Cardiff 2025 Air Quality Progress Report

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

Local Air Quality Management

Date: September 2025

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Report Reference Number	SRS/CC/APR/2025
Date	September 2025

Executive Summary: Air Quality in Our Area

What has become distinctly apparent is that air Pollution is a local and national problem. Long-term exposure reduces life expectancy by increasing mortality, as well as increasing morbidity risks from heart disease and strokes, respiratory diseases, lung cancer and other effects.

Poor air quality in Wales poses a significant concern for Public Health and is regarded as the most significant environmental determinant of health. Its associated adverse risk to public health is particularly prevalent within urban areas and near major roads. The pollutants of concern for public health are particulate matter (PM_{10}, $PM_{2.5}$) and primary/ secondary derived nitrogen dioxide (NO_2). Both pollutants primarily originate from motor vehicles. Particulate matter can also be generated by industrial sources and forms of domestic solid fuel burning, such as wood burning stoves.

The UK expert Committee on the Medical Effects of Air Pollution (COMEAP) estimated that air pollution is responsible for "an effect equivalent of between 28,000 and 36,000 deaths (at typical ages) each year" in the UK. In 2022, the UK Health Security Agency updated this estimate; the burden range is now reported as the equivalent of between 29,000 and 43,000 deaths per year[1].

The burden range does not reflect 'actual' deaths from air pollution exposure but is an estimate of the 'equivalent' reduced life expectancy, when summed, which everyone experiences because of air pollution exposure (6-8 months on average but could range from days to years).

In Wales – based on modelled air pollution data pre-pandemic – Public Health Wales estimated the burden of long-term air pollution exposure to be around the equivalent of 1,000 to 1,400 deaths each year[2]. This estimate was calculated using a more accurate method that considers the combined effects of different pollutants, meaning that the overlapping effects of $PM_{2.5}$ and NO_2 are accounted for. Impact estimates are uncertain, however, which

[1] https://airquality.gov.wales/about-air-quality/health-advice

[2] https://phw.nhs.wales/services-and-teams/environmental-public-health/air-quality/air-pollution-and-health-fact-sheet/

is why they should always be presented as a range of values, rather than a single, central estimate.

Although estimating the burden of air pollution is difficult, there is clear and strong evidence that it does harm health. It is therefore important to take action to reduce air pollution and the harms that go with it.

Air Quality in Cardiff

Local authorities have a statutory duty under Part IV of the Environment Act 1995 (as amended by the Environment Act 2021) & Air Quality Strategy for England, Scotland, Wales, and Northern Ireland 2007 to manage local air quality. Under Section 82 of the Environment Act 1995, the Local Air Quality Management (LAQM) process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether air quality objectives are likely to be achieved.

The air quality objectives applicable to LAQM in Wales are set out in the Air Quality (Wales) Regulations 2000, No. 1940 (Wales 138) and Air Quality (Amendment) (Wales) Regulations 2002, No 3182 (Wales 298). Where the air quality reviews indicate that the air quality objectives may not be met, the local authority is required to designate an Air Quality Management Area (AQMA). Action must then be taken at a local level and outlined in a specific Air Quality Action Plan (AQAP) to ensure that air quality in the identified area improves. Details for Air Quality Objectives Included in Regulations for the Purpose of LAQM in Wales can be found in Appendix B.

In line with the Cardiff Council's (CC) statutory duties under Part IV of the Environment Act 1995, Shared Regulatory Services (SRS) on behalf of Cardiff Council (CC) undertakes regular air quality monitoring at specifically allocated locations across Cardiff using automated and non-automated principles for ambient air Nitrogen Dioxide (NO_2), Particulate Matter (PM_{10} & $PM_{2.5}$), Sulphur Dioxide (SO_2), Carbon Monoxide (CO) & Ozone (O_3).

With regards to prioritising ambient air quality sampling locations, the Council adopts a risk-based approach to any allocation of monitoring sites, considering the requirements of The Department for Environment, Food and Rural Affairs' (Defra) Local Air Quality Management Technical Guidance (TG22)[3]. The designated monitoring locations are assigned based on

[3] https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf

relevant exposure and where the Air Quality Objective levels for a particular pollutant applies. TG22 states that annual mean objectives should apply at “All locations where members of the public might be regularly exposed. Building facades of residential properties, schools, hospitals, care homes etc.”

There are currently four Air Quality Management Areas (AQMAs) within Cardiff. These areas are at locations within Ely Bridge, Llandaff, Stephenson Court on Newport Road, and Cardiff City Centre. In 2024, all monitoring locations within the AQMAs were compliant with the relevant objectives for NO_2.

In Cardiff, the main pollutant related to Local Air Quality Management (LAQM) is vehicle derived nitrogen dioxide (NO_2). Nitrogen Oxides (NOx) are formed through combustion of fossil fuels. Primary NO_2 is produced by motor vehicles and is particularly prevalent with diesel engines. Nitric Oxide (NO) is also produced, and chemical reactions with Ozone (O_3) gases within the atmosphere create secondary NO_2. Therefore, the focus on improving air quality within Cardiff in recent years has been to improve and reduce vehicle-derived emissions and exposure to these pollutants.

In 2024, the highest annual average concentration of NO_2 within Cardiff was measured at 32.8µg/m^3 at monitoring point 179, located on Bute terrace. However, this monitoring point is at a kerbside location and not representative of actual relevant exposure with regard to the annual objective.

There were no exceedances of air quality objectives within any location in Cardiff. This includes locations within AQMAs. In previous years, the highest concentration of NO_2 in Cardiff was experienced at diffusion tube site 212 within Llandaff AQMA. However, as displayed in Figure 1, NO_2 concentrations have improved when compared to 2023 and have remained within the annual objective limit for NO_2 since 2019.

Figure 1 - Llandaff AQMA 2019 - 2024 Annual Average NO_2 Diffusion Tube Concentrations µg/m^3

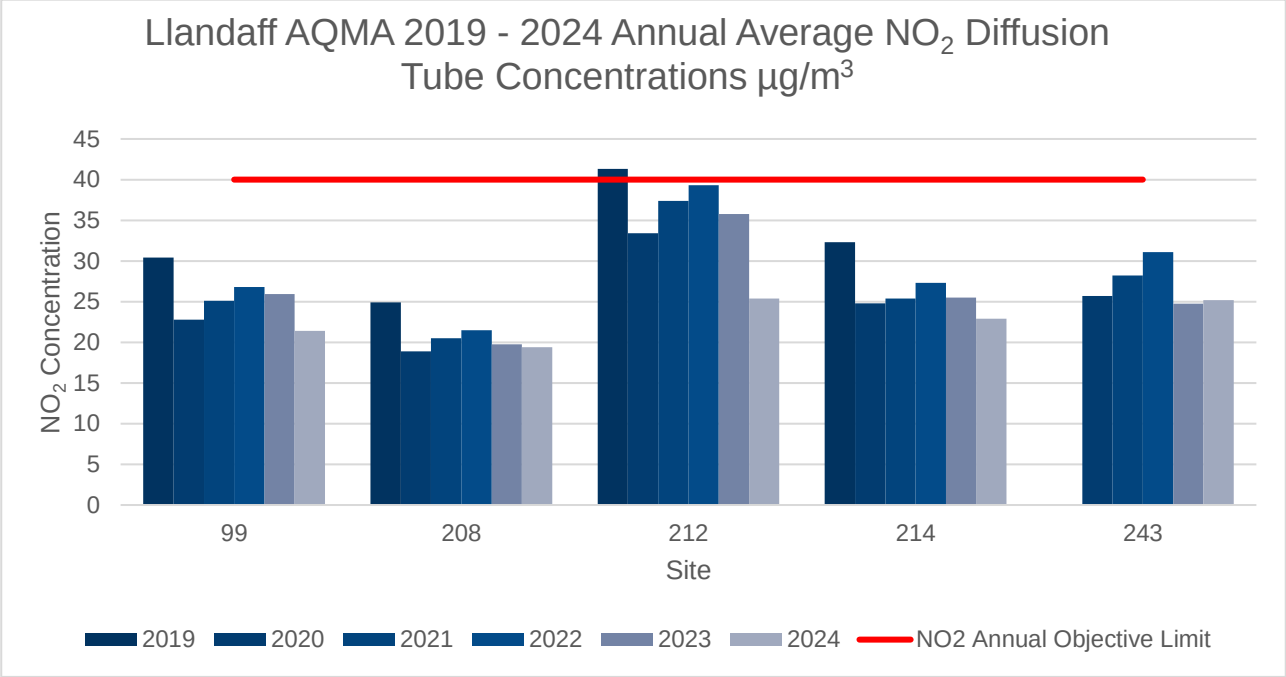
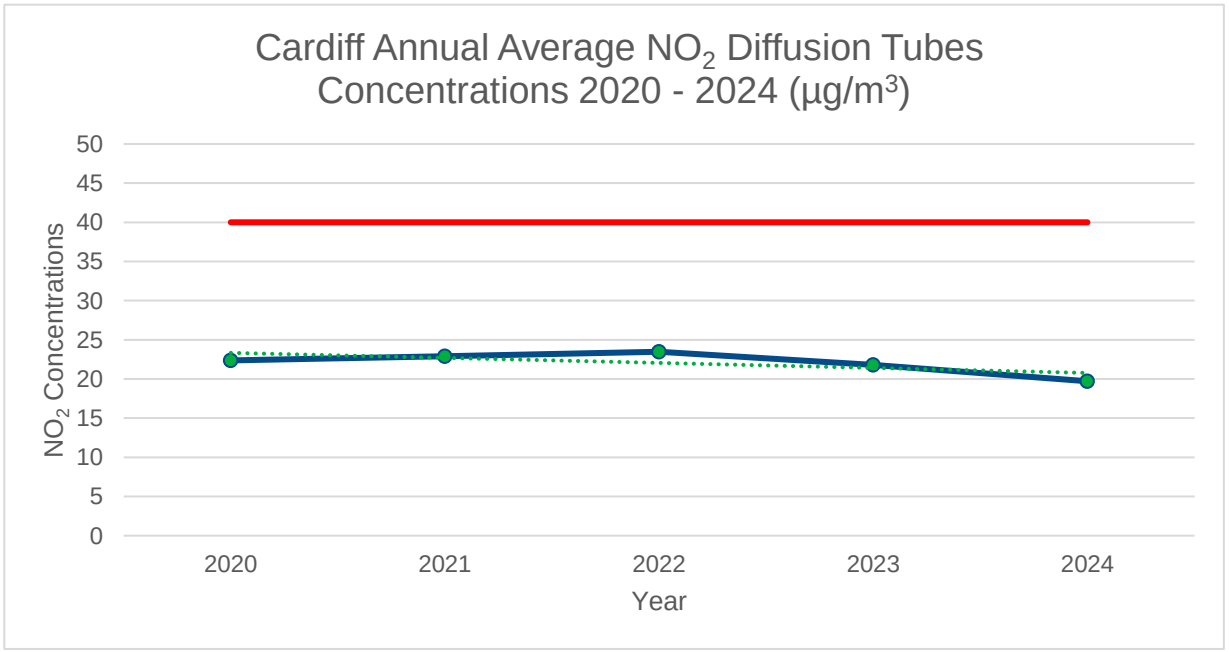


Figure 2 below displays the annual average concentrations of NO_2 at roadside diffusion tube sites within the current non-automatic monitoring network since 2019. When examining average NO_2 concentrations across Cardiff, an improving trend is evident, and we are now experiencing NO_2 concentrations lower than those experienced during the pandemic.

Figure 2 - Cardiff Annual Average NO_2 Diffusion Tubes Concentrations 2020 - 2024



There are various factors that have contributed to improved air quality in this period. The ongoing turnover in vehicle fleet resulting in the phasing out of older vehicles producing more emissions can improve air quality year by year. Remote and Hybrid working has also remained higher than pre-pandemic levels[4]. These working practices contribute towards decreased traffic and emissions on our roads.

Work carried out by Cardiff Council, as stipulated within the Clean Air Strategy and Action Plan (CASAP), such as the implementation of electric buses and have also contributed towards improving air quality.

Actions to Improve Air Quality

Clean Air Strategy and Action Plan

Shared Regulatory Services (SRS) and Cardiff Council (CC) are very aware of the concerns for air quality impacts. SRS & CC are committed to achieving levels as low as reasonably practicable by demonstrating levels beyond the annual objectives set for pollutants. In order to improve the air quality in Cardiff, action needed to be taken across the city as a whole. The main air pollutants which cause a public health concern and primarily worsen air quality in Cardiff are particulate matter and primary/ secondary derived nitrogen dioxide (NO_2), derived by transport vehicles.

Welsh Government's publication: Local Air Quality Management, Policy Guidance, June 2017[5] recommended two clear goals:

(1) achieve compliance with the national air quality objectives in specific hotspots; and

(2) reduce exposure to pollution more widely, to achieve the greatest public health benefit.

Collective efforts, therefore, should look beyond targeted action in localised air pollution hotspots and do this in parallel with universal action to reduce risks for everyone.

[4] Home working by region and month UK April 2017 to March 2023 - Office for National Statistics

[5] https://www.gov.wales/sites/default/files/publications/2019-04/local-air-quality-management-in-wales.pdf

In view of the statutory obligation to produce an AQAP for each AQMA, in 2019 SRS & CC developed a citywide Clean Air Strategy & Action Plan (CASAP) for Cardiff[6]. The strategy is an evolving document and coincides with Cardiff's Capital Ambition report, helping to implement and deliver the priorities outlined in the Ambition report with an overarching aim to improve air quality to protect and improve public health in Cardiff. The CAS & Action Plan appoints strategic measures that will look to generate a positive impact to citywide air quality levels, in particular traffic derived NO_2 levels. Each measure has endured a cost benefit appraisal procedure by weighting the measures in terms of air quality impact, cost, and timescale. The key theme of the strategic measures is to increase the uptake of sustainable modes of transport by influencing a behavioural change in Cardiff. The CASAP fulfils the requirements of the LAQM process to produce an Air Quality Action Plan (AQAP).

The Air Quality Action Plan for Cardiff is due for renewal or replacement with a potential Air Quality Strategy (AQS) in 2025-2026. Currently, three of the four AQMA's for Cardiff are suitable for revocation due to continued compliance with the annual objective limit for NO_2 and three consecutive years of NO_2 concentrations well below 10% of the annual objective (below 36 µg/m^3). The fourth AQMA, Llandaff, may be due for revocation in 2026. This is dependent on the NO_2 result for 2025. It is likely that given the annual trends since 2022, and the NO_2 data to date in 2025, that the annual concentration for 2025 has the potential to be below the specified concentration of 10% below the annual objective limit to justify revocation.

Before the decision is made to revoke any AQMA, detailed assessments for projected air quality concentrations within each Cardiff AQMA will be undertaken. This will allow for robust justification for the potential revocation of AQMAs within Cardiff.

If all AQMAs are found to be suitable for revocation, an AQS will replace the existing CASAP document. An AQS will present the evidence base around current and future air quality trends in Cardiff, outlining the need for continued action to ensure that the authority is identifying and taking advantage of every feasible opportunity to further safeguard human and environmental health across the city. The AQS will be developed working closely with CC and relevant stakeholders, as well as through engagement with Cardiff residents.

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6 https://cardiff.moderngov.co.uk/documents/s28264/Cabinet%2021%20March%202019%20Clean%20Air%20App%201%20App%20C.pdf

Cardiff Hackney Emissions Reduction Grant Scheme

The Cardiff Hackney Emissions Reduction Grant Scheme[7] is a city-led initiative launched in 2024 to help reduce air pollution by encouraging taxi drivers to upgrade to cleaner, lower emission vehicles. Funded by Cardiff Council with support from the Welsh Government, the scheme offers grants of up to £10,000 for drivers switching to Euro 6 or fully electric taxis. It forms part of the city's wider One Plant Cardiff Strategy to tackle climate change and improve air quality. To date, over £200,000 has been awarded, supporting the transition of the city's taxi fleet to greener alternatives and contributing to a measurable reduction in transport related emissions.

Electric Buses

Cardiff Council has been successful in supporting the transition of buses on the Cardiff network to becoming fully electric. Cardiff Bus introduced thirty-six new electric buses into their fleet from January 2022. It was delivered through a collaboration between Cardiff Bus and Cardiff Council after a successful bid for funding from the Department for Transport's (DfT) Ultra-Low Emissions Bus (ULEB) Scheme that received funding of £5.7m.

Bus Retrofit Scheme

Following an open application process which ended on the 31st of December 2020, and subsequent review process, two application submissions were deemed successful. Here 80% funding to cover capital costs has been awarded to two bus operators/ companies, a total of £561,612 awarded.

£191,920 has been awarded to Cardiff City Transport Services Ltd (Cardiff Bus) to retrofit twenty buses, and £369,692 has been awarded to Red and White Services Ltd, T/A Stagecoach South Wales to retrofit 29 vehicles.

Both operators completed the programme of works in Q4 of 2021 and have ensured that some of their older buses have improved their NOx emissions by some 90%.

[7] Cardiff Hackney emissions reduction grant scheme (CHERG)

Cardiff Bus Interchange

The completion of the Cardiff Interchange in 2024 marks a significant step in improving air quality by promoting sustainable transport options. The facility integrates bus, rail, and active travel, encouraging a shift away from private car use and reducing traffic congestion in the city centre. With improved public transport infrastructure, the interchange supports lower emissions and contributes to Cardiff's wider Clean Air Strategy.

Bus Priority Strategy

Cardiff Council want to make it easier, safer, and cheaper for people to walk, cycle, or use public transport in Cardiff. COVID-19 changed our travel habits. There are still fewer people travelling by bus than before the pandemic.

People want a faster and more reliable bus service. Cardiff Council have developed a strategy that sets out how we will deliver key changes to help bus operators to run higher quality bus services and encourage more people to choose bus travel.

A strategy has been developed around 6 objectives. They outline our ambition for the city and how Cardiff Council want to deliver better outcomes for residents and bus service providers.

Our 6 objectives are:

- Faster and more reliable bus services.
- Attract more funding for bus priority measures.
- More accessible services that are easier to use.
- Better integration between each bus service, and with rail, light rail (trams), and bus.
- Bus routes and stops designed to complement walking and cycling facilities.
- More accessible and real time information to make journey planning easier.

It is evident that there is limited highway space, and all types of transport cannot be prioritised on all routes. Routes have been identified that carry 80% of all bus passengers and are congestion hot spots. These are where bus reliability is most important. These routes are known as route corridors.

Bus travel will take priority over other types of transport at these locations.

The 6 corridors are:

- Western Bus Corridor

- UHW to International Sports Village – Cross-City Bus Corridor
- Eastern Bus Corridor
- Southern Bus Corridor
- Northern Bus Corridor
- Roath – North-East Cardiff Bus Corridor

A public consultation was undertaken in 2024. A consultation report based on the responses to the survey will be produced. If appropriate, changes to the bus priority strategy will be made. Further projects will be created as a result of the strategy and will be consulted on in the local area.

Further information on the Bus Priority Strategy can be found at the following link Bus priority strategy.

Roath Park Cycle Route (Phase 1) – Roath Recreation Ground Improvements

In 2024, work commenced for a new cycle route from the city centre to the Roath Park area.

The route will provide key benefits such as:

- promoting sustainable and active travel to school,
- employment, and
- connections to public transport.

The route will connect to other cycle routes in the future.

Phase 1 will provide a new segregated cycleway and upgraded footpaths in Roath Recreation Ground between the junction of Wellfield Road and Alder Road.

The scheme also includes:

- Improvements to the junction of Wellfield Road, Marlborough Road, Penylan Road, and Ninian Road by upgrading crossing points, a cycle crossing and changes to the signal phasing.
- Replacing the priority narrowings on Ty Draw Road with 4 ramped pedestrian crossing points.
- Improvements to bus stops and a new northbound bus stop on Ninian Road.
- Changes the Penylan Community Centre car park to make space for the cycleway.
- Improving the zebra crossing at the Pen-y-Wain Road junction and shared footway for pedestrians and cyclists towards Roath Park Primary School.
- Upgrading the footpath around the playing field and gym equipment.
- Changes to the zebra crossing at the Alder Road junction and stop through traffic on Alder Road.

You can find out more about the Roath Park cycle route scheme from the project consultation information.

Indicative Automatic Monitoring Network

Utilising One Planet Cardiff Funding, in April 2023, automatic Vortex monitoring sensors were installed at specific locations across Cardiff, primarily within AQMA locations and near schools to measure NO_2 and particulate matter (PM_{10} and $PM_{2.5}$).

The monitors will further improve how Cardiff Council measures air pollution to deliver more comprehensive air quality benefits across the city. Data from sensors located within AQMAs in included within this report. The sensor network contract expires in April 2025. SRS on behalf of CC are exploring funding options to extend the monitoring network contract beyond 2025.

Figure 3 - VTX Sensor

One Planet Net Zero By 2030

The Welsh Government has enacted legislation aiming to achieve Net Zero Wales by 2050, with the public sector setting the standard by being Net Zero by 2030. We acknowledge the leadership role in facilitating broader Net Zero for businesses and communities in the county, and as an organization, we have committed to the Net Zero 2030 target. Air quality and its associated effects on human health can be improved by projects aimed at lowering carbon emissions[8].

The council have various projects to address climate issues, these include;

Electric Vehicle Charging Points

Up to 100 new electric vehicle charging points could be installed with Cardiff Council support over the next two years.

The plans are part of a newly published ‘Electric Vehicle Infrastructure Roadmap' to help aid the transition to electric vehicles, which also sets out the local authority's plan to focus initially on supporting public EV charging in areas with low levels of off-street parking including Heath, Gabalfa, Cathays, Roath, Penylan, Adamsdown, Riverside, Canton, Grangetown and Butetown.

[8] One Planet Cardiff

The roadmap forms part of the council's One Planet Cardiff response to climate change, which aims to reduce the 1.6 million tonnes of carbon emissions created in the city every year, 41% of which currently come from transport.

The new chargers will be predominantly standard chargers (7kW) and some fast chargers (up to 50kW). They will be delivered, operated and maintained at no net cost to the council, in partnership with the private sector through a competitive tendering process. The intention is to install these ‘on street' or in local car parks.

In tandem with the Councils work it is expected that the number of commercial public sites will continue to grow significantly across the city, leading to in the region of 600-700 charge points in 2025/2026 - up from the current figure of around 200 publicly accessible electric vehicle charging points today.

Lamby Way Solar Farm

Lamby Way solar farm produces 9mw (megawatts) of green electricity. That is enough to power 2,900 homes. It can be a challenge to make space for energy generation in a dense city like Cardiff. To tackle this, the solar farm is on an old landfill site.

As well as reducing Cardiff’s greenhouse gas emissions, the project has increased biodiversity by sowing wild plant seeds and providing refuges for the rare reptiles, bats, and birds that inhabit the site

Radyr Weir Hydro Scheme

The Taff Trail is one of Cardiff’s oldest active travel routes and is now home to an innovative hydroelectric power station. The hydro scheme produces almost half a megawatt of green electricity. That is enough to power 550 homes.

The hydro scheme uses water from the River Taff to turn 2 Archimedes screw turbines. The turbines create the power. We continually work on the hydro scheme to make sure we maximise energy generation.

Maintaining the health of the river is also a key focus. The hydro scheme uses fish pass technology to make sure the fish migratory routes are not disrupted.

Urban Forest

Coed Caerdydd is a 10-year programme of tree planting. The aim is to increase Cardiff's tree cover from 18.9% to 25% of the city's land area.

82,000 trees have already been planted across 280 sites with help from multiple council departments and almost 3,000 volunteers. Examples of the sites are:

- Trelai Park in Caerau
- Coed Glas Primary School in Llanishen
- Heol Danyrodyn verges in Pentyrch

These trees will take around 2,540 tonnes of carbon dioxide out of the atmosphere over the next 100 years. They will also provide shade and habitat for wildlife and improve flood resilience. Green infrastructure improves air quality by reducing exposure to and removing pollutants such as NO_2 and particulate matter.

Network of Segregated Cycleways

Active travel is a key part of Cardiff's ambition to create a greener and healthier city. We have built 7 miles of separated cycleways to encourage people to choose active travel.

Separated cycleways are built away from the road which helps cyclists feel safe whilst travelling.

Once the network is completed, it will be much easier to cycle throughout the city and beyond. The cycleways will connect with public transport hubs, such as bus and train stations.

Local Area Energy Plan

Welsh Government have funded the production of Local Area Energy Plans for all councils in Wales. The Cardiff LAEP is an advisory document that outlines a vision for what net-zero carbon energy could look like in 2050. Some of the key targets are to install:

- Energy efficient and insulation measures in 91,000 homes,
- 160,000 heat pumps in domestic and commercial properties to move away from gas as a heat source,
- 26,000 electric vehicle charging points for public use and for householder use,

- Rooftop solar panels on 100,000 properties to generate 510mw (megawatts) of power,
- Ground solar farms to generate 120mw of power,
- Wind turbines to generate 19mw of power.

Local Priorities and Challenges

In June 2021 Cabinet approved the construction of the original City Centre North Scheme as detailed in the initial Clean Air Plan , albeit on an interim basis. This basis of implementing an interim scheme was on the need that any wider impacts following a full post Covid recovery period could be fully accounted for to ensure that no detrimental impacts in terms of congestion and air quality would result from the Clean Air Scheme.

Following implementation of the interim scheme the Council has maintained regular monitoring and assessment of traffic and air quality impacts on Castle Street to demonstrate that compliance is being maintained. The results for 2024 detailed that compliance was achieved with an annual average NO_2 concentration of 32.2µg/m^3 recorded.

Owing to the decision for an interim scheme being implemented in late 2021, the Council has ensured that constant dialogue and ongoing collaboration with Welsh Government officials has been maintained to ensure that the Plan remains on course to deliver and maintain compliance on Castle Street.

In order to formalise a time period to bring forward a permanent scheme on Castle Street, the Welsh Government have issued the Council with a further legal direction under Part IV of the Environment Act 1995. The direction set out measures the Council needed to implement to ensure that compliance for the NO_2 limit value on Castle Street is maintained.

In 2023/24 the Council has been working with Welsh Government and their Clean Air Expert Panel to agree a revised final report and funding to deliver a permanent Castle Street Scheme. This has now been approved by Welsh Government, as per the letter from the Deputy First Minister, received 4th November 2024.

The Council will now progress to final design works with a view to tendering for the main works early in 2025

It will be imperative that the CASAP is reviewed following the full implementation of the Clean Air Plan to further prioritise measures and to ensure air quality levels are continuously improved in Cardiff.

An initial internal working group has begun reviewing all current work programmes, linked to Transport and One Planet Cardiff, in order to ensure that an updated CASAP can be developed which fully aligns with these key commitments, to ensure continued improvements in Cardiff's Air Quality can be achieved. The Council will look to bring forward an updated CASAP/Air Quality Action Plan or Air Quality Strategy in 2025/2026.

How to Get Involved

CC welcomes any correspondence relating to air quality enquiries or concerns. Shared Regulatory Services (SRS) Specialist Services Team represents CC for local air quality management and therefore is contactable using the following email address environment-srswales@valeofglamorgan.gov.uk

For any enquiries surrounding Cardiff's Clean Air Plan, specifically the roll out of mitigation measures please contact Cardiff's Clean Air Team on cleanairproject@cardiff.gov.uk.

Hourly and Monthly average automatic monitoring data for pollutants measured in Cardiff are available to view at https://airquality.gov.wales/

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1.1 Previous Work in Relation to Air Quality

Phase 1

The Local Air Quality Management regime commenced with the Air Quality Regulations 1997, which came into force in December of that year. These Regulations were revoked and superseded by the current Air Quality (Wales) Regulations 2000 (as subsequently amended in 2002).

The first phase of the review and assessment process concluded that for six of the seven pollutants included in the regulations there was little, or no risk of the objectives being breached and that Air Quality Management Areas (AQMAs) for these pollutants were not necessary. Measures taken at the national level would be sufficient to ensure that there would be no local “hot spots” of these pollutants and therefore local controls in addition to the national measures would not be required.

However, for the seventh of these pollutants, nitrogen dioxide (NO_2), it was concluded that national control measures such as vehicle emission and fuel standards, controls on industrial emissions, etc., would not, of themselves, be sufficient to ensure that the air quality objectives for this pollutant would not be met in all areas of Cardiff.

Whilst the vast majority of the area would meet the objectives, there were predicted to be local “hot spots” close to heavily trafficked road junctions where there were buildings close to the road and significant amounts of queuing traffic where the objectives would not be met.

As a result, four AQMAs were declared, each having been declared based on measurements and modelling showing predicted breaches of the annual average objective for NO_2. These AQMAs were known as;

- The Cardiff West AQMA
- The Newport Road AQMA
- The Philog AQMA
- The St Mary Street AQMA

The first three of these came into force on 1st December 2000 and the latter on 1st September 2002. Subsequent AQAPs were published in November 2002 and for St Mary Street in February 2010.

Phase 2

The Council's 2003 USA concluded that for five of the seven pollutants regulated under the LAQM regime there was no evidence to suggest that local "hot spots" for these pollutants had been missed in the first phase of the review and assessment process and that there was no need to consider these pollutants further at this time.

The 2003 USA also concluded that no local hot spots of nitrogen dioxide had been overlooked during the first phase of review and assessment and that further detailed assessment of this pollutant was not necessary.

However, whilst the USA concluded that there was no evidence to suggest a likely breach of the 2004 objective for particulate matter (PM_{10}), there was considerable doubt that the provisional 2010 objectives for PM_{10} would be achieved.

As a result of the conclusions of the 2003 USA the Council issued Progress Reports in 2004 and 2005.

Phase 3

Following the 2006 USA, the Council published and consulted upon an Air Quality Management Area (AQMA) Review during the autumn of 2006. This concluded that two of the four AQMAs could be revoked and that the then Cardiff West AQMA should be reduced in size and renamed as the Ely Bridge AQMA. Orders making the changes came into force on 1st February 2007.

The 2007 Progress Report highlighted a potential problem with regard to nitrogen dioxide concentrations on Newport Road in the immediate vicinity of Stephenson Court, where concentrations had been marginally, but consistently, above the Air Quality objective for a few years. It was concluded that the possibility of declaring a new AQMA would be assessed in the 2008 Progress Report.

The monitoring data for the Stevenson Court area presented in the 2008 Progress Report led to the conclusion that a further "watching brief" would be kept with a view to reaching a firm conclusion once ratified monitoring data for the 2008 calendar year became available.

The monitoring data for 2007 presented in the 2008 Progress Report provided reassurance that the Council's decisions in respect of the 2006 AQMA Review were soundly based.

Phase 4

The 2009 USA concluded that a Detailed Assessment for the Stephenson Court area of Newport Road was required as the annual mean concentration of nitrogen dioxide at three sites representative of relevant exposure in the area were above the air quality Objective.

A Detailed Assessment for this area was consulted upon during the summer of 2010 and the AQMA came into force on 1st December 2010.

The Council's 2010 Progress Report was submitted in December 2010 and the 2011 Progress Report in June 2011.

The 2011 Progress Report highlighted abnormally high NO_2 2010 annual mean concentrations across the Council's monitoring network which could not be attributed to a particular source and evidence was presented to show that this was a regional issue probably associated with a prolonged period of unusually cold weather during November and December 2010. After dialogue with Welsh Assembly Government with regard to the conclusions reached about this data it was concluded that the Council would proceed to Detailed Assessments for the Llandaff and Westgate Street areas of the city and review the situation with regard to other exceedances when 2011 data is available and reported in 2012.

A Further Assessment for the Stephenson Court AQMA was submitted to WAG for review in December 2011, i.e. one year after the AQMA was declared, in compliance with Section 84(2)(a) of the Environment Act 1995.

Phase 5

The 2012 USA was the first report in Phase 5 of the review and assessment process. Monitoring data for 2011 largely confirmed that the annual mean concentrations of nitrogen dioxide previously reported for 2010 were unusually elevated, both locally and regionally, and local concentrations had returned to more typical values in 2011. Detailed Assessments in respect of nitrogen dioxide in Westgate Street and for the Llandaff area were consulted upon during the summer of 2012 and as a result a new AQMA for Llandaff was declared on

1st April 2013 and Westgate Street was incorporated into the St Mary Street AQMA; this latter AQMA is now named Cardiff City Centre AQMA.

The Council's 2013 Progress Report recommended proceeding to a Detailed Assessment for the Fairoak Road Roundabout in the Plasnewydd Ward of the city as monitoring data over previous years indicated the need. This was submitted for review during 2014. The Assessment concluded that, as monitoring data for 2013 had returned to Objective compliance, there was no need to declare an AQMA at that time. It was proposed to continue monitoring in the area and review the results year-on-year.

The Further Assessment for the City Centre AQMA was submitted in April 2014 and the conclusion that the declaration of the AQMA was justified was accepted.

A Further Assessment for the Llandaff AQMA was also submitted for review in 2014. This concluded that the declaration of the AQMA was justified based upon monitoring data available at the time. However, as monitoring data for 2013 showed compliance with the Objective, it was concluded that there was no need to develop an Action Plan at that time. Monitoring would continue and the situation would be reviewed year-on-year.

In summary, there are currently four AQMAs in Cardiff; all have been declared in respect of NO_2 resulting from road-traffic emissions:

- Cardiff City Centre AQMA
- Ely Bridge AQMA
- Stephenson Court AQMA
- Llandaff AQMA

Phase 6

The 2015 USA was the first report in Phase 6 of the review and assessment process. Monitoring data for 2014 largely confirmed that the annual mean concentrations of nitrogen dioxide previously reported for 2010 were unusually elevated, both locally and regionally, and local concentrations had returned to more typical values in 2011.

Monitoring data for 2015 indicated that annual mean concentrations of nitrogen dioxide were not unduly elevated during the year and that in some location's concentrations may have been lower than expected. The 2016 Progress Report showed a number of sites

representative of relevant exposure with exceedances of the 40µgm3 annual mean objective; however, these sites and recorded exceedances were not out of character as were predominantly contained within the declared AQMAs.

2017 Annual Progress Report

There are a number of sites representative of relevant exposure with exceedances of the NO_2 annual mean objective (40µg/m^3). These sites are predominantly contained within the declared AQMAs. However, there are four monitoring locations (Site IDs 172, 180, 181, 185) which are not located within AQMAs.

Site 172 (Ocean Way) is a kerbside location situated up to 650m from any relevant exposure, used to examine potential impacts of traffic resulting from industrial development in the area.

Sites 180 & 181 were implemented due to new developments with the potential for adverse air quality impacting the amenity of future occupants (Windsor House, Windsor Lane & Fitzalan Court, Newport Road). Both developments were under construction in 2016, therefore influencing any datasets recorded. Only recently has the student accommodation at Windsor House been completed and construction still continues at the Fitzalan Court site.

Site 185 is not representative of relevant exposure and does not apply to the annual mean objective set for NO_2. Therefore, datasets collected at this monitoring location would apply to the 1-hour objective set for NO_2 (200µg/m3, not to be exceeded more than eighteen times per year).

Monitoring for other pollutants did not result in other exceedances of National Air Quality Standards.

Due to technical issues, Cardiff City Centre's AURN site recorded low data capture for PM10 measured by a TEOM- FDMS sampler. The total data capture for the year was 47.1%. As outlined in LAQM technical guidance, the data from the sampler has been annualised in accordance with Box 7.9 and the 90.4th Percentile value has been given to examine the 24-hour objective.

It was decided not to revoke the Llandaff AQMA. Since the declaration of the Llandaff AQMA in 2013, results have highlighted that levels of $NO_2$are generally improving and are now below the national objective of 40µg/m3 at locations of relevant exposure. Based on recent results the Council could be minded to revoke the AQMA. However, the 2017 APR

highlighted that any decision made to revoke the AQMA needs to be mindful of the potential development of the strategic LDP sites to the north of the AQMA, Plasdwr and BBC Studios. Whilst detailed air quality assessments undertaken as part of the planning process have modelled that there is unlikely to be a detrimental impact on air quality levels in the AQMA, this can only be fully verified through on-going monitoring.

Therefore, in an effort to reassure local residents and to be totally satisfied that levels will remain compliant with the NO_2 standard, SRS on behalf of CC reviewed the non-automatic monitoring network of NO_2 diffusion tubes for 2018. As a result, new and amended monitoring sites have been allocated. Officers will further assess the potential to implement real-time capabilities in the Llandaff AQMA as part of the Council's statutory duties under Part IV of the Environment Act 1995. There are now four monitoring locations within the Llandaff AQMA.

Monitoring for other pollutants did not result in other exceedances of National Air Quality Standards.

2018 Annual Progress Report

Monitoring data for 2017 indicates that annual mean concentrations of nitrogen dioxide recorded at sites of relevant exposure, within the already established AQMAs, continue to be elevated or exceed the annual mean NO_2 Air Quality Standard (40µg/m³).

The datasets indicate that the annual average objective for NO_2 was breached at monitoring locations outside of the existing AQMAs (Sites 172, 179, 180 & 181).

It is felt that at this stage no further detailed assessments are required.

Site 172 is placed on Ocean Way to monitor potential impacts of traffic resulting from industrial developments in the area. The site is not representative of relevant exposure, the nearest being >650m away. For 2018 Site 172 has been revoked from the monitoring network as it is felt that a strong trend of data has been collected at this location.

The 1-hour objective for NO_2 need only apply to site 179.

Sites 180 & 181 were implemented to monitor air quality levels and therefore the potential impacts to future occupants at new development sites. These developments were still under construction in 2017 and therefore datasets collected will be negatively influenced.

The report also documented the works ongoing to produce the CASAP document, as well as outlining the development of the Feasibility Study in line with the Legal Direction received from the Welsh Minister.

2019 Annual Progress Report

Monitoring undertaken in 2018 confirmed annual average NO_2 levels continued to breach or encroach upon set limit values/ air quality standards within already established AQMAs (7 exceedances of the annual mean objective in total).

The report provided an update regarding the completion of the Clean Air Strategy and Action Plan document (CASAP), as well as an update of mitigation measures proposed to address air quality concerns for Cardiff. The report also documented the finalisation of the Full Business Case (FBC) and its outcome in accordance with Welsh Government's issued Legal Direction.

2020 Annual Progress Report

The 2020 reported identified that in 2019, out of the 100 diffusion tube monitoring locations, 6 monitoring sites recorded exceedances of the annual average objective set for NO_2 (40 $\mu g/m^3$). All six monitoring locations were recorded within the already established City Centre and Llandaff air quality management areas (AQMA).

The report provided an update on the monitoring undertaken at 9 schools across Cardiff where previous studies from Client Earth identified the schools to be in close proximity to road links likely to cause exceedances of the NO_2 air quality standards. Monitoring undertaken at the nine schools fully demonstrated continuous compliance with the annual average air quality standard for NO_2 for two success years. The report also provided an update of monitoring undertaken at a further six schools as part of a citizens science project funded by Natural Resources Wales. Again, monitoring at these six schools demonstrated compliance with the objective for NO_2.

The report documented the approval from Welsh Government of the Final Clean Air Plan and awarding of funding to ensure the Council delivered compliance with the NO_2 limit value under the legal duties of the Ambient Air Quality Directive.

2021 Annual Progress Report

Monitoring data for 2020 indicated that annual mean concentrations of nitrogen dioxide recorded at sites of relevant exposure, within the already established AQMAs, all showed compliance with the annual mean NO_2 Air Quality Standard (40µg/m³). The results are indicative that the impacts of the COVID lockdowns and restrictions therein have had an impact on pollution levels in Cardiff which is likely owing to traffic volumes having decreased. It is therefore likely that the concentrations recorded in 2020 are not representative of a true business as usual scenario and the results have generated a bias/ underestimation of levels of pollution across Cardiff in 2020.

2022 Annual Progress Report

Monitoring data for 2021 indicates that annual mean concentrations of nitrogen dioxide recorded at sites of relevant exposure within the already established AQMAs are compliant with the annual mean NO_2 Air Quality Standard (40µg/m³). The results are indicative that the impacts of the COVID lockdowns and restrictions at the beginning of 2021, and the subsequent behavioural changes once restrictions were lifted, may have influenced pollution levels in Cardiff in 2021. It is therefore likely that the concentrations recorded in 2021 are not representative of a true business as usual scenario and the results have generated a bias/ underestimation of levels of pollution across Cardiff in 2021.

Therefore, monitoring within the AQMAs has continued in 2022, consideration of any future actions for the AQMAs will be assessed by the Council once an assessment of the longer-term recovery from Covid has been determined.

2023 Annual Progress Report

The 2023 APR found that concentrations of NO_2 at site 212 within Llandaff AQMA were close to the annual mean NO_2 Air Quality Standard (40µg/m³), therefore further investigation and assessment of the local issues in the AQMA were considered before deciding on whether further action may be necessary.

SRS will continue to monitor and review results in the Stephenson Court AQMA. It may be feasible to consider revoking the AQMA due to continued compliance with the annual mean NO_2 Air Quality Standard (40µg/m³). Any such decision to revoke the AQMA will require statutory consultation and approval from Welsh Government. The Council will need to

undertake a detailed assessment to demonstrate that compliance will continue. Any decision on the revocation of AQMA will need to consider the potential of any revised air quality targets as a result of the Environment (Air Quality and Soundscapes) (Wales) Bill.

At all other locations, concentrations are all below the objectives, therefore no further action was required.

The implementation of COVID measures in the City Centre accelerated the Council's achievement of compliance with limit values for NO_2 under the Ambient Air Quality Directive, on Castle Street. The Interim implementation of the Castle Street Scheme as approved by Welsh Government, was completed at the end of October 2021. The Council has ensured ongoing monitoring has been undertaken. At the time of writing this report a Final Plan is being drafted which includes further assessments using updated traffic data, collected post Covid. The Final Plan will detail that the Councils preferred option will be to install a permanent version of the existing interim scheme, and this will be implemented upon approval from Welsh Government.

Annual Progress Report 2024

SRS on behalf of Cardiff Council have examined the results from monitoring in Cardiff. Concentrations for all pollutants are all below the relevant air quality objectives, therefore no further action is required. Concentrations of NO_2 at site 212 within Llandaff AQMA have been found to be close to the annual mean NO_2 Air Quality Standard (40µg/m³) in recent years. However, NO_2 concentrations at this location in 2023 have improved when compared to 2022 and are currently below the threshold of within 10% of the annual mean NO_2. It is recommended that revocation of an AQMA should be considered following three consecutive years of annual mean NO_2 concentrations being lower than 36µg/m^3. Continued monitoring is required to assess trends at this location. It is likely that an increase in NO_2 concentrations close to or exceeding the NO_2 annual objective limit will require investigation and assessment of the local issues in the AQMA, and further action may be necessary.

Concentrations of 36.0µg/m^3 NO_2 at diffusion tube site 179 are located at a kerbside site. Therefore, this does not represent relevant exposure. After application of distance correction calculations to the nearest building façade, the relevant exposure concentration has been corrected to 31.0µg/m^3.

SRS will continue to monitor and review results in the Stephenson Court AQMA. It may be feasible to consider revoking the AQMA due to continued compliance with the annual mean

NO_2 Air Quality Standard (40µg/m³). Any such decision to revoke the AQMA will require statutory consultation and approval from Welsh Government. The Council will need to undertake a detailed assessment to demonstrate that compliance will continue.

1.2 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when air quality is close to or above an acceptable level of pollution (known as the air quality objective (Please see Table 16). After declaring an AQMA the authority must prepare an Air Quality Action Plan (AQAP) within 18 months setting out measures it intends to put in place to improve air quality to at least the air quality objectives, if not even better. AQMA(s) are seen by local authorities as the focal points to channel resources into the most pressing areas of pollution as a priority.

A summary of AQMAs declared by Cardiff Council can be found in Table 1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/list

Table 1 - Declared AQMAs

AQMA	Relevant Air Quality Objective(s)	Comments on Air Quality Trend	Description	Action Plan
Cardiff City Centre	NO_2 annual mean	2024 monitoring results indicate a mean improvement in air quality compared to 2023	Former St Mary Street AQMA with the addition of Westgate Street in Cardiff City Centre	Cabinet 13 June 2019 Clean Air Appendix 1 Clean Air FBC.pdf (moderngov.co.uk)
Llandaff	NO_2 annual mean	2024 monitoring results indicate a mean improvement in air quality compared to 2023	Centre on Cardiff Road through Llandaff village	
Stephenson Court	NO_2 annual mean	2024 monitoring results indicate a mean improvement in air quality compared to 2023	From NE and NW boundaries of Stephenson Court, NW boundary of Burgess Court, NW and SW boundaries of Four Elms Court, SW corner of Four Elms Court south across Newport road to the junction with Orbit street, West across Newport Road to the SE corner of Stephenson Court	
Ely Bridge	NO_2 annual mean	2024 monitoring results indicate a mean improvement in air quality compared to 2023	A number of residential premises along the A48 Cowbridge Road West,	

AQMA boundary maps are included in Appendix D.

1.3 Implementation of Action Plans

Although AQMAs within Cardiff are now compliant with the relevant air quality objectives and the trend in NO_2 concentrations is decreasing, Cardiff Council will continue to work towards various actions which have a positive impact on air quality.

These actions can be considered under broad topics that improve air quality city wide, rather than targeting individual AQMAs which are currently compliant with the annual objective for NO_2.

- Promoting low emission transport
- Promoting travel alternatives
- Transport planning and infrastructure
- Traffic management
- Continued extensive monitoring network for NO_2 and Particulate Matter

In the updated AQAP / Air Quality Strategy we will outline how we plan to effectively tackle air quality issues within our control. However, we recognise that there are a large number of air quality policy areas that are outside of our influence (such as vehicle emissions standards agreed in Europe), but for which we may have useful evidence, and so we will continue to work with regional and central government on policies and issues beyond Cardiff Council's direct influence.

Subject to air quality monitoring results and further detailed assessment, due to continued compliance with the NO_2 annual air quality objective there may be a case for the revocation of the AQMA order at Stephenson Court, Ely Bridge and Cardiff City Centre in 2025. The revocation of an AQMA should be considered following three consecutive years of compliance, 10% below the relevant objective at the point of exposure.

Table 2 - Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
Modal Shift and Influencing Travel Choice											
1.1	Bus based park and ride. LDP Strategic site D. 1000 total spaces, 750 accessible from Junction 33 of the M4 and 250 spaces accessible from the A4119.	Alternatives to private vehicle use.	Bus based park and ride.	Unconfirmed.	Unconfirmed.	Local Authority Transport Dept. Developer Bus companies.	. Planning.	Not calculated / Required.	Bus patronage figures produced via telematics. Traffic figures. City wide NO_2 concentrations.	The preparation of a draft Park and Ride Strategy for Cardiff has begun, and the Park and Ride at Junction 33 is being planned for delivery by the developer.	Lengthy Timescale.
1.2	Cycling Strategy.	Promoting Travel Alternatives. Transport Planning and Infrastructure.	Promotion of cycling and walking. Cycle network.	Ongoing.	Ongoing.	Local Authority.	Ongoing.	Not calculated / Required.	Traffic figures. Cycling trips generated. City-wide NO_2 concentrations.	Ongoing.	
1.3	School Active Travel Plans.	Promoting Travel Alternatives.	School Travel Plans.	Ongoing	Ongoing	Cardiff Council Keep Cardiff Moving Project.	Ongoing	Not calculated / required.	School case studies. Surveys.	A number of schools in Cardiff have successfully written their school active travel plan and are working towards a more active and sustainable journey to school.	
1.4	School Street Zones.	Promoting Travel Alternatives	School Travel Plans	Ongoing	Ongoing	Local Authority	Ongoing	Decreasing trends in NO_2 concentrations.	Air Quality concentrations.	School Streets and air quality monitoring ongoing.	Monitoring sites are part of LAQM monitoring network.

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
								within School Street Zones.			
1.5	Staff. Healthy Travel Charter/ Personalised Travel Planning	Promoting Travel Alternatives. Alternatives to private vehicle use.	Various	2019	Ongoing	Public Health Wales/ Vale and Cardiff Health Board	Ongoing	Not calculated / required	Modal shift counts. Traffic counts. Number of participating public sector organisations.	The Charter was signed by 17 public sector organisations, employing over 33,000 staff, with additional public and private sector organisations subsequently invited to sign up to the Charter.	
1.6	Increase awareness of air quality concerns	Public Information	Various	Ongoing	Ongoing	Local Authority	Ongoing	Not calculated / required	City wide air quality concentrations.	Car free days promoted in Cardiff in recent years.	Update Shared Regulatory Services air quality website to improve awareness of air quality concerns.
1.7	Green wall School Projects	Green Infrastructure / Public Awareness	Green Infrastructure	2020	Ongoing	Local Authority /Cardiff Local Nature partnership	Green walls remain installed	Not required, however AQ monitoring has taken place and indicates benefits.	Air quality monitoring data	A number of Green Wall School Projects have been completed in recent years.	Potential expansion of Green Wall Schools.
1.8	Keep Cardiff Walking Website	Promoting Travel Alternatives. Transport Planning and Infrastructure	Intensive active travel campaign & infrastructure.	2019	Ongoing	Cardiff Council	Ongoing	Not calculated / required	No. of website visits	Website to provide advice and promote sustainable transport and active travel in Cardiff online is ongoing.	
Transport, Planning and Infrastructure											
2.1	Bus Route Improvements / Bus Priority Infrastructure Plan.	Transport Planning and Infrastructure	Bus Route Improvements	2024	2030	Local Authority	Public consultation completed	No calculated / required	Air quality monitoring data	Public consultation completed January 2025.	

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
2.2	Cycle Hire Scheme	Promoting Travel Alternatives. Transport Planning and Infrastructure	Promotion of cycling and walking. Cycle network.	Feasibility study underway		Local Authority / Cycle hire providers	Feasibility assessment undertaken.			Existing cycle hire scheme ceased in December 2023 due to vandalism and theft.	A feasibility study is underway that will give the Council clarity on the best way forward and is looking at the latest technology available
2.3	Cycle Network	Promoting Travel Alternatives. Transport Planning and Infrastructure	Proposed Cycleways	Ongoing	Ongoing	Local Authority / Welsh Government	Ongoing	Not calculated	Reduction in private vehicle traffic counts. Air quality improvement trends.	Approximately 11km of Cycleways completed. Aim to complete fully segregated cycle network by 2026 to connect six primary cycleways.	
2.4	New Cardiff Central Interchange development	Public transport improvements- interchanges stations and services	Public Transport Improvements		2023	Cardiff Council	Complete	To ensure development does not cause any adverse impact and where possible reduce levels to as low as reasonably practicable.	Air quality trends and improvements.	Complete	
2.5	20mph Limits	Transport Planning and Infrastructure		2023	Ongoing	Welsh Government	Ongoing	Not calculated	Air quality trends and improvements.	Ongoing	Improving trends in air quality across Cardiff. Difficult to identify exact impact of 20mph restrictions.
2.6	Cardiff Capital Region Metro. Proposed by WG (Rail and bus based rapid transit routes).	Transport Planning and Infrastructure	Public Transport Improvements	2026		Local Authority / Transport for Wales/ Welsh Government / UK Government	Ongoing	Not calculated/ required	Air quality trends and improvements. Traffic count. Passenger numbers.	Ongoing	
Lower Emission Vehicles											

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
3.1	Public Vehicle Procurement - Ultra-Low Emission Bus (ULEB) fund made available by the Department for Transport (DfT).	Promoting Low Emission Transport	Low Emission Fuels for stationary and mobile sources in Public Procurement	2019	Complete	Local Authority / Welsh Government / Bus Companies	Complete	Improvements to NO_2 monitored by CC at sensitive receptor locations on specified routes. >2µg/m3 reductions NO_2 in sensitive receptor locations along Westgate Street.	Improving air quality trends.	Application received by DfT and deemed successful. Initial buses delivered in November 2021 and all 36 launched in January 2022.	
3.2	Company Vehicle Procurement- Prioritising uptake of low emission vehicles/ EV recharging.	Promoting Low Emission Transport	Low Emission Fuels for stationary and mobile sources in Public Procurement	2019	Ongoing	Local Authority	Ongoing	Not calculated	Improving trends in city wide air quality.	Cardiff Council has replaced part of its fleet with 53 electric vehicles and 36 electric buses, reducing fleet emissions by 13% since 2019.	
3.3	Electric Vehicle Charging	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2019	Ongoing	Local Authority / Cardiff Capital Region	Ongoing	Not calculated	Improving trends in city wide air quality. 600-700 public chargers, including commercial sites by 2025/2026. Maintain 95% charger uptime. Track charger usage and dwell time.	As of October 2024, Cardiff has approximately 200 publicly accessible EV charging points, with plans to install 100 additional chargers within the next two years.	
3.4	Taxi Incentives to Operate Cleaner Vehicles Cardiff Hackney Emission Reduction Grant Scheme	Promoting Low Emission Transport	Low Emission Fuels for stationary and mobile sources	2024	Ongoing	Local Authority/ Welsh Government / Cardiff Capital Region	Ongoing	Not calculated	Emissions reductions. Drive participation Air quality improvement	Over £200,000 in grants have helped Cardiff taxi driver upgrade to cleaner vehicles, reducing emissions across the fleet.	

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
3.5	Cardiff Bus Retrofit Scheme	Promoting Low Emission Transport	Low Emission Fuels for stationary and mobile sources in Public Procurement	2021	2022	Cardiff Council / Welsh Government/ Bus Companies		Studies identify that the retrofit alone would achieve compliance on Castle Street 39.6 µg/m^3 in 2021 with 150 vehicles retrofitted.	Air quality improvements and trends.	Cardiff has retrofitted 49 older buses, 20 from Cardiff bus and 29 from Stagecoach, cutting NOx emissions by up to 97%	
Policy											
4.1	Citywide strategy to reduce emissions and improve air quality	Policy Guidance	Air Quality Planning and Policy Guidance	2019	Complete	Local Authority	Ongoing	To meet compliance with NO_2 annual objectives within all AQMA's	Air quality data and trends	All locations are now compliant with the relevant objectives at all locations in Cardiff	Cardiff Council are now working towards assessments to revoke AQMAs and publish a replacement Action Plan/Strategy.
4.2	Taxi Licensing conditions	Policy guidance	Amendments made to Cardiff taxi licensing conditions to promote a cleaner fleet.	2020	Ongoing	Local Authority	Ongoing	Not calculated / required	Composition of vehicle fleet	Hackney carriages that are licensed on licence number 958 or above must be either a fully electric vehicle*, or a purpose-built wheelchair accessible vehicle that is under 5 years old and meets the Euro 6 emission standard when licensed for the first time.	
4.3	Transport White Paper	Promoting Low Emission Plant Promoting Travel Alternatives	Other Policy	2020	2030	Local Authority	Ongoing	Not required / Calculated	Modal shift targets. Reduction in city wide pollution concentrations.	As of June 2025, Cardiff Council has made progress on its transport white paper. However, some active travel targets have not been met with	Includes other projects such as cycle network and Cardiff bus interchange

Measure No.	Measure	Category	Classification	Estimated Year Measure to be Introduced	Estimated / Actual Completion Year	Organisations Involved	Measure Status	Target Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Potential Barriers to Implementation
		Policy guidance and Development Control								reduction in cycling to work and walking.	

2 Air Quality Monitoring Data and Comparison with Air Quality Objectives

2.1 Summary of Monitoring Undertaken in 2024

2.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how results compare with the objectives.

SRS on behalf of CC undertook automatic (continuous) monitoring and carried out Local Site Operator (LSO) duties at three sites during 2024. These sites, Castle Street, Newport Road, and Cardiff City Centre are part of the Welsh Automatic Urban Pollution Monitoring Network and the Automatic Urban and Rural Network (AURN). Data from these monitors undergoes quality assurance and quality control (QC/QA) ratification processes from external consultants. Table 3 presents the details of the sites. National monitoring results are available at https://airquality.gov.wales/. Maps showing the location of the monitoring sites are provided in Figure 5 to Figure 6. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

Monitors for Poly Aromatic Hydrocarbon (PAH) and Toxic Organic Micro Particle (TOMP) networks are also located at an urban background location within Cardiff. Information from PAH and TOMPs monitoring is not included within this report and instead can be found at Polycyclic Aromatic Hydrocarbons (PAH) data - Defra, UK and Toxic Organic Micro Pollutants (TOMPs) Networks - Defra, UK.

In addition to the above monitoring, 45 Vortex additional air monitoring sensors were located across Cardiff from April 2023. These sensors provide indicative air quality data for NO_2, PM_{10}, $PM_{2.5}$ and O_3 at specific locations within AQMA's and close to schools. To reduce the risk of vandalism and theft, these monitors are located at a height of three to four metres. Maps showing the location of the monitoring sites are provided in Figure 4 to Figure 8. Results for AQMA locations are included within this report. Further details for these monitors can be found at VTX Air Quality Monitors | Vortex (vortexiot.com)

2.1.2 Non-Automating Monitoring Sites

SRS on behalf of Cardiff Council undertook non- automatic (passive) monitoring of NO_2 at 99 sites during 2024. Table 5 presents the details of the sites.

Maps showing the location of the monitoring sites are provided in Figure 9 to Figure 19. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

Table 3 - Details of Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? *(Y/N with distance (m) to relevant exposure)*	Distance to kerb of nearest road *(N/A if not applicable)*	Does this location represent worst-case exposure?
Cardiff City Centre AURN	Urban Background	318416	176525	NO_2	N	Chemiluminescence	Y (5m)	200m	N
				PM_{10}, $PM_{2.5}$		TEOM- FDMS	Y (5m)	200m	N
				SO_2		UV Fluorescence	Y (5m)	200m	N
				CO		Infra-Red GFC	Y (5m)	200m	N
				O_3		UV Absorption	Y (5m)	200m	N
Cardiff Newport Road AURN	Roadside/ Urban Traffic	320095	177520	NO_2	N	Chemiluminescence	Y (12m)	4.5m	N
				PM_{10}		Beta Attenuation Monitor with Gravimetric Equivalence	Y (12m)	4.5m	N
Cardiff Castle Street	Roadside/ Urban Traffic	318055	176459	NO_2 PM_{10}, $PM_{2.5}$	N	Chemiluminescence	Y(2m)	2m	Y
						Beta Attenuation Monitor with Gravimetric Equivalence			

Notes:

(1) N/A if not applicable (2) 0m indicates that the sited monitor represents exposure and as such no distance calculation is required.

Table 4 - Details for Indicative Automatic Monitoring Sites

Sensor Number	Network	Road	x	y
SN-0604	Ely Bridge AQMA	Cowbridge Road West	314527	176788
SN-0677	Ely Bridge AQMA	Cowbridge Road West	314418	176721
SN-0572	Ely Bridge AQMA	Mills Road	314437	176827
SN-0659	Ely Bridge AQMA	Dyfrig Road	314634	176752
SN-0634	Stephenson Court AQMA	Newport Road	319293	176923
SN-0131	Stephenson Court AQMA	Newport Road	319410	176988
SN-0649	Llandaff AQMA	Llantrisant Road	315163	178255
SN-0609	Llandaff AQMA	Cardiff Road	315231	178188
SN-0517	Llandaff AQMA	Cardiff Road	315264	178100
SN-0638	City Centre AQMA	Westgate Street	318134	176229
SN-0596	City Centre AQMA	Westgate Street	318204	176174
SN-0409	City Centre AQMA	Westgate Street	317984	176374

Figure 4 - Map of Indicative Automatic Monitoring Sites Llandaff AQMA

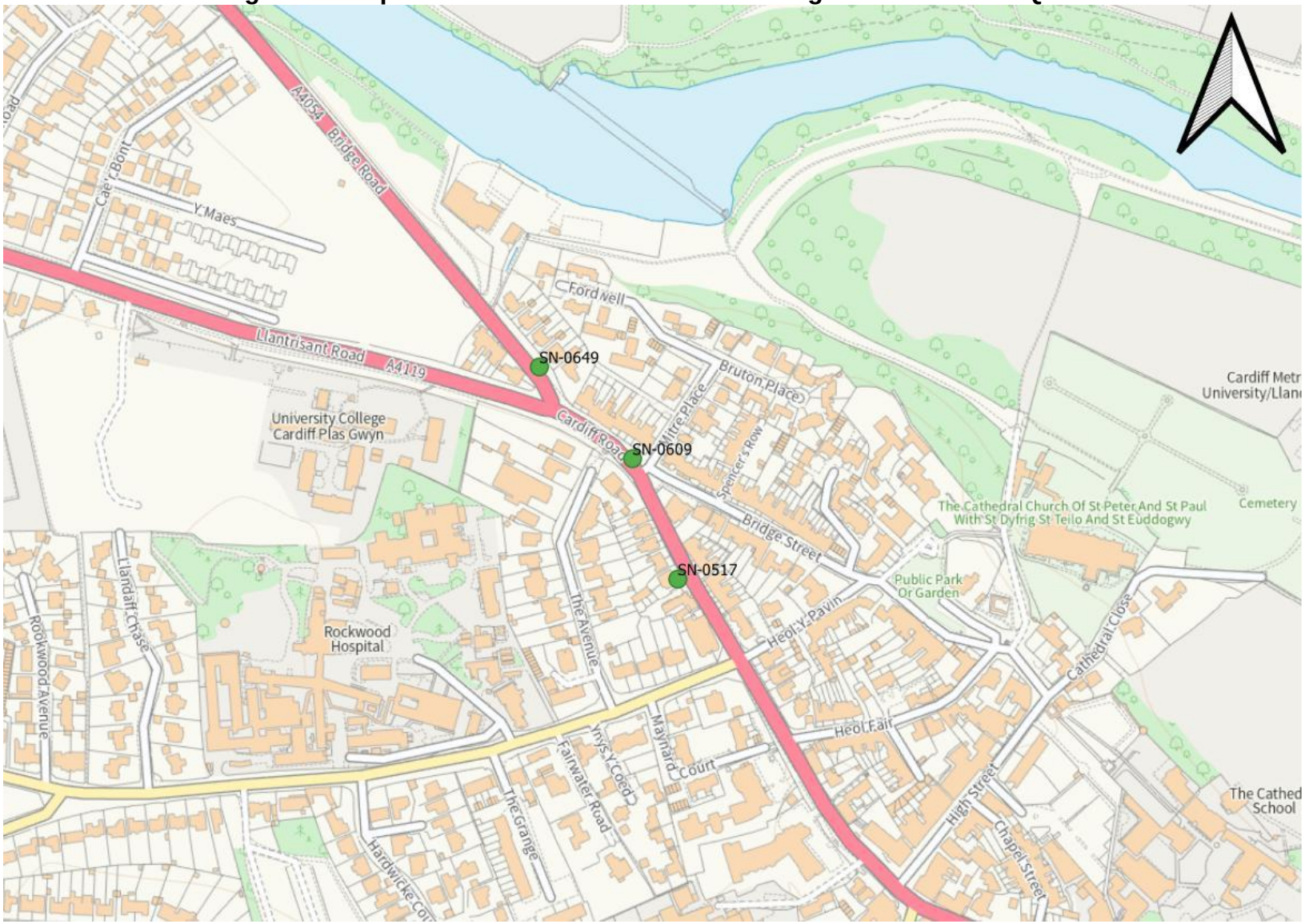


Figure 5 - Map of Automatic Monitoring Sites Cardiff City Centre

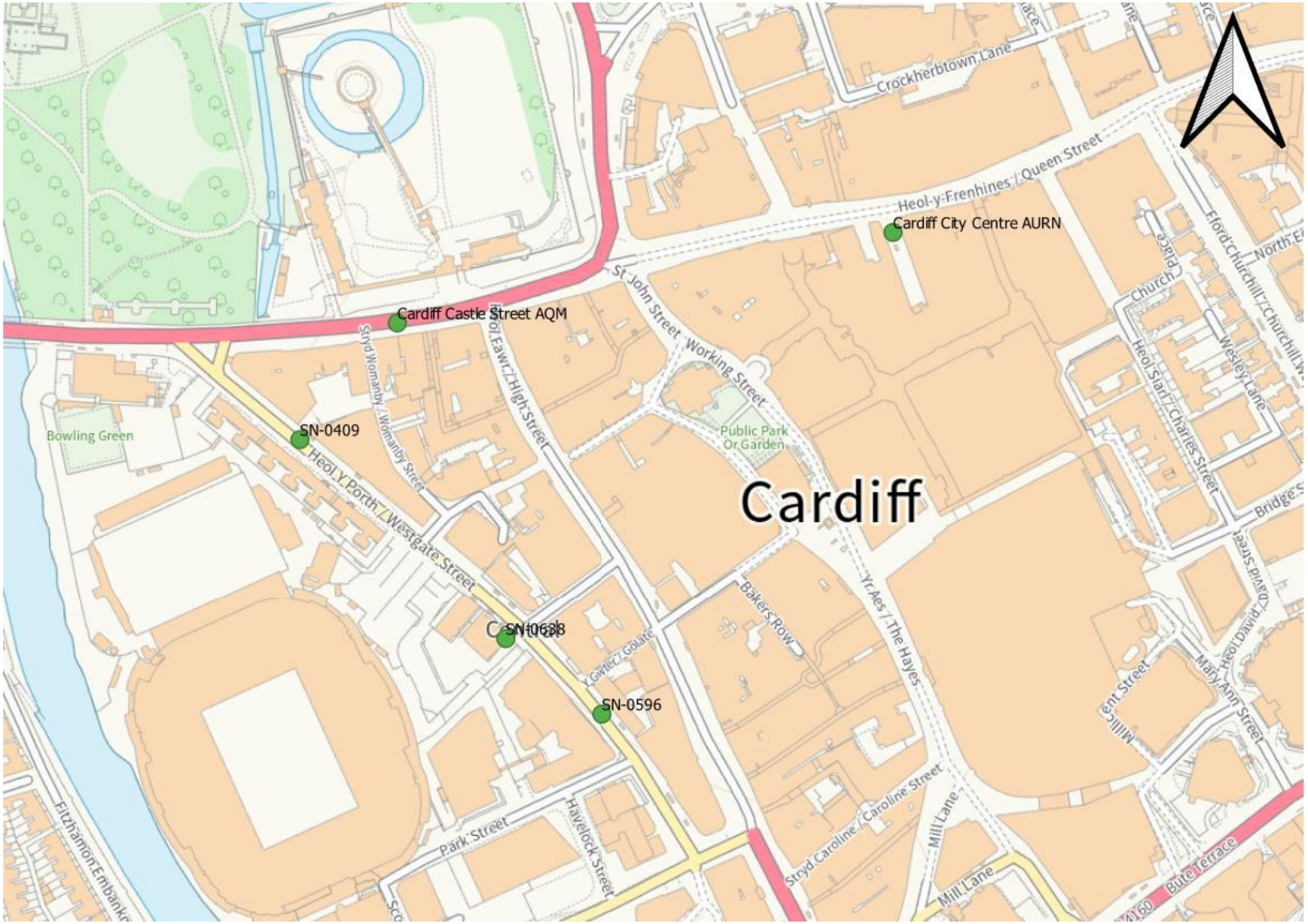


Figure 6 - Map of Automatic Monitoring Site Newport Road AURN

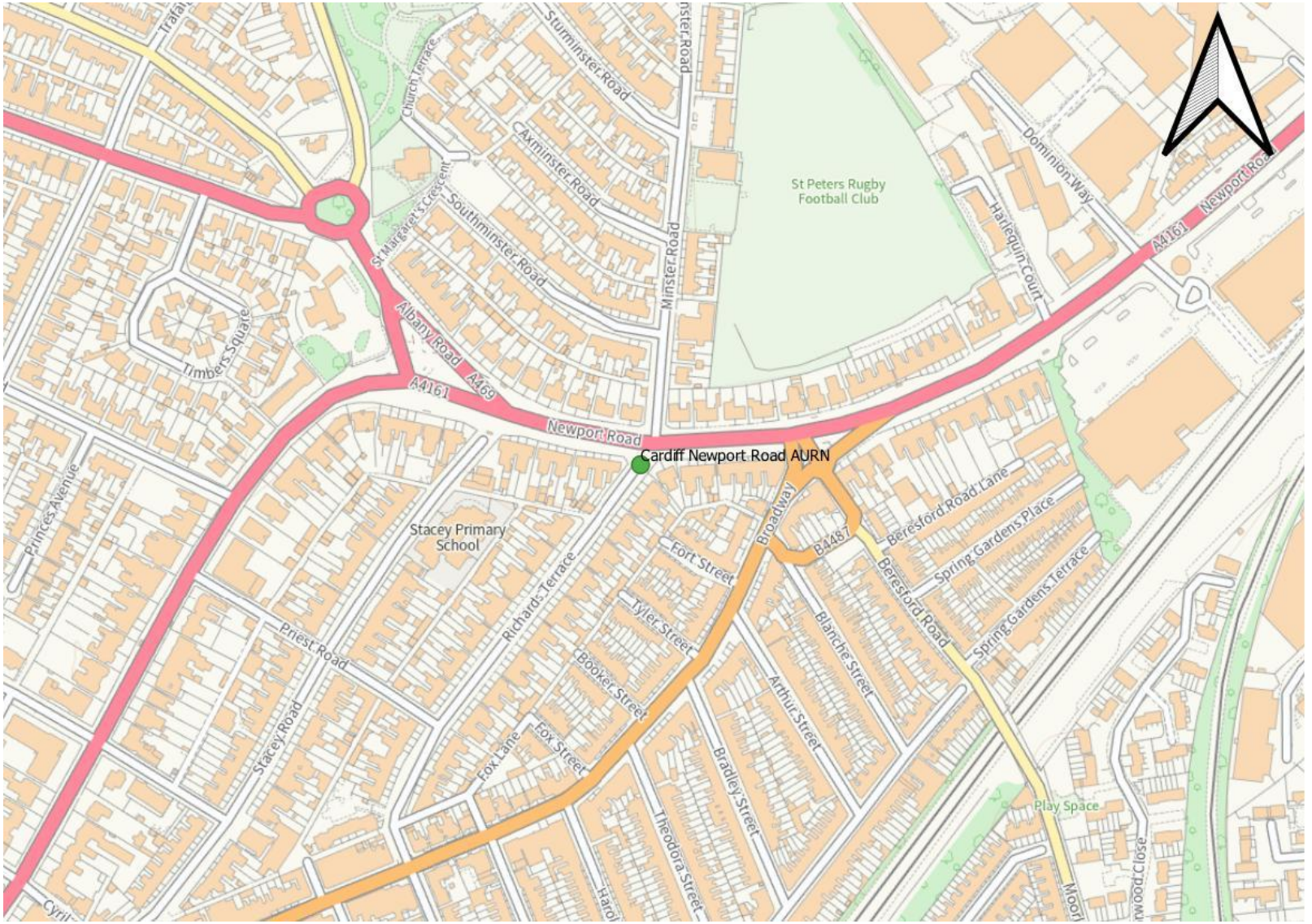


Figure 7 - Map of Automatic Monitoring Sites Stepheson Court AQMA

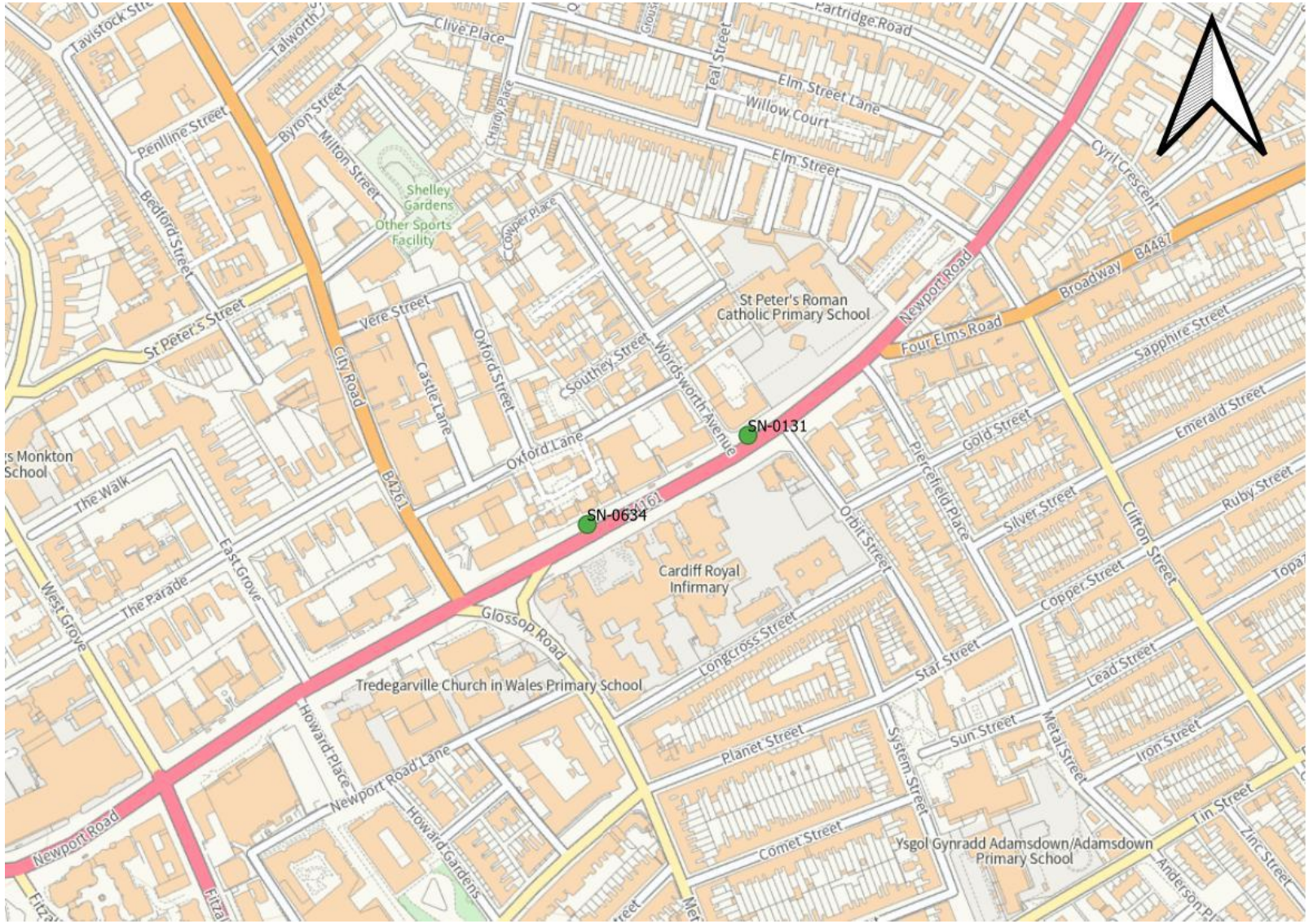


Figure 8 - Map of Automatic Monitoring Sites Ely Bridge AQMA

Table 5 - Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m)	Tube Co-located with a Continuous Analyser
16	167 Ninian Park Road	Roadside	317040	176060	NO_2		0.0	5.0	
258	Lamppost 116 Penarth Road	Roadside	317760	175310	NO_2		4.0	2.0	
58	Westgate Street	Kerbside	317937	176400	NO_2	City Centre	5.0	0.0	
81	Stephenson Court	Roadside	319387	176980	NO_2	Stephens on Court	0.0	5.0	
86	19 Fairoak Road	Roadside	318452	178805	NO_2		0.0	10.0	
96	Manor Way Junction	Roadside	316601	179653	NO_2		0.0	5.0	
98	Western Avenue (premises)	Roadside	314805	177345	NO_2		0.0	10.0	
99	Cardiff Road Llandaff	Roadside	315275	178117	NO_2	Llandaff	0.0	3.0	
259	Wellfield Road	Kerbside	319201	178031	NO_2		4.0	1.0	
260	St Marys Catholic School, Canton	Roadside	316847	176762	NO_2		0.0	2.0	
264	Beechley Drive	Roadside	313142	177870	NO_2		0.0	7.0	
106	30 Caerphilly Road	Roadside	316851	179520	NO_2		0.0	5.0	

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m)	Tube Co-located with a Continuous Analyser
112	17 Sloper Road	Roadside	316613	175910	NO_2		0.0	5.0	
115	21 Llandaff Road	Roadside	316604	176641	NO_2		0.0	3.0	
117	25 Cowbridge Road West	Roadside	314458	176735	NO_2	Ely Bridge	0.0	2.0	
126	Westgate Street Flats	Roadside	317946	176387	NO_2	City Centre	0.0	5.0	
128	117 Tudor Street	Roadside	317540	175979	NO_2		0.0	5.0	
131	Dragon Court	Roadside	319292	176932	NO_2	Stephens on Court	0.0	5.0	
143	Windsor House	Roadside	318009	176337	NO_2		0.0	6.0	
144	Marlborough House	Roadside	318046	176307	NO_2		0.0	6.0	
147	211 Penarth Road	Roadside	317636	175161	NO_2		0.0	7.0	
271	Moorland Road Splott	Kerbside	320401	177212	NO_2		1.5	1.5	
149	10 Corporation Road	Roadside	317764	175174	NO_2		0.0	5.0	
156	2a/4 Colum Road	Roadside	317997	177412	NO_2		0.0	5.0	
157	47 Birchgrove Road	Roadside	316605	179703	NO_2		0.0	8.0	

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m)	Tube Co-located with a Continuous Analyser
158	64/ 66 Cathays Terrace	Roadside	318093	177716	NO_2		0.0	3.0	
159	IMO façade replacement	Roadside	320709	177918	NO_2		0.0	4.0	
166	163 Lansdowne Road	Roadside	315950	176424	NO_2		0.0	5.0	
168	570 Cowbridge Road East	Roadside	314856	176929	NO_2		0.0	5.0	
174	76 North Road	Roadside	317508	177868	NO_2		0.0	1.0	
179	Altolusso, Bute Terrace	Kerbside	318627	176039	NO_2		5.0	2.0	
183	Station Terrace	Kerbside	318765	176623	NO_2		5.0	0.0	
184	Hophouse, St Mary Street	Roadside	318335	176074	NO_2	City Centre	0.0	3.0	
186	Dempsey's Public House, Castle Street	Roadside	318044	176449	NO_2	City Centre	0.0	3.0	
187	Angel Hotel	Roadside	317944	176436	NO_2	City Centre	0.0	3.0	
188	Westgate Street (45 Apartments)	Roadside	318229	176154	NO_2	City Centre	0.0	3.0	
191	7 Mackintosh Place	Roadside	318724	177776	NO_2		0.0	3.0	
194	115 Cowbridge Road West	Roadside	313870	176212	NO_2		0.0	12.0	

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m)	Tube Co-located with a Continuous Analyser
195	244 Newport Road	Roadside	320147	177523	NO_2		0.0	6.0	
196	2 Pencisely Road	Roadside	316223	177305	NO_2		0.0	6.0	
198	Next Building to Stephenson Court	Roadside	319348	176958	NO_2	Stephens on Court	0.0	5.0	
199	157 Newport Road	Roadside	319599	177174	NO_2		0.0	12.0	
200	350 Whitchurch Road	Roadside	317038	179073	NO_2		0.0	3.0	
201	23 Lower Cathedral Road	Roadside	317547	176411	NO_2		0.0	3.0	
202	22 Clare Street	Roadside	317604	176053	NO_2		0.0	3.0	
203	10 Fairoak Road	Roadside	318255	178533	NO_2		0.0	4.0	
204	53 Neville Street	Roadside	317487	176303	NO_2		0.0	5.0	
207	42 Waungron Road	Roadside	314769	177343	NO_2		0.0	7.0	
208	2 Llantrisant Road	Roadside	315152	178245	NO_2	Llandaff	0.0	3.0	
209	178 North Road	Roadside	317200	178537	NO_2		0.0	3.0	
210	485 Caerphilly Road	Roadside	316692	181088	NO_2		0.0	7.0	

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m)	Tube Co-located with a Continuous Analyser
211	19 Well Wood Close, Penylan	Roadside	320247	178903	NO_2		0.0	28.0	
212	Bridge Road	Kerbside	315197	178221	NO_2	Llandaff	0.0	1.0	
214	Mitre Place	Roadside	315254	178153	NO_2	Llandaff	0.0	3.0	
218	16-18 Cowbridge Road West	Roadside	314467	176767	NO_2	Ely Bridge	0.0	4.0	
254	Giraffe Nursery Cathedral road	Roadside	317523	176548	NO_2		0.0	2.0	
220	Fitzalan Court Newport Road	Kerbside	318928	176683	NO_2		6.0	1.0	
221	Stuttgarter Strasse (New student flats)	Kerbside	318530	177468	NO_2		8.0	1.0	
190	3 Pearson Street	Roadside	319056	177343	NO_2		0.0	1.0	
224	110 Cardiff Road	Roadside	315714	177740	NO_2		0.0	4.0	
243	25 Cardiff Road	Kerbside	315318	178044	NO_2		4.0	1.0	
244	25 Bridge Road	Roadside	314963	178846	NO_2		0.0	4.0	
245	47 Willows Ave	Urban Background	321006	179081	NO_2		0.0	0.0	
263	Pierhead Street	Roadside	319715	174791	NO_2		0.0	4.0	

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m)	Tube Co-located with a Continuous Analyser
266	Pentrych Primary School	Roadside	312857	180734	NO_2		4.0	2.0	
262	54 Llandaff Road	Kerbside	316593	176728	NO_2		2.0	2.0	
249	Wentloog Road, Rumney	Roadside	318201	180367	NO_2		0.0	3.0	
250	Central Square Cardiff, City Centre	Roadside	313244	176769	NO_2		4.0	2.0	
251	Heol Isaf, Radyr	Kerbside	313244	180367	NO_2		0.0	5.0	
255	Castle Street Co-Location 1	Kerbside	318075	176462	NO_2	City Centre	0.0	1.5	Yes
255	Castle Street Co-Location 2	Kerbside	318075	176462	NO_2	City Centre	0.0	1.5	Yes
255	Castle Street Co-Location 3	Roadside	314505	176769	NO_2	City Centre	0.0	1.5	Yes
192	3 Cowbridge road West	Roadside	314505	176769	NO_2	Ely Bridge	0.0	3.0	
265	Green Giraffe Nursery, Cardiff Bay	Kerbside	317684	173479	NO_2		2.0	3.8	
270	Llandaff, School entrance	Kerbside	315396	177897	NO_2	Llandaff	18.5	1.5	
267	University Hospital Wales 1	Roadside	317717	179220	NO_2		0.0	3.8	
268	University Hospital Wales 2	Kerbside	317505	179230	NO_2		13.0	2.5	

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m)	Tube Co-located with a Continuous Analyser
269	University Hospital Wales 3	Kerbside	317375	179252	NO_2		14.0	2.0	
TRO-001	Whitchurch High Lower School	Kerbside	315621	180320	NO_2		4.0	5.0	
TRO-006	36 Old Church Rd (outside)	Roadside	315497	180140	NO_2		0.0	2.0	
TRO-009	3 Carter Place	Roadside	314022	178334	NO_2		0.0	5.0	
TRO-012	48 Hendre Rd Llandaff	Roadside	315209	177668	NO_2		0.0	3.0	
TRO-015	6A Cyntwell Avenue	Roadside	312734	175411	NO_2		0.0	3.0	
TRO-018	Llansdowne Road	Roadside	315801	176492	NO_2		0.0	4.0	
TRO-021	58 Letton Road	Kerbside	318945	175546	NO_2		2.0	1.0	
TRO-024	Glossops Road	Kerbside	319283	176827	NO_2		5.0	1.0	
TRO-027	Wordsworth Avenue	Kerbside	319327	177080	NO_2		2.0	1.0	
TRO-030	Cwmdare Street	Kerbside	317855	178921	NO_2		2.0	1.0	
TRO-033	Woolaston Avenue	Kerbside	318898	180012	NO_2		2.0	1.0	
TRO-036	Uphill Road	Kerbside	321834	180331	NO_2		2.0	1.0	

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m)	Distance to Kerb of Nearest Road (m)	Tube Co-located with a Continuous Analyser
TRO-039	Thackerey Crescent	Kerbside	321834	181282	NO_2		2.0	1.0	
TRO-042	Sandbrook Road	Kerbside	324529	180975	NO_2		2.0	1.0	
TRO-045	TY-Nant Road	Kerbside	307967	181585	NO_2		2.0	1.0	
TRO-048	Heol-Y-Deri	Roadside	315825	181374	NO_2		5.0	1.0	
TRO-051	Lawrenny Avenue	Roadside	316150	175887	NO_2		3.0	2.0	
TRO-054	Maple Road	Roadside	312883	178154	NO_2		5.0	1.0	
TRO-057	196 Ninian Park Road	Kerbside	316823	176118	NO_2		2.0	0.5	
TRO-060	Paget Street	Kerbside	317758	174813	NO_2		15.0	0.5	
TRO-063	Church Road	Kerbside	322244	182234	NO_2		2.0	4.0	

Notes:

(1) 0m indicates that the sited monitor represents exposure and as such no distance calculation is required.

(2) N/A if not applicable.

Figure 9 - Map of Non-Automatic Sites Llandaff AQMA

Figure 10 - Map of Non-Automatic Monitoring Sites Ely Bridge AQMA

Figure 11 - Map of Non-Automatic Monitoring Sites City Centre AQMA

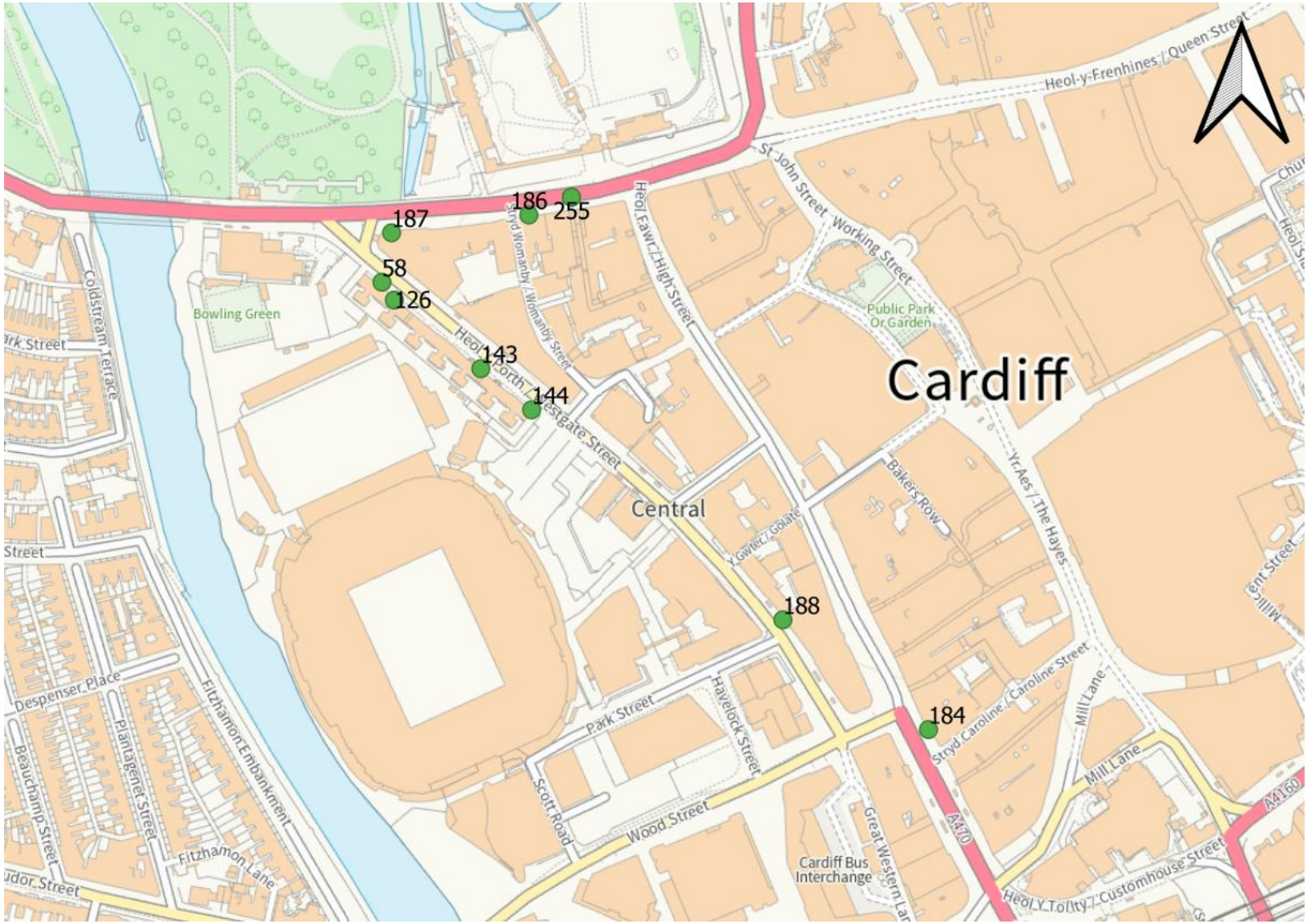


Figure 12 - Map of Non-Automatic Sites Stephenson Court AQMA

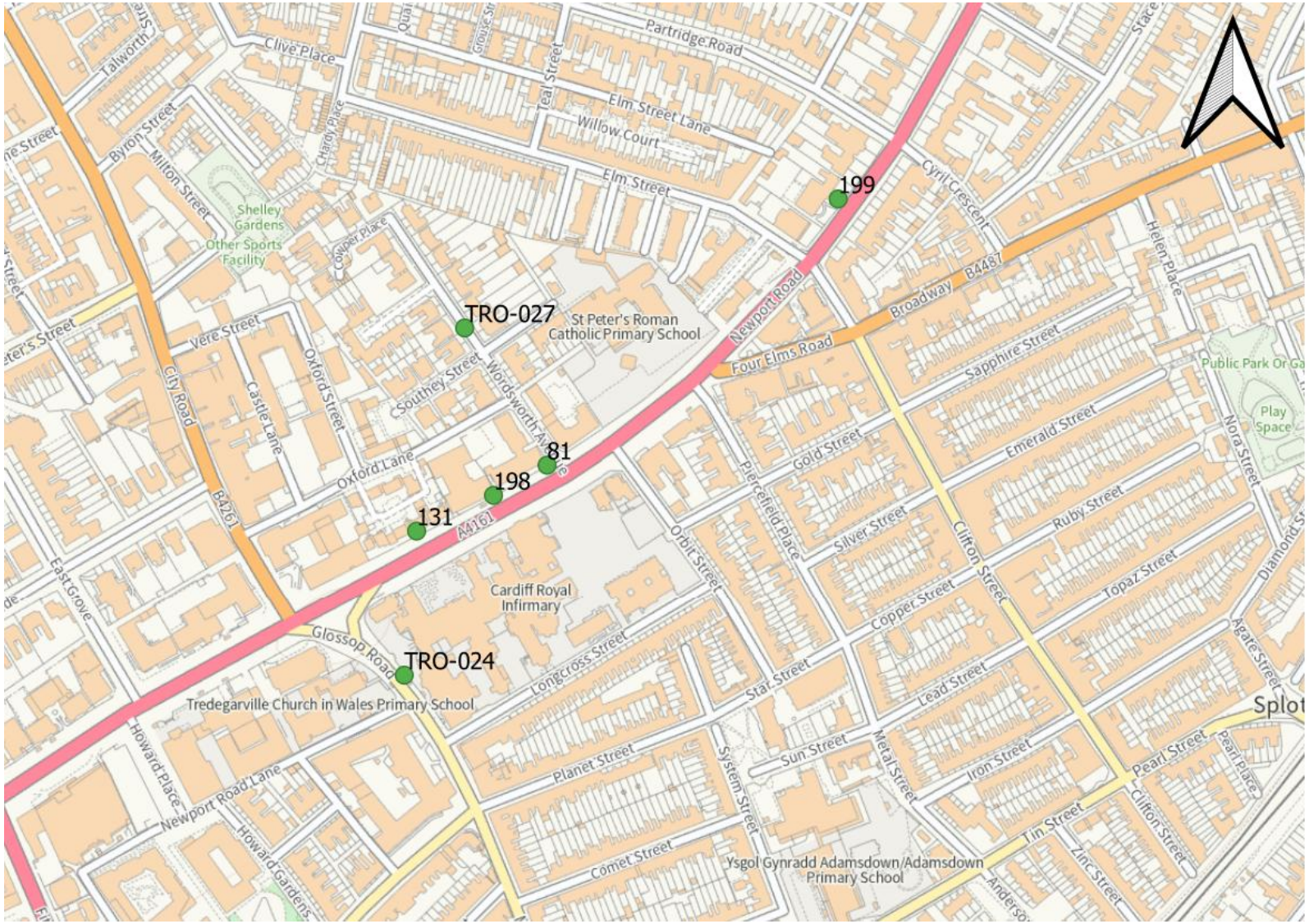


Figure 13 - Map of Non-Automatic Monitoring Sites Cardiff North

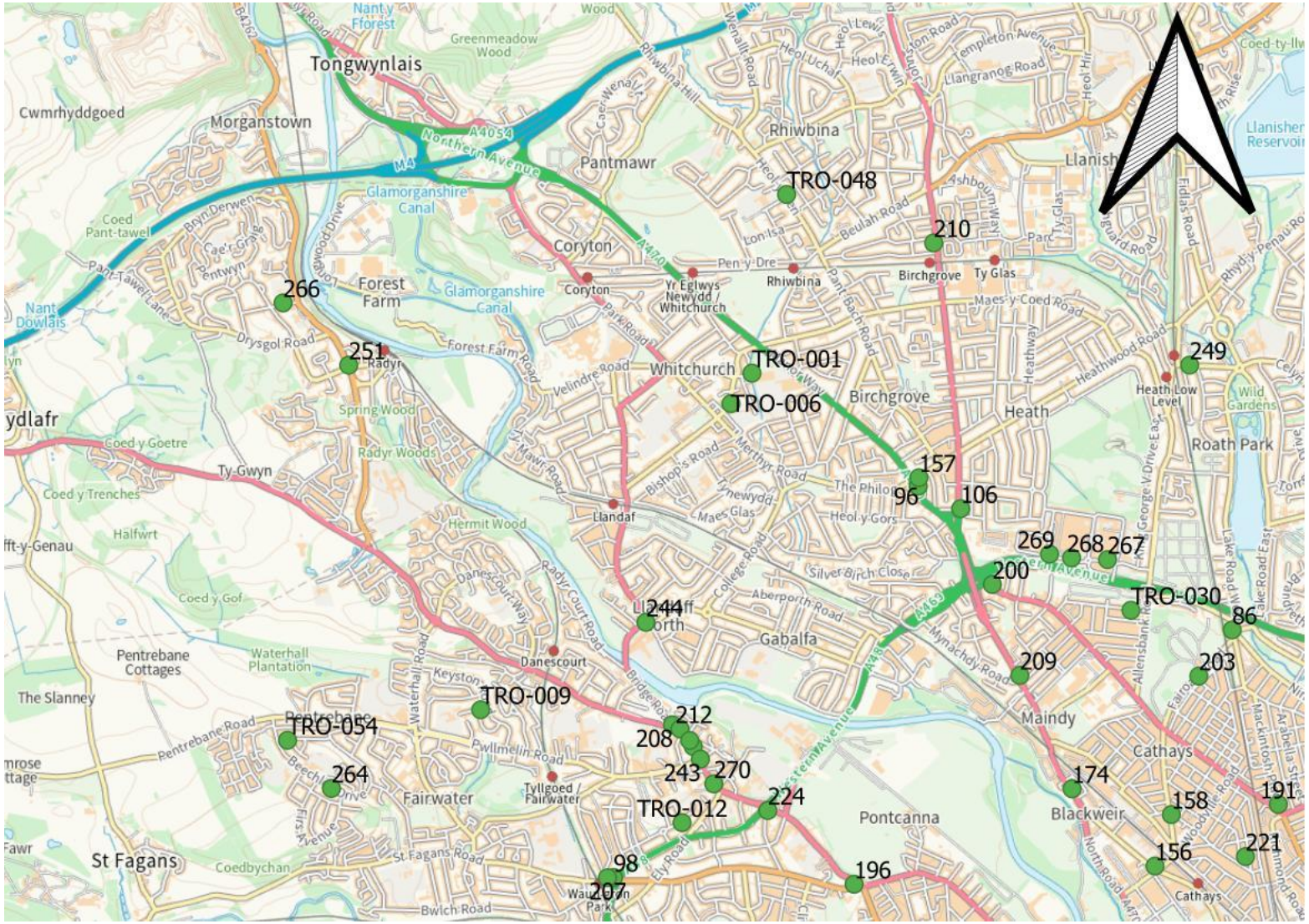


Figure 14 - Non-Automatic Monitoring Sites Cardiff Northwest

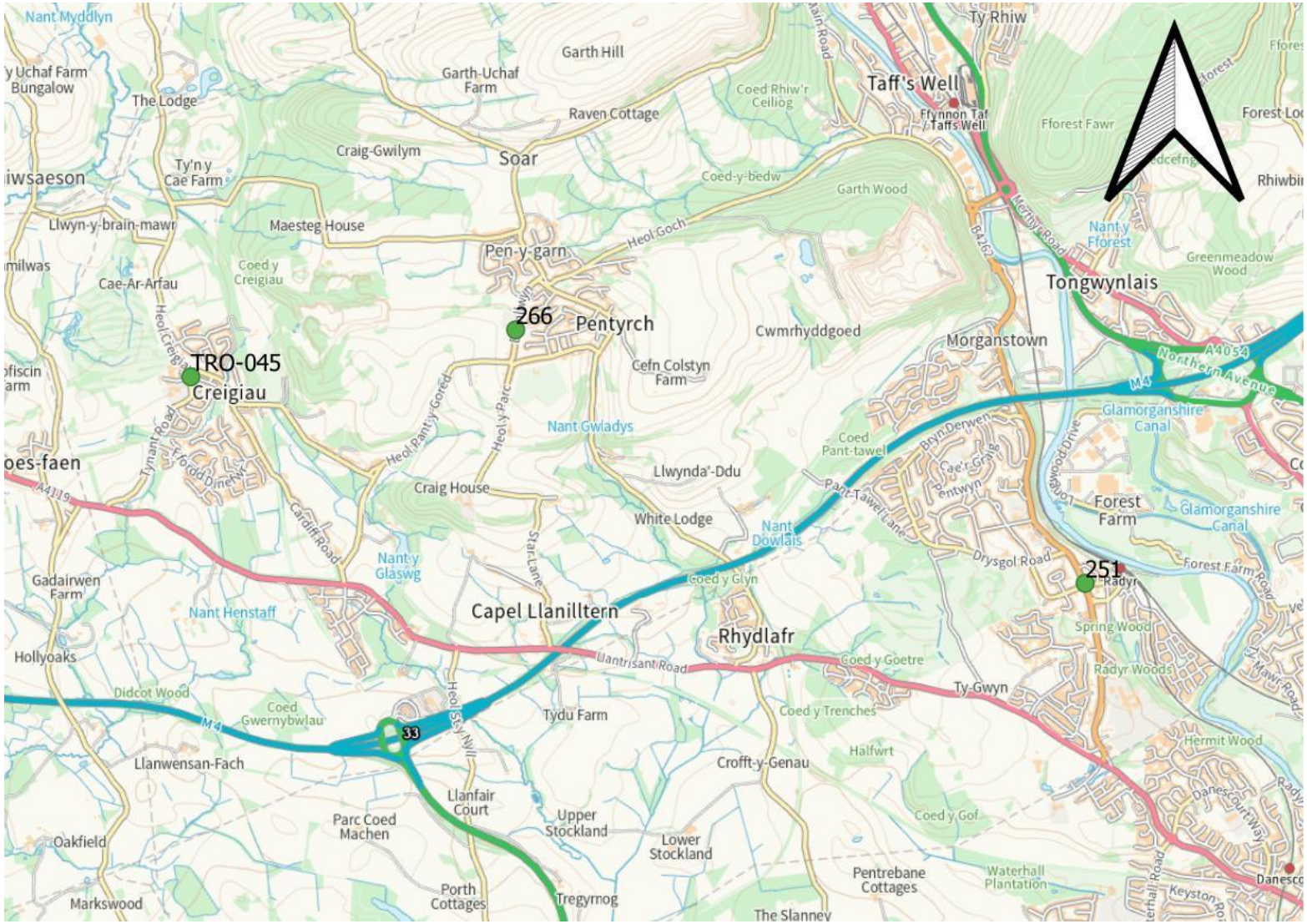


Figure 15 - Map of Non-Automatic Monitoring Sites Cardiff Northwest

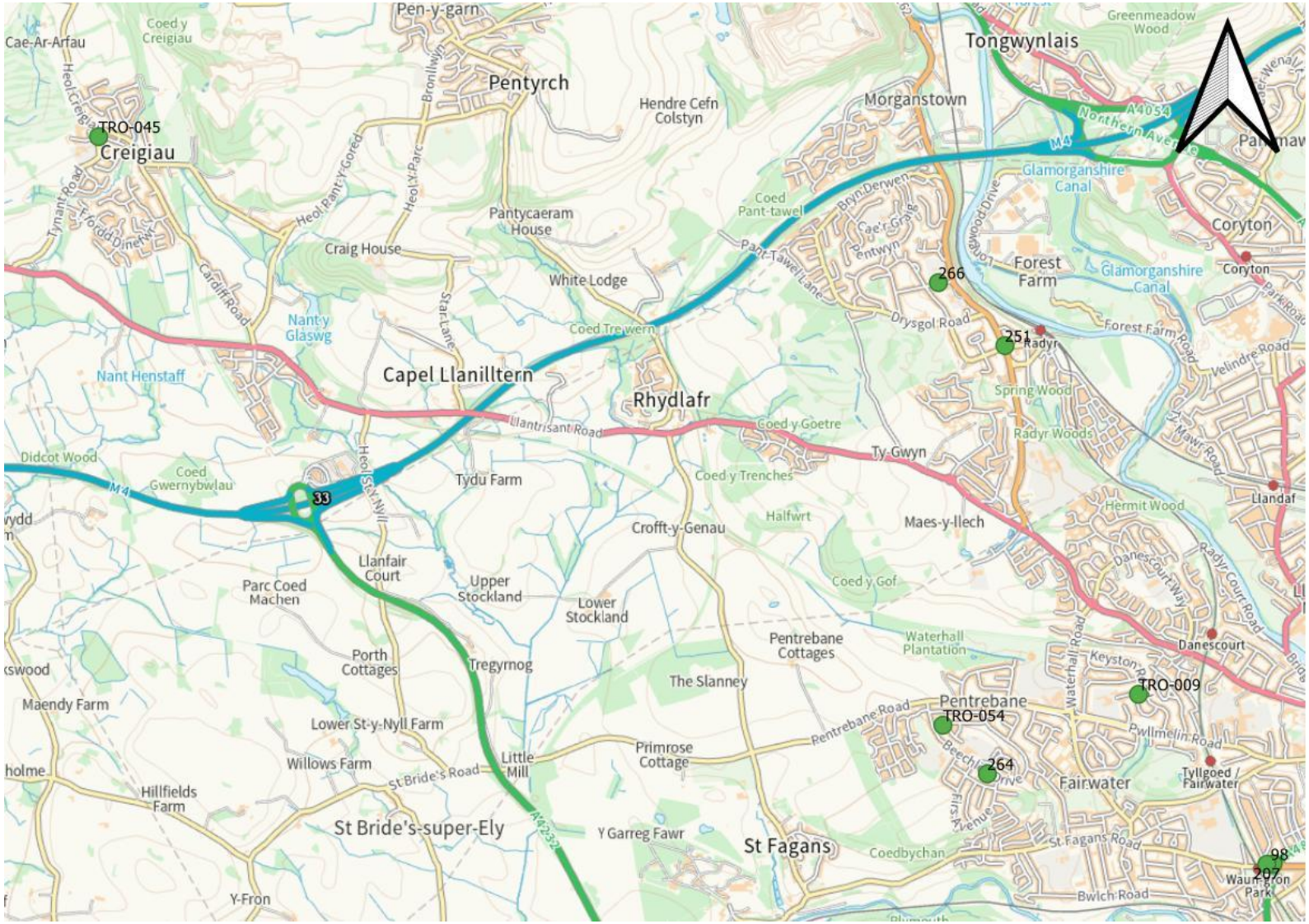


Figure 16 - Map of Non-Automatic Monitoring Sites Cardiff West

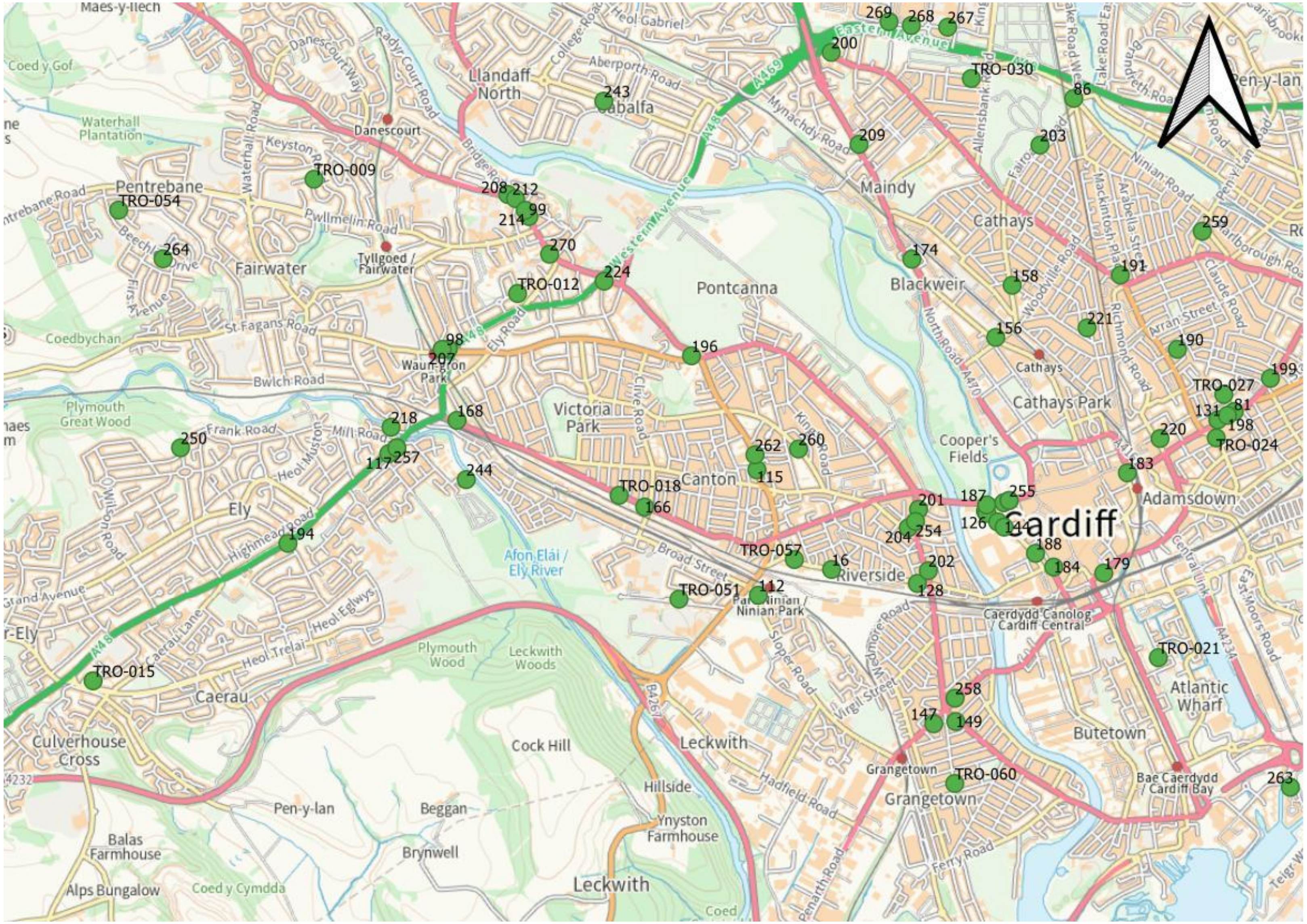


Figure 17 - Map of Non-Automatic Monitoring Sites Cardiff Central

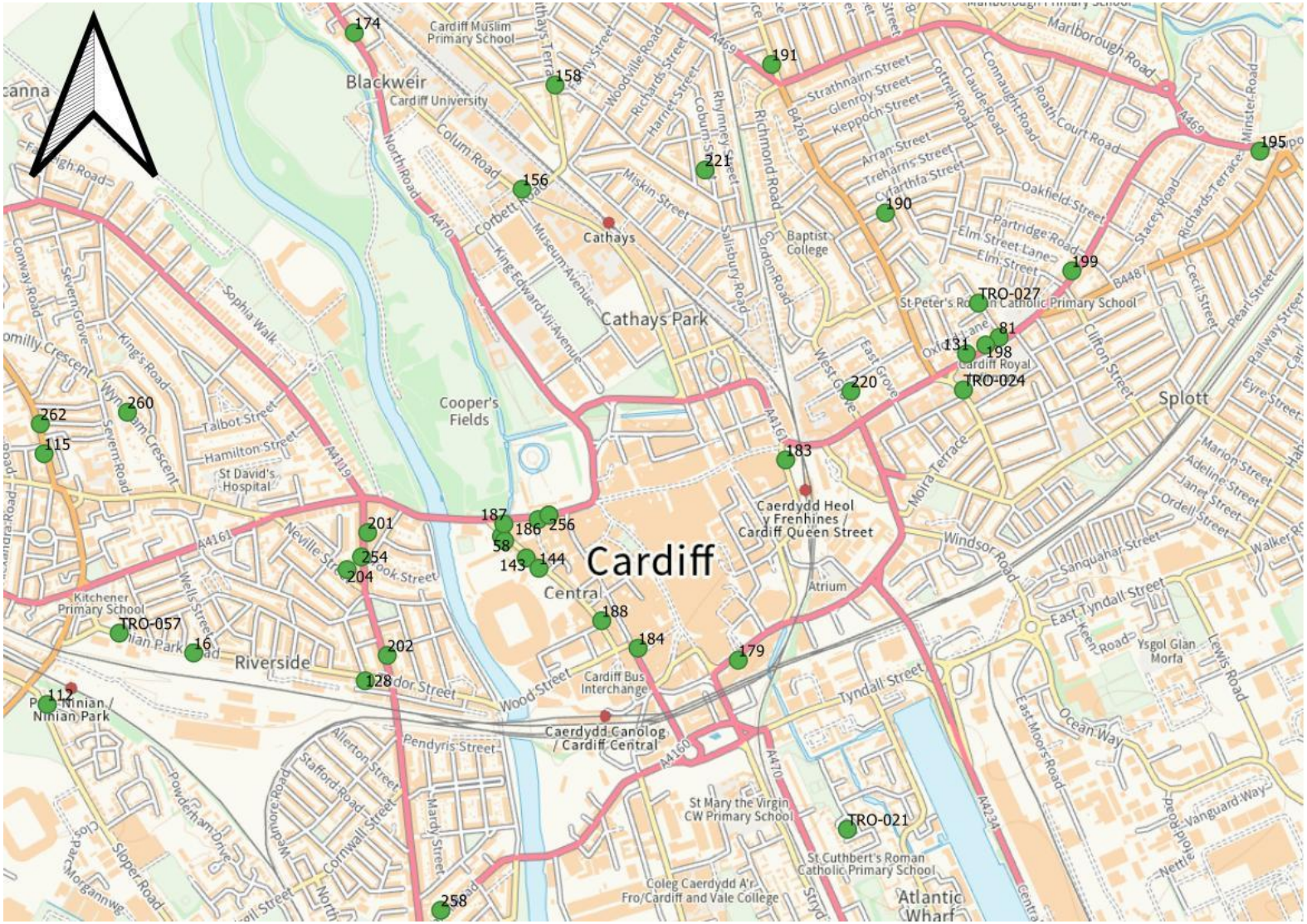


Figure 18 - Map of Non-Automatic Monitoring Sites Cardiff South

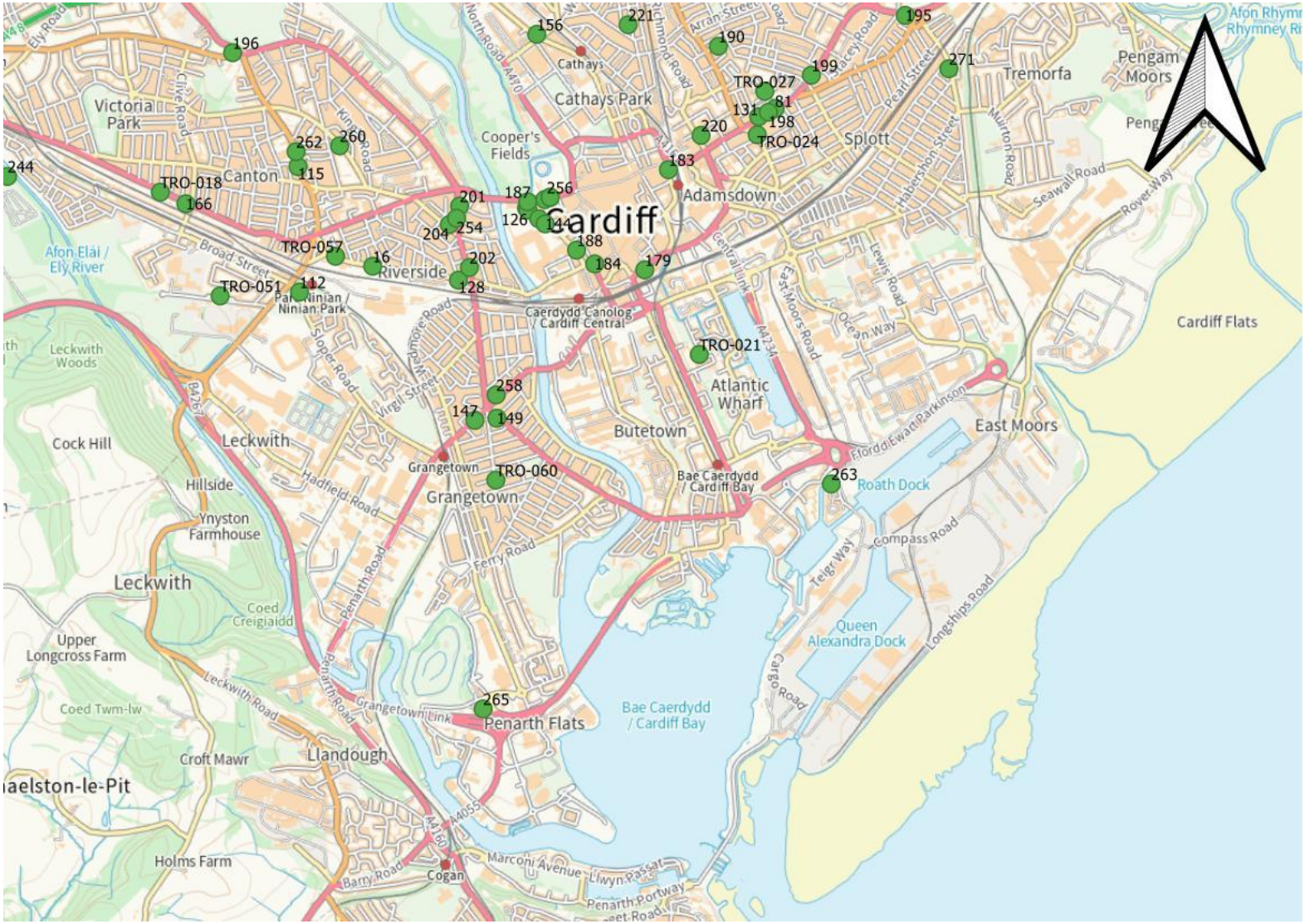
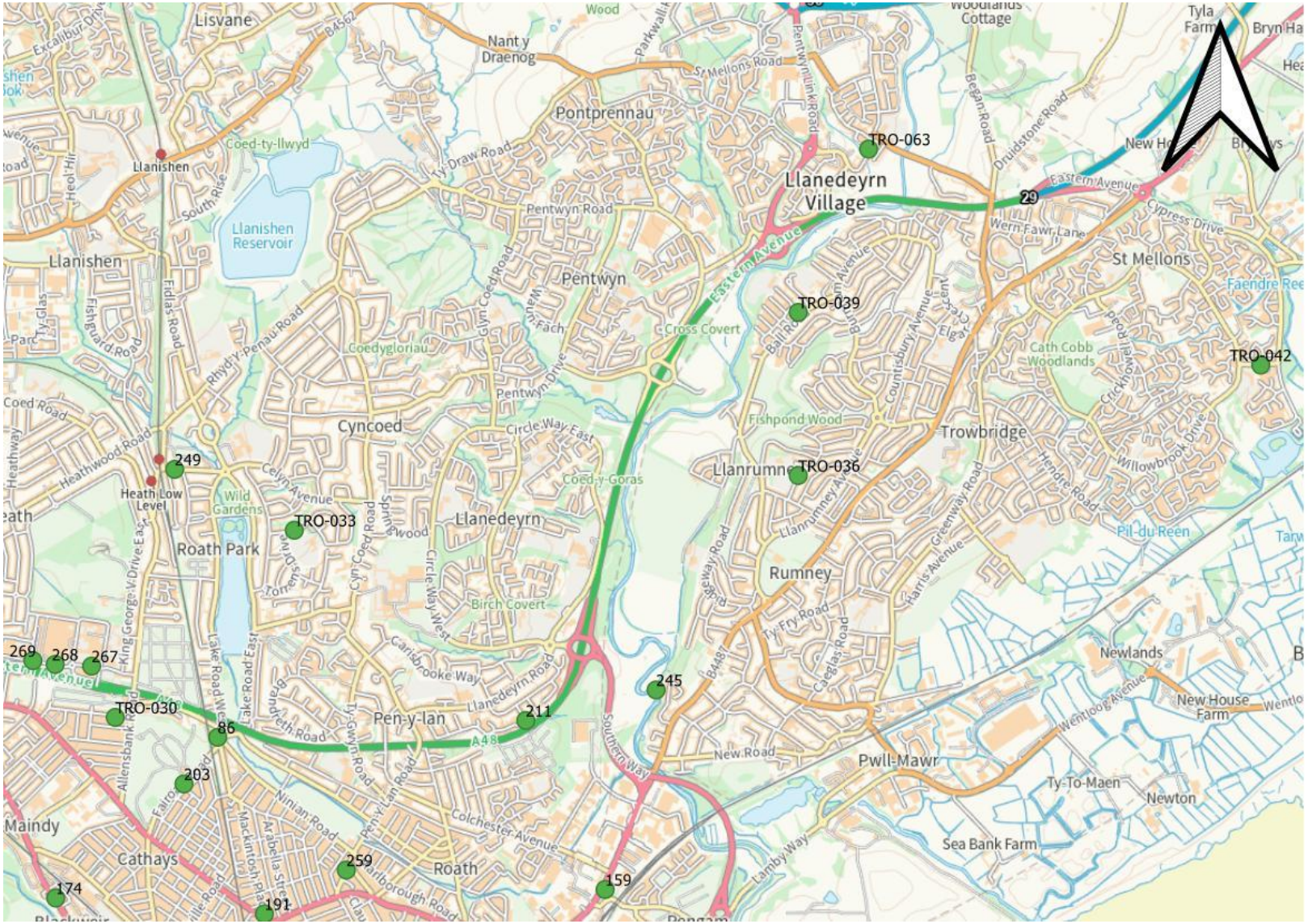


Figure 19 - Map of Non-Automatic Monitoring Sites Cardiff East



2.2 2024 Air Quality Monitoring Results

Table 6 - 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 2024 (%) (2)	2020	2021	2022	2023	2024
Cardiff City Centre AURN	Urban background	Automatic	93	93	16	16	17	16	14
Cardiff, Newport Road AURN	Roadside	Automatic	99	99	19	22	22	19	17
Cardiff Castle Street	Roadside	Automatic	94	94		25	34	33	30

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 7 - Indicative Monitoring Sensor Network AQMA NO_2 Results 2024

Sensor No.	Sensor Network	Location	x	y	Pollutant	µg/m^3
SN-0604	Ely Bridge AQMA	Cowbridge Road West	314527	176788	NO_2	11
SN-0677	Ely Bridge AQMA	Cowbridge Road West	314418	176721	NO_2	13
SN-0572	Ely Bridge AQMA	Mills Road	314437	176827	NO_2	24
SN-0659	Ely Bridge AQMA	Dyfrig Road	314634	176752	NO_2	8
SN-0634	Stephenson Court AQMA	Newport Road	319293	176923	NO_2	14
SN-0131	Stephenson Court AQMA	Newport Road	319410	176988	NO_2	11
SN-0649	Llandaff AQMA	Llantrisant Road	315141	178234	NO_2	12
SN-0609	Llandaff AQMA	Cardiff Road	315231	178188	NO_2	10
SN-0517	Llandaff AQMA	Cardiff Road	315264	178100	NO_2	9.0
SN-0638	City Centre AQMA	Westgate Street	318134	176229	NO_2	19
SN-0596	City Centre AQMA	Westgate Street	318204	176174	NO_2	10
SN-0409	City Centre AQMA	Westgate Street	317984	176374	NO_2	14

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.**

Table 8 - 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 (%)	Valid Data Capture 2024 (%)	NO_2 Annual Mean Concentration (µg/m^3)				
						2020	2021	2022	2023	2024
16	317040	176060	Roadside	100.0	100.0	23.6	23.2	24.1	21.7	21.5
258	317760	175310	Roadside	84.9	84.9		29.4	29.5	26.7	26.7
58	317937	176400	Kerbside	84.9	84.9	30.0	30.8	31.0	30.7	29.7
81	319387	176980	Roadside	92.5	92.5	27.2	29.3	27.0	24.5	22.2
86	318452	178805	Roadside	100.0	100.0	25.8	27.0	28.6	27.1	24.2
96	316601	179653	Roadside	100.0	100.0	22.2	24.2	25.2	22.4	20.7
98	314805	177345	Roadside	75.0	75.0	20.0	20.8	22.0	19.2	20.7
99	315275	178117	Roadside	83.0	83.0	22.8	25.1	26.8	25.9	21.4
259	319201	178031	Kerbside	90.6	90.6			26.1	20.5	20.3
260	316847	176762	Roadside	100.0	100.0			20.6	18.9	17.1
264	313142	177870	Roadside	92.5	92.5			11.5	9.8	9.2

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%)	Valid Data Capture 2024 (%)	NO_2 Annual Mean Concentration (µg/m^3)				
						2020	2021	2022	2023	2024
106	316851	179520	Roadside	100.0	100.0	24.5	23.7	24.5	20.9	21.0
112	316613	175910	Roadside	100.0	100.0	20.7	23.1	22.9	20.9	18.2
115	316604	176641	Roadside	83.0	83.0	25.3	25.6	27.5	25.0	23.2
117	314458	176735	Roadside	92.5	92.5	30.7	36.0	33.7	31.0	28.5
126	317946	176387	Roadside	100.0	100.0	22.3	24.0	25.3	25.6	20.4
128	317540	175979	Roadside	100.0	100.0	25.0	25.0	27.2	26.9	23.8
131	319292	176932	Roadside	100.0	100.0	28.8	26.7	26.0	24.8	24.6
143	318009	176337	Roadside	83.0	83.0	23.5	25.7	25.7	25.4	21.7
144	318046	176307	Roadside	84.9	84.9	25.0	26.4	27.9	27.6	25.7
147	317636	175161	Roadside	100.0	100.0	20.5	23.8	24.3	22.0	21.2
271	320401	177212	Kerbside	75.0	25.0					29.8
149	317764	175174	Roadside	100.0	100.0	26.8	25.9	27.1	26.2	24.7

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%)	Valid Data Capture 2024 (%)	NO_2 Annual Mean Concentration ($\mu g/m^3$)				
						2020	2021	2022	2023	2024
156	317997	177412	Roadside	75.0	75.0	17.4	20.1	21.9	19.5	18.5
157	316605	179703	Roadside	100.0	100.0	19.3	19.4	19.3	19.6	17.0
158	318093	177716	Roadside	75.0	75.0	17.6	21.0	22.4	20.2	18.8
159	320709	177918	Roadside	90.6	90.6	26.4	27.4	28.7	26.7	24.2
166	315950	176424	Roadside	92.5	92.5	26.3	26.7	27.1	27.8	22.3
168	314856	176929	Roadside	83.0	83.0	21.1	22.7	23.6	20.9	19.1
174	317508	177868	Kerbside	100.0	100.0	17.7	20.0	23.2	21.5	19.5
179	318627	176039	Roadside	81.1	81.1	32.4	37.6	31.7	36.0	32.8
183	318765	176623	Kerbside	58.5	58.5	23.5	23.7	25.9	22.2	21.8
184	318335	176074	Roadside	84.9	84.9	28.3	27.5	28.3	24.7	24.1
186	318044	176449	Roadside	83.0	83.0	23.1	24.5	31.6	30.8	29.5
187	317944	176436	Roadside	75.0	75.0	25.7	26.1	31.5	27.6	29.5

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%)	Valid Data Capture 2024 (%)	NO_2 Annual Mean Concentration (µg/m^3)				
						2020	2021	2022	2023	2024
188	318229	176154	Roadside	64.2	64.2	32.5	26.8	28.5	26.7	27.1
191	318724	177776	Roadside	49.1	49.1	22.5	24.3	25.4	23.2	23.9
194	313870	176212	Roadside	100.0	100.0	15.8	18.4	20.2	19.5	16.6
195	320147	177523	Roadside	100.0	100.0	24.2	24.6	25.0	22.1	21.9
196	316223	177305	Roadside	100.0	100.0	19.4	22.0	22.6	19.9	19.3
198	319348	176958	Roadside	100.0	100.0	25.7	28.7	28.3	26.3	22.3
199	319599	177174	Roadside	92.5	92.5	20.7	20.1	20.1	19.0	17.9
200	317038	179073	Roadside	90.6	90.6	27.4	27.4	27.6	25.2	24.6
201	317547	176411	Roadside	100.0	100.0	22.1	24.0	27.0	23.1	22.9
202	317604	176053	Roadside	100.0	100.0	23.3	24.5	26.3	22.9	22.4
203	318255	178533	Roadside	92.5	92.5	17.2	17.1	17.6	14.8	14.9
204	317487	176303	Roadside	100.0	100.0	18.7	20.1	20.9	20.3	16.7

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%)	Valid Data Capture 2024 (%)	NO_2 Annual Mean Concentration ($\mu g/m^3$)				
						2020	2021	2022	2023	2024
207	314769	177343	Roadside	100.0	100.0	16.7	18.3	18.6	17.1	15.6
208	315152	178245	Roadside	92.5	92.5	18.9	20.5	21.5	19.7	19.4
209	317200	178537	Roadside	100.0	100.0	15.2	16.6	19.1	19.1	16.2
210	316692	181088	Roadside	39.6	39.6	16.6	17.5	18.2	16.3	15.2
211	320247	178903	Roadside	100.0	100.0	18.1	19.7	18.4	17.1	16.1
212	315197	178221	Kerbside	56.6	56.6	33.4	37.4	39.3	35.8	25.4
214	315254	178153	Roadside	100.0	100.0	24.8	25.4	27.3	25.5	22.9
218	314467	176767	Roadside	100.0	100.0	28.2	31.6	31.4	28.5	27.4
254	317523	176548	Roadside	100.0	100.0		27.7	30.2	26.6	26.6
220	318928	176683	Kerbside	83.0	83.0	27.9	30.4	31.3	28.0	24.3
221	318530	177468	Kerbside	34.0	34.0	30.4	26.9	33.8	30.2	26.2
190	319056	177343	Roadside	92.5	92.5	20.7	20.1	21.1	19.8	20.6

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%)	Valid Data Capture 2024 (%)	NO_2 Annual Mean Concentration ($\mu g/m^3$)				
						2020	2021	2022	2023	2024
224	315714	177740	Roadside	75.0	75.0	18.5	18.8	18.5	17.4	14.0
243	315318	178044	Kerbside	90.6	90.6	25.7	28.2	31.1	24.7	25.2
244	314963	178846	Roadside	100.0	100.0	18.2	18.0	18.7	19.3	16.4
245	321006	179081	Urban Background	90.6	90.6	14.3	15.0	15.4	14.8	13.6
263	319715	174791	Roadside	100.0	100.0			14.4	16.2	15.4
266	309884	181862	Roadside	92.5	92.5					7.7
262	316593	176728	Kerbside	100.0	100.0			15.3	19.1	15.4
249	318201	180367	Roadside	100.0	100.0	17.3	16.5	16.2	16.5	14.0
250	313244	176769	Roadside	100.0	100.0	26.7	28.4	26.3	24.7	20.9
251	313244	180367	Kerbside	90.6	90.6	13.5	14.9	15.6	14.5	13.7
255	318075	176462	Kerbside	90.6	90.6		25.8	33.3	33.0	32.2
256	318075	176462	Kerbside	100.0	100.0	30.8	31.7	33.3	30.9	31.3

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%)	Valid Data Capture 2024 (%)	NO_2 Annual Mean Concentration ($\mu g/m^3$)				
						2020	2021	2022	2023	2024
257	314505	176769	Roadside	100.0	100.0					28.6
192	314505	176769	Roadside	90.6	90.6	30.8	31.7	33.3	30.9	26.6
265	317684	173479	Kerbside	90.6	90.6				13.6	15.4
270	315396	177897	Kerbside	17.0	17.0					21.9
267	317717	179220	Roadside	60.4	60.4					25.1
268	317505	179230	Kerbside	67.9	67.9					20.5
269	317375	179252	Kerbside	50.9	50.9					23.1
TRO-001	315621	180320	Kerbside	49.1	49.1	10.9	11.9	12.6	14.0	11.4
TRO-006	315497	180140	Roadside	56.6	56.6	17.0	17.0	19.3	16.4	14.8
TRO-009	314022	178334	Roadside	100.0	100.0	9.3	9.2	9.8	9.7	9.1
TRO-012	315209	177668	Roadside	100.0	100.0	10.6	10.4	11.2	10.5	10.3
TRO-015	312734	175411	Roadside	58.5	58.5	11.5	11.8	10.4	10.7	10.1

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%)	Valid Data Capture 2024 (%)	NO_2 Annual Mean Concentration (µg/m^3)				
						2020	2021	2022	2023	2024
TRO-018	315801	176492	Roadside	92.5	92.5		23.3	17.1	25.8	21.9
TRO-021	318945	175546	Kerbside	100.0	100.0		17.2	16.5	13.6	14.4
TRO-024	319283	176827	Kerbside	100.0	100.0		29.6	32.4	26.2	18.9
TRO-027	319327	177080	Kerbside	75.0	75.0		16.4	18.5	15.6	17.1
TRO-030	317855	178921	Kerbside	92.5	92.5		13.8	15.1	13.9	12.8
TRO-033	318898	180012	Kerbside	83.0	83.0		11.1	11.1	9.8	8.9
TRO-036	321834	180331	Kerbside	83.0	83.0		11.3	10.6	10.8	10.1
TRO-039	321834	181282	Kerbside	100.0	100.0				12.8	11.8
TRO-042	324529	180975	Kerbside	83.0	83.0				11.3	10.6
TRO-045	307967	181585	Kerbside	100.0	100.0				9.4	9.5
TRO-048	315825	181374	Roadside	100.0	100.0				14.8	13.8
TRO-051	316150	175887	Roadside	83	83				12.3	11.0

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%)	Valid Data Capture 2024 (%)	NO_2 Annual Mean Concentration ($\mu g/m^3$)				
						2020	2021	2022	2023	2024
TRO-054	312883	178154	Roadside	75.0	75.0					8.5
TRO-057	316823	176118	Kerbside	100.0	100.0				22.2	17.5
TRO-060	317758	174813	Kerbside	92.5	92.5				13.9	14.2
TRO-063	322244	182234	Kerbside	43.4	43.4				13.5	13.6

The annual mean concentrations are presented as $\mu g/m^3$.

Exceedances of the NO_2 annual mean objective of $40\mu g/m^3$ are shown in **bold**.

NO_2 annual means exceeding $60\mu g/m^3$, 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.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(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 20 - Trends in Annual Mean Automatic Monitoring NO_2 Concentrations (µg/m^3)

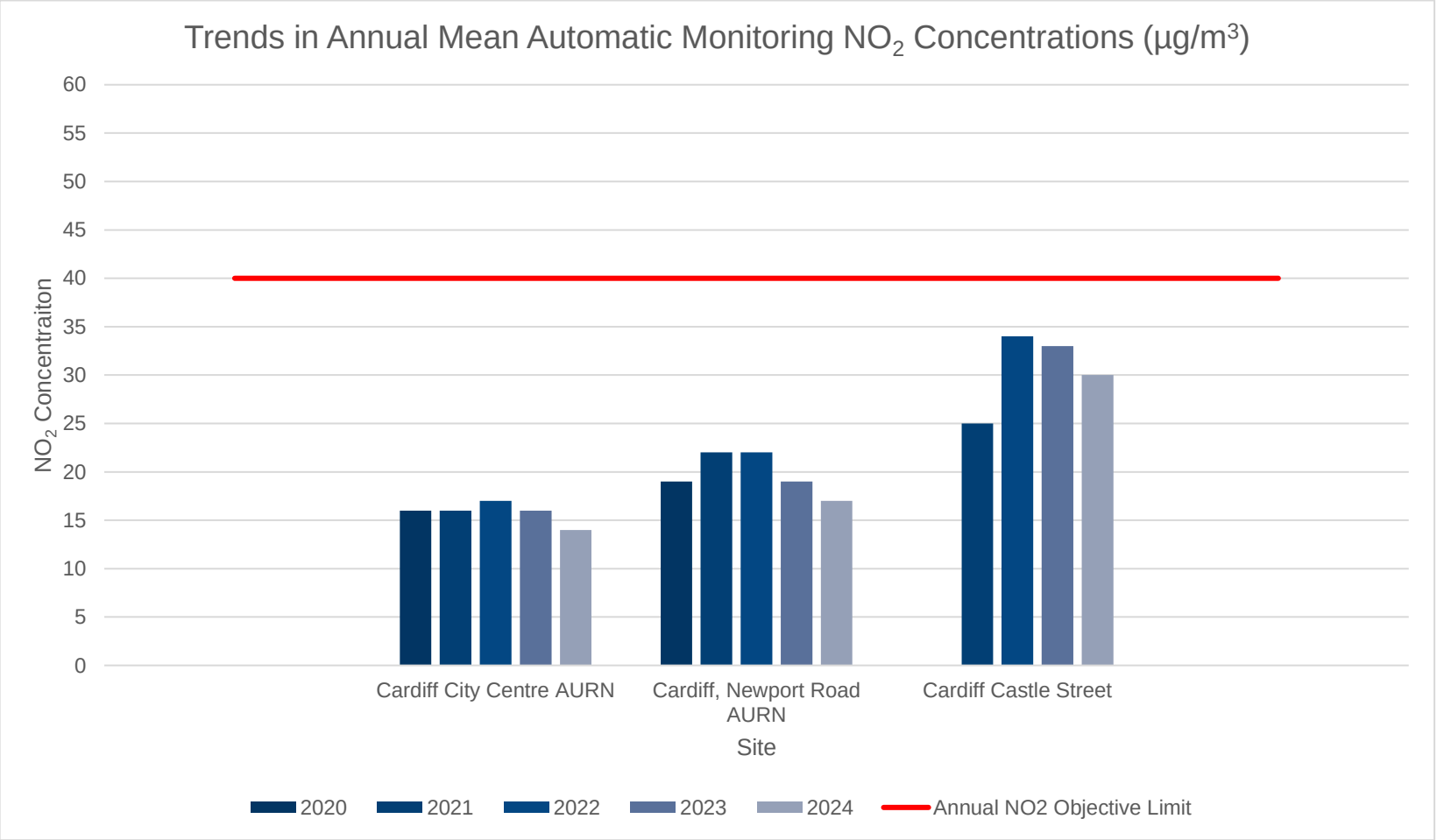


Figure 20 displays NO_2 concentrations within the annual objective limit since 2020 and an improving trend at all automatic monitoring locations.

Figure 21 - Llandaff AQMA Indicative Sensor SN-0517 NO_2 Annual Graph

Figure 22 - Llandaff AQMA Indicative Sensor SN-0609 NO_2 Annual Graph

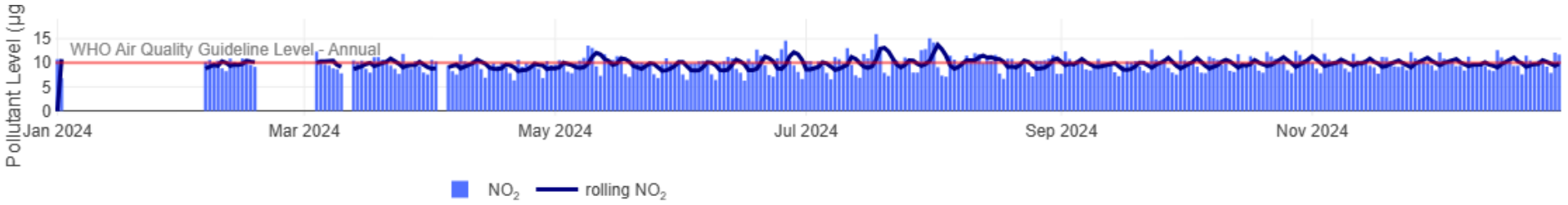


Figure 23 - Llandaff AQMA Indicative Sensor SN-0649 NO_2 Annual Graph

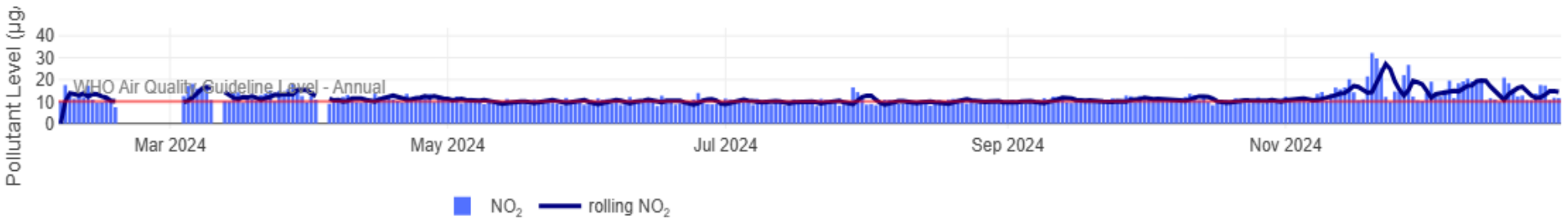


Figure 24 – Ely Bridge AQMA Indicative Sensor SN-0572 NO_2 Annual Graph

Figure 25 - Ely Bridge AQMA Indicative Sensor SN-0604 NO_2 Annual Graph

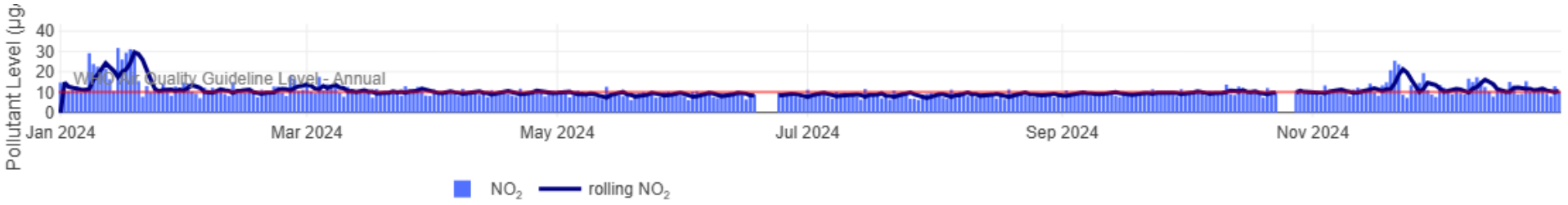


Figure 26 - Ely Bridge AQMA Indicative Sensor SN-0659 NO_2 Annual Graph

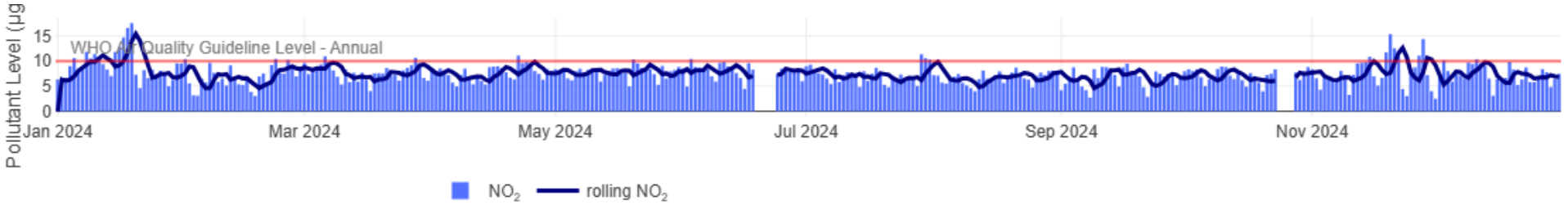


Figure 27 - Ely Bridge AQMA Indicative Sensor SN-0677 NO_2 Annual Graph

Figure 28 – Stephenson Court AQMA Indicative Sensor SN-0131 NO_2 Annual Graph

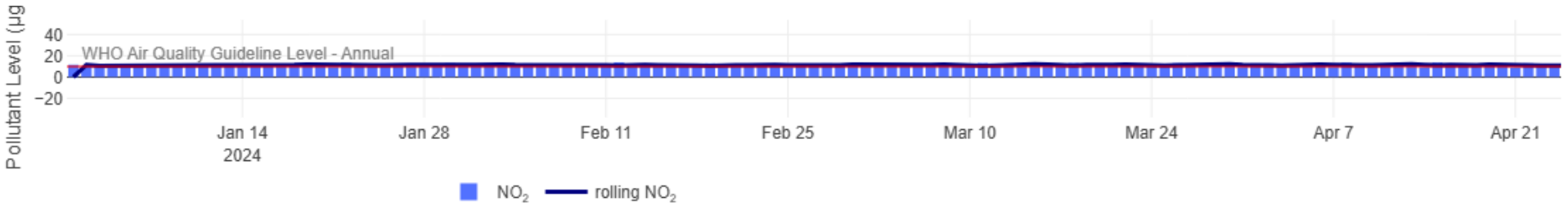


Figure 29 - Stephenson Court AQMA Indicative Sensor SN-0634 NO_2 Annual Graph

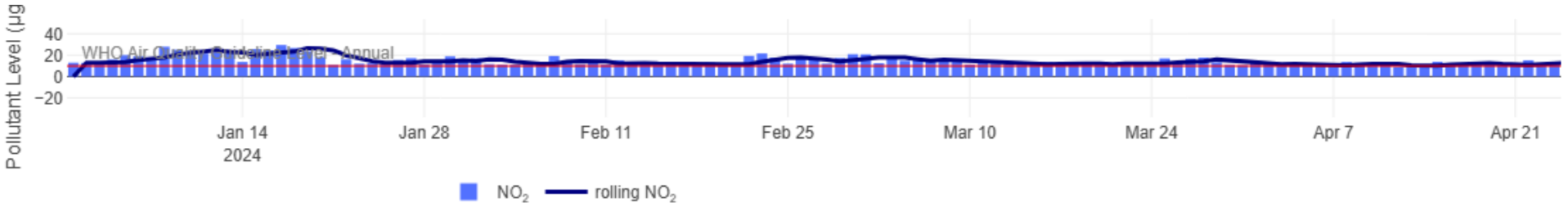


Figure 30 - City Centre AQMA Indicative Sensor SN-0638 NO_2 Annual Graph

Figure 31 - City Centre AQMA Indicative Sensor SN-0596 NO_2 Annual Graph

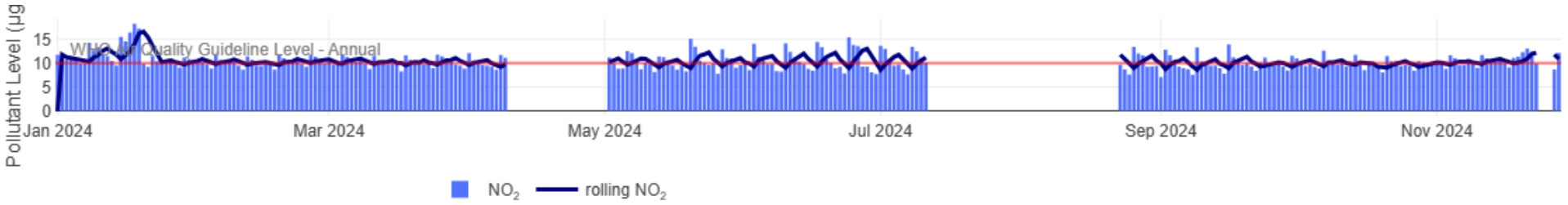
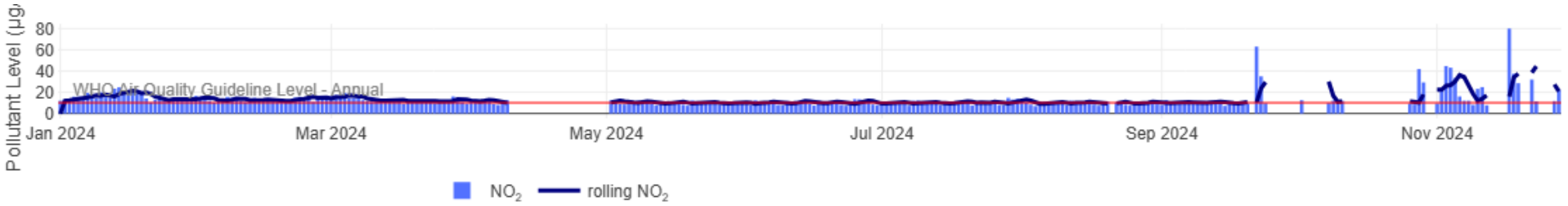


Figure 32 - City Centre AQMA Indicative Sensor SN-0409 NO_2 Annual Graph



Figures 21 – 32 display indictive NO_2 sensor trends within AQMA locations for comparison with the World Health Organization (WHO) guidelines. All concentrations are within the annual objective limit for NO_2.

Figure 33 - Llandaff AQMA 2020 - 2024 Non-Automatic Annual Average NO_2 Concentrations µg/m³

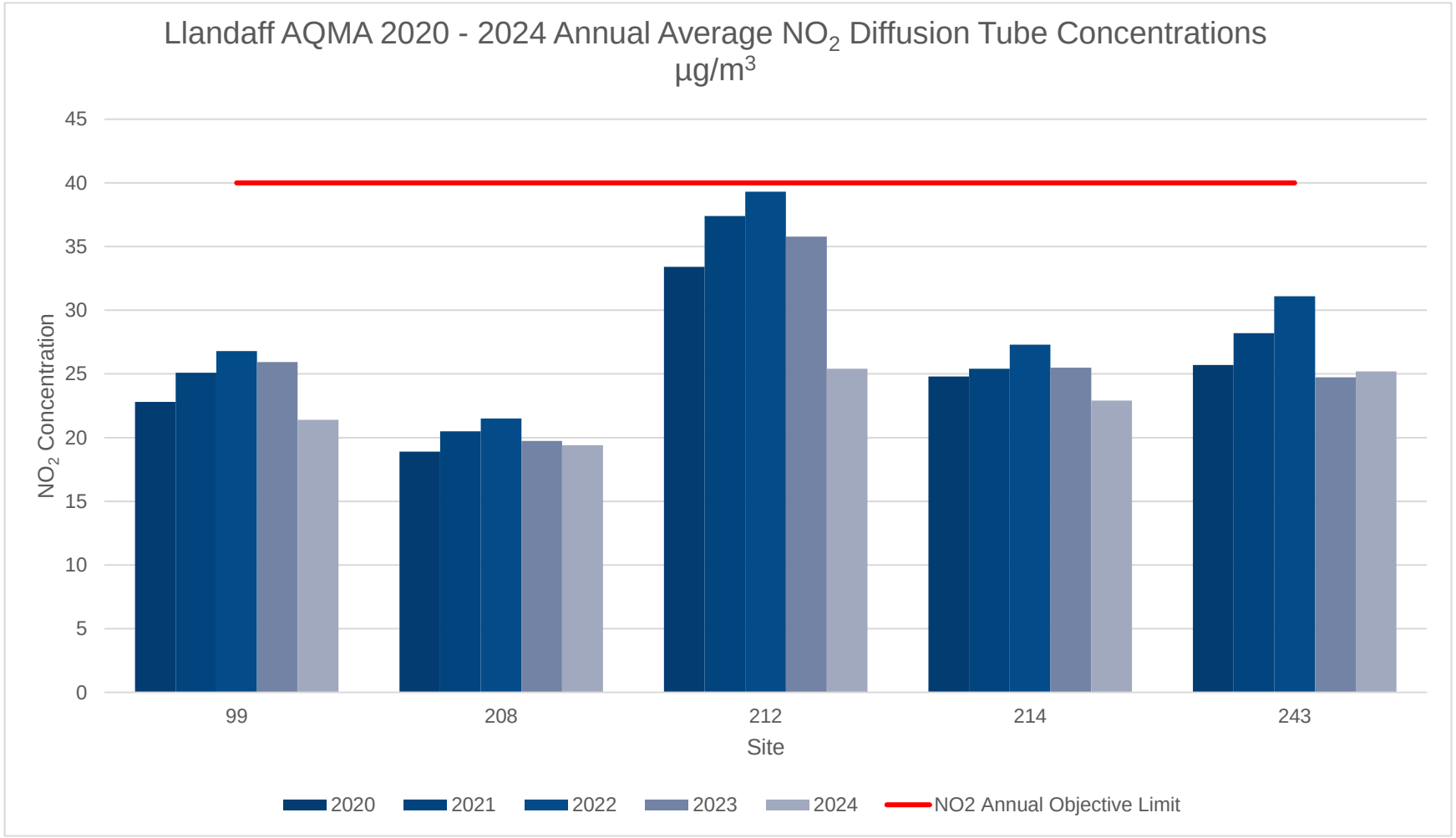


Figure 33 displays NO_2 concentrations within the annual objective limit and an improving trend at Llandaff AQMA since 2020.

Figure 34 - Ely Bridge AQMA Trends in Non-Automatic Annual Mean NO_2 Concentrations µg/m^3

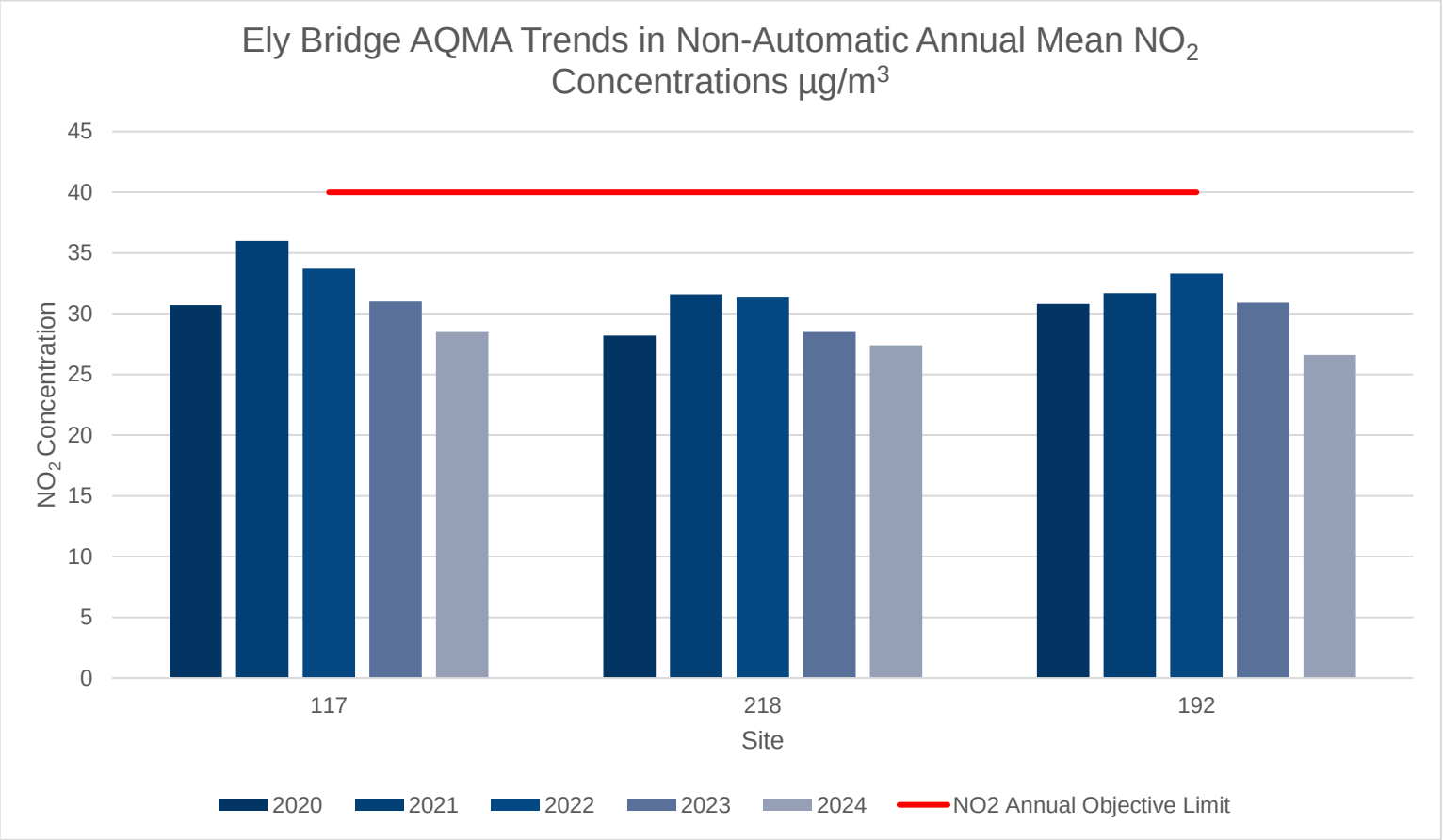


Figure 34 displays NO_2 concentrations within the annual objective limit and an improving trend at Ely Bridge AQMA since 2020.

Figure 35 - Stephenson Court AQMA Trends in Non-Automatic Annual Mean NO_2 Concentrations µg/m^3

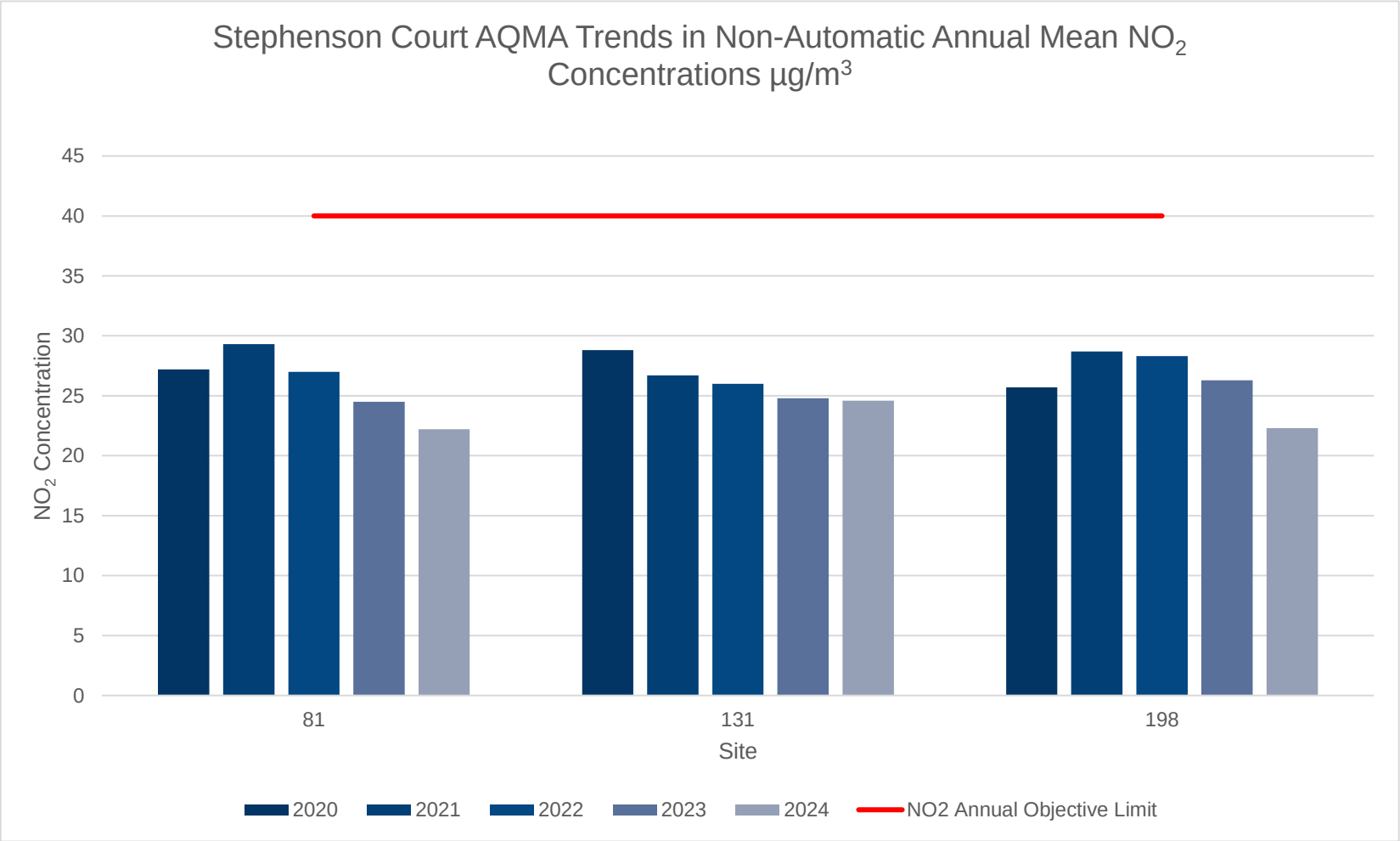


Figure 35 displays NO_2 concentrations within the annual objective limit and an improving trend at Stephenson Court AQMA since 2020.

Figure 36 - City Centre AQMA 2020 - 2024 Non-Automatic Trends in Annual Mean NO_2 Concentrations µg/m^3

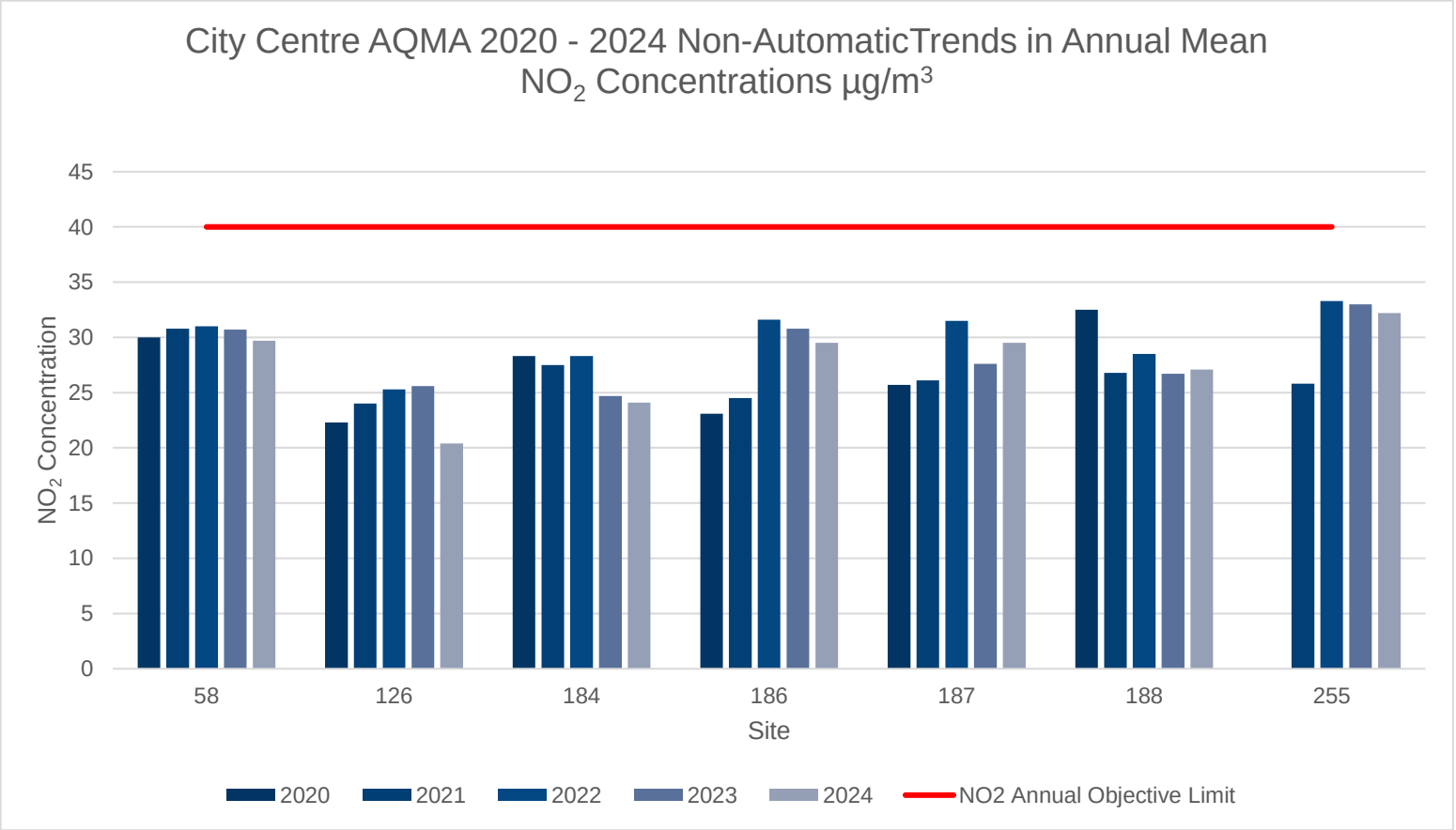


Figure 36 displays trends in NO_2 concentrations within the annual objective limit at the City Centre AQMA since 2020.

Figure 37 - Cardiff Annual Average NO_2 Diffusion Tubes Concentrations 2020 - 2024 ($\mu g/m^3$)

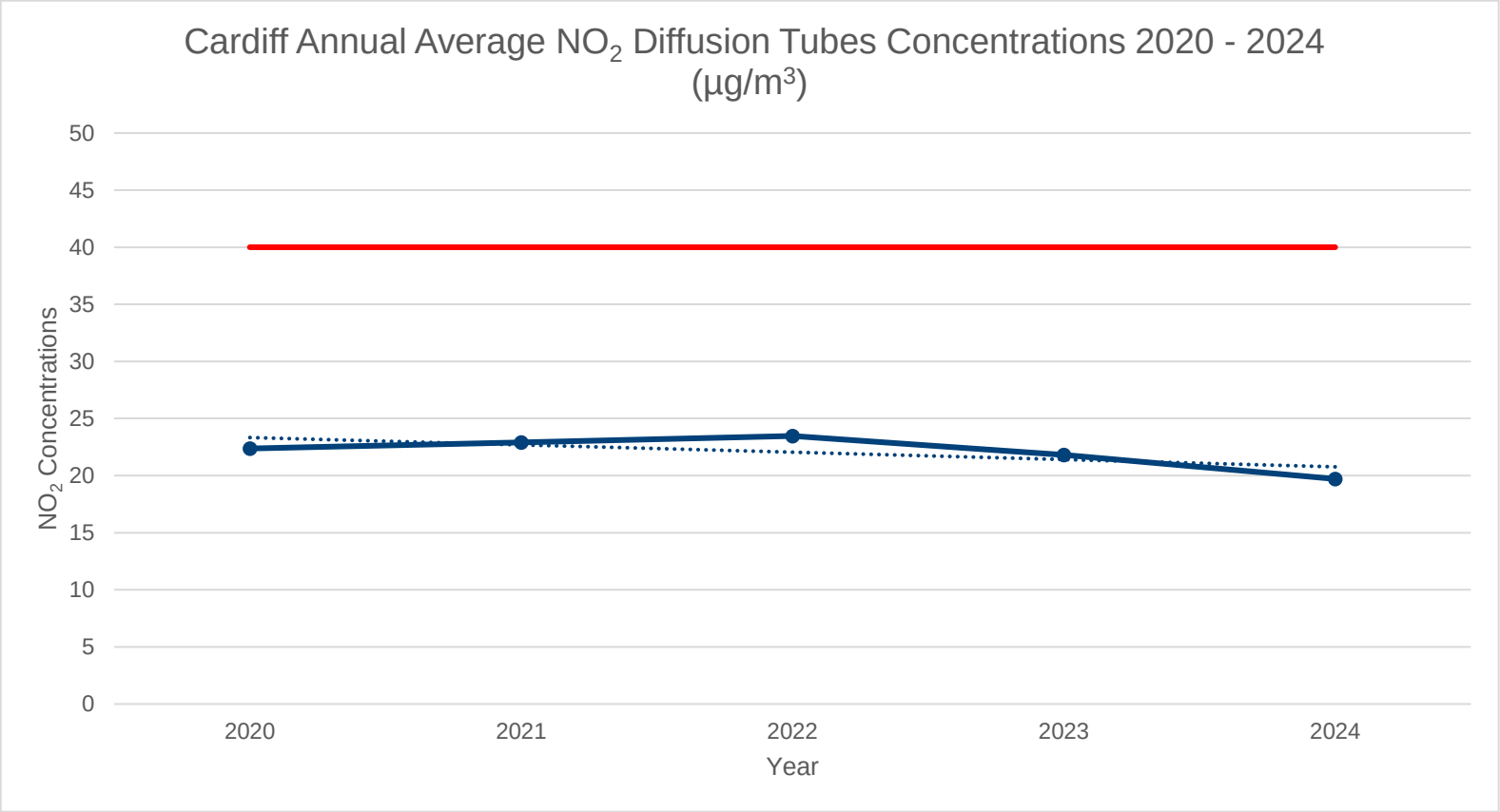


Figure 37 displays an improving trend in NO_2 concentrations within Cardiff since 2020.

Table 9 - 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 2024 (%) (2)	2020	2021	2022	2023	2024
Cardiff City Centre AURN	Urban background	Automatic	93	93	0	0	0	0	0
Cardiff, Newport Road AURN	Roadside	Automatic	99	99	0	0	0	0	0
Cardiff Castle Street	Roadside	Automatic	94	94		0	0	0	0

Notes:

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

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%).

Table 10 - Annual Mean PM_{10} Monitoring Results ($\mu g/m^3$)

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2023 (%) (2)	2020	2021	2022	2023	2024
Cardiff City Centre AURN	Urban background	Automatic	97	97	14	13	16	16	12
Cardiff, Newport Road AURN	Roadside	Automatic	96	96	17	17	18	16	15
Cardiff Castle Street	Roadside	Automatic	95	95		12	20	18	17

Notes:

Exceedances of the PM_{10} annual mean objective of 40µg/m^3 are shown in **bold**.

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 11 - Indicative Monitoring Sensor Network AQMA PM_{10} Results 2024

Sensor Number	Network	Road	x	y	Pollutant	µg/m³
SN-0604	Ely Bridge AQMA	Cowbridge Road West	314527	176788	PM_{10}	7
SN-0677	Ely Bridge AQMA	Cowbridge Road West	314418	176721	PM_{10}	11
SN-0572	Ely Bridge AQMA	Mills Road	314437	176827	PM_{10}	7
SN-0659	Ely Bridge AQMA	Dyfrig Road	314634	176752	PM_{10}	5
SN-0634	Stephenson Court AQMA	Newport Road	319293	176923	PM_{10}	PM error
SN-0131	Stephenson Court AQMA	Newport Road	319410	176988	PM_{10}	10
SN-0649	Llandaff AQMA	Llantrisant Road	315141	178234	PM_{10}	8
SN-0609	Llandaff AQMA	Cardiff Road	315231	178188	PM_{10}	5
SN-0517	Llandaff AQMA	Cardiff Road	315264	178100	PM_{10}	6
SN-0638	City Centre AQMA	Westgate Street	318134	176229	PM_{10}	12
SN-0596	City Centre AQMA	Westgate Street	318204	176174	PM_{10}	7
SN-0648	City Centre AQMA	Cowbridge Road East	317913	176450	PM_{10}	5
SN-0409	City Centre AQMA	Westgate Street	317984	176374	PM_{10}	8

Figure 38 – Trends in Annual Mean PM_{10} Concentrations

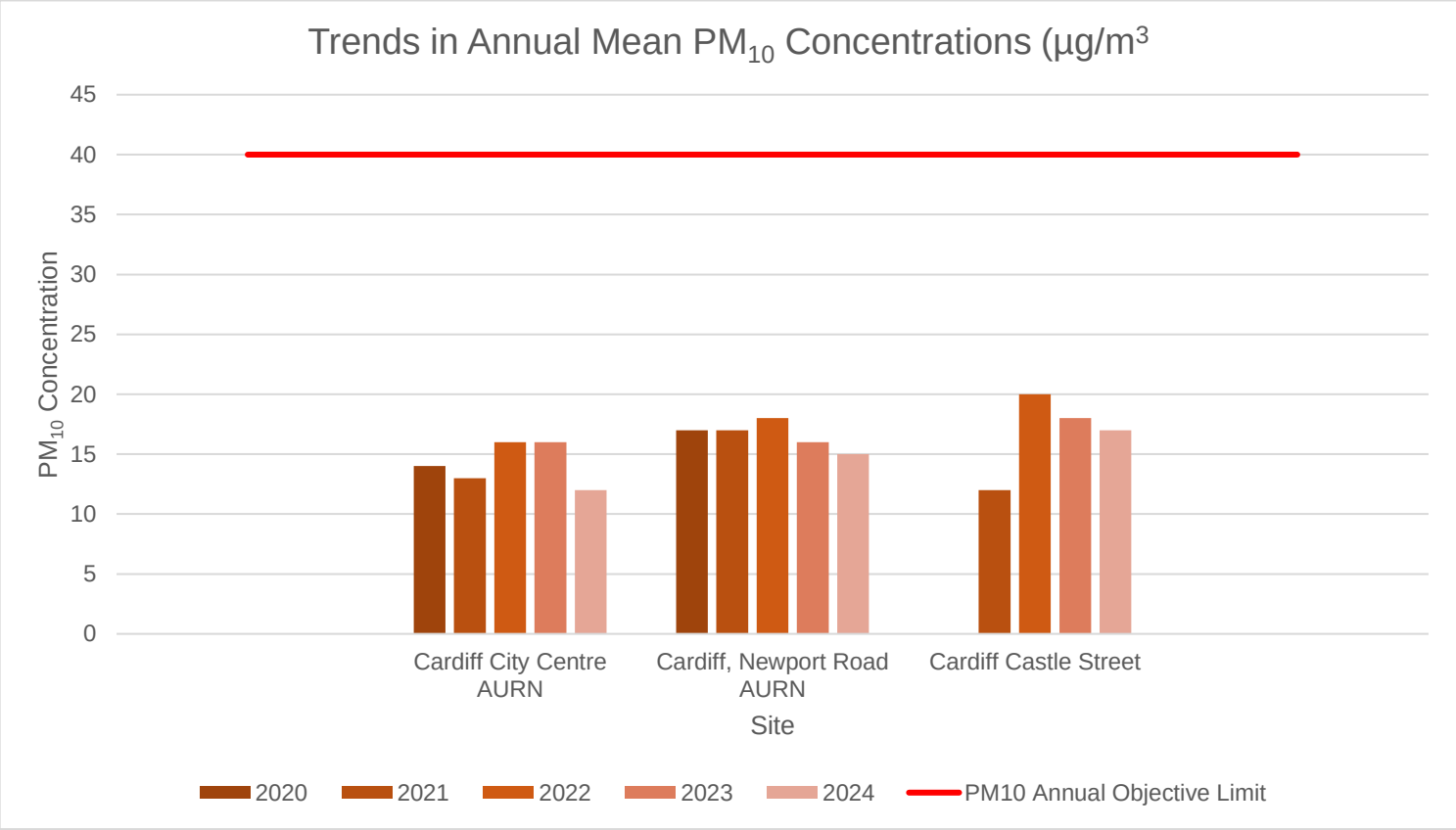


Figure 38 displays PM_{10} concentrations within the annual objective limit and an improving trend at automatic monitors since 2020.

Figure 39 - Llandaff AQMA Indicative Sensor SN-0517 PM_{10} Annual Graph

Figure 40 - Llandaff AQMA Indicative Sensor SN-0609 PM_{10} Annual Graph

Figure 41 - Llandaff AQMA Indicative Sensor SN-0649 PM_{10} Annual Graph

Figure 42 – Ely Bridge AQMA Indicative Sensor SN-0572 PM_{10} Annual Graph

Figure 43 - Ely Bridge AQMA Indicative Sensor SN-0604 PM_{10} Annual Graph

Figure 44 - Ely Bridge AQMA Indicative Sensor SN-0659 PM_{10} Annual Graph

Figure 45 - Ely Bridge AQMA Indicative Sensor SN-0677 PM_{10} Annual Graph

Figure 46 – Stephenson Court AQMA Indicative Sensor SN-0131 PM_{10} Annual Graph

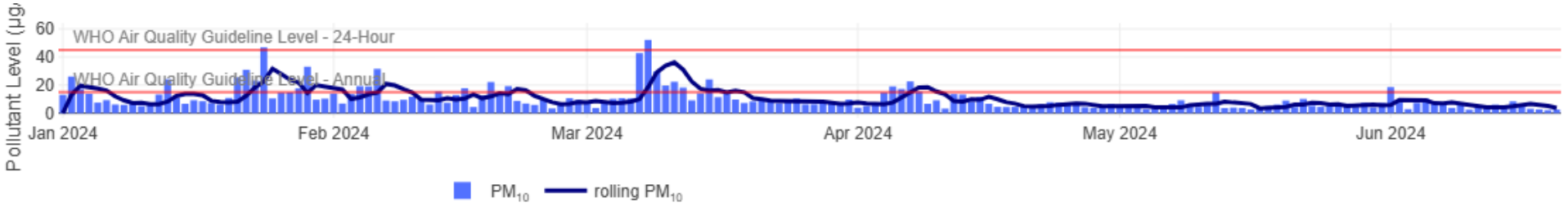


Figure 47 – City Centre AQMA Indicative Sensor SN-0409 PM_{10} Annual Graph

Figure 48 - City Centre AQMA Indicative Sensor SN-0596 PM_{10} Annual Graph

Figure 49 - City Centre AQMA Indicative Sensor SN-0638 PM_{10} Annual Graph

Figures 39 – 49 display indictive PM_{10} sensor trends within AQMA locations for comparison with the World Health Organization (WHO) guidelines. All concentrations are within the annual objective limit for PM_{10}.

Table 12 - 24-Hour Mean PM_{10} Monitoring Results, Number of PM_{10} 24-Hour Means > 50µg/m^3

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
Cardiff City Centre AURN	Urban background	Automatic	97	97	0	0	0	0	0
Cardiff, Newport Road AURN	Roadside	Automatic	96	96	0	0	0	0	0
Cardiff Castle Street	Roadside	Automatic	95	95		0	0	0	0

Notes:

Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold**.

If the period of valid data is less than 85%, the 90.4th 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 13 - $PM_{2.5}$ Monitoring Results ($\mu g/m^3$)

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2024 (%) (2)	2020	2021	2022	2023	2024
Cardiff City Centre AURN	Urban background	Automatic	95	95	7	9	11	10	8
Cardiff Castle Street	Roadside	Automatic	96	96		9	10	8	7

Notes:

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 14 - Indicative Monitoring Sensor Network AQMA $PM_{2.5}$ Results 2024

Sensor Number	Network	Road	x	y	Pollutant	µg/m³
SN-0604	Ely Bridge AQMA	Cowbridge Road West	314527	176788	$PM_{2.5}$	2
SN-0677	Ely Bridge AQMA	Cowbridge Road West	314418	176721	$PM_{2.5}$	7
SN-0572	Ely Bridge AQMA	Mills Road	314437	176827	$PM_{2.5}$	2
SN-0659	Ely Bridge AQMA	Dyfrig Road	314634	176752	$PM_{2.5}$	2
SN-0634	Stephenson Court AQMA	Newport Road	319293	176923	$PM_{2.5}$	PM error
SN-0131	Stephenson Court AQMA	Newport Road	319410	176988	$PM_{2.5}$	3
SN-0649	Llandaff AQMA	Llantrisant Road	315141	178234	$PM_{2.5}$	3
SN-0609	Llandaff AQMA	Cardiff Road	315231	178188	$PM_{2.5}$	2
SN-0517	Llandaff AQMA	Cardiff Road	315264	178100	$PM_{2.5}$	2
SN-0638	City Centre AQMA	Westgate Street	318134	176229	$PM_{2.5}$	3
SN-0596	City Centre AQMA	Westgate Street	318204	176174	$PM_{2.5}$	2
SN-0648	City Centre AQMA	Cowbridge Road East	317913	176450	$PM_{2.5}$	2
SN-0409	City Centre AQMA	Westgate Street	317984	176374	$PM_{2.5}$	2

Figure 50 – Trends in Annual Mean $PM_{2.5}$ Concentrations

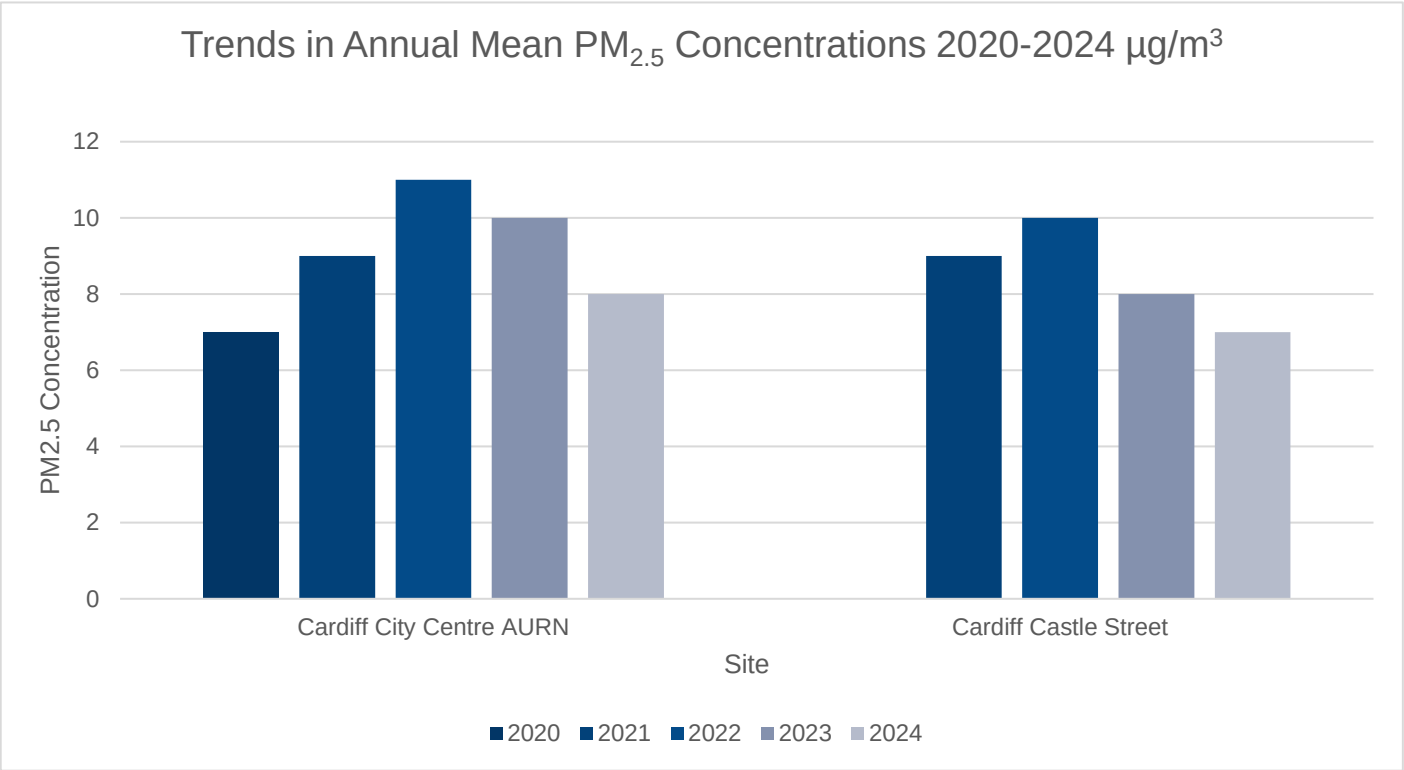


Figure 50 displays an improving trend in $PM_{2.5}$ concentrations at automatic monitoring stations

Figure 51 – Llandaff AQMA Indicative Sensor SN-0649 $PM_{2.5}$ Annual Graph

Figure 52 - Llandaff AQMA Indicative Sensor SN-0609 $PM_{2.5}$ Annual Graph

Figure 53 - Llandaff AQMA Indicative Sensor SN-0517 $PM_{2.5}$ Annual Graph

Figure 54 – Ely Bridge AQMA Indicative Sensor SN-0572 $PM_{2.5}$ Annual Graph

Figure 55 – Ely Bridge AQMA Indicative Sensor SN-0604 $PM_{2.5}$ Annual Graph

Figure 56 - Ely Bridge AQMA Indicative Sensor SN-0659 $PM_{2.5}$ Annual Graph

Figure 57 - Ely Bridge AQMA Indicative Sensor SN-0677 $PM_{2.5}$ Annual Graph

Figure 58 – Stephenson Court AQMA Indicative Sensor SN-0131 $PM_{2.5}$ Annual Graph

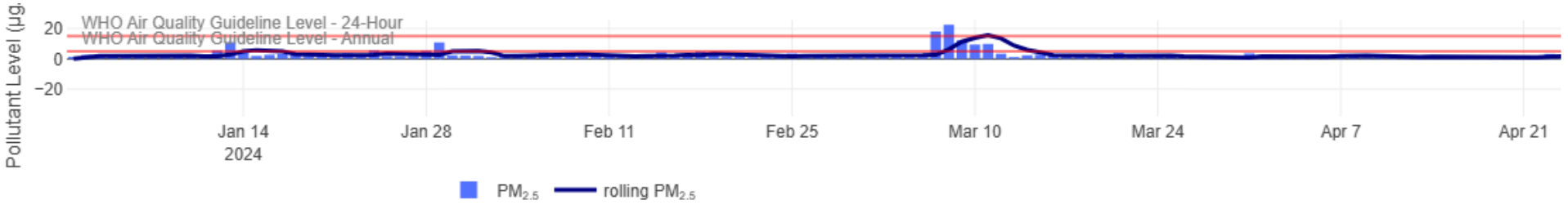


Figure 59 – City Centre AQMA Indicative Sensor SN-0409 $PM_{2.5}$ Annual Graph

Figure 60 - City Centre AQMA Indicative Sensor SN-0596 $PM_{2.5}$ Annual Graph

Figure 61 - City Centre AQMA Indicative Sensor SN-0638 $PM_{2.5}$ Annual Graph

Figures 51 – 61 display indictive $PM_{2.5}$ sensor trends within AQMA locations for comparison with the World Health Organization (WHO) guidelines.

2.3 Comparison of 2024 Monitoring Results with Previous Years and the Air Quality Objectives

2.3.1 Nitrogen Dioxide (NO_2)

Nitrogen dioxide was measured during 2024 at three sites equipped with an automatic NOx analyser, and by a network of 99 diffusion tubes. NO_2 was also measured by indicative automatic sensors in various locations within AQMA and across Cardiff.

In order to ratify the 2024 diffusion tube dataset, a local bias adjustment factor of 0.87 was applied to the annual average readings. The factor was derived from a co-location study carried out at the Castle Street automatic monitor. The local bias correction factor was utilised as it would provide results representative of a worst-case scenario.

There were no exceedances in either the annual or short-term air quality objectives for NO_2 at any automatic and non-automatic monitoring site during 2024.

When examining average NO_2 concentrations at non-automatic diffusion tube sites across Cardiff, we are now experiencing pollutant concentrations at levels lower than those experienced during the pandemic, and an overall decreasing trend in NO_2 concentrations is seen since 2020.

2.3.2 Particulate Matter (PM_{10})

Monitoring of PM_{10} was carried out at the Cardiff Centre AURN, Newport Road AURN and Cardiff Castle Street monitoring sites. PM_{10} monitoring was also carried out by a network of indicative automatic sensors. The result of the monitoring indicates that recorded PM_{10} concentrations at these monitoring stations are compliant with both the annual mean and 24-hour mean Air Quality Objectives set for PM_{10}.

A stable trend in PM_{10} concentrations can be seen at all locations since 2020, with reductions in PM_{10} concentrations at Cardiff City Centre AURN, Newport Road AURN and Cardiff Castle street when compared to 2023.

2.3.3 Particulate Matter ($PM_{2.5}$)

Monitoring for $PM_{2.5}$ was carried out at the Cardiff Castle Street, Cardiff Centre AURN and four indicative monitoring sites. There is no formal Air Quality Objective in Wales for $PM_{2.5}$, although all concentrations are <10µg/m^3 and compliant with the EU target value of 25µg/m^3.

2.3.4 Other Pollutants Monitored

Sulphur Dioxide (SO_2)

Sulphur dioxide was measured at the Cardiff Centre AURN automatic monitoring site during 2024. The site is classified as “Urban Background” and is a relevant location for the 15-minute and 1-hour Objectives. There were no exceedances of the set objectives during 2022.

Ozone (O_3)

Ozone monitoring is useful due to its potential correlations with other pollutants. In 2024, ozone was measured at the Cardiff City Centre AURN site. The results are compared with the running 8-hour mean objective as set by the Expert Panel on Air Quality Standards (EPAQs) which states the running 8-hour mean should not exceed 100µg/m^3 on more than 10 days per year. There were no exceedances of the ozone objective in Cardiff in 2024.

Carbon Monoxide (CO)

Carbon monoxide was also monitored at Cardiff City AURN site during 2024. There were no exceedances of the Air Quality Strategy Objective for (CO) 8-hour running mean > 10 mg/m^3 during this period.

2.4 Summary of Compliance with AQS Objectives as of 2024

SRS on behalf of Cardiff Council have examined the results from monitoring in Cardiff. Concentrations for all pollutants are all below the relevant air quality objectives, therefore no further action is required.

Concentrations of NO_2 at site 212 within Llandaff AQMA have been found to be close to the annual mean NO_2 Air Quality Standard (40µg/m^3) in recent years. However, in 2024 NO_2 concentrations at this location have improved when compared to 2023 and are currently below the threshold of within 10% of the annual mean NO_2. It is recommended that revocation of an AQMA should be considered following three consecutive years of annual mean NO_2 concentrations being lower than 36µg/m^3.

In 2024, the highest annual average concentration of NO_2 within Cardiff was measured at 32.8µg/m^3 at monitoring point 179, located on Bute terrace. However, this monitoring point

is at a kerbside location and not representative of actual relevant exposure with regard to the annual objective.

3 New Local Developments

SRS of behalf of Cardiff Council continues to monitor the impact of proposed developments and recent developments already underway or in use.

There have been several planning applications for residential and commercial developments within the last year which required air quality assessments due to the introduction of new receptors or increased emissions due to additional vehicle movements. No air quality assessment received by the council have predicted adverse air quality impacts related to any new developments.

The following developments may either be of significance in respect of local air quality or be a proposed development where air quality is a consideration.

24/01635/FUL Land At The Wharf Schooner Way Butetown Cardiff

Shared Regulatory Services (SRS) Environment Team have reviewed the Air Quality Assessment (AQA) provided as part of the planning application.

The daily vehicle generation (AADT) from the operational development would be significantly lower than the IAQM screening criteria Impacts on local air quality. As a result, the air quality impacts of operational traffic are therefore concluded to be negligible.

The site is deemed appropriate for residential and commercial development since it meets the applicable limit values for $PM_{2.5}$, PM_{10}, and NO_2. Additionally, exposure effects are expected to be negligible.

There is no combustion source for energy generation within the proposed development. The report states up diesel emergency generator would not have a significant impact on local air quality and the impact would be negligible if the generator is operating only within test parameters once a month. Full details of the backup generator are unavailable at this time.

Recommended Condition

The most significant impact on local air quality will be from the construction phase of the development. The developer should therefore implement appropriate dust and pollution control measures as set out within the IAQM guidance. A summary of these measures is set

out in Appendix C of the AQA. The proposed measures should be set out within a Construction Environmental Management Plan (CEMP) and approved by CCC prior to commencement of any work on site

Reason: To protect the amenities of occupiers of other premises in the vicinity and to ensure acceptable air quality in accordance with Policy EN13 of the adopted Cardiff Local Development Plan (2006-2026).

24/00407/FUL Trafalgar House 5 Fitzalan Place Adamsdown Cardiff CF24 0ED

The Shared Regulatory Services (SRS) Environment Team have reviewed the Air Quality Assessment (AQA) in relation to the impact of the development on local air quality.

The proposed development provides a decrease in vehicle generations when compared to the existing site. Therefore, there will be improvements in air quality with the new development compared to its current use. This has been addressed within the AQA and full dispersion modelling to assess the operational phase of the development has been scoped out of the report.

The new development will include non-combustible heating and hot water supplies provided by photo voltaic (PV) panels and air source heat pumps. Since these energy sources won't produce any emissions on-site, their effects on the quality of the local air will be negligible. A small on-site back-up generator will be in place. SRS agree with the conclusion that the impact of this backup generator will be negligible.

The main content of the AQA relates to the construction phase impacts of the development. The proposed development has been identified as a low risk for dust soiling effects during earthworks and construction and negligible risk during track out. For human health, the site has been identified as a negligible risk site. Recommended mitigation measures for demolition and construction phase dust impacts have been included within Appendix C of the report.

SRS recommend the following condition related to construction phase mitigation measures.

Condition - The proposed mitigation measures in Appendix C of the AQA should be set out within a Construction Environmental Management Plan (CEMP) for the site and approved by CCC prior to commencement of any work on site.

Reason: protection of the environment and public amenity EN13 of the adopted City of Cardiff Local Development Plan (2006-2026)

24/01984/FUL | Full planning permission for senior living accommodation with associated car parking, cycle parking, and landscaping. | Plot 1 Cardiff Peninsula International Sports Village Cardiff CF11 0JS

The Shared Regulatory Services (SRS) Environment Team have reviewed the application in relation to the air quality impact of the construction and operational phases of the development.

Operational Phase

The traffic generated by the new development does not exceed the criteria set within EPUK & IAQM Guidance document (Land-use Planning and Development Control: Planning for Air Quality). Therefore, the impact of the vehicles generated by the new development is not significant. The proposed development does not include sources of combustion for the provision of heating and hot water, and it is understood that energy will be provided by an all-electric energy centre. As the development does not include for combustion plant, a detailed assessment of emissions associated with this source has been scoped out. There are no current air quality concerns, or Air Quality Management areas (AQMAS) within the area of the development, therefore residents of the new development will not be exposed to unacceptable levels of air pollution.

Construction Phase

An assessment of construction phase impacts has been undertaken. The Annual Average Daily Traffic count (AADT) for HGV's during the construction has not been included within the assessment. However, the assessment mentions that based on the local air quality in the area, and the proximity of sensitive receptors to the roads likely to be used by construction vehicles, the impacts are therefore considered to be slight adverse without the implementation of mitigation. As a result, the AADT for HGV's using Empire Way requires quantification to assess potential air quality impacts for nearby residential receptors, and the

requirement for further mitigation measures for the duration of the construction phase related to construction vehicles.

A qualitative assessment of construction phase impacts has been carried out. The assessment identifies a Medium risk of dust soiling during demolition, earthworks, construction, and track out activities. This impact can be reduced with the implementation of mitigation measures included within the assessment. As a condition, SRS recommend these mitigation measures are included within a site-specific Construction Environmental Management Plan.

Reason: To protect the amenities of occupiers of other premises in the vicinity and to ensure acceptable air quality in accordance with Policy EN13 of the adopted Cardiff Local Development Plan (2006-2026).

3.1 Road Traffic Sources (and Other Transport)

19/02523/MJR | Outline planning application, with all matters reserved except for strategic access, for the development approximately 650 dwellings, Land South Of Creigiau CF72 8NG

The 2019 air quality assessment includes baseline air quality concentrations and predicted air quality concentrations as a result of the development. The predicted results include worst case sensitivity test which accounts for the underperformance of emissions control technology for diesel cars and vans. The ‘minor adverse’ predicted nitrogen dioxide concentrations at three receptors within Llandaff Air Quality Management area (AQMA) are based on the results from the worst-case sensitivity test. Without the application of the worst-case sensitivity test, the impact of the development on all receptors is predicted as ‘negligible.’

Since the 2019 assessment, there have been improvements to air quality within Llandaff AQMA. This is due to implementation of interventions within the Cardiff Clean Air Plan, increased levels of home working, and the ongoing turnover in vehicle fleet resulting in the phasing out of older vehicles which improves air quality year by year.

In 2023, baseline concentrations within Llandaff AQMA are much improved when compared to 2019. As a result of these improvements in air quality within Llandaff AQMA, it is the opinion of SRS that, if using 2023 baseline conditions, the impact of the new development

will be negligible. Air quality concentrations remain within relevant legal air quality objective limits. As stated within the 2019 assessment, the overall operational air quality effects of the proposed development are judged to be 'not significant'. Therefore, no further mitigation is required with regard to the operational effect of the development.

Construction phase

SRS recommend the following condition related to construction phase mitigation measures.

Condition - Proposed mitigation measures as stated within Appendix 5 of the Environmental Assessment should be set out within a Construction Environmental Management Plan (CEMP), or Dust Management Plan (DMP) for the site and approved by the local planning authority prior to commencement of any work on site.

Reason: protection of the environment and public amenity EN13 of the adopted City of Cardiff Local Development Plan (2006-2026)

24/02716/FUL | Demolition of existing buildings and construction of Co-Living Accommodation Units Asset House 63 Penarth Road Butetown Cardiff CF10 5RA

Shared Regulatory Services (SRS) Environment Team have reviewed the Air Quality Assessment (AQA) submitted for 24/02716/FUL.

Operational Phase

The assessment for the operational phase of the development has taken into account air quality within the local area and exposure for future residents of the development. According to an analysis of local monitoring data, nitrogen dioxide (NO_2) and particulate matter (PM_{10}, $PM_{2.5}$) concentrations are below the applicable air quality limit values throughout the site. As a result, it is deemed appropriate for both residential and commercial use, with minimal effects on new exposure. The traffic generated by the new development is not considered significant in terms of influencing air quality.

Construction Phase

Construction of the development will have a temporary impact on air quality. The assessment identifies a Medium to high risk of dust soiling during demolition, earthworks, construction, and track out activities. This impact can be reduced with the implementation of mitigation measures included within the assessment.

As a condition, SRS recommend these mitigation measures are included within a site-specific Construction Environmental Management Plan / Dust Management Plan.

Reason: To protect the amenities of occupiers of other premises in the vicinity and to ensure acceptable air quality in accordance with Policy EN13 of the adopted Cardiff Local Development Plan (2006-2026).

Velindre Cancer Centre

Application was received for the temporary construction access route for the construction of the approved Velindre Cancer Centre, for a period of no more than 48 months following the completion of the related highway improvement works.

A revised air quality assessment (AQA) was undertaken as part of this application to ascertain the likely air quality impacts associated with the amended proposal through its construction phase. The results from the assessment show that the changes in construction traffic on Pendwyallt Road and Park Road from using this access route is expected to have a negligible air quality impact on nearby sensitive human health and ecological receptors. The predicted concentrations of pollutants at receptors also remain well below the air quality objectives and therefore the air quality impacts associated with the southern access route are not significant in accordance with guidance set out by EPUK and IAQM.

As such no specific planning condition was initially requested for further mitigation in terms of air quality impacts. However, the planning committee, took into consideration several concerns raised by residents placed the following condition on the approval notice dated 2nd February 2021:

Condition 11: Prior to commencement of the development hereby approved details of an air monitoring unit and its location shall be submitted to and approved in writing with the Local Planning Authority. The monitoring unit shall be implemented in accordance with the

approved details and remain operational until cessation of the development. Data from the air monitoring unit shall be provided to the Local Planning Authority on request.

Reason: To monitor air quality in accordance with Policy EN13 of the adopted Cardiff Local Plan (2006-2026).

The developer's appointed consultants have installed automatic air monitoring units at various locations along the access road measuring nitrogen dioxide and particulate matter as well as implementation of a diffusion tube monitoring program. Monthly reports are issued displaying data collected in this area and can be found at the following link, https://velindre.nhs.wales/transforming-cancer-services/news/tcs-news/air-quality/air-quality-documents/

The enabling works for the Velindre cancer centre have now been completed. Air quality monitoring will continue at the relevant locations to ensure there is no adverse impact on local air quality due to construction of the centre.

Subject - 24/02986/VAR Temporary construction access route to the site of the approved Velindre Cancer Centre. Variation of Condition 1 (Vehicular Use Timeframe) of 22/02280/FUL to amend the approved scheme to allow a further 12 months of vehicular use of the temporary road (until 30th November 2027) to align with the construction programme.

The Shared Regulatory Services (SRS) Environment Team have reviewed the application for air quality impacts. An addendum to the existing air quality assessment has been produced to support the application for an amendment to the existing planning permission. This amendment seeks to extend the use of the Temporary Construction Access Route (TCAR) by an additional 12 months to November 2027.

The assessment provides air quality data for relevant pollutants gathered since the TCAR has been use, in addition to local air quality monitoring data obtained by the council. To confirm the data provided by the applicant, Shared Regulatory Services have reviewed air quality data from their indicative automatic sensor installed in the area. It is evident that pollutant concentrations are well within the relevant objective limits at all automatic and non-automatic monitoring locations. It is also important to note that the majority of monitoring locations are installed at the kerbside close to the road. This indicates that annual air quality

concentrations will be much lower at residential building façades where annual air quality objectives apply.

It is understood that there will no change to the proposed construction traffic as part of this planning application and only an extension to the TCAR until November 2027 is being applied for. It is therefore concluded that there is not expected to be any change to the potential impacts as previously assessed. Therefore, Shared Regulatory Services have no objections regarding the application.

3.2 Industrial / Fugitive or Uncontrolled Sources / Commercial Sources

Inland Revenue Buildings, Ty-Glas Road Demolition

An application for a demolition project for the Inland Revenue Buildings, Ty-Glas Road was received in 2023. To accompany the application, a detailed Air Quality Dust Management Plan (AQDMP) was submitted. This management plan included an assessment is based on the principles provided within the Institute of Air Quality Management (IAQM) Guidance on the assessment of dust from demolition and construction [9]. This guidance is considered industry standard for the assessment and mitigation of dust impacts related to demolition and construction. Listed within the assessment are various mitigation measures related to dust abatement, dust and particulate monitoring, and dust nuisance reporting during the period of demolition.

The report recommended a trigger level of 190µg/m^3 is set as a 1 hour mean for concentrations of PM_{10} close to construction sites. Where the site threshold for PM_{10} is being significantly breached, developers should stop work immediately and ensure best practice measures are in place before restarting. When the trigger level is exceeded, alerts will be sent to the Site Manager. An internal amber PM_{10} alert will be set at 150 ug/m^3 (15-minute mean). SRS have reviewed PM_{10} data during the period of construction and have concluded that the trigger level set within the AQDMP has not been breached. Concentrations at the

[9] https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf

monitored locations are also within the relevant air quality objectives for PM_{10}, despite these monitoring locations being at the boundary of the demolition site.

3.3 Other Sources

Domestic Wood Burners

Previous reports have confirmed that there are no known areas in Cardiff where coal or solid fuel burning provides a significant level or primary household heating. Nothing has changed in this regard since the 2023 APR, despite the potential for increasing popularity of solid fuel heating with increased fossil-fuel prices, and there is no need to consider this further at this time.

It should be noted that the Council receives a number of enquiries each year from residents in respect of national or local requirements were they to wish to install log-burners or similar appliances in their homes. There are no smoke control areas in Cardiff and hence no legal requirements with regard to appliances that may be installed. However, residents are always reminded of the legislation in respect of statutory smoke nuisance and, where they can't be persuaded otherwise for reasons of air quality and health, are recommended to seek out an appliance certified for use in a smoke control area.

SRS on behalf of Cardiff Council can confirm that there are no areas of significant domestic fuel use in the Local Authority area.

4 Policies and Strategies Affecting Airborne Pollution

4.1 Local / Regional Air Quality Strategy

SRS on behalf of Cardiff Council have coordinated and developed a Clean Air Strategy (CAS) & Action Plan document. The document outlines a citywide approach to mitigate poor air quality in Cardiff and recognises that interventions to address poor air quality cannot be utilised and implemented locally. Therefore, citywide measures need to be put into practise to hopefully provide citywide improvements to air quality.

The document fulfils the requirements of the LAQM process to produce an Air Quality Action Plan (AQAP). The document also captures the Direction given to CC in March 2018 by WG for Cardiff to address its air quality concerns along highlighted major road networks.

An updated AQAP is due to be published in 2025.

4.2 Air Quality Planning Policies

Cardiff's LDP 2006-2026, forms the basis for decisions on land use planning in Cardiff up to 2026 and assumes that, within the plan's time frame, approximately 40,000 new jobs and 41,100 new dwellings will be developed in Cardiff as a direct response to Cardiff's role as the economic driver of the City- region.

In addition to its independent examination, the LDP was subject to a Strategic Environmental Assessment (SEA) to ensure that the policies reflect sustainability principles and consider environmental impacts.

Policy KP2 of the LDP allocates 8 Strategic Sites to help meet the need for new dwellings and jobs. These strategic allocations on both greenfield and brownfield sites will include 500 homes or more and/or include significant employment/mixed uses which will bring significant benefits to the city. The sites are:

(i) Cardiff Central Enterprise Zone;

(ii) Former Gas Works, Ferry Road;

(iii) Northwest Cardiff;

(iv) North of Junction 33 on the M4;

(v) South of Creigiau;

(vi) Northeast Cardiff (West of Pontprennau);

(vii) East of Pontprennau Link Road; and

(viii) South of St. Mellons Business Park – Employment Only.

The LDP identifies that sustainable transportation solutions are required in order to respond to the challenges associated with new development by setting out an approach aimed at minimising car travel, maximising access by sustainable transportation and improving connectivity between Cardiff and the wider region.

The Plan sets out a strategy to achieve this by making the best use of the current network, managing demand, and reducing it where possible by widening travel choices. The aim is to secure a modal split of 50% car and 50% non-car modes.

The following LDP policies are of relevance to air quality;

KP8: SUSTAINABLE TRAVEL

For Cardiff to accommodate the planned levels of growth, existing and future residents will need to be far less reliant on the private car. Therefore, ensuring that more everyday journeys are undertaken by sustainable modes of transport, walking, cycling and public transport, will be essential.

Development in Cardiff will be integrated with transport infrastructure and services in order to:

i. Achieve the target of a 50:50 modal split between journeys by car and journeys by walking, cycling and public transport.

ii. Reduce travel demand and dependence on the car;

iii. Enable and maximise use of sustainable and active modes of transport;

iv. Integrate travel modes;

v. Provide for people with particular access and mobility requirements;

vi. Improve safety for all travellers;

vii. Maintain and improve the efficiency and reliability of the transport network

viii. Support the movement of freight by rail or water; and

ix. Manage freight movements by road and minimise their impacts.

KP14: HEALTHY LIVING

Cardiff will be made a healthier place to live by seeking to reduce health inequalities through encouraging healthy lifestyles, addressing the social determinants of health and providing accessible health care facilities. This will be achieved by supporting developments which provide for active travel, accessible and useable green spaces, including allotments.

KP18: NATURAL RESOURCES:

In the interests of the long-term sustainable development of Cardiff, development proposals must take full account of the need to minimise impacts on the city's natural resources and minimise pollution, in particular the following elements.....minimising air pollution from industrial, domestic and road transportation sources and managing air quality.

EN13: AIR, NOISE, LIGHT POLLUTION AND LAND CONTAMINATION

Development will not be permitted where it would cause or result in unacceptable harm to health, local amenity, the character and quality of the countryside, or interests of nature conservation, landscape or built heritage importance because of air, noise, light pollution, or the presence of unacceptable levels of land contamination.

C6: HEALTH

Priority in new developments will be given to reducing health inequalities and encouraging healthy lifestyles through:

i. Identifying sites for new health facilities, reflecting the spatial distribution of need, ensuring they are accessible and have the potential to be shared by different service providers; and

ii. Ensuring that they provide a physical and built environment that supports interconnectivity, active travel choices, promotes healthy lifestyles and enhances road safety.

The LDP also outlines the approach the Council will take to increase the proportion of people travelling by sustainable modes and to achieve the 50:50 modal split target. This will involve:

- enabling people to access employment, essential services and community facilities by walking and cycling through, for example, high quality, sustainable design, and measures to minimise vehicle speed and give priority to pedestrians and cyclists;
- developing strategic bus and rapid transit corridor enhancements and facilitating their integration with the wider transport network;
- facilitating the transfer between transport modes by, for example, improving existing interchanges and developing new facilities such as strategically located park and ride facilities; and
- maximising provision for sustainable travel within new developments and securing infrastructure investment which can support modal shift within existing settlements.

4.3 Local Transport Plans and Strategies

The Transport White Paper was launched on 15 January 2020 and lays out an ambitious 10- year plan to tackle the climate emergency, reduce congestion and improve air quality. It includes proposals for developing the Southeast Wales Metro, including new Metro lines connecting new and existing communities in the city, Rapid Bus Transport, Active Travel and improvements to our streets and the future of the car, including reducing car ownership through car clubs and greening through the expansion of EV charging infrastructure. Key regional projects are identified, with significant improvements proposed for all the major routes into the city. It also outlines the intention to consider all delivery options and to work with Welsh Government to develop a comprehensive investment plan. The timescale for the White Paper was amended in line with ongoing developments in relation to the Clean Air Plan to ensure alignment. The document is available at;

https://www.cardiff.gov.uk/ENG/resident/Parking-roads-and-travel/transport-policies-plans/transport-white-paper/Documents/White%20Paper%20for%20Cardiff%20Transport%202019.pdf

Bus Priority Strategy

We want to make it easier, safer, and cheaper for people to walk, cycle, or use public transport in Cardiff. COVID-19 changed our travel habits. There are still fewer people travelling by bus than before the pandemic.

We know people want a faster and more reliable bus service. We have developed a strategy that sets out how we will deliver key changes to help bus operators to run higher quality bus services and encourage more people to choose bus travel.

We have developed the strategy around 6 objectives. They outline our ambition for the city and how we want to deliver better outcomes for residents and bus service providers.

Our 6 objectives are:

- Faster and more reliable bus services.
- Attract more funding for bus priority measures.
- More accessible services that are easier to use.
- Better integration between each bus service, and with rail, light rail (trams), and bus.
- Bus routes and stops designed to complement walking and cycling facilities.
- More accessible and real time information to make journey planning easier.

We know there is limited highway space, and all types of transport cannot be prioritised on all routes. We have identified the routes that carry 80% of all bus passengers and are congestion hot spots. These are where bus reliability is most important. We call these routes corridors.

Bus travel will take priority over other types of transport at these locations.

The 6 corridors are:

- Western Bus Corridor
- UHW to International Sports Village – Cross-City Bus Corridor
- Eastern Bus Corridor
- Southern Bus Corridor
- Northern Bus Corridor
- Roath – North-East Cardiff Bus Corridor

A public consultation was undertaken in 2024. A consultation report based on the responses to the survey will be produced. If appropriate, changes to the bus priority strategy will be

made. Further projects will be created as a result of the strategy and will be consulted on in the local area.

Further information on the Bus Priority Strategy can be found at the following link Bus priority strategy.

4.4 Active Travel Plans and Strategies

The Active Travel Network Map shows existing and future routes for walking and cycling that will help residents travel around the city more easily. We have done this in order to meet the requirements of the Active Travel (Wales) Act 2013.

The future routes shown on the map are proposals to be introduced over the next 15 years. The map will be used to decide which walking and cycling transport schemes will be prioritised for design and implementation.

The existing routes have been audited to show that they meet the standards required by the Welsh Government Active Travel Design Guidance. Other routes for walking and cycling are available in Cardiff but only those which meet these standards are shown on the map.

Following the 2021 public consultation, the council revised the Active Travel Network Map which was approved by Welsh Government in December 2022.

Further details can be found at the following link https://www.cardiff.gov.uk/ENG/resident/Parking-roads-and-travel/transport-policies-plans/Active-Travel-Network-Map/Pages/default.aspx

Roath Park Cycle Route (Phase 1) – Roath Recreation Ground Improvements

In 2024, work commenced for a new cycle route from the city centre to the Roath Park area.

The route will provide key benefits such as:

- promoting sustainable and active travel to school,
- employment, and
- connections to public transport.

The route will connect to other cycle routes in the future.

Phase 1 will provide a new segregated cycleway and upgraded footpaths in Roath Recreation Ground between the junction of Wellfield Road and Alder Road.

The scheme also includes:

- Improvements to the junction of Wellfield Road, Marlborough Road, Penylan Road, and Ninian Road by upgrading crossing points, a cycle crossing and changes to the signal phasing.
- Replacing the priority narrowings on Ty Draw Road with 4 ramped pedestrian crossing points.
- Improvements to bus stops and a new northbound bus stop on Ninian Road.
- Changes the Penylan Community Centre car park to make space for the cycleway.
- Improving the zebra crossing at the Pen-y-Wain Road junction and shared footway for pedestrians and cyclists towards Roath Park Primary School.
- Upgrading the footpath around the playing field and gym equipment.
- Changes to the zebra crossing at the Alder Road junction and stop through traffic on Alder Road.

You can find out more about the Roath Park cycle route scheme from the project consultation information.

4.5 Local Authorities Well-being Objectives

In 2015 Welsh Government made a new law called the Well-being of Future Generations (WFG) (Wales) Act. The new law has the sustainable development principle at its heart. This means that we need to work in a way that improves wellbeing for people today without doing anything that could make things worse for future generations. There are seven

national well-being goals that form the basis of the Act and five ways of working which support the goals.

CC adopts the principles of The Well-being of Future Generations (Wales) Act 2015. The Act is a significant enabler to improve air quality as it calls for sustainable cross-sector action based on the principles of long-term, prevention-focused integration, collaboration, and involvement. It intends to improve economic, social, environmental, and cultural well-being in Wales to ensure the needs of the present are met without compromising the ability of future generations to meet their own needs.

Under the WFG Act the Cardiff Public Services Board (PSB) has produced its Well-Being Plan for 2018- 2023, which sets out the Cardiff PSB's priorities for action over the next 5 years, and beyond. The Plan contains Well-being Objectives, high-level priorities that the Cardiff PSB have identified as being most important. It also contains 'Commitments,' or practical steps that the city's public services, together, will deliver over the next 5 years. The Well-Being Plan has set out Well-Being Objectives as follows:

- **Objective 1** - A Capital City that Works for Wales;
- **Objective 2** - Cardiff grows in a resilient way;
- **Objective 3 -**Safe, Confident and Empowered Communities
- **Objective 4** - Cardiff is a great place to grow up;
- **Objective 5** - Supporting People out of poverty;
- **Objective 6** - Cardiff is a great place to grow older; and
- **Objective 7 -**Modernising and Integrating Our Public Services

Within the Well-Being Plan Objective 2 details the following: *Cardiff is one of Britain's fastest growing cities and is by far the fastest growing local authority area in Wales. Successful cities are those in which people want to live, and this growth is welcomed and a sure sign of strength for the city. However, this growth will bring challenges too, putting pressure on both the city's physical infrastructures, community cohesion, its natural environment, and public services. Managing the impacts of this population growth and of climate change in a resilient and sustainable fashion will be a major long-term challenge for Cardiff.*

Improving levels of NO_2 and particulate matter (PM_{10}, $_{2.5}$) is a City level outcome indicator that the PSB will seek to impact in order to meet this specific Objective. The Plan forecasts a future Cardiff with improved air quality and has committed to taking 'a *city-wide response to air pollution through supporting the development and delivery of a Cardiff Clean Air Strategy.*

4.6 Green Infrastructure Plans and Strategies

Outlined in Cardiff's Local Development Plan (LDP) 2006- 2026, Policy **KP16** focuses upon Green infrastructure.

Policy KP16 Green Infrastructure

The policy aims to ensure that Cardiff's green infrastructure assets are strategically planned and delivered through a green infrastructure network. Other policies in the Plan provide more detailed guidance on aspects of these assets, together with supporting SPG.

Where development is permitted, planning conditions and/or obligations will be used to protect or enhance the natural heritage network.

New developments should incorporate new and / or enhanced green infrastructure of an appropriate size, type and standard to ensure no fragmentation or loss of connectivity.

Where the benefits of development outweigh the conservation interest, mitigation and/or compensation measures will be required to offset adverse effects and appropriate planning obligations sought. The implementation of policies designed to provide and protect public open space throughout Cardiff would also serve to offset any increase in recreational pressure on the Cardiff Beech Woods SAC, thereby helping to avoid likely significant effect upon that site.

Management of Cardiff's green infrastructure network should be in place prior to development, and appropriate planning obligations sought. SPG on this topic will more fully outline the extent of Cardiff's green infrastructure and how this policy can be implemented in more detail.

As previously mentioned, a new Supplementary Planning Guidance (SPG) concerning Green Infrastructure was approved in 2017 by CC to provide a detailed understanding to the elements raised in the LDP.

- This document provides planning advice on a number of areas relating to development and the environment, including protection and provision of open space, ecology and biodiversity, trees, soils, public rights of way, and river corridors.
- The new document also differs from previous SPGs by providing more in-depth design advice, aimed at giving developers a clearer understanding of the approach expected when submitting designs for new developments. By having this information up-front developers are better able to provide suitable designs to the Council through the planning process.

4.7 Climate Change Strategies

The Welsh Government has enacted legislation aiming to achieve Net Zero Wales by 2050, with the public sector setting the standard by being Net Zero by 2030. We acknowledge the leadership role in facilitating broader Net Zero for businesses and communities in the county, and as an organization, we have committed to the Net Zero 2030 target. Air quality and its associated effects on human health can be improved by projects aimed at lowering carbon emissions.

The council have various projects to address climate issues, these include;

Electric Vehicle Charging Points

Up to 100 new electric vehicle charging points could be installed with Cardiff Council support over the next two years.

The plans are part of a newly published ‘Electric Vehicle Infrastructure Roadmap' to help aid the transition to electric vehicles, which also sets out the local authority's plan to focus initially on supporting public EV charging in areas with low levels of off-street parking including Heath, Gabalfa, Cathays, Roath, Penylan, Adamsdown, Riverside, Canton, Grangetown and Butetown.

The roadmap forms part of the council's One Planet Cardiff response to climate change, which aims to reduce the 1.6 million tonnes of carbon emissions created in the city every year, 41% of which currently come from transport.

The new chargers will be predominantly standard chargers (7kW) and some fast chargers (up to 50kW). They will be delivered, operated and maintained at no net cost to the council, in partnership with the private sector through a competitive tendering process. The intention is to install these ‘on street' or in local car parks.

In tandem with the Councils work it is expected that the number of commercial public sites will continue to grow significantly across the city, leading to in the region of 600-700 charge points in 2025/2026 - up from the current figure of around 200 publicly accessible electric vehicle charging points today.

Lamby Way Solar Farm

Lamby Way solar farm produces 9mw (megawatts) of green electricity. That is enough to power 2,900 homes. It can be a challenge to make space for energy generation in a dense city like Cardiff. To tackle this, the solar farm is on an old landfill site.

As well as reducing Cardiff’s greenhouse gas emissions, the project has increased biodiversity by sowing wild plant seeds and providing refuges for the rare reptiles, bats, and birds that inhabit the site

Radyr Weir Hydro Scheme

The Taff Trail is one of Cardiff’s oldest active travel routes and is now home to an innovative hydroelectric power station. The hydro scheme produces almost half a megawatt of green electricity. That is enough to power 550 homes.

The hydro scheme uses water from the River Taff to turn 2 Archimedes screw turbines. The turbines create the power. We continually work on the hydro scheme to make sure we maximise energy generation.

Maintaining the health of the river is also a key focus. The hydro scheme uses fish pass technology to make sure the fish migratory routes are not disrupted.

Urban Forest

Coed Caerdydd is a 10-year programme of tree planting. The aim is to increase Cardiff's tree cover from 18.9% to 25% of the city's land area.

82,000 trees have already been planted across 280 sites with help from multiple council departments and almost 3,000 volunteers. Examples of the sites are:

- Trelai Park in Caerau
- Coed Glas Primary School in Llanishen
- Heol Danyrodyn verges in Pentyrch

These trees will take around 2,540 tonnes of carbon dioxide out of the atmosphere over the next 100 years. They will also provide shade and habitat for wildlife and improve flood resilience. Green infrastructure improves air quality by reducing exposure to and removing pollutants such as NO_2 and particulate matter.

Network of Segregated Cycleways

Active travel is a key part of Cardiff's ambition to create a greener and healthier city. We have built 7 miles of separated cycleways to encourage people to choose active travel.

Separated cycleways are built away from the road which helps cyclists feel safe whilst travelling.

Once the network is completed, it will be much easier to cycle throughout the city and beyond. The cycleways will connect with public transport hubs, such as bus and train stations.

Local Area Energy Plan

Welsh Government have funded the production of Local Area Energy Plans for all councils in Wales. The Cardiff LAEP is an advisory document that outlines a vision for what net-zero carbon energy could look like in 2050. Some of the key targets are to install:

- Energy efficient and insulation measures in 91,000 homes,
- 160,000 heat pumps in domestic and commercial properties to move away from gas as a heat source,

- 26,000 electric vehicle charging points for public use and for householder use,
- Rooftop solar panels on 100,000 properties to generate 510mw (megawatts) of power,
- Ground solar farms to generate 120mw of power,
- Wind turbines to generate 19mw of power.

5 Conclusion and Proposed Actions

5.1 Conclusions from New Monitoring Data

Monitoring data for 2024 indicates that annual mean concentrations of nitrogen dioxide recorded at sites of relevant exposure within the already established AQMAs are compliant with the annual mean NO_2 Air Quality Standard (40µg/m³).

SRS will continue to monitor and review results in across Cardiff. It may be feasible to consider revoking Ely Bridge, Stephenson Court, and City Centre AQMAs due to continued compliance with the annual mean NO_2 Air Quality Standard (40µg/m³) dependant on results in 2025.

All other monitoring sites remain compliant with the relevant objectives in 2024.

The Air Quality Action Plan for Cardiff is due for renewal or the potential replacement with an Air Quality Strategy (AQS) in 2026. Currently, three of the four AQMA's for Cardiff are suitable for revocation due to continued compliance with the annual objective limit for NO_2 with three consecutive years of NO_2 concentrations well below 10% of the annual objective (below 36 µg/m^3). The fourth AQMA, Llandaff, will be due for revocation in 2026. This is dependent on the NO_2 result for 2025. It is likely that given the annual trends since 2022, and the NO_2 data to date in 2025, that the annual concentration for 2025 will be well below the specified concentration of 10% below the annual objective limit to justify revocation.

Before the decision is made to revoke any AQMA, detailed assessments for projected air quality concentrations within each Cardiff AQMA will be undertaken. This will allow for robust justification for the potential revocation of AQMAs within Cardiff before any formal decision is made.

If all AQMAs are found to be suitable for revocation, an AQS will replace the existing CASAP document. An AQS will present the evidence base around current and future air quality trends in Cardiff, outlining the need for continued action to ensure that the authority is identifying and taking advantage of every feasible opportunity to further safeguard human and environmental health across the city. The AQS will be developed working closely with CC and relevant stakeholders, as well as through engagement with Cardiff residents if desired.

5.2 Conclusions relating to New Local Developments

SRS on behalf of Cardiff Council will continue to work with developers and consultants to ensure that planning applications consider and minimise the operational air quality impacts of proposed developments. This is achieved through the request and review of Air Quality Assessments (AQA's), and in the case of demolition and construction related air quality impacts, the review of any mitigation measures listed within AQA's, or Construction Environmental Management plans (CEMP's) related to construction traffic or dust management.

5.3 Other Conclusions

The implementation of COVID measures in the City Centre accelerated the Council's achievement of compliance with limit values for NO_2 under the Ambient Air Quality Directive, on Castle Street. The Interim implementation of the Castle Street Scheme as approved by Welsh Government, was completed at the end of October 2021. The Council has ensured ongoing monitoring has been undertaken.

A final scheme plan for Castle Street was approved by the Deputy First Minister in his letter dated 4th November 2024 and this included confirmation of funding award for the initial preparatory revenue costs of £262k in 2024-25, and consideration of further funding award of up to, but not exceeding, £7.292m.

The Council is now in the stages of tendering for the works, with a proposed construction start date in early 2026.

During the construction work air quality monitoring will be undertaken to assess any potential distributional impacts on the City Centre network that may temporarily occur, as a result of the construction of the scheme. It is likely that works may overlap with the Phase 1 of the Crossrail works around Callaghan Square, and therefore these measures will be essential to assess any short-term air quality impacts

5.4 Proposed Actions

As a result of the information provided herein, it is proposed to -

1. Deliver and implement the proposed mitigation measures quantified within the Clean Air Plan;
2. Continue monitoring within and around the existing AQMAs and other areas of concern. The diffusion tube network appointed by SRS on behalf of Cardiff Council will be reviewed and an assessment on locations made.
3. Carry out detailed assessments of AQMAs to investigate the feasibility of revoking AQMA orders.
4. Review the Realtime indicative Monitoring Network.
5. Continue to drive Air Quality as a major aspect to be considered during any planning applications.
6. Submit an Annual Progress Report (APR) in 2026; and
7. Update the existing Clean Air Strategy and Action Plan / Air Quality Strategy to represent most recent actions in 2024/2025.

References

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Cardiff Active Travel Active Travel Network Map

Office for National Statistics Home working by region and month UK April 2017 to March 2023 - Office for National Statistics

One Planet Cardiff One Planet Cardiff

Public Health Wales – Air Pollution Fact Sheet https://phw.nhs.wales/services-and-teams/environmental-public-health/air-quality/air-pollution-and-health-fact-sheet/

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Appendices

Appendix A: Monthly Diffusion Tube Monitoring Results

Appendix B: A Summary of Local Air Quality Management

Appendix C: Air Quality Monitoring Data QA/QC

Appendix D: AQMA Boundary Maps

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

Table 15 - Full Monthly Diffusion Tube Results for 2024 (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m³)												Simple Annual Mean (µg/m³)		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.87) and Annualised	Distance Corrected to Nearest Exposure
16	317040	176060	32.7	29.2	31.6	21.6	23.1	18.1	21.1	19.2	21.3	20.8	32.4	25.6	24.7	21.5	-
258	317760	175310	46.0	35.5	26.9	30.5	25.5			26.0	28.7	32.9	40.2	14.7	30.7	26.7	-
58	317937	176400	37.6	43.4	34.8	33.6	32.2			29.0	29.7	30.1	41.9	29.5	34.2	29.7	-
81	319387	176980	32.6	33.0	28.3	25.7	26.0	22.9	22.6	12.5	29.4	29.2		18.5	25.5	22.2	-
86	318452	178805	28.6	32.6	33.0	31.5	25.8	26.5	26.7	24.9	28.1	17.2	32.0	27.0	27.8	24.2	-
96	316601	179653	29.8	26.5	28.1	23.0	24.5	19.0	19.8	18.9	22.2	29.8	32.9	11.3	23.8	20.7	-
98	314805	177345	32.9	28.1	24.4	22.5	21.0			16.0	21.6		29.1	18.2	23.8	20.7	-
99	315275	178117	37.3			23.2	28.1	17.5	18.4	18.0	26.5	25.7	34.6	16.7	24.6	21.4	-
259	319201	178031	35.9	29.0	22.1	24.7	21.3	15.8	17.6	18.1	15.5	21.7	35.7		23.4	20.3	-
260	316847	176762	33.4	19.5	22.1	18.1	15.3	12.4	13.4	15.3	16.3	20.8	28.5	20.4	19.6	17.1	-
264	313142	177870	16.7	12.9	11.8	11.0	6.9	5.8	5.6	6.0		14.1	16.7	8.9	10.6	9.2	-
106	316851	179520	31.0	30.7	29.4	23.5	20.8	16.2	18.7	19.3	19.4	21.9	35.0	24.3	24.2	21.0	-
112	316613	175910	33.3	25.6	25.3	21.6	21.9	13.2	17.3	16.2	24.0	19.1	23.5	9.6	20.9	18.2	-
115	316604	176641	34.7	32.8	31.8	25.8	25.8	21.5	21.0	22.6			27.6	23.6	26.7	23.2	-
117	314458	176735	42.4	31.3	37.4	29.2	35.1		24.7	20.3	32.4	36.4	40.6	30.2	32.7	28.5	-
126	317946	176387	31.1	33.1	24.0	21.3	25.8	17.9	19.6	18.1	23.6	23.7	30.4	12.6	23.4	20.4	-
128	317540	175979	34.4	36.0	33.4	29.1	24.8	18.7	22.0	23.4	22.9	31.8	42.3	9.1	27.3	23.8	-

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m³)												Simple Annual Mean (µg/m³)		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.87) and Annualised	Distance Corrected to Nearest Exposure
131	319292	176932	36.3	37.4	27.8	28.0	27.1	22.4	25.5	25.6	29.5	28.7	33.1	18.3	28.3	24.6	-
143	318009	176337	31.6	32.6	26.9	23.1	27.5	18.8	22.9	22.3	19.3			24.7	25.0	21.7	-
144	318046	176307	34.6	40.7	30.6	30.3	28.8		27.5	29.1	19.1	30.3		25.0	29.6	25.7	-
147	317636	175161	33.6	31.2	26.1	20.9	23.0	14.4	17.3	16.3	22.0	30.3	30.4	27.6	24.4	21.2	-
271	320401	177212								34.0			45.2	30.4	36.5	29.8	-
149	317764	175174	35.3	35.1	29.7	26.1	27.8	24.6	25.6	22.2	26.0	27.7	35.1	26.2	28.5	24.7	-
156	317997	177412	31.5	21.8	21.3	20.5	20.9			12.6	22.3	27.2		13.1	21.2	18.5	-
157	316605	179703	30.4	18.4	21.6	19.3	17.5	13.5	16.6	14.5	15.4	21.9	23.8	22.2	19.6	17.0	-
158	318093	177716	28.7	25.7	22.5	19.5	18.7	11.1		14.6	20.6		33.3		21.6	18.8	-
159	320709	177918	39.7	30.5	35.6	24.5	31.0	14.7	25.1	22.9	23.3		36.5	22.3	27.8	24.2	-
166	315950	176424	33.9	34.2	28.6	25.3	23.9		21.4	22.4	20.2	24.5	34.2	13.2	25.6	22.3	-
168	314856	176929	27.8	28.4	21.6	21.1	23.5	17.8	16.1	17.2	27.1			19.4	22.0	19.1	-
174	317508	177868	30.4	28.4	24.1	20.4	22.2	14.0	12.7	13.3	20.5	29.3	29.3	24.7	22.4	19.5	-
179	318627	176039	41.4	46.4	36.3	40.2		38.5	37.2	24.9	25.7		50.9	35.8	37.7	32.8	-
183	318765	176623	29.6						18.2	17.2	21.9	31.5	43.7	27.9	27.1	21.8	-
184	318335	176074	34.0	34.0	33.2	29.9	31.0	10.5	24.4	23.9		37.0		19.0	27.7	24.1	-
186	318044	176449	39.5	47.1	34.4	35.8	34.6	26.7		28.1	27.9		46.8	18.5	33.9	29.5	-
187	317944	176436	37.6	38.0	36.7	32.7			26.2	26.9	27.3	37.9	42.2		33.9	29.5	-
188	318229	176154			31.2	28.2	31.1	22.4	22.7		28.5	36.0	39.9		30.0	27.1	-
191	318724	177776	34.2	32.5	27.6	27.2	23.1	19.3							27.3	23.9	-

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m³)												Simple Annual Mean (µg/m³)		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.87) and Annualised	Distance Corrected to Nearest Exposure
194	313870	176212	26.9	24.6	17.6	16.0	18.1	14.4	14.5	13.1	19.8	21.2	23.2	20.0	19.1	16.6	-
195	320147	177523	34.1	28.0	30.2	21.8	22.8	17.1	18.2	18.2	19.6	27.7	35.2	28.7	25.1	21.9	-
196	316223	177305	31.5	25.9	21.9	22.3	19.6	14.0	16.0	13.0	20.5	27.1	30.3	24.5	22.2	19.3	-
198	319348	176958	33.7	29.5	24.1	23.0	24.8	22.6	16.9	23.6	26.2	26.2	37.1	20.7	25.7	22.3	-
199	319599	177174	31.3	28.6	18.1	19.9	18.0	15.4	14.9	14.1		22.4	30.0	14.1	20.6	17.9	-
200	317038	179073	35.4	35.1	28.3	28.1	24.7	21.0	21.5	24.1	29.3		37.5	26.7	28.3	24.6	-
201	317547	176411	35.1	28.3	30.5	25.4	26.2	16.3	17.5	16.5	25.5	27.5	38.6	29.3	26.4	22.9	-
202	317604	176053	30.5	22.8	31.5	25.1	28.2	18.3	20.0	20.4	20.1	31.4	34.8	26.7	25.8	22.4	-
203	318255	178533	25.0	20.9	17.4	15.7	14.5	10.2	11.9	13.0		19.0	25.6	14.9	17.1	14.9	-
204	317487	176303	30.8	23.1	20.6	17.3	17.9	10.6	10.9	12.6	14.5	23.6	28.5	20.3	19.2	16.7	-
207	314769	177343	25.4	22.2	16.3	16.2	17.6	13.6	12.6	13.2	16.5	19.2	25.9	15.9	17.9	15.6	-
208	315152	178245	35.8	26.1	29.2	30.4	16.2	15.1		17.2	13.2	18.1	27.2	16.9	22.3	19.4	-
209	317200	178537	28.5	18.3	19.5	17.9	17.9	12.7	13.6	12.5	18.8	22.9	22.3	19.1	18.7	16.2	-
210	316692	181088	23.2	21.4	16.7	16.5			13.2						18.2	15.2	-
211	320247	178903	24.3	24.4	20.6	13.6	15.4	11.9	12.3	14.2	14.7	23.4	27.5	19.5	18.5	16.1	-
212	315197	178221	28.6			32.3		27.0	30.2			39.9	42.5	19.5	31.4	25.4	-
214	315254	178153	31.3	25.5	23.7	21.6	28.7	23.2	22.9	20.8	24.9	33.6	35.7	24.2	26.3	22.9	-
218	314467	176767	40.5	41.7	30.0	32.4	30.9	27.5	26.6	23.8	32.7	30.6	35.1	25.7	31.5	27.4	-
254	317523	176548	41.4	37.1	36.6	25.8	30.3	25.9	24.2	26.4	25.6	31.0	34.6	28.8	30.6	26.6	-
220	318928	176683		37.8	30.7	30.4	28.8	20.0	24.1	22.5	24.9		31.4	29.3	28.0	24.3	-

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m³)												Simple Annual Mean (µg/m³)		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.87) and Annualised	Distance Corrected to Nearest Exposure
221	318530	177468							24.0	23.9	25.4			18.7	23.0	26.2	-
190	319056	177343	32.3	25.4	26.4	20.3	19.3		16.8	15.5	19.7	29.8	30.6	25.0	23.7	20.6	-
224	315714	177740	23.4	19.1	16.8	15.4	16.8	12.9	11.8	12.9	15.4				16.1	14.0	-
243	315318	178044	38.4	32.1	34.8	27.4	26.1	20.8	25.4	27.8	21.6		36.5	27.8	29.0	25.2	-
244	314963	178846	25.6	26.5	15.5	17.7	18.0	15.2	14.6	14.1	17.8	21.2	26.0	13.5	18.8	16.4	-
245	321006	179081	24.8	17.6	15.1	16.9	11.6	11.3	11.3	11.1	13.1		23.9	15.1	15.6	13.6	-
263	319715	174791	24.9	16.0	16.1	15.3	15.1	13.1	13.1	15.0	20.3	16.7	27.2	19.7	17.7	15.4	-
266	312857	180734		7.3	10.0	11.7	6.6	7.0	8.2	8.4	6.9	11.4	16.2	3.9	8.9	7.7	-
262	316593	176728	17.6	18.3	14.1	17.2	16.9	11.8	13.9	12.9	13.7	25.9	30.9	19.2	17.7	15.4	-
249	318201	180367	20.0	17.1	16.6	12.8	12.8	9.7	11.1	10.0	16.1	19.3	30.0	17.4	16.1	14.0	-
250	313244	176769	15.3	0.6	30.3	29.5	28.3	22.7	21.6	21.4	27.8	35.0	40.5	15.7	24.1	20.9	-
251	313244	180367	24.1	19.7	18.1	18.5	10.7	10.0	9.6	9.6	11.9	18.4	22.7		15.8	13.7	-
255	318075	176462	39.4		62.0	38.2	32.8	30.3	32.2	30.9	30.6	38.7	48.0	24.3	37.0	32.2	-
256	318075	176462	42.0	42.7	34.4	36.8	36.3	29.3	31.5	31.1	27.5	40.6	48.6	31.8	36.1	31.3	-
257	314505	176769	35.7	42.0	35.2	33.2	33.4	26.9	31.4	29.0	25.3	35.8	46.4	20.5	32.9	28.6	-
192	314505	176769	24.3	44.0	31.4	32.0	33.0	25.0	25.6	23.6	28.2	30.4	39.1		30.6	26.6	-
265	317684	173479	20.6	23.4	19.8	15.5	15.9	10.9	12.8	14.2	15.1	21.8	24.5		17.7	15.4	-
270	315396	177897											38.2	12.2	25.2	21.9	-
267	317717	179220					16.3		24.6	27.3	27.0	31.8	37.5	33.0	28.2	25.1	-
268	317505	179230					24.4	25.1	16.8	17.2	17.4	25.2	31.0	19.3	22.1	20.5	-

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m³)												Simple Annual Mean (µg/m³)		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.87) and Annualised	Distance Corrected to Nearest Exposure
269	317375	179252							20.5	20.0	27.3	29.0	37.1	26.1	26.7	23.1	-
TRO-001	315621	180320	18.8	18.9	5.0	12.3				9.8	13.7				13.1	11.4	-
TRO-006	315497	180140	14.5			10.8		13.6		11.7	16.2	35.2	23.7		18.0	14.8	-
TRO-009	314022	178334	15.0	13.8	3.9	7.8	6.8	6.1	5.2	6.0	8.2	22.9	15.5	14.1	10.4	9.1	-
TRO-012	315209	177668	17.5	15.1	4.9	9.2	7.8	7.4	5.4	7.4	10.3	25.3	17.8	14.4	11.9	10.3	-
TRO-015	312734	175411	19.0	18.0	4.9	9.2	8.8						19.2	13.5	13.2	10.1	-
TRO-018	315801	176492	30.8	30.3	12.6	25.2	22.3	21.8		19.4	21.4	42.3	27.1	24.1	25.2	21.9	-
TRO-021	318945	175546	23.0	23.2	7.0	14.6	13.1	12.6	11.5	11.9	11.1	21.8	24.1	24.3	16.5	14.4	-
TRO-024	319283	176827	27.0	27.5	12.0	19.6	15.9	14.0	14.4	15.0	19.5	39.1	29.7	27.5	21.8	18.9	-
TRO-027	319327	177080	23.1	25.4	8.4	12.3		11.3	12.2			35.6	26.4	22.8	19.7	17.1	-
TRO-030	317855	178921	19.3	19.6	5.6	13.2	9.6		9.1	10.1	13.2	27.5	18.9	16.1	14.7	12.8	-
TRO-033	318898	180012	17.1	10.4	5.5		7.7	7.6	7.4	8.3	7.8		19.0	11.4	10.2	8.9	-
TRO-036	321834	180331	18.9	15.2		11.1	7.3	7.3	6.4	7.2	9.3		15.6	17.4	11.6	10.1	-
TRO-039	321834	181282	20.6	18.5	6.0	11.3	8.9	9.8	7.6	8.6	11.3	26.3	13.8	20.4	13.6	11.8	-
TRO-042	324529	180975	18.6	7.9	5.5	10.2	8.9		8.3	7.1	11.6	23.6	19.7		12.1	10.6	-
TRO-045	307967	181585	13.2	13.0	5.3	10.3	8.3	7.2	6.2	6.5	8.1	22.2	15.9	15.5	11.0	9.5	-
TRO-048	315825	181374	19.9	22.4	7.0	14.9	12.6	11.3	10.0	10.6	12.7	30.6	23.0	15.0	15.8	13.8	-
TRO-051	316150	175887		15.9	6.1	11.9	10.4	9.0		7.5	11.8	17.8	18.2	17.9	12.7	11.0	-
TRO-054	312883	178154	15.1	11.2	5.4	8.3		6.6	5.7	6.1			16.2	13.1	9.7	8.5	-
TRO-057	316823	176118	24.4	27.3	10.4	17.1	14.5	13.2	12.3	13.0	15.7	42.7	25.2	25.6	20.1	17.5	-

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m³)												Simple Annual Mean (µg/m³)		
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.87) and Annualised	Distance Corrected to Nearest Exposure
TRO-060	317758	174813	23.9	19.2	6.9	13.9	11.4	9.0		10.8	14.3	32.6	24.0	13.3	16.3	14.2	-
TRO-063	322244	182234		16.4							14.5	30.6	20.2	14.0	19.1	13.6	-

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m³ are shown in **bold**.

NO_2 annual means exceeding 60µg/m³, 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 B: A Summary of Local Air Quality Management

5.5 Purpose of an Annual Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in the Environment Act 1995, as amended by the Environment Act 2021, and associated government guidance. 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 being achieved. Where exceedances occur, or are likely to occur, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) within 18 months of declaration setting out the measures it intends to put in place in pursuit of the objectives. Action plans must then be reviewed and updated no later than every five years; or if a local authority considers there is a need for further or different measures to be taken in order to achieve air quality standards; or if significant changes to sources occur within your local area.

For Local Authorities in Wales, an Annual Progress Report replaces all other formal reporting requirements and have a very clear purpose of updating the general public on air quality, including what ongoing actions are being taken locally to improve it if necessary.

5.6 Air Quality Objectives

The air quality objectives applicable to LAQM in Wales are set out in the Air Quality (Wales) Regulations 2000, No. 1940 (Wales 138), Air Quality (Amendment) (Wales) Regulations 2002, No 3182 (Wales 298), and are shown Table 16.

The table shows the objectives in units of micrograms per cubic metre µg/m^3 (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedances in each year that are permitted (where applicable).

Table 16 - Air Quality Objectives Included in Regulations for the Purpose of LAQM in Wales

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as	Date to be achieved by
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean	31.12.2005
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean	31.12.2010
Particulate Matter (PM_{10})	40µg/m^3	Annual mean	31.12.2010
Sulphur dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
Sulphur dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
Sulphur dioxide (SO_2)	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	16.25µg/m^3	Running annual mean	31.12.2003
Benzene	5µg/m^3	Annual mean	31 12 2010
1,3 Butadiene	2.25µg/m^3	Running annual mean	31.12.2003
Carbon Monoxide	10.0mg/m^3	Maximum Daily Running 8-Hour mean	31.12.2003
Lead	0.25µg/m^3	Annual Mean	31.12.2008

Appendix C: Air Quality Monitoring Data QA/QC

5.7 QA/QC of Diffusion Tube Monitoring

The diffusion tubes are supplied and analysed by Socotec UK Ltd Didcot, using the 50% triethanolamine (TEA) in water method. Socotec UK Ltd Didcot participates in the Annual Field Inter-Comparison Exercise and Workplace Analysis Scheme for Proficiency (WASP) inter-comparison scheme for nitrogen dioxide diffusion tube analysis. From April 2014 the WASP Scheme was combined with the STACKS scheme to form the new AIR scheme, which Socotec UK Ltd Didcot participates in. The AIR scheme is an independent analytical proficiency testing scheme operated by LGC Standards and supported by the Health and Safety Laboratory (HSL).

The laboratory Socotec UK Ltd Didcot is regarded ranked as the highest rank of satisfactory in relation to the WASP intercomparison scheme for spiked nitrogen dioxide diffusion tubes. Information regarding tube precision can be obtained via http://laqm.defra.gov.uk/diffusion-tubes/precision.html Information regarding WASP results can be obtained via http://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html

Diffusion Tube Annualisation

14 diffusion tube sites required annualisation in 2024. Details for these sites are provided in Table 18. Annualisation is required for any site with data capture less than 75% but greater than 25%.

Diffusion Tube Bias Adjustment Factors

A local bias adjustment factor of 0.82 has been applied to the 2024 monitoring data. A summary of bias adjustment factors used over the past five years is presented in Table 17.

Obtaining a local bias adjustment factor was performed by carrying out a co-location study at Castle Street continuous automatic monitor. Triplicate diffusion tubes were sited next to the NOX inlet of the monitoring station. The diffusion tube results are then compared to those measured by the continuous monitor. Once all ratified annual data is obtained, a data check is carried out to check the precision of data. Precision is calculated based on the diffusion tube data only. Tube precision is categorised as good or poor. Good precision applies where the coefficient of variation (CV) of triplicate diffusion tubes for eight or more periods during the year is less than 20%, and the average CV of all monitoring periods is

less than 10%. Poor precision applies where the CV of four or more periods is greater than 20% and/or the average CV is greater than 10%. Details for this co-location study are presented in Table 19.

Table 17 - Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2024	Local	-	0.87
2023	Local	-	0.82
2022	Local	-	0.79
2021	National	03/22	0.78
2020	National	06/21	0.76

NO_2 Fall-off with Distance from the Road

No diffusion tube NO_2 monitoring locations within Cardiff required distance correction during 2024.

5.8 QA/QC of Automatic Monitoring

Local Site Operator duties are performed by officers within the Shared Regulatory Services Environment Team. Cardiff Newport Road and Cardiff Centre Automatic Urban Rural Network (AURN) sites are owned by DEFRA and managed by Bureau Veritas. SRS officers are contracted to visit these sites at fortnightly and monthly intervals to carry out calibrations. The AURN is the UK's largest automatic monitoring network and is the main network used for compliance reporting against the Ambient Air Quality Directives.

The Cardiff Castle Street automatic monitor is owned and managed by Cardiff Council. This monitor is calibrated fortnightly by an officer from the Shared Regulatory Services Environment Team.

Automatic monitoring data presented in this APR from the above monitors is ratified by Ricardo. Live and historical data is available at https://airquality.gov.wales/.

In addition to the network monitors, indicative monitors where also used in Cardiff in 2024. These monitors do not form part of the regulated Welsh automated monitoring network, but

as specified they are an indicative form of monitoring and a useful tool to look at datasets on a high-resolution basis. Prior to deployment, all candidate devices undergo a two week burn-in period on our calibration rig. Data is compared against gold-standard devices, which are routinely sent to be co-located at a local AURN site and calibrated accordingly. Once a deployment is complete, an internal review of the data is performed after a standard two-week bedding in period to ensure all the devices are working correctly. An AI model is used to correct for calibration drift whilst a device is co-located with a local AURN site for reference and to highlight drift issues.

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

The type of PM_{10} and $PM_{2.5}$ monitors utilised within Cardiff do not required the application of a correction factor.

Automatic Monitoring Annualisation

All automatic monitoring locations within Cardiff recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

NO_2 Fall-off with Distance from the Road

No automatic NO_2 monitoring locations within Cardiff required distance correction during 2024.

Table 18 - Annualisation Summary (concentrations presented in µg/m^3)

Diffusion Tube ID	Annualisation Factor Cardiff Centre	Annualisation Factor Newport AURN	Average Annualisation Factor	Raw Data Simple Annual Mean (µg/m^3)	Annualised Data Simple Annual Mean (µg/m3)
271	0.9235	0.9549	0.9392	36.5	34.3
183	0.9327	0.9167	0.9247	27.1	25.1
188	1.0429	1.0375	1.0402	30.0	31.2
191	0.9959	1.0157	1.0058	27.3	27.5
210	0.9462	0.9789	0.9626	18.2	17.5
212	0.9275	0.9299	0.9287	31.4	29.2
221	1.3273	1.2936	1.3104	23.0	30.1
267	1.0296	1.0136	1.0216	28.2	28.8
268	1.0780	1.0586	1.0683	22.1	23.6
269	1.0041	0.9847	0.9944	26.7	26.5
TRO-001	1.0020	1.0001	1.0010	13.1	13.1
TRO-006	0.9667	0.9333	0.9500	18.0	17.1
TRO-015	0.8556	0.8971	0.8763	13.2	11.6
TRO-063	0.8125	0.8256	0.8191	19.1	15.7

Table 19 - Local Bias Adjustment Calculations

	STEP 3a Local Bias Adjustment Input 1
Periods used to calculate bias	8
Bias Adjustment Factor A	0.87 (0.78 - 0.99)
Diffusion Tube Bias B	15% (1% - 28%)
Diffusion Tube Mean (µg/m^3)	35.0
Mean CV (Precision)	5.4%
Automatic Mean (µg/m^3)	30.5
Data Capture	100%
Adjusted Tube Mean (µg/m^3)	30 (27 - 35)

Overall Diffusion Tube Precision	**Good Overall Precision**
Overall Continuous Monitor Data Capture	**Good Overall Data Capture**

Local Bias Adjustment Factor	**0.87**

Notes:

A single local bias adjustment factor has been used to bias adjust the 2024 diffusion tube results.

Appendix D: AQMA Boundary Maps

Figure 62 - Llandaff AQMA

Figure 63 - Ely Bridge AQMA

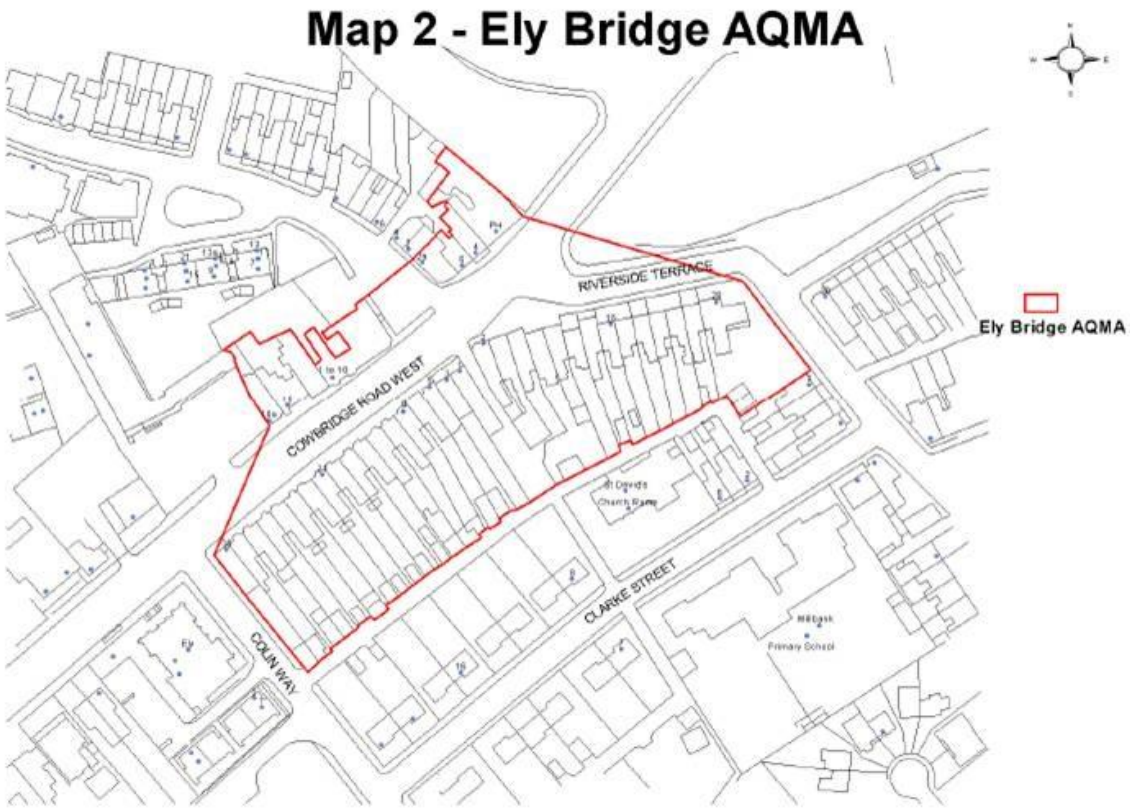

Figure 64 - Stephenson Court AQMA

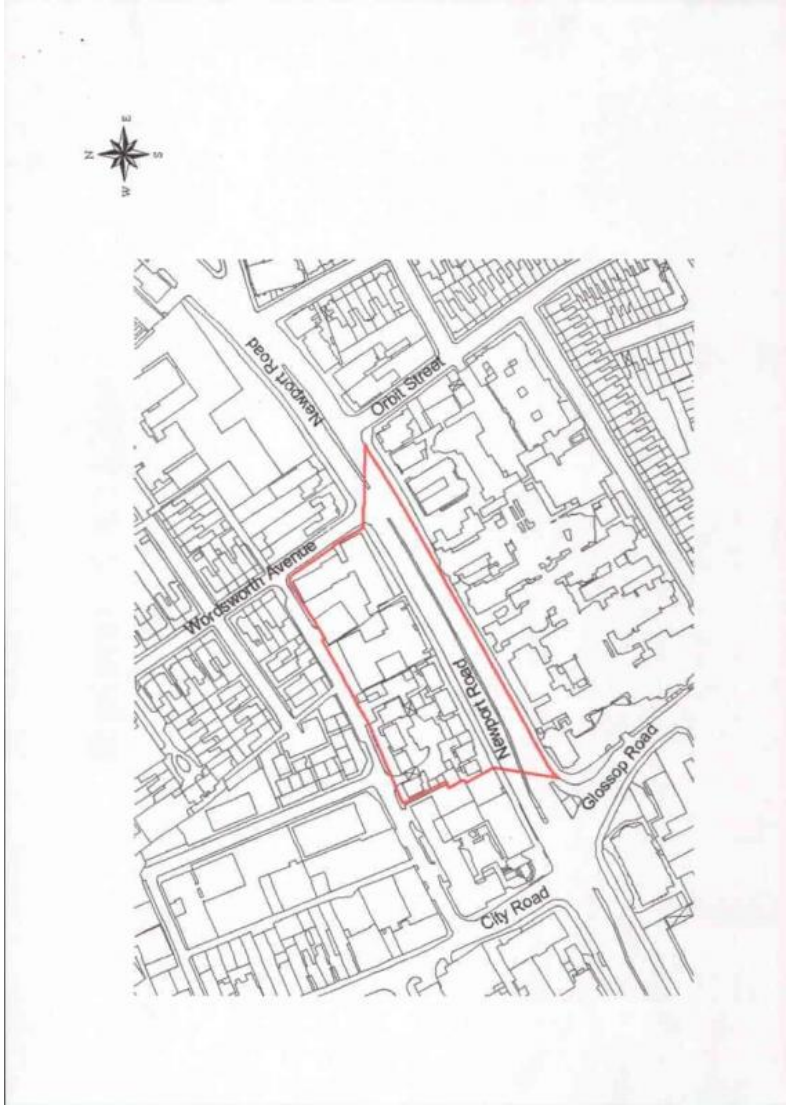

Figure 65 - City Centre AQMA

Glossary of Terms

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