024 but PKC will continue to consult on planning applications for any new developments that have the potential to impact Crieff's air quality.

There were eight Pre-Applications for proposed new developments which could impact upon air quality within the PKC area, two are within Perth's AQMA and six out-with but could still have an impact on AQMA such as a development at Scone Palace which has the potential to affect AQ at Bridgend in Perth. PKC through consultee responses has advised that AQ Screening Assessments and/or AQIA are required at the full application stages.

6.3 Proposed Actions

- Based on the information gathered in 2023 no changes are currently recommended to the Perth AQMA at this time. As the building works behind the Atholl Street RTM have now concluded we can expect PM_{10} levels to reduce and be more indicative of roadside emissions over the coming year, however it will take several years for a trend to reestablish as the last three years of monitoring data have been influenced by the building works. Data collected from Crieff continues to show no exceedances of either NO_2 or PM_{10} and PKC will revoke the Crieff AQMA in 2024.

- PKC will also seek to complete the review and update of the Perth AQAP in 2024. Following public consultation, the final Perth AQAP will be completed and presented to Elected Members before being published. Once this is complete and the new Action Plan is published, PKC will work towards implementation of the

newly agreed measures and continue to deliver those measures which are already underway.

- The North Muirton background PM monitor was relocated to Glasgow Road, Perth in 2023 and made a roadside monitor due to modelling work showing potentially high levels of NO_2 and PM_{10} at the site. An NO_2 monitor will be installed at this new site in 2024, and the site will be added to the AURN network in late 2024.

- In advance of the anticipated opening of the Cross Tay Link Road in Spring 2025, PKC will review our air quality monitoring network and relocate diffusion tubes where necessary to determine the impact of the redirected traffic on local air quality. While traffic and emission levels are expected to reduce along the Bridgend/Atholl St/Dunkeld Rd corridor, parts of Scone and surrounding areas may see increases.

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? Which AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
Perth 1	Bridgend	Roadside	312254	724159	NO_2; PM_{10}; $PM_{2.5}$; PM_1	Y; Perth AQMA	Chemiluminescent; FIDAS	2.90	2.92	1.8
Perth 2	Atholl Street	Roadside	311575	723917	NO_2; PM_{10}; $PM_{2.5}$; PM_1	Y; Perth AQMA	Chemiluminescent; FIDAS	22.3	2.3	1.5
Perth 3 (moved)	Muirton	Background	310658	725658	PM_{10}; $PM_{2.5}$; PM_1	Y; Perth AQMA	FIDAS	N/A	N/A	2
Perth 3	Glasgow Road	Roadside	308843	722754	PM_{10}; $PM_{2.5}$; PM_1	Y; Perth AQMA	FIDAS	26	4.4	1.5
Crieff 1	James Square	Roadside	286363	721614	NO_2; PM_{10}; $PM_{2.5}$; PM_1	Y; Crieff AQMA	Chemiluminescent FIDAS	9.5	5.3	1.5

Notes:

(1) 0m 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? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
P1C, P1L, P1R	42 Scott St Perth	Roadside	311674	723501	NO_2	Yes, Perth City	0.6	2.3	No	2.7
P2	17 Speygate Perth	Roadside	312018	723411	NO_2	Yes, Perth City	3.8	1.2	No	2.3
P5	8 Stormont Street	Urban Centre	311584	723993	NO_2	Yes, Perth City	13.6	1.3	No	2.5
P6	41 Mull Place	Urban Background	310501	725764	NO_2	Yes, Perth City	6.6	1.6	No	2.4
P13	86 South Street	Roadside	311846	723454	NO_2	Yes, Perth City	0.0	2.6	No	2.9
P20	2 Crieff Road	Roadside	311058	724395	NO_2	Yes, Perth City	0.3	4.4	No	2.3
P29	37 York Place	Roadside	311252	723518	NO_2	Yes, Perth City	2.8	4.9	No	2.8
P30C, P30L, P30R	114 South Street	Roadside	311797	723457	NO_2	Yes, Perth City	0.0	2.5	No	2.9

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
P31	45-47 South Street	Roadside	311925	723465	NO_2	Yes, Perth City	0.0	3.6	No	2.8
P32	135 South Street	Roadside	311704	723483	NO_2	Yes, Perth City	0.0	5.3	No	2.7
P33	216 South Street	Roadside	311587	723475	NO_2	Yes, Perth City	0.0	2.2	No	3.0
P34	10 County Place	Roadside	311503	723480	NO_2	Yes, Perth City	0.0	2.1	No	2.9
P35	17 Princes Street	Roadside	311930	723416	NO_2	Yes, Perth City	7.2	1.5	No	2.7
P36	51 Glasgow Road	Roadside	310773	723557	NO_2	Yes, Perth City	12.4	1.6	No	2.4
P37	Riggs Road	Roadside	310857	723577	NO_2	Yes, Perth City	0.0	7.6	No	2.7
P39	39 Main Street	Roadside	312257	724013	NO_2	Yes, Perth City	2.0	2.6	No	2.4

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
P40	18 Main Street	Roadside	312245	723965	NO_2	Yes, Perth City	0.1	2.2	No	2.6
P41	76 Atholl Street	Roadside	311462	723941	NO_2	Yes, Perth City	0.5	2.2	No	2.9
P43C, P43L, P43R	17 Atholl Street	Roadside	311619	723933	NO_2	Yes, Perth City	0.0	2.3	No	2.9
P45	Ballantine Place	Urban Centre	311095	724356	NO_2	Yes, Perth City	3.7	1.8	No	3.1
P46	204 Crieff Road	Roadside	309364	724875	NO_2	Yes, Perth City	11.7	4.0	No	2.1
P47	5 East Huntingtower	Roadside	308293	724892	NO_2	Yes, Perth City	5.3	1.9	No	2.8
P51	2 West Bridge St	Roadside	312233	723921	NO_2	Yes, Perth City	2.5	1.9	No	2.5
P55	7 West High Street, Crieff,	Roadside	286334	721640	NO_2	Yes, Crieff	1.8	0.4	No	2.4

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
P56	39 High Street, Crieff,	Urban Centre	286541	721559	NO_2	Yes, Crieff	0.0	1.3	No	2.4
P57	62 High Street, Crieff,	Urban Centre	286541	721563	NO_2	Yes, Crieff	0.6	1.6	No	2.5
P58	9 East High Street, Crieff,	Urban Centre	286582	721553	NO_2	Yes, Crieff	0.5	1.2	No	2.5
P61C, P61L, P61R	RTM, Atholl Street	Roadside	311584	723931	NO_2	Yes, Perth City	0.6	2.2	Yes	1.8
P62	84 Dundee Road	Roadside	312503	722930	NO_2	Yes, Perth City	0.8	1.6	No	2.6
P63	30 Dundee Road	Roadside	312413	723252	NO_2	Yes, Perth City	1.2	1.2	No	2.6
P64	Isla Road	Roadside	312228	724120	NO_2	Yes, Perth City	0.2	2.6	No	2.6
P65	5 Charlotte Street	Roadside	311943	723864	NO_2	Yes, Perth City	2.4	2.0	No	2.5

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
P67	1 Atholl Street	Roadside	311697	723939	NO_2	Yes, Perth City	0.3	2.4	No	2.5
P68	2 Atholl Street	Roadside	311720	723955	NO_2	Yes, Perth City	6.6	1.3	No	2.1
P72	82 Crieff Road	Roadside	310335	724550	NO_2	Yes, Perth City	11.1	2.4	No	2.4
P73	19 West High Street, Crieff	Urban Centre	286302	721651	NO_2	Yes, Crieff	0.0	1.6	No	2.4
P74	43 High Street, Crieff	Urban Centre	286517	721559	NO_2	Yes, Crieff	2.4	1.5	No	2.4
P75C, P75L, P75R	RTM, Crieff	Roadside	286360	721617	NO_2	Yes, Crieff	5.1	3.7	Yes	1.6
P76	10/12 West High Street, Crieff	Urban Centre	286324	721632	NO_2	Yes, Crieff	0.0	1.4	No	3.2
P78	1 Lodge Street, Crieff	Urban Centre	286194	721692	NO_2	Yes, Crieff	0.0	1.7	No	3.1

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
P79C, P79R, P79L	17 Main Street	Roadside	312262	723976	NO_2	Yes, Perth City	0.0	3.0	No	2.5
P82	66 High Street, Auchterarder	Roadside	294569	712888	NO_2	No	1.7	0.5	No	3.1
P86	2 Friarton Road	Roadside	311788	721397	NO_2	Yes, Perth City	3.7	1.2	No	2.1
P87	Hollybush Road	Suburban	287043	721486	NO_2	No	17.0	7.0	No	2.6
P89	59 South Methven St	Roadside	311546	723544	NO_2	Yes, Perth City	0.0	3.0	No	2.2
P90	22 North Methven St	Roadside	311539	723798	NO_2	Yes, Perth City	0.0	3.0	No	2.6
P95	26-28 Atholl Street	Kerbside	311636	723950	NO_2	Yes, Perth City	1.7	0.9	No	2.4
P96	22 Barrack St	Kerbside	311424	723976	NO_2	Yes, Perth City	3.0	0.5	No	2.6

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
P97	St Ninians School,	Roadside	311370	724040	NO_2	Yes, Perth City	7.0	1.9	No	2.4
P99	15 Murray Cr Perth	Roadside	310536	722928	NO_2	Yes, Perth City	6.8	1.6	No	2.3
P100	9 Comrie Street, Crieff	Urban Centre	286271	721684	NO_2	Yes, Crieff	0.0	2.0	No	2.3
P101	28 Dunkeld Road	Roadside	311012	724483	NO_2	Yes, Perth City	4.1	3.1	No	2.4
P103	28 York Place	Roadside	311207	723504	NO_2	Yes, Perth City	8.0	2.1	No	2.6
P104	202 Glasgow Road	Roadside	310157	722634	NO_2	Yes, Perth City	5.6	1.5	No	2.4
P107	1 Glover Street Perth	Roadside	311201	722871	NO_2	Yes, Perth City	3.5	1.0	No	2.6
P108	Balmoral Road, Blairgowrie	Roadside	318293	745415	NO_2	No	0.2	1.8	No	2.3

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
P109	44 Kinnoull Street, Perth	Roadside	311660	723897	NO_2	Yes, Perth City	2.8	2.4	No	2.4
P110	231 Glasgow Road, Perth	Roadside	309922	722633	NO_2	Yes, Perth City	2.8	2.4	No	2.3
P111	Glasgow Road nr Lamberkine Road, Perth	Roadside	308904	722731	NO_2	Yes, Perth City	0.9	1.0	No	2.6
P112	Lamberkine Drive, Perth	Roadside	308528	722895	NO_2	Yes, Perth City	20.3	1.8	No	2.9
P113	38 Perth Road, Scone	Roadside	313781	726119	NO_2	No	4.7	1.8	No	2.5
P114	Barossa Street, Perth	Roadside	311625	724063	NO_2	Yes, Perth City	0.0	1.3	No	2.6
P115	Balhousie Street, Perth	Roadside	311197	724857	NO_2	Yes, Perth City	5.0	3.2	No	2.4
P116	Jeanfield Road, Perth	Roadside	310791	723817	NO_2	Yes, Perth City	8.0	1.6	No	2.6

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
P117	19 Riggs Rd, Perth	Roadside	310791	723817	NO_2	Yes, Perth City	6.0	1.7	No	2.6
P119	Kinnoull PS, Dundee Rd	Roadside	312322	723515	NO_2	Yes, Perth City	18.0	2.3	No	2.5
P120	25 West High St, Crieff	Roadside	286286	721656	NO_2	Yes, Crieff	4.0	1.8	No	2.5
P121	Railway Sidings, Caledonia Rd	Roadside	311252	723301	NO_2	Yes, Perth City	16.0	2.2	No	2.6
P122C, P122L, P122R	Bridgend RTM	Roadside	312260	724170	NO_2	Yes, Perth City	5.0	2.5	Yes	1.8
P123	9 Lismore Court, Perth	Roadside	310231	725590	NO_2	Yes, Perth City	5.5	24.0	No	2.4
P124	12 St Catherine's Road	Roadside	311290	723761	NO_2	Yes, Perth City	0.0	5.1	No	2.4
P125	Andrew Heiton Court, Perth	Roadside	311279	723437	NO_2	Yes, Perth City	0.0	2.9	No	2.9

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube co-located with a Continuous Analyser?	Tube Height (m)
P126	131 Perth Road, Scone	Roadside	313438	725637	NO_2	No	2.9	1.8	No	2.4

Notes:

(1) 0m 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: Automatic Monitoring (µg/m^3)

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
Perth 1 (Bridgend)	Roadside	Automatic	99	99	N/A	N/A	19.0	18.2	17.8
Perth 2 (Atholl Street)	Roadside	Automatic	99	99	36.4	27.6	31.1	30.0	32.9
Crieff (James Square)	Roadside	Automatic	96	96	16.5	12.8	13.2	12.4	11.3

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**.

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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%).

Table A.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2019	2020	2021	2022	2023
P1C, P1L, P1R	311674	723501	Roadside	100	100.0	33.0	26.0	28.6	23.3	22.9
P2	312018	723411	Roadside	100	100.0	18.0	13.0	12.8	13.0	12.3
P5	311584	723993	Urban Centre	100	100.0	18.0	13.0	13.6	12.8	11.3
P6	310501	725764	Urban Background	100	100.0	10.0	8.0	8.6	7.2	7.0
P13	311846	723454	Roadside	100	100.0	26.0	22.0	22.3	17.5	18.2
P20	311058	724395	Roadside	100	81.1	23.0	16.0	19.7	17.8	16.8
P29	311252	723518	Roadside	100	100.0	28.0	19.0	25.9	19.5	19.2
P30C, P30L, P30R	311797	723457	Roadside	100	100.0	29.0	24.0	23.6	20.8	18.8
P31	311925	723465	Roadside	100	100.0	22.0	18.0	19.1	17.9	17.3
P32	311704	723483	Roadside	100	100.0	30.0	22.0	24.7	19.9	18.8
P33	311587	723475	Roadside	100	100.0	32.0	23.0	26.7	23.2	23.0

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2019	2020	2021	2022	2023
P34	311503	723480	Roadside	100	100.0	37.0	30.0	32.3	27.0	24.7
P35	311930	723416	Roadside	100	100.0	20.0	16.0	16.5	14.1	14.8
P36	310773	723557	Roadside	100	100.0	26.0	18.0	21.7	18.2	17.1
P37	310857	723577	Roadside	100	100.0	22.0	16.0	18.5	16.0	15.5
P39	312257	724013	Roadside	100	100.0	32.0	25.0	28.0	23.2	22.8
P40	312245	723965	Roadside	100	100.0	32.0	27.0	27.1	24.0	21.2
P41	311462	723941	Roadside	100	100.0	31.0	24.0	28.4	22.8	22.8
P43C, P43L, P43R	311619	723933	Roadside	100	100.0	38.0	32.0	34.9	32.7	31.4
P45	311095	724356	Urban Centre	100	100.0	18.0	14.0	16.5	13.4	13.2
P46	309364	724875	Roadside	100	100.0	19.0	15.0	16.9	14.3	14.3
P47	308293	724892	Roadside	100	100.0	19.0	14.0	16.2	14.3	14.5

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2019	2020	2021	2022	2023
P51	312233	723921	Roadside	100	100.0	23.0	18.0	19.0	15.7	15.5
P55	286334	721640	Roadside	100	100.0	35.0	23.0	28.3	23.8	23.5
P56	286541	721559	Urban Centre	100	100.0	22.0	16.0	18.0	14.3	14.1
P57	286541	721563	Urban Centre	100	100.0	24.0	18.0	18.8	16.9	15.8
P58	286582	721553	Urban Centre	100	100.0	29.0	23.0	27.1	22.4	21.8
P61C, P61L, P61R	311584	723931	Roadside	100	100.0	36.0	28.0	31.4	30.1	31.7
P62	312503	722930	Roadside	100	100.0	23.0	16.0	19.0	16.1	17.6
P63	312413	723252	Roadside	100	83.0	30.0	22.0	25.3	22.0	21.0
P64	312228	724120	Roadside	100	100.0	36.0	28.0	31.7	28.0	27.3
P65	311943	723864	Roadside	100	92.5	24.0	18.0	18.2	15.5	15.3
P67	311697	723939	Roadside	100	100.0	28.0	23.0	24.3	22.3	18.9

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2019	2020	2021	2022	2023
P68	311720	723955	Roadside	100	100.0	26.0	23.0	20.9	19.9	16.6
P72	310335	724550	Roadside	100	100.0	28.0	24.0	25.6	22.5	21.3
P73	286302	721651	Urban Centre	100	100.0	34.0	24.0	28.8	24.0	23.5
P74	286517	721559	Urban Centre	100	100.0	21.0	15.0	20.4	16.4	16.8
P75C, P75L, P75R	286360	721617	Roadside	100	100.0	16.0	14.0	13.7	12.4	11.4
P76	286324	721632	Urban Centre	100	100.0	28.0	21.0	24.4	21.6	18.8
P78	286194	721692	Urban Centre	100	100.0	19.0	16.0	17.7	12.9	14.5
P79C, P79R, P79L	312262	723976	Roadside	100	100.0	30.0	24.0	26.4	22.6	22.9
P82	294569	712888	Roadside	100	100.0	20.0	17.0	16.4	14.9	15.5
P86	311788	721397	Roadside	100	100.0	20.0	15.0	16.9	15.3	16.9
P87	287043	721486	Suburban	100	100.0	6.0	4.0	5.2	3.8	4.2

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2019	2020	2021	2022	2023
P89	311546	723544	Roadside	100	100.0	29.0	23.0	24.9	21.6	19.6
P90	311539	723798	Roadside	100	100.0	25.0	21.0	20.6	17.6	16.2
P95	311636	723950	Kerbside	100	66.0	36.0	26.0	31.6	26.7	29.5
P96	311424	723976	Kerbside	100	100.0	30.0	24.0	27.7	22.6	22.8
P97	311370	724040	Roadside	100	90.6	27.0	24.0	26.4	19.9	19.1
P99	310536	722928	Roadside	100	100.0	14.0	11.0	11.8	9.4	11.1
P100	286271	721684	Urban Centre	100	100.0	19.0	11.0	14.3	10.9	10.9
P101	311012	724483	Roadside	100	100.0	24.0	22.0	22.6	19.8	17.3
P103	311207	723504	Roadside	100	100.0	35.0	22.0	29.5	25.8	23.9
P104	310157	722634	Roadside	100	100.0	26.0	18.0	19.0	15.4	16.5
P107	311201	722871	Roadside	100	100.0	25.0	21.0	23.5	19.8	20.0

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2019	2020	2021	2022	2023
P108	318293	745415	Roadside	100	100.0	24.0	17.0	18.8	17.3	16.8
P109	311660	723897	Roadside	100	81.1	25.0	20.0	20.6	18.5	17.1
P110	309922	722633	Roadside	100	92.5	23.0	16.0	17.4	13.8	13.5
P111	308904	722731	Roadside	100	100.0	24.0	19.0	21.2	17.8	16.1
P112	308528	722895	Roadside	100	100.0	19.0	13.0	15.6	13.9	13.2
P113	313781	726119	Roadside	100	100.0	21.0	17.0	17.8	15.1	15.1
P114	311625	724063	Roadside	100	100.0	16.0	13.0	10.8	10.1	9.7
P115	311197	724857	Roadside	100	100.0	18.0	14.0	13.6	11.1	10.7
P116	310791	723817	Roadside	100	100.0	26.0	22.0	21.3	16.3	17.9
P117	310791	723817	Roadside	100	100.0	N/A	16.0	16.0	13.5	14.4
P119	312322	723515	Roadside	100	100.0	N/A	13.0	19.0	16.6	14.2

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2019	2020	2021	2022	2023
P120	286286	721656	Roadside	100	100.0	N/A	20.0	23.7	18.9	19.2
P121	311252	723301	Roadside	100	100.0	N/A	25.0	29.8	23.8	22.7
P122C, P122L, P122R	312260	724170	Roadside	84.9	84.9	N/A	N/A	19.4	18.5	17.1
P123	310231	725590	Roadside	100	100.0	N/A	N/A	12.7	11.8	12.0
P124	311290	723761	Roadside	100	92.5	N/A	N/A	N/A	18.5	17.3
P125	311279	723437	Roadside	100	100.0	N/A	N/A	N/A	20.9	19.1
P126	313438	725637	Roadside	100	100.0	N/A	N/A	N/A	10.5	12.6

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22**

☒ **Diffusion tube data has been bias adjusted**

☒ **Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction**

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**.

Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG(22) if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

(4) 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%).

Table A.5 – 1-Hour Mean NO_2 Monitoring Results, Number of 1-Hour Means > 200µg/m^3

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
Perth 1 (Bridgend)	Roadside	Automatic	99	99	N/A	N/A	0	0	0
Perth 2 (Atholl Street)	Roadside	Automatic	99	99	0	0	0	0	0
Crieff (James Square)	Roadside	Automatic	96	96	0	0	0	0	0

Notes:

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

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

(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%).

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

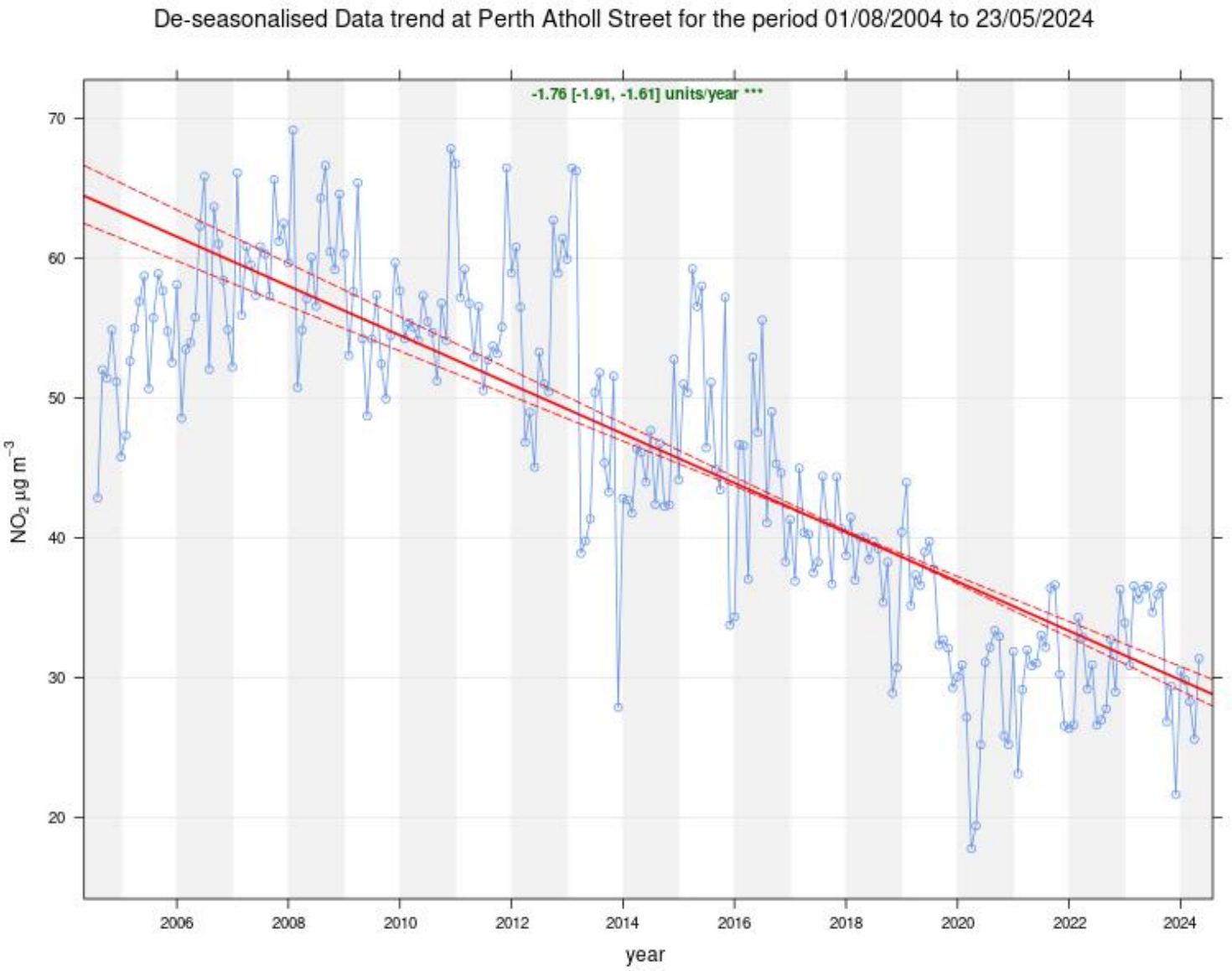


Figure A.2: Annual Mean Trend for NO_2 at Crieff

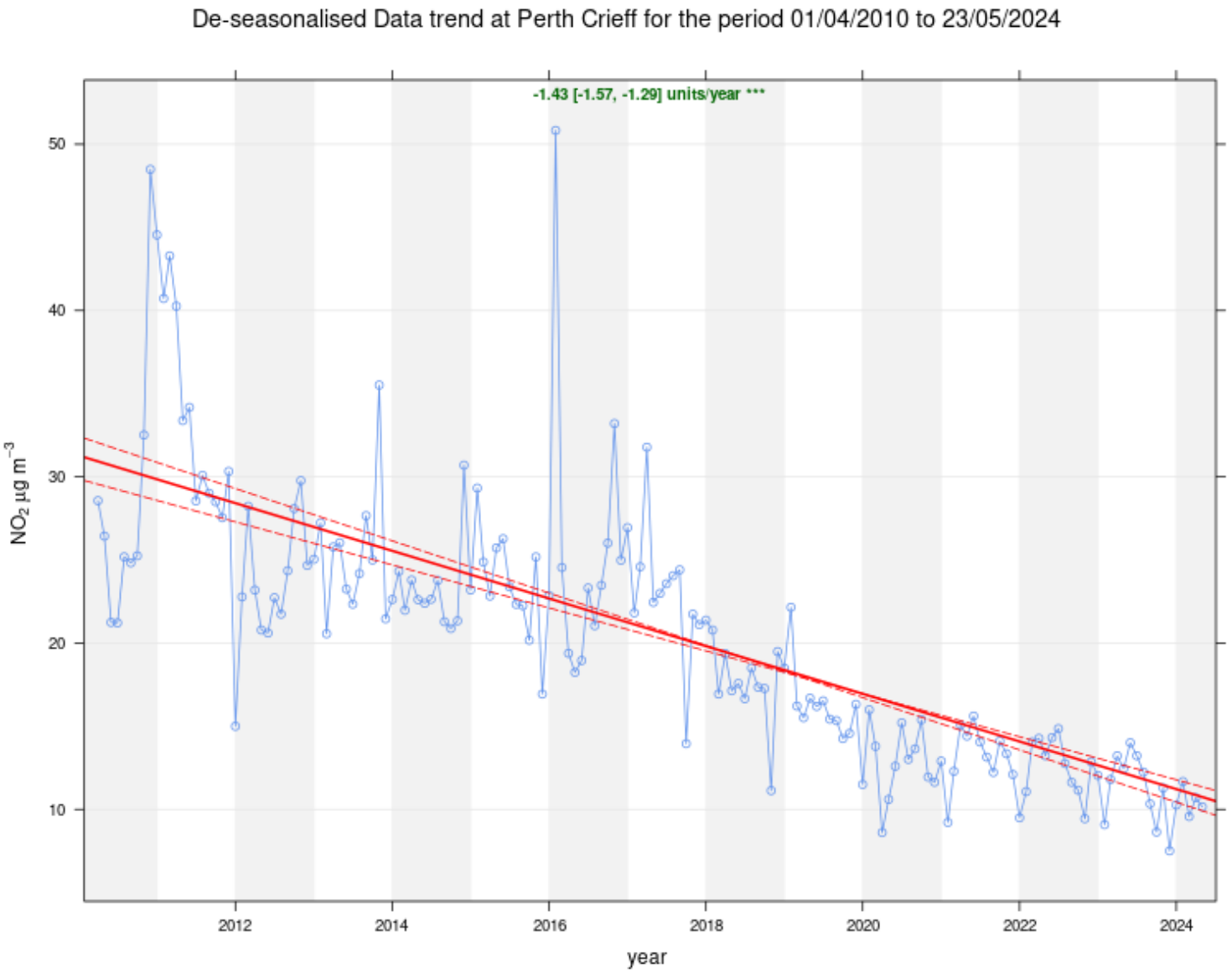


Figure A.3: Annual Mean Trend for NO_2 at Bridgend

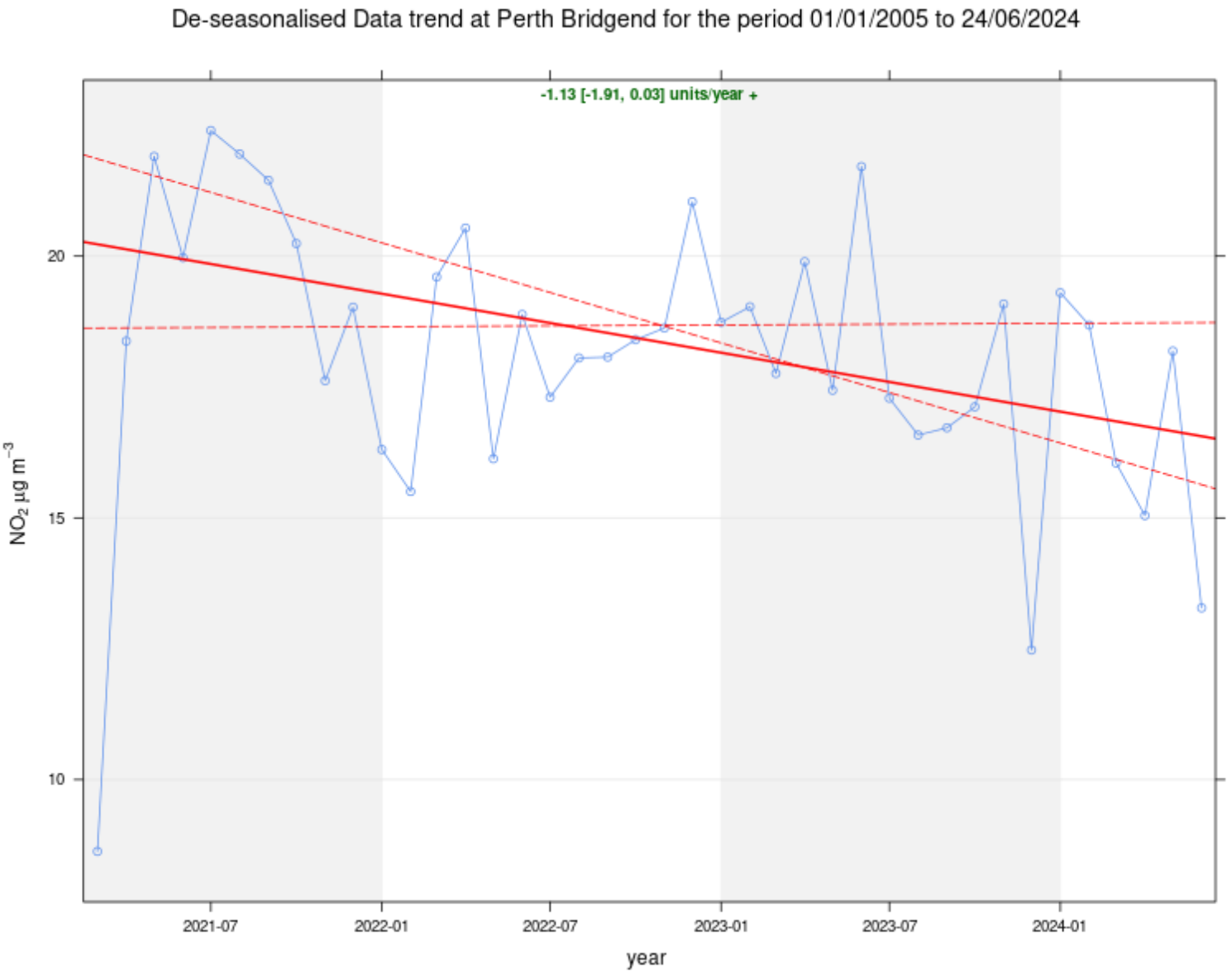


Table A.6 – Annual Mean PM_{10} Monitoring Results (µg/m^3)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
Perth 1 (Bridgend)	Roadside	100	100	N/A	N/A	9.6	9.7	9.7
Perth 2 (Atholl Street)	Roadside	100	100	12.7	10.2	14.0	15.9	21.3
Perth 3 (Muirton)	Urban Background	100	53	8.5	6.2	8.0	9.6	7.7
Perth 3 (Glasgow Road)	Roadside	58	19	N/A	N/A	N/A	N/A	(8.6)(3)
Crieff (James Square)	Roadside	92	92	9.9	7.1	8.8	9.6	9.7

Notes:

Exceedances of the PM_{10} annual mean objective of 18 µg/m^3 are shown in bold.

All means have been “annualised” as per LAQM.TG(22), valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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) Data capture period for Glasgow Road >25%, in line with LAQM.TG22 annualisation cannot be carried out.

Table A.7 – Annual Mean PM_{10} Monitoring Results (µg/m^3) - Corrected FIDAS 200 Data

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
Perth 1 (Bridgend)	Roadside	100	100	N/A	N/A	10.6	10.7	10.6
Perth 2 (Atholl Street)	Roadside	100	100	14.0	11.2	15.4	17.5	23.4
Perth 3 (Muirton)	Urban Background	100	53	9.3	6.8	8.8	9.6	(9.1)(3)
Perth 3 (Glasgow Road)	Roadside	58	19	N/A	N/A	N/A	N/A	(8.6)
Crieff (James Square)	Roadside	92	92	10.2	7.9	9.8	10.6	10.8

Notes:

Exceedances of the PM_{10} annual mean objective of 18 µg/m^3 are shown in bold.

The above data has also been corrected as per Scottish Government Guidance following the Scottish Government Pilot Research Study to investigate Particulate Matter Monitoring Techniques in Scotland.

(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) Full Corrected PM_{10} data not available, meaning annualization of Muirton RTM corrected PM_{10} results was not possible .

Table A.8 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
Perth 1 (Bridgend)	Roadside	100	100	N/A	N/A	0	2	0
Perth 2 (Atholl Street)	Roadside	100	100	1	0	7	7	15
Perth 3 (Muirton)	Urban Background	100	53	1	0	0	1	(0)
Perth 3 (Glasgow Road)	Roadside	58	19	N/A	N/A	N/A	N/A	(0)
Crieff (James Square)	Roadside	92	92	1	0	0	0	1

Notes:

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

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

(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%).

Table A.9 – 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3 - Corrected FIDAS 200 Data

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
Perth 1 (Bridgend)	Roadside	100	100	N/A	N/A	0	2	0
Perth 2 (Atholl Street)	Roadside	100	100	3	0	**8**	**11**	**25**
Perth 3 (Muirton)	Urban Background	100	53	1	0	0	1	(0)
Perth 3 (Glasgow Road)	Roadside	58	19	N/A	N/A	N/A	N/A	(0)
Crieff (James Square)	Roadside	92	92	1	0	0	1	1

Notes:

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

If the period of valid data is less than 85%, the 98.1st percentile of 24-hour means is provided in brackets. The above data has also been corrected as per Scottish Government Guidance following the Scottish Government Pilot Research Study to investigate Particulate Matter Monitoring Techniques in Scotland.

(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%).

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

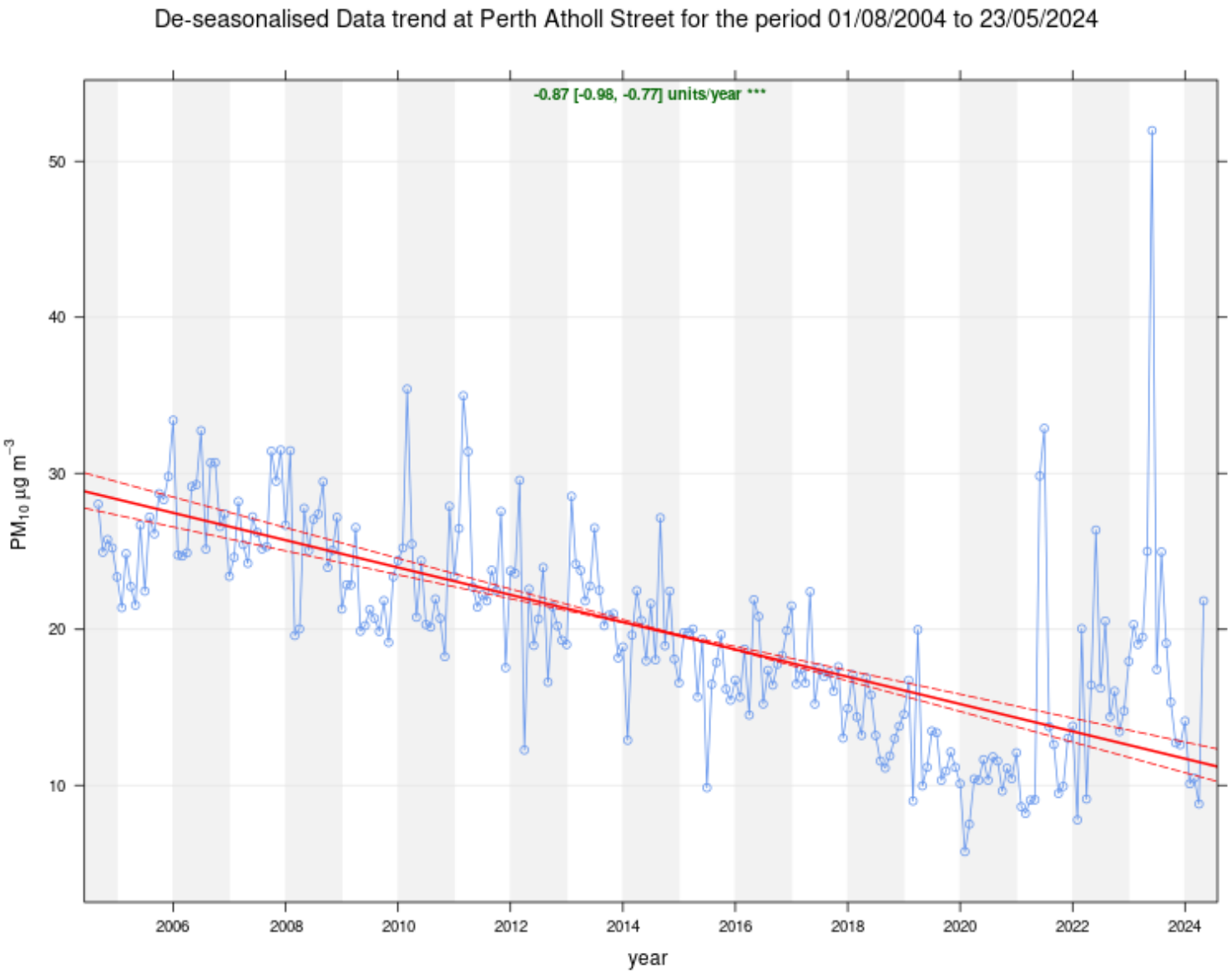


Figure A.5: PM_{10} Trend for Crieff

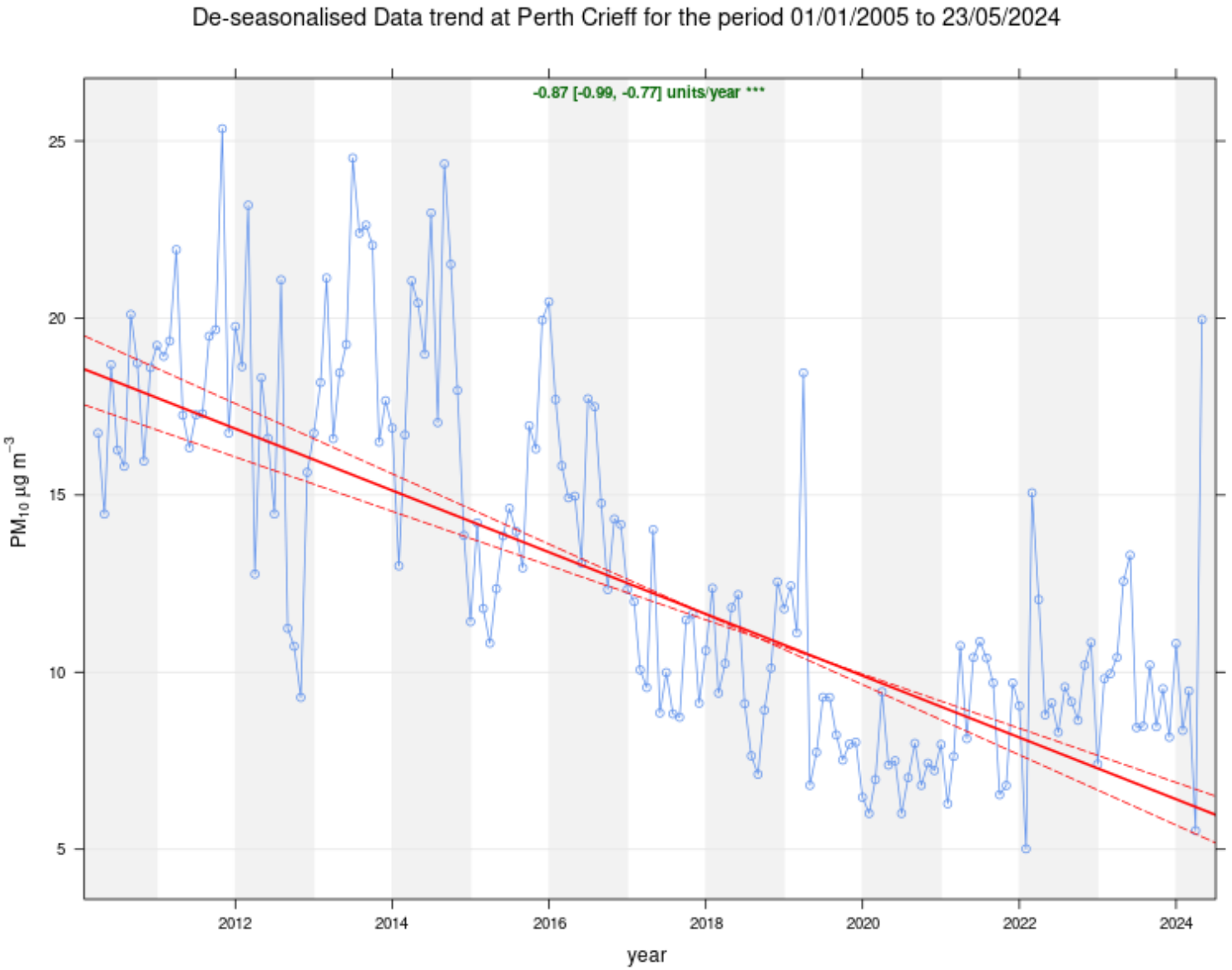


Figure A.6: PM_{10} Trend for Muirton

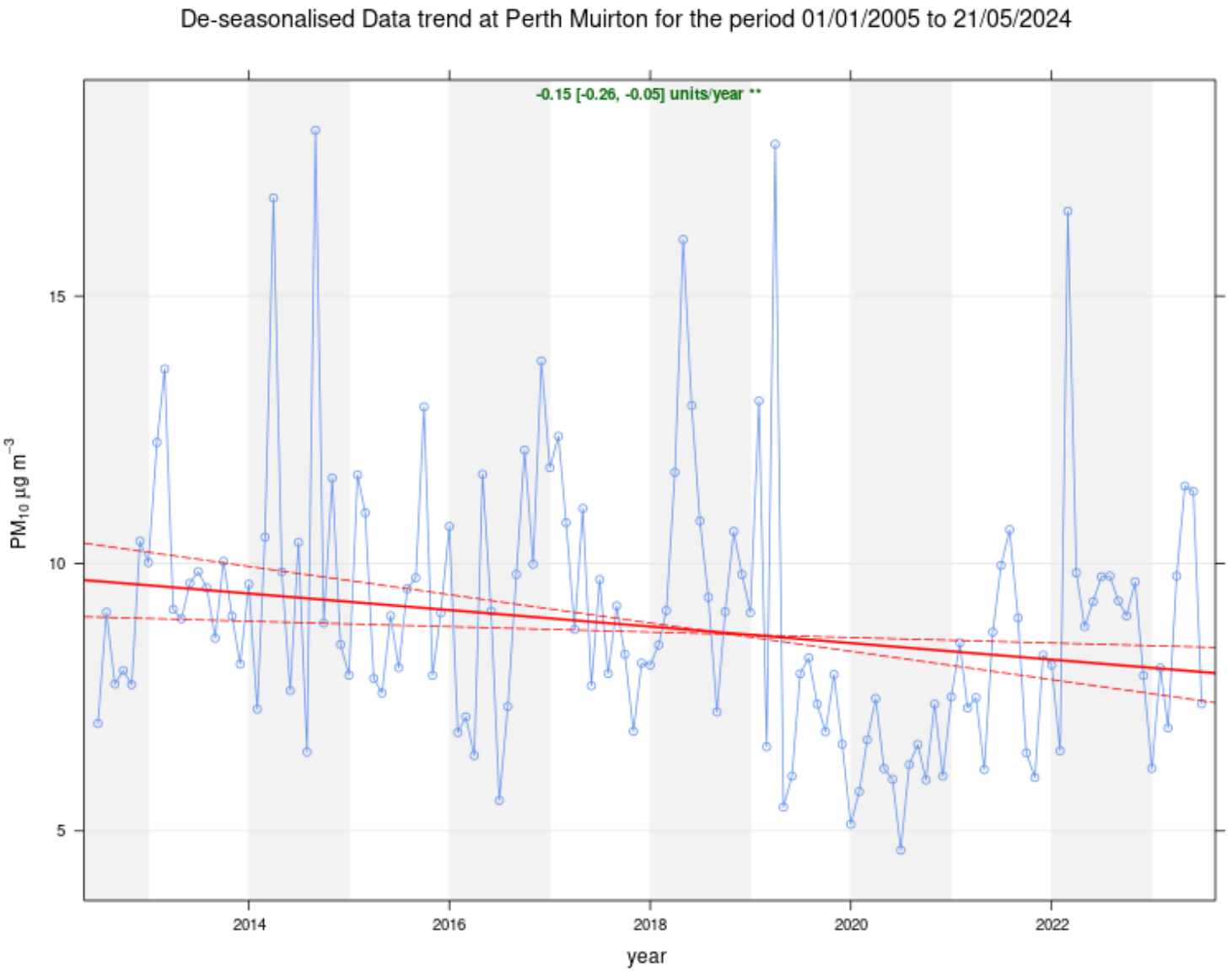


Table A.10 – Annual Mean $PM_{2.5}$ Monitoring Results (µg/m^3)

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
Perth 1 (Bridgend)	Roadside	100	100	N/A	N/A	4.9	5.7	5.0
Perth 2 (Atholl Street)	Roadside	100	100	7.0	5.6	6.4	6.9	6.9
Perth 3 (Muirton)	Urban Background	100	53	5.1	3.7	4.8	5.1	4.5
Perth 3 (Glasgow Road)	Roadside	58	19	N/A	N/A	N/A	N/A	(4.5)(3)
Crieff (James Square)	Roadside	92	92	5.5	3.9	4.8	5.2	5.1

Notes:

Exceedances of the $PM_{2.5}$ annual mean objective of 10 µg/m^3 are shown in bold.

All means have been "annualised" as per LAQM.TG(22), valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(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) Data capture period for Glasgow Road >25%, in line with LAQM.TG22 annualisation cannot be carried out

Table A.11 – Annual Mean $PM_{2.5}$ Monitoring Results (µg/m^3) - Corrected FIDAS 200 Data

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2019	2020	2021	2022	2023
Perth 1 (Bridgend)	Roadside	100	100	N/A	N/A	5.2	5.7	5.3
Perth 2 (Atholl Street)	Roadside	100	100	7.5	6	6.8	7.4	7.3
Perth 3 (Muirton)	Urban Background	100	53	5.4	3.9	5	5.4	(5.3)(3)
Perth 3 (Glasgow Road)	Roadside	58	19	N/A	N/A	N/A	N/A	(4.5)
Crieff (James Square)	Roadside	92	92	5.8	4.2	5.1	5.5	5.4

Notes:

Exceedances of the $PM_{2.5}$ annual mean objective of 10 µg/m^3 are shown in bold.

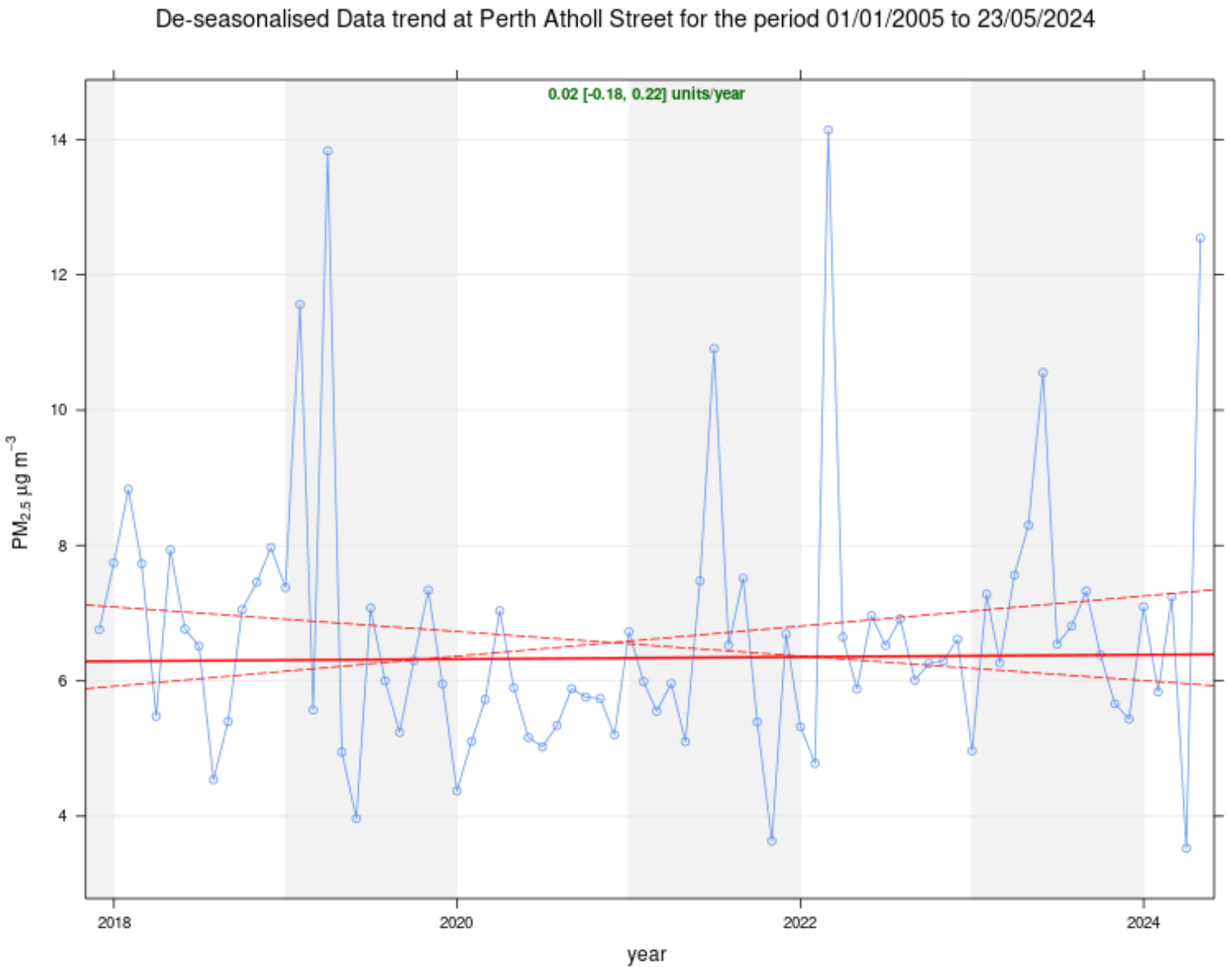
The above data has also been corrected as per Scottish Government Guidance following the Scottish Government Pilot Research Study to investigate Particulate Matter Monitoring Techniques in Scotland. See Appendix C for details.

(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%).

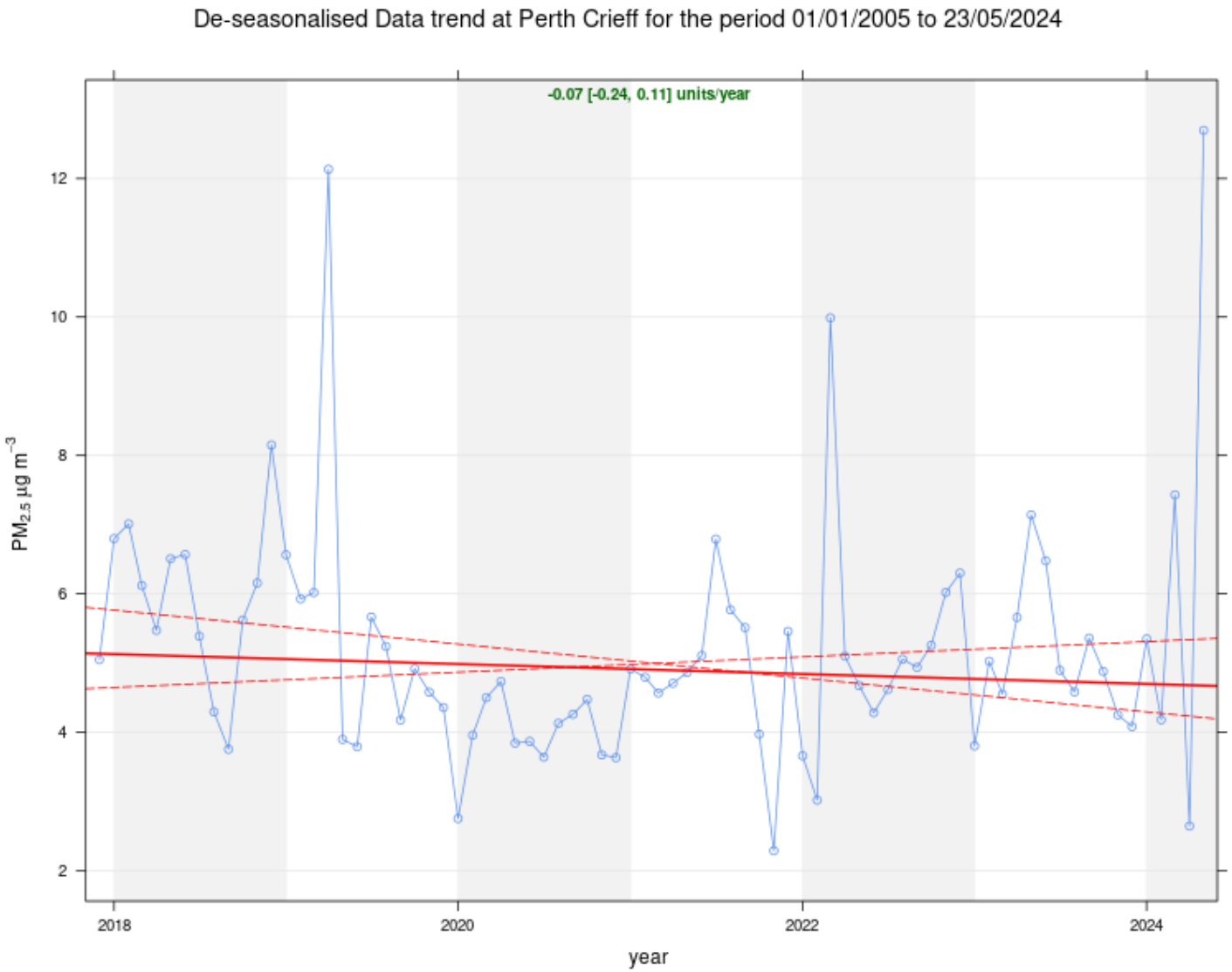
(3) Full Corrected PM_{10} data not available, meaning annualization of Muirton RTM corrected PM_{10} results was not possible.

Figure A.7: $PM_{2.5}$ Trend for Atholl Street



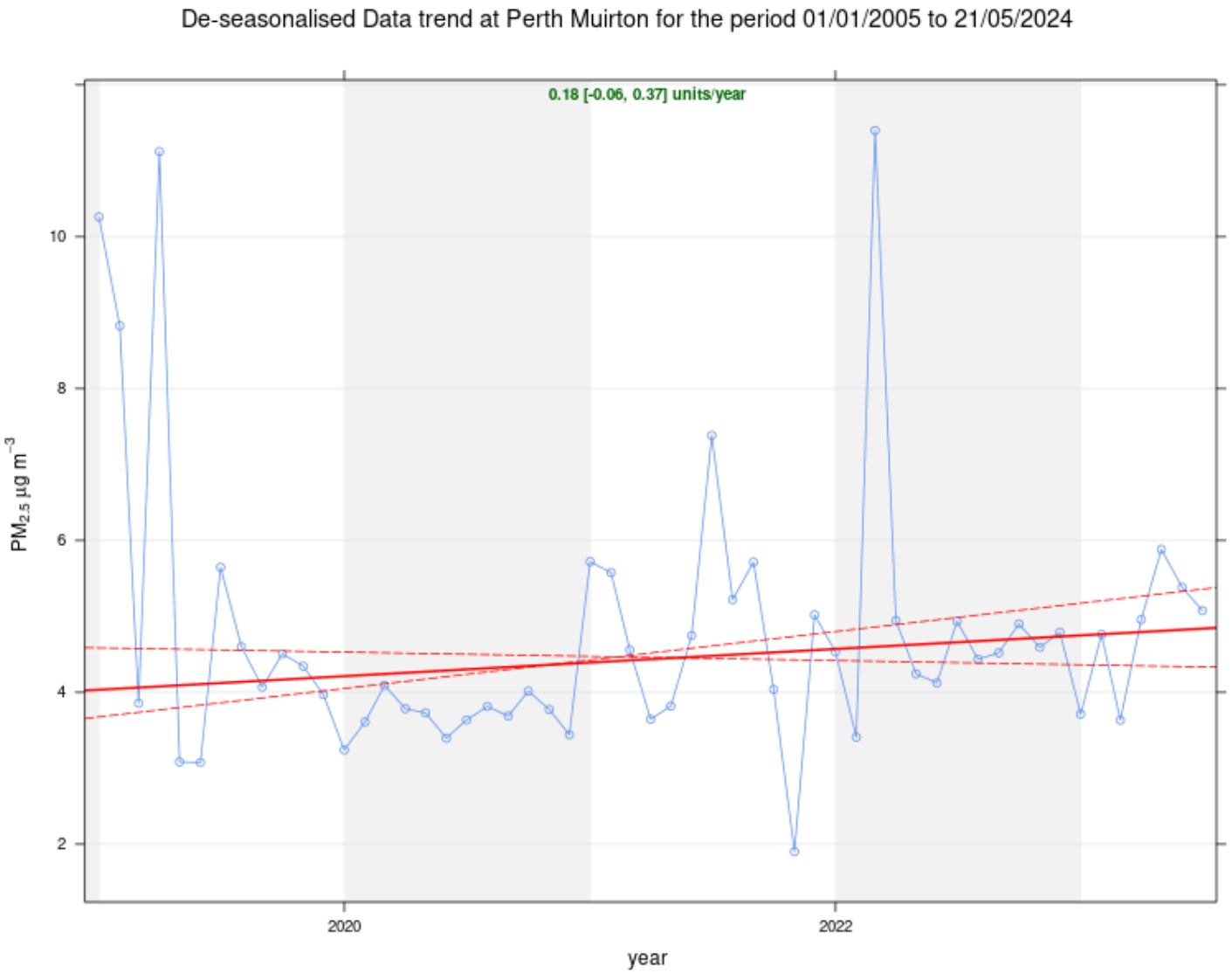
(4)

Figure A.8: $PM_{2.5}$ Trend for Crieff



(5)

Figure A.9: $PM_{2.5}$ Trend for Muirton



(1)

Appendix B: Full Monthly Diffusion Tube Results for 2023

Table B.1 – NO_2 2023 Monthly Diffusion Tube Results ($\mu g/m^3$)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.8)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
P1C	311674	723501	34.4	32.7	35.2	30.0	24.6	25.3	21.8	21.1	25.9	27.6	35.9	27.8	-	-	-	Triplicate Site with P1C, P1L and P1R - Annual data provided for P1R only
P1L	311674	723501	35.0	33.6	34.8	31.7	25.9	26.2	21.2	21.7	30.4	28.2	37.7	31.2	-	-	-	Triplicate Site with P1C, P1L and P1R - Annual data provided for P1R only
P1R	311674	723501	30.4	31.1	34.2	28.4	28.4	23.2	20.4	21.4	22.1	18.3	44.5	31.8	28.7	22.9	-	Triplicate Site with P1C, P1L and P1R - Annual data provided for P1R only
P2	312018	723411	23.5	18.9	18.7	11.2	12.1	11.4	10.7	12.7	14.7	13.8	23.5	14.7	15.5	12.3	-	
P5	311584	723993	23.4	17.5	16.9	7.8	12.0	10.1	8.5	10.9	14.5	11.7	18.5	19.3	14.3	11.3	-	
P6	310501	725764	14.7	10.3	10.2	5.2	6.4	4.6	4.3	5.1	8.0	6.7	19.0	11.5	8.8	7.0	-	
P13	311846	723454	31.1	32.6	27.1	19.4	21.3	18.5	16.0	16.9	22.0	17.2	25.0	26.8	22.8	18.2	-	
P20	311058	724395	27.4	23.0		18.2	18.3		15.3	16.6	19.6	17.1	30.2	25.8	21.2	16.8	-	
P29	311252	723518	27.2	30.1	32.1	25.0	18.8	16.5	13.8	18.4	16.2	21.3	37.8	32.8	24.2	19.2	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.8)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
P30C	311797	723457	35.2	30.5	26.6	20.4	22.2	19.9	18.1	18.4	21.2	20.3	29.0	27.7	-	-	-	Triplicate Site with P30C, P30L and P30R - Annual data provided for P30R only
P30L	311797	723457	34.5	28.6	25.4	17.9	19.9	18.5	16.8	14.9	22.3	18.1	24.5	29.7	-	-	-	Triplicate Site with P30C, P30L and P30R - Annual data provided for P30R only
P30R	311797	723457	35.2	28.4	25.4	20.1	23.0	19.6	17.9	18.1	23.5	22.4	27.7	28.8	23.6	18.8	-	Triplicate Site with P30C, P30L and P30R - Annual data provided for P30R only
P31	311925	723465	29.7	22.4	21.0	11.9	16.8	17.1	14.2	15.7	17.0	22.1	34.3	38.7	21.7	17.3	-	
P32	311704	723483	32.5	30.1	23.2	25.1	20.6	18.4	19.9	16.9	20.5	14.4	33.1	28.6	23.6	18.8	-	
P33	311587	723475	34.3	28.3	31.0	26.1	23.0	22.7	19.2	20.8	25.5	23.1	38.2	53.9	28.8	23.0	-	
P34	311503	723480	35.0	32.1	36.3	28.6	31.5	29.6	25.5	27.5	34.2	24.6	31.9	35.2	31.0	24.7	-	
P35	311930	723416	22.7	22.2	12.0	15.4	16.8	15.1	13.8	16.6	18.0	17.3	27.3	25.8	18.6	14.8	-	
P36	310773	723557	26.7	22.0	25.8	18.8	19.2	16.8	14.4	15.6	20.3	18.6	31.2	29.2	21.6	17.1	-	
P37	310857	723577	23.6	23.1	23.8	19.1	17.3	15.0	13.3	10.4	18.9	15.8	25.9	27.4	19.5	15.5	-	
P39	312257	724013	20.8	35.0	39.6	35.6	30.7	30.7	26.1	12.5	27.8	27.7	30.6	27.4	28.7	22.8	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.8)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
P40	312245	723965	38.6	32.7	30.5	27.2	29.6	26.6	23.1	0.3	25.4	21.9	33.3	30.0	26.6	21.2	-	
P41	311462	723941	31.4	33.9	36.8	16.5	31.0	29.9	21.5	23.1	25.5	27.8	34.8	30.9	28.6	22.8	-	
P43C	311619	723933	47.1	43.9	46.7	40.7	39.7	37.7	35.2	34.4	39.6	31.8	41.5	42.1	-	-	-	Triplicate Site with P43C, P43L and P43R - Annual data provided for P43R only
P43L	311619	723933	48.1	43.8	43.9	42.1	40.0	37.8	33.5	32.5	40.9	31.2	38.8	39.9	-	-	-	Triplicate Site with P43C, P43L and P43R - Annual data provided for P43R only
P43R	311619	723933	47.1	42.6	40.8	40.0	40.1	37.2	34.1	35.5	40.3	31.6	36.5	39.8	39.4	31.4	-	Triplicate Site with P43C, P43L and P43R - Annual data provided for P43R only
P45	311095	724356	21.6	19.3	20.1	14.2	13.7	11.4	9.2	11.6	13.2	14.2	26.8	24.1	16.6	13.2	-	
P46	309364	724875	19.7	19.1	18.9	18.0	16.8	18.3	11.0	12.6	16.9	18.3	25.9	20.5	18.0	14.3	-	
P47	308293	724892	19.5	16.9	20.4	19.4	15.9	16.4	13.5	13.7	10.9	18.4	28.7	25.1	18.2	14.5	-	
P51	312233	723921	23.3	22.5	25.3	20.6	18.7	14.8	15.7	15.1	14.8	17.0	25.6	20.1	19.5	15.5	-	
P55	286334	721640	28.8	31.1	33.6	38.0	28.9	30.5	22.1	26.9	24.0	27.5	31.6	30.9	29.5	23.5	-	
P56	286541	721559	22.7	18.0	20.2	21.9	18.1	16.9	11.8	13.8	16.0	14.6	19.4	19.7	17.8	14.1	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.8)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
P57	286541	721563	23.8	19.6	20.3	23.6	17.1	18.2	14.9	15.6	18.8	17.7	24.0	24.2	19.8	15.8	-	
P58	286582	721553	32.0	29.3	31.9	31.4	26.2	27.0	19.9	21.6	26.5	21.9	30.8	30.6	27.4	21.8	-	
P61C	311584	723931	47.6	44.5	49.9	42.0	40.1	40.0	33.9	36.6	40.6	32.2	40.4	40.2	-	-	-	Triplicate Site with P61C, P61L and P61R - Annual data provided for P61R only
P61L	311584	723931	46.6	45.0	47.5	40.2	40.0	38.6	32.7	33.8	49.1	30.6	35.2	42.9	-	-	-	Triplicate Site with P61C, P61L and P61R - Annual data provided for P61R only
P61R	311584	723931	44.1	44.4	47.4	39.2	39.1	36.5	32.1	32.8	41.5	31.9	36.8	38.8	39.9	31.7	-	Triplicate Site with P61C, P61L and P61R - Annual data provided for P61R only
P62	312503	722930	23.7	31.0	27.6	21.4	20.4	16.9	15.7	16.3	16.7	17.9	31.5	25.9	22.1	17.6	-	
P63	312413	723252	29.2	28.9	31.9	26.7		26.4	24.1	18.9	21.9	26.9	29.0		26.4	21.0	-	
P64	312228	724120	40.0	39.5	39.8	28.5	34.8	28.3	30.4	31.7	33.1	29.1	41.0	35.0	34.3	27.3	-	
P65	311943	723864		25.9	20.7	13.8	20.1	18.4	12.9	16.1	17.2	19.2	25.1	21.8	19.2	15.3	-	
P67	311697	723939	20.0	33.2	28.1	19.8	23.8	19.1	19.3	20.5	27.6	17.5	26.6	29.0	23.7	18.9	-	
P68	311720	723955	18.3	29.7	25.5	17.0	20.6	15.8	17.9	17.3	21.0	18.2	28.7	20.5	20.9	16.6	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.8)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
P72	310335	724550	34.1	30.7	31.7	23.4	26.9	22.7	19.6	22.0	26.3	18.3	33.5	32.1	26.8	21.3	-	
P73	286302	721651	26.9	27.8	35.4	37.7	24.7	33.5	21.6	25.0	27.8	24.8	39.4	29.1	29.5	23.5	-	
P74	286517	721559	27.4	21.7	25.1	23.9	19.3	19.2	15.0	17.5	19.5	17.8	23.5	23.6	21.1	16.8	-	
P75C	286360	721617	22.3	14.9	16.3	14.0	12.7	10.7	10.5	10.8	11.5	4.4	19.6	18.2	-	-	-	Triplicate Site with P75C, P75L and P75R - Annual data provided for P75R only
P75L	286360	721617	23.6	15.6	14.7	14.1	13.2	10.3	10.3	10.8	14.7	12.6	18.8	17.5	-	-	-	Triplicate Site with P75C, P75L and P75R - Annual data provided for P75R only
P75R	286360	721617	21.8	15.4	15.1	15.4	13.1	10.0	10.0	10.4	13.1	12.4	18.4	18.9	14.3	11.4	-	Triplicate Site with P75C, P75L and P75R - Annual data provided for P75R only
P76	286324	721632	33.7	23.9	30.1	27.4	25.6	27.4	19.3	0.5	26.4	18.3	22.8	27.6	23.6	18.8	-	
P78	286194	721692	17.5	16.7	22.2	22.3	17.2	16.4	12.4	13.7	17.6	18.5	22.5	21.5	18.2	14.5	-	
P79C	312262	723976	28.2	32.9	36.0	35.9	33.1	29.2	23.2	23.1	24.7	25.8	26.6	23.8	-	-	-	Triplicate Site with P79C, P79R and P79L - Annual data provided for P79L only
P79R	312262	723976	30.3	32.1	31.7	36.6	31.0	29.7	22.8	24.8	26.6	27.6	32.9	28.1	-	-	-	Triplicate Site with P79C, P79R and P79L - Annual data provided for P79L only

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.8)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
P79L	312262	723976	26.2	30.2	34.4	34.8	29.4	29.5	24.2	22.5	24.8	26.2	30.5	28.2	28.8	22.9	-	Triplicate Site with P79C, P79R and P79L - Annual data provided for P79L only
P82	294569	712888	25.2	24.1	21.8	19.7	18.7	18.0	14.7	13.9	17.2	16.7	21.8	22.1	19.5	15.5	-	
P86	311788	721397	23.0	20.1	23.8	19.6	16.1	14.9	16.4	22.2	23.7	19.5	30.3	25.4	21.3	16.9	-	
P87	287043	721486	7.2	4.9	5.6	5.4	4.3	3.6	2.4	3.2	4.5	5.9	8.0	8.1	5.3	4.2	-	
P89	311546	723544	34.5	30.6	28.1	21.7	20.6	18.2	17.2	18.5	25.4	18.4	32.2	30.3	24.6	19.6	-	
P90	311539	723798	28.5	25.7	26.2	17.3	16.7	14.4	14.1	15.5	17.4	14.8	27.8	25.9	20.4	16.2	-	
P95	311636	723950		40.4		40.3	33.1	31.1	28.7	28.3	30.2			34.9	33.4	29.5	-	
P96	311424	723976	32.5	34.3	34.5	32.7	26.6	23.8	21.9	22.8	23.5	23.1	34.7	33.5	28.7	22.8	-	
P97	311370	724040	34.2	26.9	27.5	20.3	20.1	17.4	16.0		23.3	16.8	30.8	30.3	24.0	19.1	-	
P99	310536	722928	15.5	14.4	14.6	10.8	28.6	7.7	6.8	8.2	9.5	11.7	21.7	17.7	13.9	11.1	-	
P100	286271	721684	15.3	12.7	14.4	17.1	9.4	15.6	9.6	12.3	10.7	13.3	16.7	17.0	13.7	10.9	-	
P101	311012	724483	31.0	28.7	30.8	24.8	13.4	19.3	21.6	18.3	22.0	18.3	32.3	1.0	21.8	17.3	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.8)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
P103	311207	723504	38.8	36.6	38.0	27.1	28.5	26.1	20.4	25.4	30.5	23.0	37.1	28.6	30.0	23.9	-	
P104	310157	722634	26.1	24.6	25.2	19.5	18.7	15.4	12.9	13.6	17.9	18.9	28.6	27.9	20.8	16.5	-	
P107	311201	722871	31.4	27.7	31.5	25.5	21.7	20.2	17.5	17.4	23.0	22.5	32.7	30.9	25.2	20.0	-	
P108	318293	745415	23.2	25.2	25.9	23.0	17.8	23.8	17.5	18.8	23.0	22.0	21.7	12.1	21.2	16.8	-	
P109	311660	723897	31.5	27.1	27.2	21.4	20.9	14.6	16.9	18.4	20.2	17.2			21.5	17.1	-	
P110	309922	722633	24.0		19.8	17.5	17.3	12.5	12.0	0.5	15.2	17.6	28.9	21.3	17.0	13.5	-	
P111	308904	722731	25.4	22.9	22.8	20.8	15.8	14.1	13.2	16.3	17.7	16.8	31.4	25.4	20.2	16.1	-	
P112	308528	722895	20.4	20.3	19.2	14.3	14.9	11.8	11.5	12.8	14.9	13.6	23.6	22.2	16.6	13.2	-	
P113	313781	726119	27.6	24.1	21.1	17.9	15.1	13.2	12.7	14.6	16.7	15.7	25.7	22.7	18.9	15.1	-	
P114	311625	724063	18.8	15.1	13.9	9.5	9.6	10.2	6.6	8.0	11.8	9.2	17.9	15.7	12.2	9.7	-	
P115	311197	724857	21.5	16.9	16.8	10.2	10.1	8.2	7.5	8.6	12.0	9.7	20.4	18.8	13.4	10.7	-	
P116	310791	723817	29.7	27.7	26.6	21.3	19.9	17.5	15.7	13.8	23.5	19.7	31.6	22.8	22.5	17.9	-	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.8)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
P117	310791	723817	22.8	20.1	21.2	17.3	14.4	13.3	12.4	11.6	16.8	16.1	26.3	25.5	18.2	14.4	-	
P119	312322	723515	21.7	20.7	21.7	17.9	15.0	14.8	12.4	11.8	18.0	14.5	24.9	20.8	17.9	14.2	-	
P120	286286	721656	23.5	21.7	28.7	31.9	23.5	26.0	17.7	15.5	22.3	22.0	32.0	25.3	24.2	19.2	-	
P121	311252	723301	34.9	33.4	29.4	25.8	28.6	23.2	19.4	22.4	29.7	22.6	32.6	39.8	28.5	22.7	-	
P122C	312260	724170			27.1	22.2	23.7	23.1	17.3	18.0	21.8	19.3	24.8	22.9	-	-	-	Triplicate Site with P122C, P122L and P122R - Annual data provided for P122R only
P122L	312260	724170			26.3	25.8	23.3	22.7	18.1	17.9	19.6	20.1	20.1	19.7	-	-	-	Triplicate Site with P122C, P122L and P122R - Annual data provided for P122R only
P122R	312260	724170			25.6	26.5	24.2	17.8	18.9	18.8	21.1	21.5	22.6	15.7	21.6	17.1	-	Triplicate Site with P122C, P122L and P122R - Annual data provided for P122R only
P123	310231	725590	23.1	16.4	14.8	11.2	11.3	8.3	8.8	10.0	11.6	11.8	27.5	26.7	15.1	12.0	-	
P124	311290	723761		28.4	26.3	18.9	19.6	16.2	14.7	18.5	22.5	17.9	29.5	27.3	21.8	17.3	-	
P125	311279	723437	31.5	29.9	32.1	25.3	24.1	22.5	12.7	0.5	25.0	20.8	32.5	30.5	24.0	19.1	-	
P126	313438	725637	19.4	18.2	17.4	14.9	14.2	13.9	11.2	12.2	13.9	16.2	19.6	19.1	15.9	12.6	-	

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.1**

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22**

☒ **Local bias adjustment factor used**

☐ **National bias adjustment factor used**

☒ **Where applicable, data has been distance corrected for relevant exposure in the final column**

☒ **Perth and Kinross Council confirm that all 2023 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System**.

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**.

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Perth and Kinross During 2023

PKC has not identified any new sources relating to air quality within the reporting year of 2023.

Additional Air Quality Works Undertaken by PKC During 2023

In 2023 Sweco UK Ltd on behalf of PKC carried out a detailed assessment of Crieff's current and future air quality to determine whether the AQMA could be revoked. The assessment included use of Sweco's existing air quality dispersion model for Crieff which had a base year of 2018 and meteorological data for 2018, while also utilising traffic data collected in 2023.

The assessment considered:

- The last five years of monitoring data
- 2018 and 2023 traffic data
- Source apportionment analysis
- Assessment of potential future concentrations
    - Met sensitivity of 5 years of meteorological conditions
    - The potential increase in traffic volume required to result in exceedance of the NO_2 and PM_{10} annual mean objectives

Both the review of monitoring data and the dispersion modelling indicated that the NO_2 and PM_{10} annual mean objectives are no longer exceeded within the Crieff AQMA or at any location considered within the study, with levels staying well below the objectives since the last exceedance in 2018.

The future year scenarios also concluded it was unlikely that the SAQ annual mean NO_2 and PM_{10} objectives would be exceeded in future years, as a significant increase in traffic flow within the AQMA would be required for this to occur (increase of 4,885-26,296 AADT required for NO_2 exceedance and 29,409-97,610 AADT increase for PM_{10} exceedance).

The results from the detailed assessment therefore confirmed that the Crieff AQMA meets the requirements for revocation, and that PKC should proceed. The revocation process is now almost complete, with completion expected late 2024.

The full detailed assessment report can be found on the PKC Air Quality webpage.

QA/QC of Diffusion Tube Monitoring

Analysis of diffusion tubes in 2023 was carried out by SOCOTEC at the Didcot lab. The method of preparation used was 20% TEA in water.

The analysis carried out by SOCOTEC on the diffusion tubes is covered within their UKAS schedule. SOCOTEC participate in the AIR-PT scheme in which they are rated a satisfactory laboratory.

Monitoring was carried out in line with the 2023 Diffusion Tube Monitoring calendar.

Diffusion Tube Annualisation

Annualisation is required for any site with data capture less than 75% but greater than 25%. As such, one site within Perth & Kinross required annualisation in 2023. This was conducted using the latest version of the Diffusion Tube Data Processing Tool (v4.0) utilising data from three automatic monitoring sites. These sites, alongside the details of the calculation method undertaken, are provided in Table C.2.

Diffusion Tube Bias Adjustment Factors

Perth and Kinross Council have applied a local bias adjustment factor of 0.8 to the 2023 monitoring data. A summary of bias adjustment factors used by Perth and Kinross Council over the past five years is presented in Table C.1.

The adjustment factor has been calculated from all three of the roadside monitors –Perth Atholl Street, Bridgend and Crieff. The use of a local adjustment factor is consistent with

our approach in previous years and is also more conservative than the relevant national adjustment factor (0.75, SOCOTEC Didcot, 20% TEA in water).

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2023	Local	-	0.8
2022	Local	-	0.79
2021	Local	-	0.88
2020	Local	-	0.8
2019	Local	-	0.8

NO_2 Fall-off with Distance from the Road

No diffusion tube NO_2 monitoring locations within Perth and Kinross required distance correction during 2023.

QA/QC of Automatic Monitoring

Ricardo E&E Ltd carries out the data management and Local Site Operator (LSO) duties for the automatic monitors in P&K.

The monitors are serviced on a six-monthly basis in coordination with Ricardo's QA/QC audits (i.e., service is carried out following the audit). During each site audit the performance of the analysers is checked, in addition to a traceable calibration to UK and international metrology standards for the on-site calibration gases. Site calibrations are also carried out on a three weekly basis using a traceable gas standard. Data is ratified on a 3-monthly basis, the process for which consists of detailed review of calibrations, diagnostics, faults and engineer visits.

All data used within this report has been ratified. Live and historic data for the RTMs is available from https://www.scottishairquality.scot/latest

PM_{10} and $PM_{2.5}$ Monitoring Adjustment

Perth & Kinross Council uses Fidas 200 monitors to measure PM_{10} and $PM_{2.5}$ within our Local Authority area. Following the completion of the Scottish Government Pilot Research

Study to investigate Particulate Matter Monitoring Techniques in Scotland, Scottish Government issued the following guidance for local authorities on the reporting and use of PM data from Fidas 200 instruments within the SAQD network:

- Fidas 200 PM_{10} data collected within the SAQD should be corrected by **dividing** ratified data by **0.909**
- Fidas 200 $PM_{2.5}$ data collected within the SAQD should be corrected by **multiplying** ratified data by **1.06**

- For completeness, it is recommended that authorities report both the corrected and uncorrected ratified data statistics.

Following Scottish Government guidance, PKC has therefore reported both corrected and uncorrected ratified data statistics for PM_{10} and $PM_{2.5}$ in Table A.5 – A.10

Automatic Monitoring Annualisation

Two of the automatic monitoring locations within Perth and Kinross recorded data capture below 75%: Muirton and Glasgow Road. Data capture at Glasgow Road was below 25% (19%) and therefore did not require annualisation.

Muirton had a data capture of 53% and required annualisation for PM_{10} and $PM_{2.5}$. Annualisation was carried out as per the guidance in LAQM TG.22 and the resultant data is provided in Table C.2.

NO_2 Fall-off with Distance from the Road

No automatic NO_2 monitoring locations within Perth & Kinross required distance correction during 2023.

Table C.2 – NO_2 Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Atholl Street	Annualisation Factor Bridgend	Annualisation Factor Crieff	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
P95	1.0612	1.0930	1.1781	1.1108	33.4	37.1	

Table C.3 – PM_{10} Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Atholl Street	Annualisation Factor Bridgend	Annualisation Factor Crieff	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
Muirton RTM (PM_{10})	0.8041	0.8622	0.8694	0.8453	9.1	7.69	Period from 1/1/23 to 14/06/23

Table C.4 – $PM_{2.5}$ Annualisation Summary (concentrations presented in µg/m^3)

Site ID	Annualisation Factor Atholl Street	Annualisation Factor Bridgend	Annualisation Factor Crieff	Average Annualisation Factor	Raw Data Annual Mean	Annualised Annual Mean	Comments
Muirton RTM ($PM_{2.5}$)	0.8833	0.9030	0.8877	0.8913	5.0	4.46	Period from 1/1/23 to 14/06/23

Table C.5 – Local Bias Adjustment Calculations

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2	Local Bias Adjustment Input 3
Periods used to calculate bias	11	10	9
Bias Factor A	0.82 (0.78 - 0.87)	0.77 (0.72 - 0.84)	0.79 (0.73 - 0.86)
Bias Factor B	21% (15% - 28%)	29% (19% - 39%)	27% (16% - 37%)
Diffusion Tube Mean (µg/m^3)			
Mean CV (Precision)	39.8	14.4	21.8
Automatic Mean (µg/m^3)	4.2%	4.3%	6.3%
Data Capture			
Adjusted Tube Mean (µg/m^3)	32.8	11.1	17.2

Notes:

A single local bias adjustment factor has been used to bias adjust the 2023 diffusion tube results.

Appendix D: NLEF Stage 1 Screening Appraisal (2020)

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
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.

No.	NLEF Stage 1 Screening Appraisal Question	Appraisal Response
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.
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 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.

No.	NLEF Stage 1 Screening Appraisal Question	Appraisal Response
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 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

No.	NLEF Stage 1 Screening Appraisal Question	Appraisal Response
		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. • 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 predetermined stages are completed to 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

No.	NLEF Stage 1 Screening Appraisal Question	Appraisal Response
		• 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 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.

No.	NLEF Stage 1 Screening Appraisal Question	Appraisal Response
		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. 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

No.	NLEF Stage 1 Screening Appraisal Question	Appraisal Response
		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. 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.

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)
ANPR	Automatic Number Plate Recognition
CHP	Combined Heat and Power
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EV	Electric Vehicle
EFT	Emissions Factor Toolkit
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
LDP	Local Development Plan
LEZ	Low Emission Zone
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

RTPI	Real Time Passenger Information
RTM	Real Time Monitor
SO_2	Sulphur Dioxide
TACTRAN	Tayside & Central Scotland Transport Partnership

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Perth Transport Futures https://www.perthtransportfutures.co.uk/

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

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