2020 Air Quality Annual Status Report (ASR)

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

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Local Authority Officer	Corinne Mason
Department	Environmental Protection
Address	Civic Centre, Breck Road, Poulton-le-Fylde, FY6 7PU
Telephone	01253 891000
E-mail	corinne.mason@wyre.gov.uk
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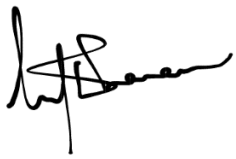
Endorsed by	Dr Sakthi Karunanithi, Director of Public Health and Wellbeing, Lancashire County Council.
Signature	

Executive Summary: Air Quality in Our Area

Air Quality in Wyre

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

Air quality within the borough of Wyre is generally good. The district is largely rural in nature, and is bounded by the sea along parts of its western and northern boundaries. There are no areas in the borough which contain substantial activity with the potential to pollute. The most significant source of air pollution within the borough is therefore motor vehicles. These emit, amongst other pollutants, oxides of nitrogen; carbon monoxide; carbon dioxide; and, fine particulate matter (PM_{10} and $PM_{2.5}$). Those areas of the borough which have at times experienced periods of poorer air quality, have been those where narrow built up streets are combined with high volumes of slow moving traffic.

Pursuant with its legal obligation to periodically review and assess air quality within Wyre, the council currently monitors nitrogen dioxide (NO_2), at 19 diffusion tube sites throughout its administrative district. These sites are located close to busy roads, in areas where the public are likely to be exposed to traffic emissions. The locations of these sites can be found within Appendix D.

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

As a result of the council's monitoring programme, exceedances of the national objective for NO_2 have been established at a total of three sites within the council's monitoring network over recent years. These exceedances led to the declaration of an Air Quality Management Area (AQMA) in Chapel Street Poulton, in August 2009. Shortly after, the council compiled an Air Quality Action Plan (AQAP), outlining its intentions to improve air quality in the area. This plan was formally approved by DEFRA in 2012. Details of the Chapel Street AQMA, including a map illustrating the extent of its boundaries can be found in Table 2.1 and Figure 2.1 of the main report.

The Chapel Street AQMA incorporates two triplicate diffusion tube sites (Site R1-3 and Site R4-6), and is the council's only AQMA. Whilst exceedances of the national objective for NO_2 have also been indicated in the past at Site 14 (just to the north of Chapel Street), no extension of the AQMA boundaries has ever been made. This is due to uncertainties in the data indicating those exceedances, and to the existence of active measures designed to tackle poor air quality within the area already. The original boundaries of the Chapel Street AQMA therefore remain.

In terms of the current position with air quality within the borough, the 2019 monitoring results suggest a reduction in annual mean NO_2 concentration across the council's entire monitoring network. Most significantly however, they provide the seventh consecutive year in which there are no sites within the district where the national objective for NO_2 is being exceeded. This includes the two monitoring sites located within the Chapel Street AQMA, in which the highest recorded annual mean NO_2 concentration for 2019 was 28.1ug/m^3 at Site R1-3, i.e.: well below the national objective of 40ug/m^3. This was also the highest annual mean recorded across the council's entire monitoring network, indicating that all locations within the council's network have annual mean concentrations of at least 10ug/m^3 below the national objective.

In terms of the significance of the 2019 results, they are clearly very promising and provide further evidence to support the revocation of the Chapel Street AQMA. However, as detailed within the 2019 ASR, following the identification of a significant

area of land for development within the council's newly adopted Local Plan (2011-31), the council made the decision to take a precautionary approach and retain the current status of the AQMA until such time that the likely impact of that development on local air quality can be determined. The development of concern which is located immediately north of Poulton Town Centre and is designed to deliver 300 dwellings; a primary school; and, a car park to serve the town, has now been submitted for consultation as a draft Master Plan, and is currently awaiting consideration by the council's Master Plan Team. The council has already increased its monitoring resource in the area in order to ensure the availability of reliable baseline data, and will ensure that this data helps inform a detailed air quality impact assessment for the development. In the meantime, the Chapel Street AQMA will remain in place, however the council will continue to review the situation on a regular basis, and will provide a further update of its intentions in the 2021 ASR.

In respects to the council's monitoring intentions for the year ahead, no new sources of pollution have been identified. The council has also just completed a detailed review of its monitoring provision across the whole borough, and as such is confident that the monitoring locations it now has in place are both sufficient in number, and suitably placed to provide both a good indication of the air quality across the borough, whilst enabling the impact of any exiting sources and proposed development to be determined. The council does not therefore propose to make any further amendments to its monitoring network within the next 12 months, however it will continue to review matters periodically to take account of any changes within the borough, or any concerns raised by members of the public.

A further review of the council's position in respects to air quality will be undertaken within the 2021 Annual Status Report (ASR). Until that time, the council will continue to take a proactive approach to managing air quality; making best use of the air quality policy now incorporated into its newly adopted Local Plan (2011-2031), when giving consideration to any future planning proposals.

The council will also continue to work closely with other agencies and partners to maximise the number and range of options available to improve air quality within the borough. This will include working with colleagues within the Highways / Transport Planning Department, and Public Health Departments of Lancashire County Council; for example to bring about improvements to local road networks, and to raise awareness of potential health impacts. The council will also continue to work closely with the Environment Agency, for example, to address the potential impacts of industrial emissions; and with neighbouring local authorities; for example, to bring into effect countywide initiatives, and to ensure that a consistent approach to air quality management is achieved. The council has many partners in the management of local air quality, and will continue to work with them closely in order to best fulfil its statutory obligations, whilst bringing about the most effective solutions to combat air pollution.

Actions to Improve Air Quality

Since the declaration of the Chapel Street AQMA in August 2009, the council has focussed its resources on working to reduce NO_2 concentrations within Poulton Town Centre via the implementation of its Chapel Street Air Quality Action Plan (AQAP), which was formally approved by DEFRA in 2012. The Plan originally contained a total of 11 actions aimed at reducing traffic emissions within the AQMA; primarily via the promotion of travel alternatives, and through interventions with traffic management.

During the lifetime of the Chapel Street AQAP, all but two of the 11 actions were completed, resulting in a steady decline in NO_2 concentration within the AQMA to below the national objective. Most significant of all the actions completed was the construction of a link road (Wheatsheaf Way), designed to divert traffic away from the Chapel Street AQMA, whilst also improving the flow of traffic in and around Poulton Town Centre. Less significant, but equally beneficial actions included the provision of improved signage to a number of priority pedestrian and cycle pathways within and around Poulton Town Centre; the provision of a cycle storage pod at Poulton Railway Station; and, the promotion of a ‘walk to school’ initiative within a number of Poulton Schools; all of which were designed to encourage alternative modes of transport other than the domestic car.

Since 2016, all work undertaken by the council to improve air quality has been over and above that originally proposed within its Chapel Street AQAP. As such, the council made a decision within the 2018 ASR to abandon the last two remaining actions of the Chapel Street AQAP, and to replace the Plan with a number of proactive measures to address air quality, relevant to the wider district.

Those measures identified as a priority for progress and / or completion within 2019 are listed below:

- 'Ensuring the Adoption and Implementation of Improved Guidance to Planning Applicants'. With the council's 2011- 2031 Local Plan having been formally adopted in February 2019, the council had hoped to have adopted one of three Planning Guidance Templates designed by the Lancashire Authorities in association with the Low Emissions Partnership to increase both transparency and consistency in the consideration of air quality concerns within the planning process. Delays with the implementation of this measure have however occurred due to the council's desire to ensure that the right template is chosen for Wyre, with careful consideration being given to the principles applied within each template to ensure that the level of assessment and mitigation required of any planning proposal is proportionate to the potential impact of that development on local air quality. A suitable template has however now been selected and it is intended that it will be adopted in the form of either a Supplementary Planning Document or at the very least, a Planning Advisory Note, within the next few months.

  A copy of the council's chosen planning template will be provided on the council's web site on adoption. In the meantime, a copy of the council's new Local Plan can be found on the council's website at https://www.wyre.gov.uk/localplan for information, whilst a summary of those adopted planning policies relevant to air quality are provided within Appendix C.2 of the main report.

- ‘Undertaking a Review of Its Existing Monitoring Resource’ – Following the identification of significant areas of land for further development within the council’s new Local Plan (2011-2031), the council identified the need to undertake a detailed review of its monitoring resource to ensure that it was both sufficient and suitably located to inform future planning decisions by way of detailed assessment. Having regard to the identification of an extensive area for development within close proximity to the Chapel Street AQMA, the review initially focussed on the town of Poulton-le-Fylde and resulted in the introduction of a further monitoring station at an already busy junction sited close to the proposed development site. Consideration was then given to the wider district and to those areas in which extensive development is proposed and where little or no monitoring resource was already in place. This resulted in the siting of new monitoring stations within the villages and towns of Great Eccleston, Inskip, and Garstang. Whilst the original intention was to resource these new locations by relocating some of the permanent monitoring stations within the borough, a decision was made to retain all existing monitoring stations and to instead increase the number of test stations available from 3 to 5. Each new monitoring station is therefore only temporary at this time and its position within the borough will be reviewed at 6 monthly intervals, having regard to any new sources of pollution or areas of concern. These additions have now been made to the council’s air quality webpage, however these changes will not be visible to the public until the council’s new website launches in late Autumn.

- ‘Continuing to Work With & Support the Council’s Partners in their Role to Address Air Quality’. Further to the success of previous ‘shared’ actions within its Chapel Street AQAP, including the completion of the Hardhorn Link Road, and the improvement of local cycle / pedestrian pathways; the council pledged to continue to work closely with Lancashire County Council and its neighbouring authorities to maximise its success in tackling air pollution. Over the last 12 months this has involved the council contributing to discussions around how we can better equip local schools with information about air quality as means of raising awareness amongst their local community, and encouraging sustainable forms of travel, including the possibility of providing them with their own form of monitoring equipment. Further work includes that being undertaken in

partnership with both the County Council and 6 other Lancashire Authorities to secure the installation of 24 electric vehicle charging units across the county, specifically for use within the taxi trade. Further detail in respects to the work being undertaken around schools will be provided as discussions progress, whilst further detail in respects to the acquisition of electric vehicle charging points is provided below.

- 'Encouraging the Use of Electric Vehicles'. Building on Lancashire County Council's commitment to install 150 electric vehicle charging points within the county, the council made its own pledge within its 2017 ASR to encourage electric vehicle uptake across the borough through the introduction of electric vehicle infrastructure in key locations in the district, and through the provision of reliable information relating to electric vehicle use. That pledge has now led to the undertaking of three separate infrastructure projects, the first being the joint project referred to above, in which the council is working with Lancashire County Council and 5 other local authorities, to secure the installation of 24 electric vehicle charging units across the county, specifically for use by the taxi trade. This project will on completion involve a series of promotional activities aimed at taxi personnel, and will in time be supported by regulatory changes to further encourage electric vehicle uptake within the industry. The second project involves the gradual transition of the council's own transport fleet to cleaner and greener alternatives, and the third project involves the installation of a further 5 fast, dual headed electric vehicle charging points within the council's car parks, suitably located to both increase accessibility to electric vehicle infrastructure to the general public and to those residents within the district with little or no off street parking.

  Progress with each of the three projects is ongoing, with projects one and three currently awaiting the completion of site feasibility studies by the council's providers before any installation works can commence. Installation works have however already been completed in respects to project two, resulting in the provision of 6 electric overnight charging units at the council's Copse Road Depot, Fleetwood. The council now intends to purchase a total of 4 Nissan NV200 electric vans to add to its existing Nissan Leaf pool car, and is also in

the process of reviewing cleaner alternatives for its existing grounds maintenance plant and equipment, with a view to extending this initiative to all areas of the council's work where possible.

- 'Increasing Awareness of Air Quality Issues, through the better provision of information to local business and residents within Wyre. Following on from previous improvements made to the council's air quality webpage, the council has now completed the proposals outlined within its 2019 ASR, and has updated the page to include information relating to the availability of electric vehicle charging points located within Wyre, and an enquiry form enabling residents to ask the council questions about the air quality in the area. Whilst the recent changes to the council's webpage will not be accessible to the public until the launch of the council's new website in late Autumn, the council will continue to make regular updates to the information available, and will also make best use of its social media platform in order to keep the public informed on air quality initiatives taking place within the local area, and to promote general awareness of air quality issues. The council's current air quality webpage can be accessed at www.wyre.gov.uk/airquality.

All other measures identified for completion within the 2019 ASR are routine and will therefore continue to be progressed over the next 12 months.

Conclusions and Priorities

Despite the 2019 monitoring results providing yet further evidence to support the revocation of the Chapel Street AQMA, having regard to both the extent of all ongoing and proposed development in and around Poulton-le-Fylde, the council does not intend to make any changes to the AQMA at this time. Instead the Council will utilise its increased monitoring provision in the area to help determine the likely impact of that development on local air quality, and to ensure that air quality remains a priority consideration in the consent and design of all future development in the area. Of the outstanding actions from the 2019 ASR, the council will give priority to the adoption and implementation of a suitable Planning Guidance Document in order to ensure both

a transparent and consistent approach to the consideration of air quality impacts within the planning process in future. Thereafter, the council will look to progress its work in relation to the installation of electric vehicle charging infrastructure within the borough, and to the launch of the council's updated air quality web page.

A further review of the council's progress in relation to its key measures outlined above will be provided within the 2021 ASR, alongside a further review of its position in relation to the Chapel Street AQMA. Updates in relation to individual actions will also be made available on the council's website throughout the year, as and when they become available.

Local Engagement and How to get Involved

The council encourages contact from anyone concerned about the quality of air within Wyre.

The council regularly reviews the suitability of all its monitoring sites across the borough and constantly seeks to identify new areas of potential air quality concern. Where concern for an area is expressed, either by a member of the public, or as a result of new development, the council has some provision to establish a temporary monitoring station, in order to determine the air quality conditions in that location. The council currently has a total of five 'temporary' sites which it uses for this purpose. The location of these sites is changed on average every 12 months, with any sites of continued concern being made permanent. The location of all the council's 'test' sites both current and historical, together with the results obtained during their installation, are made available on the council's website.

Any concerns regarding air quality should be directed to the Environmental Protection Department on 01253 891000, or via email at pollution@wyre.gov.uk. An online enquiry form will also be available on the council's air quality webpage shortly to allow the easy submission of any questions or concerns relating to local air quality.

In addition to informing the public about what the council and its partners are doing to improve air quality, the council also encourages the uptake of measures by the public to enhance the work the council and its partners are undertaking. Everyone has a responsibility to protect air quality and everyone can make a positive contribution to improving air quality in their area. Examples of everyday choices which can lead to improved air quality include:

- Using public transport (buses / trains), instead of domestic cars to make a journey
- Walking or cycling whenever you can – which is also good for your health
- Car sharing whenever possible
- Turning your car engine off whenever you are at a standstill
- Avoiding driving during congested peak traffic periods
- Using a low emission vehicle such as an electric or hybrid car
- Refraining from burning garden waste
- Being as energy efficient as possible by insulating your home
- Using electric heating powered by non-combustion forms of renewable energy
- Using energy efficient appliances within your home
- Recycling your waste
- Turning off the lights when you leave a room

There are many other examples available of how everyone can help to improve the air which we breathe. Further information, including links to useful websites and advice on reducing exposure to air pollution, can be found on the council's website at www.wyre.gov.uk/airquality.

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1 Local Air Quality Management

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

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Wyre Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in **Error! Reference source not found.** in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

Wyre Council has declared only one AQMA within its administrative district. The AQMA which is situated within Chapel Street, Poulton-le-Fylde, was declared in August 2009. Details of the AQMA (including a plan of its location and boundaries) can be found below in Table 2.1 and Figure 2.1 overleaf, and on the council's Air Quality Webpage at https://www.wyre.gov.uk/info/200384/pollution/342/air_quality. A map illustrating the position of all monitoring locations in relation to the Chapel Street AQMA can be found in Appendix D.

Whilst 2019 provides the seventh consecutive year in which NO_2 concentrations within the Chapel Street AQMA have been recorded below the national objective of 40ug/m^3, due to a significant area of land within Poulton-le-Fylde being outlined for housing development within the council's newly adopted Local Plan (2011-2031), the council has made a decision not to revoke the AQMA at this time. The council does however intend to review this decision on a regular basis.

Details as to the priority measures the council intends to take in respects to both the Chapel Street AQMA and the wider district can be found in Chapter 2.2 of this Report.

Figure 2.1 Map of Chapel Street AQMA Boundaries

Site R Chapel Street, Poulton-le-Fylde (includes R1-3 and R4-6)

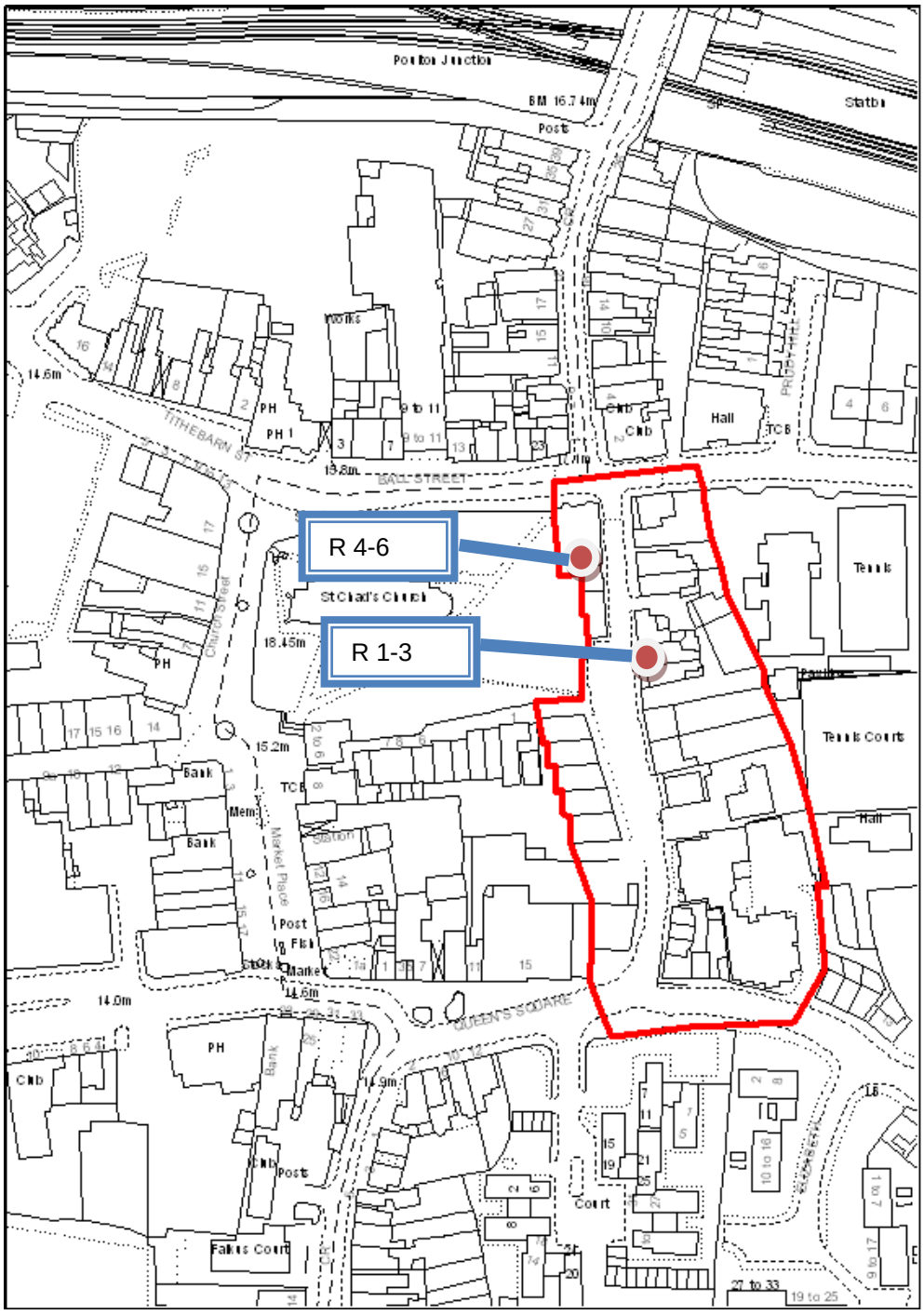

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
Chapel Street, Poulton-le-Fylde	August 2009	NO_2 annual mean (40ug/m^3)	Poulton-le-Fylde	One way street with both commercial and domestic properties situated close to the roadside.	NO	40.7	ug/m^3	29.7	ug/m^3	Chapel Street Action Plan	2012	https://www.wyre.gov.uk/downloads/file/1036/air_quality_action_plan

☒ **Wyre Council confirm the information on UK-Air regarding their AQMA(s) is up to date**

2.2 Progress and Impact of Measures to address Air Quality in Wyre

Defra's appraisal of last year's ASR concluded that the council's 2018 monitoring results provided a further year in which no exceedances of the national objective had occurred, either within the Chapel Street AQMA or the wider Wyre district; therefore providing the evidence required to support any intention to revoke the Chapel Street AQMA. However, Defra also acknowledged the council's concerns in relation to the amount of new development, both proposed and currently underway, in and around Poulton-le-Fylde, and confirmed its understanding if the council wished to defer its intention to revoke its only AQMA, thereby delaying any decision until the impact of the completed developments on local air quality are able to be determined.

Defra also acknowledged that the council had revised its 2012 AQAP to account for having completed all but two of its intended actions, and acknowledged that in doing so the council would be better able to improve and protect air quality throughout its entire administrative district, rather than focussing primarily on the Chapel Street AQMA. Defra also concurred that the council's revised measures would enable the council to take a more proactive rather than purely a reactive approach to addressing air quality concerns moving forward.

Further to Defra's appraisal, the council has continued to progress those measures included within its 2019 ASR, giving priority to those measures designed to better equip and enable the council to protect areas of the borough subject to significant proposed development, including Poulton-le-Fylde and the Chapel Street AQMA. Those measures include:

- 'The Adoption of Improved Guidance to Planning Applicants'. This measure relates to the agreement and implementation of suitable planning guidance, designed to provide detailed and early advice to planning applicants in respects to the way in which the council will determine the likely impact of their proposed

development on local air quality, together with its expectations in terms of any necessary assessment and mitigation.

Following the adoption of the council's new Local Plan (2011-2031) in February 2019, which incorporates a number of individual policies designed to protect and enhance local air quality, it was intended that the council would by now have selected one of three potential 'planning guidance templates' available for adoption, and implemented the chosen guidance in the form of either a Supplementary Planning Document, or a Planning Advisory Note. However, delays in the decision as to which 'planning guidance template' is best suited to Wyre, means that this measure has yet to be completed in full. A template has however now been agreed, and as such it is anticipated that the chosen guidance will be adopted within the next few months.

A copy of the council's chosen planning template will be provided on the council's web site on adoption. In the meantime, a copy of the council's new Local Plan can be found on the council's website at https://www.wyre.gov.uk/localplan for information, whilst a summary of those adopted planning policies relevant to air quality are provided within Appendix C.2 of this report.

- A 'Review of the Council's Monitoring Network' – This measure was identified to extend the council's routine review which takes places on an annual basis to ensure that there is sufficient air quality monitoring resource within the Wyre district to enable any likely exceedances of the national air quality objectives to be established. This measure was intended to supplement that review, focussing on those areas of the borough in which significant development is proposed, or has recently been undertaken, and to ensure that there is adequate monitoring provision in place to measure the likely impact of that development by way of detailed assessment, and to measure the actual impact and subsequent success of any mitigation measures on completion (particularly in respects to the cumulative impact of a number of developments).

Work on this measure initially focussed on the land outlined for development in and around Poulton-le-Fylde, but later encompassed the wider district, covering those development sites already allocated for either housing, employment or mixed use development within the council's Adopted Policies Map.

Whilst the initial intention was to resource any areas in need of monitoring, or further monitoring, by way of relocating some of the existing monitoring sites within the borough, following the completion of the review, a decision was made to increase the number of temporary 'test' sites available within the district from three to five, thereby removing the need to relocate any permanent sites in order to resource other areas. The only monitoring sites relocated within the borough were therefore the 3 temporary test sites from 2018, none of which indicated a need for a permanent monitoring station in their test location.

Further to the increase of test site availability within the district, temporary monitoring stations have now been established within the areas of Poulton-le-Fylde, Garstang, Inskip and Great Eccleston, where in the case of latter two areas, there was no existing monitoring resource in place. It is therefore hoped that the council will now be better prepared to protect air quality against any adverse impact in those areas of the borough subject to increased development (either completed, current or proposed), whilst also providing an improved view of air quality over a wider area of the district.

Maps of the new temporary monitoring locations within Wyre are provided within Appendix D for information.

Additional actions included within the council's 2019 ASR and progressed over the last 12 months include:

- 'Increasing Awareness of Air Quality Issues', through the better provision of information to local businesses and residents in Wyre. Much work has been undertaken in recent years to improve the council's website content in relation to air quality to provide the public with easier access to local air quality information, including (amongst other things), all previous monitoring data collected within the borough; details in respects to the Chapel Street AQMA; information about what the council is doing to improve air quality; information about what the public and local business can do themselves to tackle air quality; and useful links to other relevant information sources on the subject; in particular, those relating to vehicle emissions and low pollution transport options. Whilst yet further improvements have been made since the 2019 ASR, including the provision of information in relation to the location and use of electric vehicle charging points within the Wyre district; this information is yet to be made visible to the public due to the imminent launch of the council's new website, which is scheduled for activation late Autumn 2020.

  Once available, the council's new air quality web page will include those proposals outlined within the 2019 ASR, including an online 'question' form, allowing members of the public to submit any questions or concerns they may have in relation to local air quality via the council's webpage. Answers to any questions asked will be posted publically for the benefit of all residents; and any concerns raised by the public in relation to particular locations within the borough will be used to influence the position of the council's future 'test' monitoring sites. The council also intends to use its social media platform to update the public on any air quality initiatives taking place within the local area, and to promote general awareness of air quality issues.

- 'Continuing to Work With and Support the Council's Partners in their Role to Address Air Quality Impacts'. In particular, the council will continue to work

closely with Lancashire County Council, and other local authorities within Lancashire to maximise its success in tackling air pollution, and to ensure that the agreed Lancashire ambitions outlined in the 2017 ASR are realised, namely to reduce the number of areas exceeding national objectives across Lancashire; to reduce the prevalence and severity of health conditions affected by poor air quality; and, to increase public awareness and responsibility for tackling emissions and reducing avoidable exposure.

Examples of some of the key areas of work currently being undertaken by the County Council to ensure these ambitions become a reality are listed below:

(I) Encouraging the use of sustainable forms of travel – Work in this area includes the 'Actively Moving Forward' programme intended to increase the number of people walking and cycling within Lancashire by 2028, through the supply of training and promotional activities, and by improving and increasing access to cycling and walking infrastructure within the county. A Local Cycling and Walking Infrastructure Plan (LCWIP) is currently being developed for each of the five Lancashire Highway and Transport Masterplan Areas, which when completed will provide a network plan for cycling and walking infrastructure within the Wyre District, together with a proposed timetable for infrastructure delivery. This work is in addition to that currently being undertaken by the County Council's Road Safety Team, who continue to actively encourage safe and sustainable modes of travel within the county by working closely with schools, workplaces and the local community. Current initiatives for schools are promoted though the Safer Travel Moodle and include: a series of cycling and walking safety training programmes; guidance and resources for teachers to encourage safe and active travel; in addition to support for creating school travel plans.

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(II) Supporting the transition to low emission vehicles - The County Council is working with BP Chargemaster to deliver 150 electric vehicle charging

points across the county. A total of 8 rapid charging units (capable of charging an average electric car within approx. 2 hours), have already been installed within the Wyre District, within the council's town centre car parks. The locations of these charging points is provided below, with details of the charging network available on Lancashire County Council's website. The County Council is also supporting six district councils (including Wyre Council) with a low emissions taxi infrastructure scheme. Funded by the Office for Low Emission Vehicles, the scheme will provide taxi drivers with access to 24 new rapid electric vehicle charging points across the six districts. This, alongside a series of promotional activities and suggested regulatory changes, is designed to produce a transition towards more low emission taxi vehicles within Lancashire.

Location and Number of Installed Charging Points Within the Wyre District
2 x F7 Units – Blackpool Old Road, Poulton-le-Fylde
4 x F7 Units – North Albert Street, Fleetwood
2 x F7 Units – Victoria Road West, Cleveleys

(III) Creating cleaner, healthier road networks – Work to develop the next Local Transport Plan (LTP4) for Lancashire, Blackpool and Blackburn with Darwen is currently underway, with vital input being made by the County Council's Public Health Team to both evidence the link between transport and health, and to provide recommendation as to how improvements to air quality can be realised by design. Air quality has been identified as a priority consideration in the development of LTP4 and it is intended that the local Highways and Transport Masterplans will be refreshed to align with the priorities of LTP4 on completion, thereby enabling the identification of longer-term network solutions that address issues in AQMAs and have a positive impact on air quality generally.

(IV) Embedding air quality considerations into policy - The County Council continues to work closely with district planners to ensure that air quality remains a key consideration of Local Plans, alongside wider public health issues. It supports district councils in developing policies that seek to ensure that new development does not contribute to increasing levels of air pollutants, and that requirements for appropriate mitigation are in place. The County Council's Highways Department also routinely comments on individual planning applications, actively encouraging measures aimed to promote sustainable forms of travel. Working under the direction of the National Planning Policy Framework, the County Council seeks measures that facilitate cycling and walking; increase the use of public transport, and provide access to electric vehicle charging points. The County Council also seeks funding from developers through section 106 contributions to support existing bus services, or to provide new bus services suitable to serve development sites once they are built. This work is in addition to ongoing research projects designed to guide future policy decisions. Examples include the work currently being undertaken in partnership with the Universities of Lancaster and Birmingham to develop evidence based guidance for the use of green infrastructure as an approach to mitigating the health impacts of road transport emissions; and the work currently being undertaken by the Lancaster City Centre Movement Strategy to identify how vehicular, public transport and pedestrian walking movements can be improved across the city of Lancaster. A key facet of the study is to examine what improvements can be implemented to prioritise public transport; reduce severance; improve air quality; and, effectively make the city centre a more welcoming environment for people. The intention is for a similar approach to be adopted as part of future Highways and Transport Masterplans for Lancashire as a whole.

(V) Raising awareness and increasing engagement – In addition to the work routinely undertaken by the County Council's Road Safety Team within local schools and communities, development of a clean air programme

is currently underway, intended to provide schools with a toolkit containing both guidance and support on developing a clean air strategy; ready to go lesson plans, activities and resources for teachers; access to cycling and walking programmes; and guidance and resources for delivering a Clean Air Day event and creating a clean air banner. This information is in addition to that available to the wider community by way of the County Council's Lancashire Insight Website, which provides up to date information on the sources and health impacts of air pollution. Access to this information can be made via https://www.lancashire.gov.uk/lancashire-insight/area-profiles/ and includes a Summary of Emissions Data, Monitoring of Air Quality and Health Impacts and an Air Quality and Health Dashboard.

The council will continue to support Lancashire County Council in its work and will continue to engage with all its partners to identify local concerns and solutions in respects to air quality, and to work with those partners to identify and acquire the policy and funding necessary to support further joint initiatives. A further update as to the progress made to fulfil the agreed Lancashire ambitions will be reported within the 2021 ASR.

- 'Encouraging the Use of Electric Vehicles'. This initiative was introduced to supplement the commitment made by Lancashire County Council to install 150 electric vehicle charging points across Lancashire, and was designed to encourage electric vehicle uptake within the Wyre District through the increase of electric vehicle infrastructure, and the provision of reliable information relating to electric vehicle use. Whilst progress in this area was initially stalled to allow the council's partners to confirm their own infrastructure plans, work is now very much underway in the form of 3 separate infrastructure projects.

  The first project is that mentioned in (II) above in which Lancashire County Council have supported the council and five other Lancashire Local Authorities

(Lancaster City Council, South Ribble Borough Council, Fylde Borough Council, Rossendale Council, and Burnley Borough Council), in successfully securing an OLev grant from the Department of Transport, to enable the provision of 4 rapid charging units per authority, for use specifically within the taxi industry. Within the last 12 months a list of available council car parks suitably located on common taxi routes, and in popular idling locations, has been passed to the council's provider Electric Blue in order to enable the feasibility of those sites to be determined. The council is now awaiting the results of the site surveys, however it is hoped that once available, installation works will be able to commence.

The second and third projects are being driven by the council alone to both further increase the number and availability of electric charging points within the district, and to improve the sustainability of the council's own transport fleet. Project 2 involves a review of the council's current transport provision and a gradual move towards more electric charged vehicles. Following on from the successful introduction of an electric pool car for visiting staff, the council is now looking to introduce four Nissan NV200 electric vans to its regular fleet. Three Garo Twin Smart charging pillars (totalling six 3.7kW charging points), have already been installed at the council's Copse Road Depot, Fleetwood, to enable overnight charging of these vehicles, and it is intended that the vans will be purchased and operational within the next 12 months. This marks the start of a long term initiative to make the council's fleet greener. Similar measures are also being taken in respects to the council's grounds maintenance plant and equipment, with a gradual move to electric powered alternatives taking place.

Lastly, Project 3 involves the acquisition of a further five fast, dual charging units (i.e.: 10 x 22kW units) within the council's car parks. Whilst the locations of these units has yet to be finalised it is intended that they will be located where possible within close proximity to residential properties with little or no available on street parking, and will on completion be capable of charging an average electric vehicle in approx. 2-3 hours. These units will be in addition to the rapid

charging unit recently installed in the council's Rough Lea Road Car Park, Cleveleys, by the Highways Agency, and the eight rapid charging units recently installed by LCC on the roadside referred to in (II above). Those car parks currently being considered as suitable installation sites by the council (but not yet approved), are listed below. It is intended that the feasibility of these sites will be confirmed within the next 12 months, thereby allowing installation works to commence. Progress in relation to this measure will be made available on the council's air quality webpage.

Proposed Location of Future Electric Charging Points Provide by Wyre Council
Civic Centre Car Park, Poulton-le-Fylde
Derby Road West Car Park, Thornton Cleveleys
Quail Holme Road Car Park, Knott End
Stannah Countryside Car Park, Thornton Cleveleys
Marine Hall Car Park, Fleetwood

Further to the above, the council will continue to implement a number of ongoing measures considered necessary for the protection of local air quality. Such measures will include:

- 'Continuing to monitor all proposed developments within the borough'; particularly those within close proximity to the current Chapel Street AQMA (Poulton Town Centre); the Hillhouse International Business Park, Thornton; and those towns and villages located on the route of the A6; i.e.: where much development has been consented, or is currently underway. Where the council identifies that development may lead to the national objectives being exceeded, or where the development itself is likely to be adversely affected by poor air quality, the council may choose to either reject or require amendment to the proposal, or may seek to secure appropriate mitigation measures via the application / implementation of suitable planning conditions and / or section 106 agreements.

- ‘Continuing to monitor NO_2 concentrations throughout the borough’, including via the use of ‘temporary’ monitoring sites, to inform future monitoring decisions and ensure that future changes in air quality are detected as early as possible.

- ‘Continuing to raise awareness of air quality concerns’ via the regular use of social media posts, and the promotion of initiatives and educational events such as ‘Cycle / Walk to Work Day’ and ‘Clean Air Day’.

- ‘Completion and submission of the 2021 Annual Status Report’.

Details of the progress made by the council in implementing its key measures will be reported in future ASR’s.

Table 2.2 – Chapel Street Air Quality Action Plan

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Undertake Network Appraisal to identify options to reduce traffic within Chapel Street AQMA by 8%	Traffic Management	UTC, Congestion Management, Traffic Reduction	Lancashire County Council	2011/12	2014/15	Production of a Network Appraisal Report	Target 8% reduction in NO2 emissions	Complete	Complete	Network Appraisal Completed in
2	Calculate the most effective option within the Network Appraisal to improve AQ within the Chapel Street AQMA. Utilise AQ Consultants for this purpose.	Traffic Management	UTC, Congestion Management, Traffic Reduction	Wyre Council	2013/14	2014/15	Production of Priority Actions Report	Target 8% reduction in NO2 emissions	Complete	Complete	Priority Actions Report completed in 2014/15. Link Road option approved by all parties.

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
3a	Lobby Lancashire County Council to implement options identified in Network Appraisal into draft Local Transport Plan	Traffic Management	UTC, Congestion Management, Traffic Reduction	Wyre Council	2013/14	2014/15	Securement of necessary finance to implement Link Road proposal	Target 8% reduction in NO2 emissions	Complete	Complete	Link Road proposal in-corporated into Local Transport Plan. Finances to implement link road secured.
3b	Construct Link Road	Traffic Management	UTC, Congestion Management, Traffic Reduction	Lancashire County Council	2013/14	2015/16	Completion of Link Road	Target 8% reduction in NO2 emissions	Complete	Complete	Link Road completed in December 2015. Open and in use.
4	Ensure regard is had to AQ in the consideration of any large scale development within Poulton	Policy Guidance & Development	AQ Planning & Policy Guidance	Wyre Council	Ongoing	Ongoing	AQ considered in all relevant cases	AQ considered in relation to numerous large scale developments within and around Poulton Town Centre	Ongoing	Ongoing	Measures remain in place to ensure adequate consideration is given to AQ Impacts resulting from proposed development. Mitigation measures encouraged in all cases regardless of likely impact.

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
5	Undertake Feasibility Study to reduce the number of circular bus journeys around Poulton Town Centre	Transport Planning & Infrastructure	Bus Route Improvements	Lancashire County Council	Not Known	Not Known	Production of Feasibility Study Findings	Not known	On-hold awaiting analysis of Link Road success	N/A	Measure abandoned as congestion within AQMA improved via completion of Link Road. Measure not considered necessary at this time.
6	Identification & Improvement of priority pathways within & around Poulton Town Centre to encourage travel to and from schools by foot & cycle	Alternatives to Private Vehicle Use	Other	Wyre Council	2012/13	2013/14	Improvement of Priority Pathways	Not Known	Complete	Complete	Improvements and additional signage provided to priority pathways. Positive feedback obtained to date.

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
7	Production of Wyre Council Travel Plan and introduction of Sustainable Travel Days as a means of encouraging alternative modes of transport to work than by car	Promoting Travel Alternatives	Workplace Travel Planning	Wyre Council	2012/13	Ongoing	Completion of Travel Plan. Undertaking of Sustainable Travel Days	Not Known	Wyre Council Travel Plan complete. Number of Sustainable Travel Days held to date	Ongoing	Intention to continue to hold a minimum of two Sustainable Travel Days each year. Success of measure to monitored via the undertaking of a staff survey.
8	Increase Sustainable Travel to and from Poulton Schools	Promoting Travel Alternatives	Promotion of Walking & Cycling School Travel Plans	Wyre Council	2012/13	2013/14	Increased sustainable travel to school	Not Known	Complete	Complete	Work completed with 3 local primary schools and 1 secondary school. All 3 participated in a walk to school campaign. Secondary school also participated in an education theatre workshop & delivered a Sustainable Message to the council. Success of measure to be monitored via consultation with schools.

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
9	Installation of an automatic monitoring station within Chapel Street AQMA to increase the council's understanding of the pollution issues			Wyre Council	2012/13	No longer to be implemented	N/A	N/A	N/A	N/A	Measure abandoned after difficulties in finding a suitable installation site. NO2 levels within the AQMA no longer justify implementation of the measure.
10	Improve deliveries associated with the Thatched Public House within Chapel Street AQMA			Wyre Council	2012/13	None Set	Improvement of Deliveries to reduce congestion at busy times	Target 8% reduction in NO2 concentration in AQMA	None	N/A	Measure abandoned as congestion within AQMA improved via completion of Link Road. Measure not considered capable of making a significant improvement to air quality.

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
11	Monitor Taxi's Idling within Chapel Street AQMA during the early hours	Traffic Management	Anti-Idling Enforcement	Wyre Council	2012/13	2013/14	Taxi's no longer Idling within Chapel Street AQMA	Taxi Ranks altered to allow for enforcement. Adherence to rank rules being monitored	Complete	Complete	Reduced tolerance for taxis within Chapel Street AQMA. Taxis prevented from idling close to residential properties. No further action proposed unless further problems arise. Situation to be monitored.

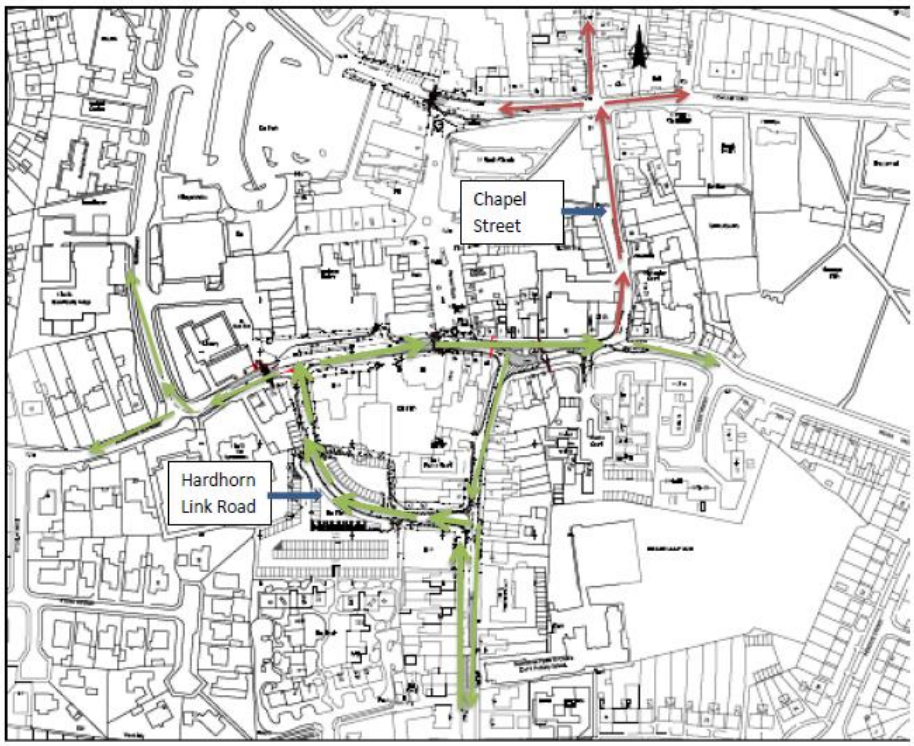


Figure 2.2 (above) Plan illustrating Hardhorn Link Road

Figure 2 (below) Priority footpaths / cycle ways within Poulton

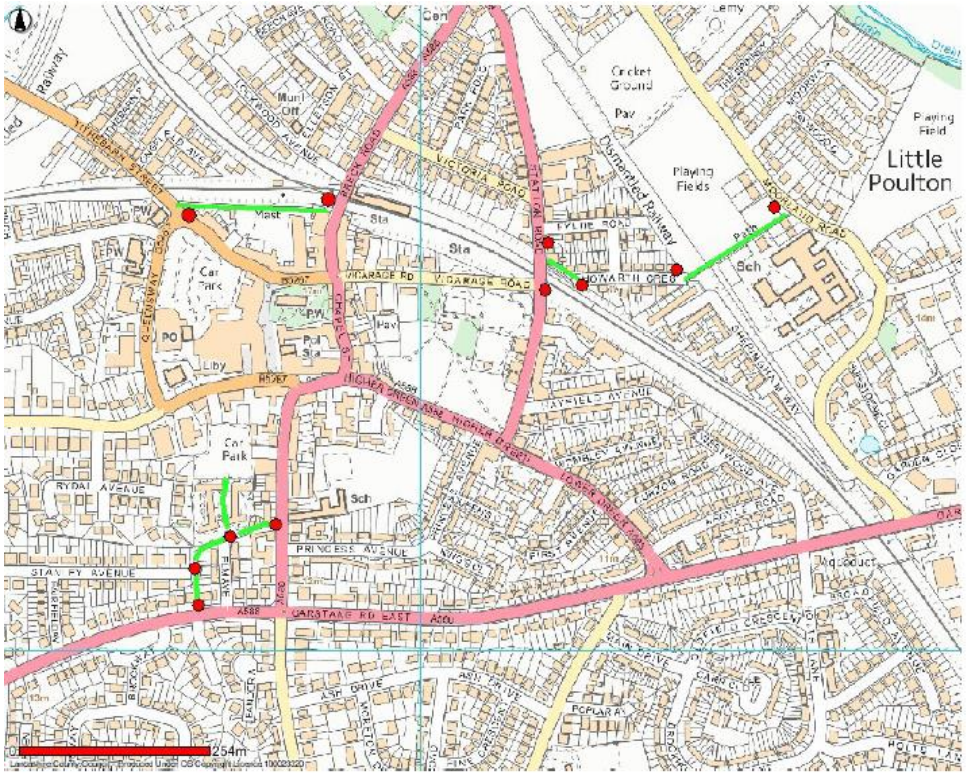


Figure 2.4 (above) – Cycle Store, Poulton Railway Station

Figure 2.5 (below) – Electric Vehicle Charing Point

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Whilst the requirement to work towards reducing the impact of $PM_{2.5}$ on public health is a relatively new one, many of the measures which were included and completed within the council's Chapel Street AQAP for the purpose of tackling NO_2 concentrations within the Chapel Street AQMA, had the potential to also impact on $PM_{2.5}$ emissions and concentrations. Co-benefit actions completed throughout the implementation of the plan included:

- Transport Planning – Actions 1-3 of the Chapel Street AQAP involved the design and delivery of a link road to reduce the number of vehicles travelling through the AQMA, whilst also improving the flow of traffic through the town centre as whole. Hardhorn Link Road (now named Wheatsheaf Way), was opened in January 2016. Its completion marked achievement of the most significant action within the council's AQAP; the action most capable of improving air quality within the AQMA. Whilst only four years have passed since its opening, initial results seem positive with current NO_2 concentrations within the AQMA remaining well below the national objective of 40ug/m^3, despite quite significant development having taken place in and around Poulton Town Centre in recent years. The success of the link road will however continue to be monitored closely in the future.

- Promotion of Cycling /Walking – Action 6 of the Chapel Street AQAP, involved the council identifying a number of priority pathways requiring improvement within and around Poulton Town Centre, with a view to encouraging travel to and from school by foot and by cycle. This action resulted in improvement works being undertaken to those pathways in terms of their condition, and / or their signage. The majority of those works were undertaken within 2015, with the final works being completed in 2016.

- Work Place Travel Planning – Action 7 of the Chapel Street AQAP involved the council promoting the sustainable travel message amongst its staff and members via the adoption of a Travel Plan, designed to promote the benefits of sustainable travel. Since the implementation of the Plan, the council has held a number of 'sustainable travel to work days', one of which was organised to coincide with promotional work being undertaken within local schools (so as to increase public awareness of the sustainability message). The council continues to encourage sustainable travel amongst its staff by way of its 'sustainable travel to work days,' and continues to monitor the success of this action in reducing the number of car journeys made by its members and staff, via the undertaking of annual staff surveys.

- School Travel Plans – Action 8 of the Chapel Street AQAP involved the council working with a total of 3 primary schools, and 2 secondary schools, located within and around Poulton Town Centre, as a means of encouraging sustainable travel. All three of the primary schools participated in a walk to school campaign (Living Street's Walk to School Programme - which rewarded the children with badges if they succeeded in walking or cycling to school at least once per week), whilst the secondary schools were invited to participate in an educational

theatre workshop, which encouraged the children to become ‘sustainable travel champions’, and culminated in them promoting the ‘sustainable message’ to both their peers and the council’s Members at a full cabinet meeting.

- Anti-Idling Enforcement – Action 11 of the Chapel Street AQAP involved the council monitoring the idling of taxis within the Chapel Street AQMA. This action was considered necessary as a result of reports that the street was being frequently used by taxi drivers as an unofficial taxi rank, due to its close proximity to a number of popular late night entertainment venues within Poulton Town Centre. Action to resolve this matter was achieved by the council in partnership with Lancashire County Council, via the introduction of a reduced ‘tolerance agreement’, whereby taxi drivers are only permitted to park up in a designated area of the street, away from residential properties. Continued compliance with this agreement is monitored by CCTV.

Wyre Council does not currently monitor for $PM_{2.5,}$ however there is already a wealth of data available across the county which has been collected by DEFRA, Lancashire County Council (LCC), and other district authorities. The Public Health Outcomes Framework (PHOF) estimates the fraction of all-cause adult mortality (for persons aged over 30 years) attributable to man-made fine particulate (PM2.5) air pollution for Lancashire to be 4.0%. Whereas within Wyre itself, the fraction of mortality attributed to $PM_{2.5}$ exposure is calculated at 3.6%, indicating that the impact of particulate air pollution on health is significant. This clearly demonstrates that further work needs to be done in respects to $PM_{2.5}$ emissions if the council is to ensure that the lives of Wyre citizens are not adversely affected by poor air quality.

The council's proposals for addressing $PM_{2.5}$ emissions / concentrations over the coming year include:

- Working closely with its partners (in particular Lancashire County Council), to establish the adequacy of $PM_{2.5}$ monitoring provision within Lancashire, and to assist in the identification of any 'hot spot' areas of elevated $PM_{2.5}$ concentrations within Wyre. The council will also work to identify and implement any suitable air quality initiatives capable of reducing $PM_{2.5}$ emissions / concentrations, particularly in sensitive locations such as within close proximity to schools. The council has already worked with a number of local schools in relation to 'walk to school' initiatives and is keen to support Lancashire County Council in its ongoing work to promote and resource walking and cycling initiatives in schools, in addition to the work it undertakes in respects to the expansion of local cycle networks. The council is also currently involved in discussions with the County Council and its neighbouring Lancashire authorities around how we can better equipment local schools with information about air quality, including the possibility of providing them with their own monitoring equipment for the purposes of education and raising awareness within their local communities.

- Adoption of a Low Emissions and Planning Guidance Document. As detailed previously, the council is currently in the process of adopting a Planning Guidance Template aimed at encouraging developers to support action through the planning system that will improve air quality and lower transport emissions. Adoption of the guidance will not only ensure that future developments are supported by adequate impact assessments and mitigating measures designed to protect local air quality, but will also ensure a consistent approach to the consideration of air quality concerns within the planning process across Lancashire. Recent adoption of the council's 2011-2031 Local Plan has

ensured the availability of appropriate planning policy under which such guidance can be implemented, and it is intended that the appropriate planning guidance will be in place and operational before the 2021 ASR.

- The promotion of electric vehicle infrastructure within Wyre. Following the recent adoption of the council's new Local Plan in February 2019, and the incorporation of suitable policy in the form of Policy CDMP6 (see Appendix C.2), the council is now in a position where it can move beyond actively encouraging the provision of electric vehicle infrastructure within future developments, to making it a necessity where relevant. The council is also in the process of installing a number of electric vehicle charging points for public use within the borough, to add to the 8 points recently installed by Lancashire County Council, and hopes also to shortly provide a total of 4 fast chargers, solely for use by the taxi industry. On completion of the installation works, the council will seek to advertise and promote use of the charging infrastructure available within the borough and beyond its boundaries, via both its website and social media, and will look to further educate and encourage the uptake and use of electric vehicles via the undertaking of promotional initiatives with its partners.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

Wyre Council has no automatic monitoring sites within the borough. The nearest sites are located in the Town of Blackpool and City of Preston. National monitoring results are available at https://uk-air.defra.gov.uk/networks/find-sites.

3.1.2 Non-Automatic Monitoring Sites

Wyre Council undertook non-automatic (passive) monitoring of NO_2 at 19 sites during 2019. Table A.1 in Appendix A shows the details of all sites within the council's monitoring network.

Maps showing the location of all monitoring sites within Wyre are provided in Appendix D.

Further details on Quality Assurance / Quality Control (QA/QC) for the diffusion tubes, including bias adjustments, and any other adjustments applied (e.g. "annualisation" and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias[4], "annualisation" (where the data capture falls below 75%), and distance correction[5]. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A. in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3. These results are also illustrated in graph form (Figure A.1).

Note that the concentration data presented in Table A. represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2019 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

Review of the 2019 monitoring data is extremely encouraging. Not only do the results suggest a reduction in annual mean NO_2 concentration across the council's entire monitoring network, comparison against air quality objectives also suggests that there are no sites within the borough where the annual mean objective of 40ug/m^3 is being exceeded. This includes the two monitoring sites within the Chapel Street AQMA (Site R1-3 and Site R4-6), together with Site 14 (located just outside of the AQMA

[4] https://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html
[5] Fall-off with distance correction criteria is provided in paragraph 7.77, LAQM.TG(16)

boundary), all of which were found to be in exceedance of the national objective in 2012.

The 2019 results also indicate that there are no sites within the council's monitoring network where the annual mean NO_2 concentration comes close to reaching the national objective of 40ug/m^3. The highest recorded annual mean from any site within the council's monitoring network was 28.1ug/m^3, which was recorded at Site R1-3 within the Chapel Street AQMA, thereby suggesting that all sites within the council's monitoring network have annual mean concentrations of at least 10ug/m^3 below the national objective.

In respects to Site K, located on Poulton Road, Fleetwood, where a slight increase in annual mean concentration has been seen over the last three years; the 2019 results suggest a reduction of 1.8ug/m^3 from 2018, to just 13.2ug/m^3. Site K thereby remains the site with the lowest annual mean NO_2 concentration with the council's network (with the exception of its urban background site), therefore the council has no current concerns regarding this location.

In terms of the significance of the 2019 results on the future of the AQMA, this is the seventh consecutive year in which those sites located within and adjacent to the Chapel Street AQMA (Site R1-3, Site R4-6 and Site 14), have fallen below the national objective for NO_2. Whilst site R1-3 recorded the highest annual mean concentration across the council's monitoring network for 2019, the results also provide the lowest annual mean concentration at this location since the declaration of the AQMA in 2009. Site R1-3 also saw the biggest reduction in annual mean concentration across the council's network in comparison to the 2018 results, with a 4.4ug/m^3 reduction from 32.5ug/m^3 to 28.1ug/m^3. The 2019 results are therefore considered to be extremely positive particularly having regard to the amount of development ongoing within and

around Poulton-le-Fylde at this time. The council does however remain cautious in the knowledge that further significant development in and around Poulton-le-Fylde is proposed within the council's newly adopted Local Plan, and thereby stands by its intention to defer any decision in relation to revoking the Chapel Street AQMA until the impact of that development on the Chapel Street AQMA can be better determined. Therefore no changes to the Chapel Street AQMA are proposed at this time.

Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
Site K	22 Poulton Road, Fleetwood FY7 6LP	Roadside	333402	447778	NO_2	NO	0	6.57	NO	2.08
Site L	153 Victoria Road East, Thornton-Cleveleys FY5 5HH	Roadside	333717	442185	NO_2	NO	0	3.63	NO	1.94
Site M	200 Fleetwood Road South, Thornton-Cleveleys FY5 5NR	Suburban	333711	441308	NO_2	NO	0	12.44	NO	2
Site N	43/44 High Street, Garstang PR3 1EA	Roadside	349237	445344	NO_2	NO	0	1.79	NO	2.31
Site R 1-3	11/13 Chapel Street, Garstang, FY6 7B	Roadside	334903	439425	NO_2	Yes	0	2.04	NO	2.22
Site R 4-6	Chapel Street, Poulton	Roadside	334887	439458	NO_2	Yes	0	1.56	NO	2.5

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
Site S	36 Tithebarn Street, Poulton, FY6 7BX	Roadside	334725	439550	NO_2	NO	0	7	NO	2.26
Site T	133 Breck Road, Poulton FY6 7HJ	Roadside	335247	440095	NO_2	NO	0	4.53	NO	2.15
Site U	Wyre Council, Breck Road, Poulton, FY6 7PU	Urban Background	334987	439868	NO_2	NO	N/A	N/A	NO	1.95
Site 3	5 Bridge Row, St Michaels, PR3 0TJ	Roadside	346143	441157	NO_2	NO	0	1.23	NO	1.97
Site 7	168 Breck Road, Poulton, FY6 7JZ	Suburban	335499	440467	NO_2	NO	0	12.23	NO	2.04
Site 8	66 Hardhorn Road, Poulton FY6 8AX	Suburban	334791	438990	NO_2	NO	0	11.55	NO	2.01
Site 9	1A Hardhorn Road, Poulton FY6 7WA	Roadside	334836	439317	NO_2	NO	0	1.85	NO	2.1
Site 11	3 Briarwood Court, Thornton-Cleveleys, FY5 5DZ	Suburban	333965	441347	NO_2	NO	0	10.96	NO	2.04
Site 12	2 Park Hill Road, Garstang PR3 1EL	Roadside	349134	445224	NO_2	NO	0	1.7	NO	2.23

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
Site 13	10 Croston Road, PR3 1FL	Roadside	349222	445455	NO_2	NO	0	1.17	NO	2.23
Site 14	Halifax, Breck Road, Poulton	Roadside	334868	439525	NO_2	NO	0	1.73	NO	2.19
Site 15	63 Trunnah Road, Thornton-Cleveleys, FY5 4HF	Roadside	333874	443054	NO_2	NO	0	1.33	NO	2.14
Site 16	24 Rose Fold, Thornton-Cleveleys FY5 4NQ	Suburban	333429	443983	NO_2	NO	0	12.58	NO	2

Notes:

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

(2) N/A if not applicable.

Table A.2 – Annual Mean NO_2 Monitoring Results

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3) (4)				
							2015	2016	2017	2018	2019
Site K	333402	447778	Roadside	Diffusion Tube	100	100	12.4	14.1	14.5	15	13.2
Site L	333717	442185	Roadside	Diffusion Tube	100	100	20.1	21.7	20.1	21.4	19.7
Site M	333711	441308	Suburban	Diffusion Tube	100	100	14.7	17.6	15.7	19.1	17.5
Site N	349237	445344	Roadside	Diffusion Tube	100	100	23.4	25.2	23.8	23.9	20
Site R 1-3	334903	439425	Roadside	Diffusion Tube	92	92	31.1	32.3	30	32.5	28.1
Site R 4-6	334887	439458	Roadside	Diffusion Tube	94	94	32.9	31.5	31.3	31.6	27.8
Site S	334725	439550	Roadside	Diffusion Tube	92	92	17.8	19	17.6	19.8	19.2
Site T	335247	440095	Roadside	Diffusion Tube	100	100	26.7	27.7	27.5	27.5	24.4
Site U	334987	439868	Urban Background	Diffusion Tube	92	92	8.6	10.1	9.5	10.2	9
Site 3	346143	441157	Roadside	Diffusion Tube	75	75	28.3	29.8	25.6	27.4	24.5
Site 7	335499	440467	Suburban	Diffusion Tube	100	100	13.7	15.7	14.8	14.8	13.3
Site 8	334791	438990	Suburban	Diffusion Tube	100	100	16.2	19.1	17.7	19.5	17.2
Site 9	334836	439317	Roadside	Diffusion Tube	100	100	20.1	22.9	20.3	21.5	19.6
Site 11	333965	441347	Suburban	Diffusion Tube	83	83	17.6	20.2	19.1	20	17.9
Site 12	349134	445224	Roadside	Diffusion Tube	97	97	23.3	25.8	24.4	24.7	21.3

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	NO_2 Annual Mean Concentration (µg/m^3) (3) (4)				
							2015	2016	2017	2018	2019
Site 13	349222	445455	Roadside	Diffusion Tube	100	100	21.9	25.6	23.0	24.0	21.0
Site 14	334868	439525	Roadside	Diffusion Tube	94	94	30.3	29.5	29.6	30.6	26.8
Site 15	333874	443054	Roadside	Diffusion Tube	94	94	27.1	28.6	28.6	28.4	27.7
Site 16	333429	443983	Suburban	Diffusion Tube	92	92	13.5	15.2	14.3	15.7	13.4

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

☒ **Annualisation has been conducted where data capture is <75%**

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

Notes:

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

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

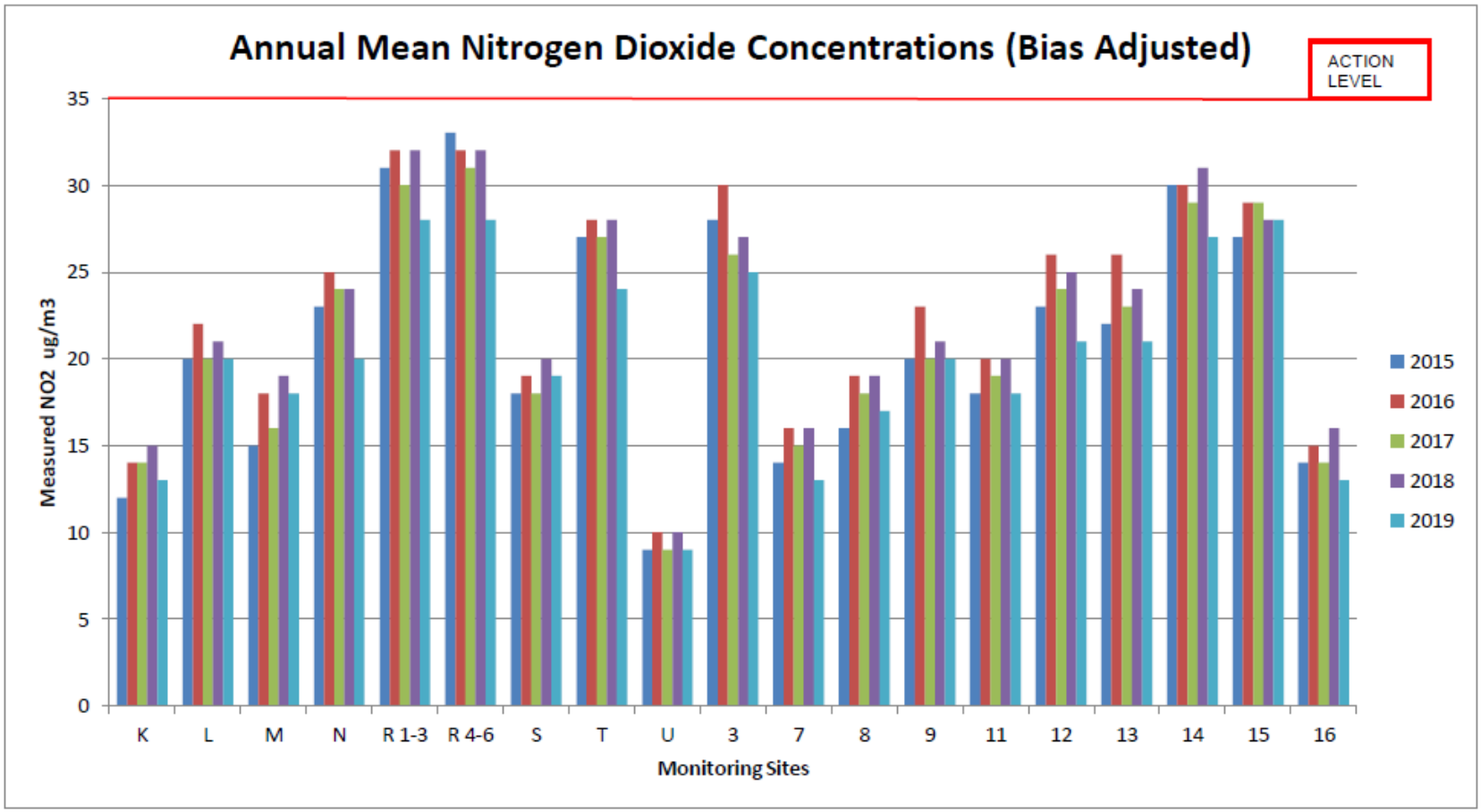
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

(3) Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

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

Figure A.1 – Trends in Annual Mean NO_2 Concentrations



Appendix B: Full Monthly Diffusion Tube Results for 2019

Table B.1 - NO_2 Monthly Diffusion Tube Results - 2019

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m^3)														
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
															Raw Data	Bias Adjusted (0.87) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
Site K	333402	447778	23.8	21.6	10.9	16.4	11.1	9.7	10	7.9	12.9	19.7	18.9	19.8	15.2	13.2	100
Site L	333717	442185	29.4	27.2	21.3	20.5	19.4	17	17.6	18.4	22.8	24.8	29.4	24.4	22.7	19.7	100
Site M	333711	441308	33.4	28.5	19.5	21.9	16.7	14.8	12	10.8	15.8	19.9	19.5	28	20.1	17.5	100
Site N	349237	445344	36.6	24.4	22.9	17	19.9	20.7	21.9	18.4	23.2	22.5	21.4	27.7	23.1	20.1	100
Site R 1-3	334903	439425	42.2	37.8	28	43.2	27.8	29.5	26.8	22.9	31.8	30.4	30.5	30.8			
Site R 1-3	334903	439425	43.4	39.1	30.2	38.6	27.5	29.9	26.6	22.3	35.6	34.8	31.9	26.1			
Site R 1-3	334903	439425	46	39.8	25.1	38.7	28	missing	outlier	18.1	33.3	37.4	Outlier	32.4	32.3	28.1	91.66666667
Site R 4-6	334887	439458	50.6	37.1	33.9	28	30.6	27.3	29.5	23.4	33.8	32.2	34.3	29			
Site R 4-6	334887	439458	46.1	38.2	34.6	30.2	27.6	29.8	30	21.6	34.6	28.1	37	32.9			

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m^3)														
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
															Raw Data	Bias Adjusted (0.87) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
Site R 4-6	334887	439458	outlier	38.3	35.3	30	30	25.9	24.6	21.5	35.3	31.3	Missing	32.5	31.9	27.8	94.44444444
Site S	334725	439550	42.4	missing	20	22.4	18.8	15.8	16.6	14.8	19.9	21.6	27.7	22.8	22.1	19.2	91.66666667
Site T	335247	440095	36.4	32	31	21.5	27.5	25.7	27.1	24.7	31.3	31.3	17.4	26.7			
Site T	335247	440095	37.5	32.7	31.9	23.9	26.7	26.1	27.8	24	33.1	30.7	20.5	27.6			
Site T	335247	440095	39	31.2	29.9	22.5	26.8	27	24.9	24.8	30	28.1	21.8	28.8	28.1	24.4	100
Site U	334987	439868	18.8	17.9	7	8.1	6.6	5.4	5.5	5.4	9.7	12.7	13.7	12			
Site U	334987	439868	18.4	16.4	7.3	9.4	6.3	5.3	5.2	5.5	9.2	11.7	13.9	12.7			
Site U	334987	439868	18.8	16.9	7.8	9.6	6.1	5.3	outlier	5.4	outlier	11.3	outlier	14.5	10.3	9	91.66666667
Site 3	346143	441157	35.5	34.2	22.5	31.2	24.9	missing	24.16	22.7	27.4	missing	31	missing	28.2	24.5	75
Site 7	335499	440467	25.4	21.9	14.4	14	14	12.7	12.5	9.8	16.3	7	19.9	15.3	15.3	13.3	100
Site 8	334791	438990	28.3	24.3	18.6	20.7	16.6	14.9	14.3	11.5	19.5	20.5	24.2	21.2			
Site 8	334791	438990	27.7	26.2	18.8	22	16.6	15.5	13.9	11.7	17	27.1	19.5	22.9			
Site 8	334791	438990	30.1	24.7	18.8	17.7	16.2	13.5	14.2	11.7	18.3	25.6	23.5	23.7	19.8	17.2	100

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m^3)														
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
															Raw Data	Bias Adjusted (0.87) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
Site 9	334836	439317	33.5	31.2	19.5	26.1	20.4	19.8	16.1	15.3	20.6	23.5	20.2	24.3	22.5	19.6	100
Site 11	333965	441347	30.5	29.1	missing	missing	12	16.7	18.3	16.7	19.8	21.6	15.6	25.5	20.6	17.9	83.33333333
Site 12	349134	445224	37.6	32	28.6	21.3	20.2	19.1	18.9	18.1	23.4	25.5	16.2	29.8			
Site 12	349134	445224	30.1	29.6	28.8	18.3	20.8	20.7	22.7	20.6	23.4	27.5	22.4	27.4			
Site 12	349134	445224	38	28.3	25.4	outlier	21.8	19.7	23.8	21	26	26.3	18.2	27.3	24.5	21.3	97.22222222
Site 13	349222	445455	32.2	26.5	22.2	18.6	23	20.4	20.1	19	26	25.8	27.8	24.5			
Site 13	349222	445455	36	27	23.3	17.8	21.2	19.5	19.7	17.6	23.9	26.5	31.3	28			
Site 13	349222	445455	36.1	26.6	24.9	18	21.7	19	21.6	17.7	26	25.4	29.6	23.9	24.1	21	100
Site 14	334868	439525	43.1	40.4	29.1	25.6	26.4	23	26.7	28.6	33.8	missing	outlier	31.2			
Site 14	334868	439525	42.8	43.5	32.2	29.1	24.8	27.1	29.1	28.2	34.9	30.6	26.6	31.5			
Site 14	334868	439525	30.3	39.7	32.1	25.6	25.8	27.5	28.9	23.9	34.1	30.1	27.1	34	30.8	26.8	94.44444444
Site 15	333874	443054	43.5	40.7	30	26.7	26.1	24.9	26	24.2	31.4	35	48.9	31.7			
Site 15	333874	443054	44.8	39	31.2	29.1	24.7	24.7	25.3	24.9	31.3	missing	43.2	31.6			
Site 15	333874	443054	43.3	37	29.8	27.5	26.4	23.2	25.1	24.8	30.6	32.6	outlier	41.5	31.8	27.7	94.44444444

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m^3)														
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
															Raw Data	Bias Adjusted (0.87) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
Site 16	333429	443983	24	20	missing	13.9	12.6	11.5	12.3	11.8	14.9	13.9	17.3	17.4	15.4	13.4	91.66666667

☐ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

☒ **Annualisation has been conducted where data capture is <75%**

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

Notes:

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

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

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

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

There have been no significant changes to sources of pollution within the borough within 2019, therefore no changes have been made to the council's monitoring programme.

The only exception to this is the increase in the number of temporary 'test' sites within the borough from three to five, and the relocation of the existing three temporary sites to new locations within the district where air quality is a current concern.

The current location of the council's 'test' monitoring stations are provided within map format in Appendix D. The permanence of these monitoring stations will be reviewed on a regular basis and the results obtained, provided on the council's air quality webpage when at least 6 months of data is available.

In terms of identifying areas of future air quality concern within the borough, the council continuously reviews all relevant planning applications where either the introduction of a potential new source of pollution is planned, or where significant changes to an existing source of pollution are proposed. The applications to which particular attention is paid within the borough include:

- Large scale retail/ leisure / commercial developments
- Large scale housing developments

- Developments likely to result in increased congestion, or changes in traffic volumes and/ or vehicle speeds
- Developments introducing new / alterations to existing roads & junctions
- Developments which significantly increase car parking provision in an area
- Large scale poultry breeding establishments
- Industrial Installations
- Biomass / CHP Installations
- Petrol Stations
- Developments involving transport, e.g.: train stations, taxi ranks, bus stations, etc.
- Developments associated with the increased use of HGV's
- Development likely to give rise to the generation of dust

The council also gives careful consideration to any applications which propose to introduce new receptors to an area of poorer air quality.

Within 2019 the council reviewed and commented on a total of 5 detailed air quality assessments associated with individual planning applications. A summary of those applications, is provided in Table C.1 overleaf, together with the outcome of their assessment.

Table C.1. Planning Proposals Supported by a Detailed AQ Assessment

Application No.	Location of Proposal	Detail of Proposal	Outcome of Impact Assessment	Application Status
18/00632/OUTMAJ	Land off Calder House Lane, Barnacre with Bonds, PR3 1ZE	Outline application residential development of up to 90 dwellings. Access from Calder House Lane.	No significant adverse impacts predicted in respects to the Construction Phase of the development providing that Best Practice mitigation implemented. However, further assessment required in respects to the Operational Phase of the development due to uncertainties within the data and assessment. No verification of the data, which coupled with the uncertainties prevents any conclusions from being drawn. Further consideration required to the cumulative impact of other developments within the area. Advice given to applicants.	Application Withdrawn
19/00137/FUL	Land South of South Road, Hillhouse Industrial Estate, Fleetwood Road North, Thornton	Non material amendment to 16/00823 in respects to the erection of a gas fired energy reserve facility	Conditions Recommended – Consent limited to the installation of four 4.5MWe and one 2.67MWe engines with maximum exhaust stack emission rate per engine of 1.25g/s and 0.58g/s respectively that must terminate either 15.5m above ground level or 14m above platform height. The consented engines must not operate for more than 2,500 hours per year.	Pending Consideration
17/00743	Westfield Farm, Garstang Road,, Claughton on Brock, PR3 0PH	Outline application for the erection of a retirement village. 200 one / two bedroomed assisted living residential dwellings. Access from A6.	No significant adverse impact predicted. Construction Management Plan required in respects to the Construction Phase of Development. One electric vehicle charging point to be provided for each dwelling with a garage or allocated parking space. Travel Plan required to support the application.	Application Refused

Application No.	Location of Proposal	Detail of Proposal	Outcome of Impact Assessment	Application Status
19/00551/FULMAJ	Land to the South of Blackpool Road, Poulton-le-Fylde	Hybrid Application consisted of detailed app for 197 dwellings with open space provision, and outline application for the development of a two form entry primary school	Conditions recommended in respects to both the Construction and Operational Phases of the development. Conditions require the submission of a Dust Management Plan in advance of any construction works commencing. Conditions also require the provision of an electric vehicle charging point for every dwelling with a garage or allocated off road parking, and a restriction that any gas boilers fitted must not emit more than 40mg NOx/kWh.	Pending Consideration
19/00860/OULMAJ	Land South of A586 & North of Copp Lane, Great Eccleston	Outline application for the erection of up to 350 dwellings, 1 hectare of employment land, a medical centre, a school, village hall and convenience	Further assessment required. Significant uncertainty within the existing assessment, particularly in respects to the potential impact on nearby junctions and cannon effect street. Guidance given to planning applicant as to the information required to enable further consideration to be given to the assessment.	Pending Consideration

C.2. Local Plan Policies Relevant to Air Quality

Those Local Plan Policies designed to protect and improve local air quality include:

SP2 Sustainable Development

1. All development should contribute positively to the overall physical, social, environmental and economic character of the area in which the development is located.

2. All development in Wyre should be sustainable and contribute to the continuation or creation of sustainable communities in terms of its location and accessibility.

3. Where there is any conflict between environmental, economic and social objectives, development proposals will be required in the first instance to seek to incorporate solutions where all objectives can be met.

4. In order to deliver sustainable communities the Local Plan includes policies and proposals which:

a) Facilitate economic growth including in the rural areas;
b) Maintain the vitality of all town, district and local centres;
c) Ensure housing provision to meet the needs of all sections of the community;
d) Facilitate the provision of strategic and local infrastructure and services;
e) Maximise the use of previously developed land;
f) Ensure accessible places and minimise the need to travel by car;
g) Maximise the use of existing infrastructure and services;
h) Reduce and manage flood risk;
i) Protect and enhance biodiversity, landscape, cultural heritage and green infrastructure assets;
j) Achieve safe and high quality designed local environments which promotes health

5. Development proposals must not compromise the Borough's ability to improve the health and well-being of local residents.

6. Development proposals must demonstrate how they respond to the challenge of climate change through appropriate design and by making best use of resources and assets, including the incorporation of water and energy efficiency measures through construction and operational phases and the reuse and recycling in construction both in the selection of materials and management of residual waste.

CDMP1 Environmental Protection

1. Development will be permitted where in isolation or in conjunction with other planned or committed developments it can be demonstrated that the development:

a) Will be compatible with adjacent existing uses or uses proposed in this plan and it would not lead to significant adverse effects on health, amenity, safety

and the operation of surrounding uses and for occupants or users of the development itself, with reference to noise, vibration, odour, light, dust, other pollution or nuisance,
Applications will be required to be accompanied, where appropriate by relevant impact assessments and mitigation proposals;

b) In the case of previously developed, other potentially contaminated or unstable land, a land remediation scheme can be secured which will ensure that the land is remediated to a standard which provides a safe environment for occupants and users and does not displace contamination;

c) (i) Will not give rise to a deterioration of air quality in a defined Air Quality Management Area or result in the declaration of a new AQMA. Where appropriate an air quality impact assessment will be required to support development proposals.

(ii) Where development will result in, or contribute to, a deterioration in air quality, permission will only be granted where any such harm caused is significantly and demonstrably outweighed by other planning considerations and appropriate mitigation measures are provided to minimise any such harm.

2. Proposals for the development of hazardous installations/pipelines, modifications to existing sites, or development in the vicinity of hazardous installations or pipelines, will be permitted where it has been demonstrated that the amount, type and location of hazardous substances would not pose unacceptable health and/or safety risks.

SP7 Infrastructure Provision and Developer Contributions

1. The Council will support infrastructure related development subject to other policies in the
Local Plan.

2. The Council will work with infrastructure providers, neighbouring authorities and stakeholders to ensure that development is supported by appropriate utility, transport, social, community and environmental infrastructure delivered in a timely and sustainable manner.

3. Development should be located so as to make the best use of existing infrastructure. Where new or improved infrastructure is required to meet needs arising directly from a development or to mitigate any adverse impacts of a development on existing infrastructure the development will make a financial contribution through Community Infrastructure Levy (CIL) or planning obligation made under Section 106 of the Town and Country Planning Act 1990 or any other future 'developer contributions' regime towards the provision of infrastructure.

4. Development should have regard to the latest Infrastructure Delivery Plan (IDP). The areas potentially subject to contributions include but are not limited to:

a) Affordable housing;

b) Highway and transport infrastructure including sustainable transport measures;

c) Flood prevention and surface water drainage including future maintenance;
d) Green infrastructure, including future maintenance;
e) Education;
f) Health care provision.

5. Where appropriate, developments may be required to incorporate new infrastructure onsite.

6. Where a financial contribution is required the level of the financial contribution will take into account the total contribution liability incurred by the development arising from all policy and site specific requirements. The overall level of contribution required will allow developments to remain viable, wherever this is compatible with securing essential works that are fundamental to the acceptability of the proposal.

7. Where appropriate and in consultation with the relevant infrastructure provider, the Council will consider proposals by developers to provide the necessary infrastructure as part of their development proposals rather than making a financial contribution.

CDMP6 Accessibility and Transport

1. Development will be permitted provided it meets the requirements of the Core Development Management Policies and it has been demonstrated that:

a) Land safeguarded for transport and highway improvements in the Local Transport Plan, Fylde Coast Highways and Transport Masterplan and any other scheme or strategy by the Highways Authority and Highways England is not compromised;

b) Road safety and the safe, efficient and convenient movement of all highway users (including bus passengers, refuse collection vehicles, the emergency services, cyclists and pedestrians) is not prejudiced;

c) Safe and adequate vehicular, cycle and pedestrian access to and from, and circulation within, a proposal site would be provided;

d) Appropriate provision is made for vehicular access, off-street servicing and parking in accordance with the Council's standards set out in Appendix B unless it is demonstrated to the satisfaction of the Local Planning Authority in consultation with the Local Highways Authority that different provision is justified taking into account local circumstances;

e) Where appropriate, access by public transport is catered for either by providing for bus access into the site where appropriate, or by ensuring that safe and convenient access exists to the nearest public facility;

f) Measures are included to encourage access on foot, by bicycle and public transport and reduce car reliance;

g) The needs of people with disabilities and older people are fully provided for, including those reliant on community transport services;

h) Developments adjacent to or affecting railway lines, including resulting in a material increase or change of character of the traffic using a rail crossing of a railway, should ensure that there will not result in an adverse impact on the operational safety of the railway network; and

i) Corridors which could be developed as future transport routes (e.g. disused railway lines) are not prejudiced.

2. Development which includes parking provision shall also make appropriate provision where practical for standard charge Electric Vehicle Recharging (EVR) points.

3. Where a development has an adverse impact on the existing highway network, developers or operators will be required to provide or contribute to such works to the transport network, including sustainable travel measures as are necessary to mitigate these impacts.

4. Where the above requirements can only be satisfied through the undertaking of off-site works the cost of these shall be borne by the developer.

5. Development which would attract large numbers of people on a regular basis or generate significant amounts of movement will be required to be supported by a Travel Plan setting out the measures that the developer, either alone or in conjunction with neighbouring uses, shall adopt to reduce reliance on the use of the private car for journeys to and from the site.

C3. Diffusion Tube Bias Adjustment Factors

All diffusion tubes used by the council during 2019 were obtained from and analysed by Gradko Ltd, using a 50% TEA in Acetone preparation method.

The bias adjustment factor used (0.87 ug/m^3) has been taken from the National Bias Adjustment Factor Spread Sheet (version 03/20), available on the LAQM Support pages of the DEFRA website[7].

The bias adjustment factor for Gradko is based on 8 studies, which were all of good precision.

C4. QA/QC of Diffusion Tube Monitoring

The council's analytical laboratory for the supply and analysis of its diffusion tubes (Gradko) is assessed annually by UKAS to establish conformance of its Laboratory Quality Procedures to the requirements of the ISO/IEC 17025 Standard. A copy of the laboratory's current UKAS certificate is provided overleaf, together with the laboratory's Technical Data Sheet for Diffusion Tube Monitoring (TDS1).

Further to the above, Gradko International participates in the AIR PT Analytical Proficiency Testing Scheme, which is an independent analytical proficiency programme, operated by LGC Standards, and supported by the Health and Safety Laboratory. The summary of laboratory performance provided on the LAQM Helpdesk[8] confirms that Gradko participated by providing two sets of test samples (2 x 4 tests) for each proficiency test round for the period January – November 2019 (Rounds AR030, AR031, AR033 and AR034). With the exception of just one sample round, all of Gradko's results submitted were deemed to be satisfactory based on a

score of ≤+2. Round AR030 (January – February 2019) was the only exception in which 75% of all the results submitted were deemed to be satisfactory.

In terms of diffusion tube precision, the council has 9 triplicate tube sites (Site's 8, 12, 13, 14, 15, R1-3, R4-6, U, & T). Use of the precision spread sheet tool available through the LAQM Helpdesk[5] indicates that all of the council's triplicate tubes demonstrated 'good' precision in 2019, i.e.: all tubes at each location demonstrated similar results to one another. Copies of the precision calculator spread sheets for each of the council's triplicate sites are provided overleaf for reference purposes.

Two calculation spread sheets are provided for Site 12, Site 14, Site 15, Site R1-3, Site R4-6, and Site U (one inclusive of data outliers and one without). The outliers identified at Site 12 (tube 12.3 in April); Site 14 (tube 14.1 in November), Site 15 (tube 15.3 in November), Site R1-3 (tube R1-3.3 in July and November), Site R4-6 (tube R4-6.3 in January); and Site U (tube U.3 in July, September and November), were the only outliers identified within the 2019 data. The tube precision calculator spread sheets for each of the site's (provided overleaf), illustrate the impact of the said outliers within the data set on tube precision.

C5. Short-Term to Long-Term Data Adjustment

Monitoring was undertaken at all 19 of the council's permanent monitoring sites for the full calandar year, resulting in 100% data capture at 9 sites. The minimum data capture from any site was 75%. Therefore no annualisation of the results was required.

Schedule of Accreditation

issued by

United Kingdom Accreditation Service

2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK

2187

Accredited to ISO/IEC 17025:2017

Gradko International Ltd (Trading as Gradko Environmental)

Issue No: 024 **Issue date:** 15 April 2020

St Martins House
77 Wales Street
Winchester
Hampshire
SO23 0RH

Contact: Mr A Poole
Tel: +44 (0)1962 860331
Fax: +44 (0)1962 841339
E-Mail: diffusion@gradko.co.uk
Website: www.gradko.co.uk

Testing performed at the above address only

DETAIL OF ACCREDITATION

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
ATMOSPHERIC POLLUTANTS Collected on diffusion (sorbent) tubes and monitors	Chemical Tests	Documented In-House Methods
	Ammonia as ammonium (NH_4^+)	GLM 8 by Ion Chromatography
	Benzene Toluene Ethyl benzene Xylene	GLM 4 by Thermal Desorption/ FID Gas Chromatography
	Hydrogen chloride as chloride (Cl^-) Nitrogen dioxide as nitrite (NO_2^-) Sulphur dioxide as sulphate (SO_4^{2-}) Hydrogen fluoride as fluoride (F^-)	GLM 3 by Ion Chromatography
	Hydrogen sulphide	GLM 5 by Colorimetric determination (UV Spectrophotometry)
	Ozone as nitrate (NO_3^-)	GLM 2 by Ion Chromatography
	Nitrogen Dioxide as nitrite (NO_2^-)	GLM 7 by Colorimetric determination (UV Spectrophotometry)
	Sulphur dioxide as sulphate (SO_4^{2-})	GLM 1 by Ion Chromatography
	Formaldehyde as formaldehyde-DNPH	GLM 18 by HPLC
	Volatile Organic Compounds including: Benzene Toluene Ethylbenzene p-Xylene o-Xylene	GLM 13 by Thermal Desorption GC-Mass Spectrometry

UKAS TESTING 2187 Accredited to ISO/IEC 17025:2017	**Schedule of Accreditation** **issued by** **United Kingdom Accreditation Service** 2 Pine Trees, Chertsey Lane, Staines-upon-Thames, TW18 3HR, UK **Gradko International Ltd** **(Trading as Gradko Environmental)** **Issue No:** 024 **Issue date:** 15 April 2020

Testing performed at main address only

Materials/Products tested	Type of test/Properties measured/Range of measurement	Standard specifications/ Equipment/Techniques used
ATMOSPHERIC POLLUTANTS Collected on diffusion (sorbent) tubes and monitors (cont'd)	Chemical Tests (cont'd)	
	Qualitative Analysis and Estimation of Volatile Organic Compounds on diffusion (sorbent) tubes and monitors	GLM 13 by Thermal Desorption GC-Mass Spectrometry with estimations in accordance with ISO standard 16000-6
	Naphthalene	GLM 13-1 by Thermal Desorption GC-Mass Spectrometry
	Tetrachloroethylene Trichloroethylene	GLM 13-2 by Thermal Desorption GC-Mass Spectrometry
	trans-1,2-Dichloroethene cis-1,2-Dichloroethene	GLM 13-3 by Thermal Desorption GC-Mass Spectrometry
	Indane Styrene	GLM 13-4 by Thermal Desorption GC-Mass Spectrometry
	1,2,3-Trimethylbenzene 1,2,4-Trimethylbenzene 1,3,5-Trimethylbenzene	GLM 13-5 by Thermal Desorption GC-Mass Spectrometry
	1,3-Butadiene	GLM 13-6 by Thermal Desorption GC-Mass Spectrometry
	Carbon Disulphide	GLM 13-7 by Thermal Desorption GC-Mass Spectrometry
	Vinyl Chloride	GLM 13-8 by Thermal Desorption GC-Mass Spectrometry
	Flexible scope for quantitative analysis of Volatile Organic Compounds on diffusion (sorbent) tubes and monitors in accordance with methods developed and validated by in-house procedure LWI 47	LWI 47 by Thermal Desorption GC-Mass Spectrometry
END		

Technical Data Sheet: TDS 1

DIF 100 RTU - NITROGEN DIOXIDE (NO_2)

This tube is designed for passively monitoring gaseous airborne Nitrogen dioxide.

Description: Acrylic tube fitted with coloured and white thermoplastic rubber caps. The coloured cap contains the absorbent.

The concentrations of Nitrite ions and hence NO_2 chemically adsorbed are quantitatively determined by UV/ Visible Spectrophotometry with reference to a calibration curve derived from the analysis of standard nitrite solutions (UKAS Accredited Methods).

Suitable for carrying out spatial or localized assessments for NO_2 in ambient air or workplace monitoring. It can be used for co-location projects alongside an automatic analyzer to obtain bias correction factors.

Clips and straps are not included and must be ordered separately.

Tube Dimensions: 71.0mm length x 11.0mm internal diameter.

Absorbent: Two preparations of Triethanolamine (TEA) absorbent are available:

20% Triethanolamine / De-ionised Water - *GREY CAP
50% Triethanolamine / Acetone – *RED CAP

Recommended Exposure Periods: 2 -4 weeks.

Air Velocity: Influence of Wind Speed < 10% between 1.0 and 4.5 $msec^{-1}$ (* based on original data).

Storage: Store in a dark, cool environment preferably between 5-10°C.

Shelf Life: 12 weeks from preparation date.

Desorption Efficiency: d = 0.98 (determined using N.I.S.T. Standard Analytes).

TDS 1:V1 March 2012

Limit of detection:

- 20%TEA/Water – less than 1.5 ugm^{-3} over a 4-week exposure period. Specific values available upon request.
- 50%TEA/Acetone – less than 2 ugm^{-3} over a 4-week exposure period. Specific values available upon request.

Analytical Expanded Measurement Uncertainty: available upon request.

Relevant Standards: BS EN 13528 Parts 1-3: 2002/3

Reference document: ED48673043 Issue-1A Feb 2008 – AEA Energy and Environment

Special Factors: Potential interference from Nitrous Acid , Peroxy Acetyl Nitrate, which could increase levels of nitrate.

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (%DC)	Tubes Precision Check	Automatic Monitor Data
1	01/01/2019	31/12/2019	28.3	27.7	30.1	29	1.3	5	3.2			Good	
2	01/01/2019	31/12/2019	24.3	26.2	24.7	25	1.0	4	2.5			Good	
3	01/01/2019	31/12/2019	18.6	18.8	18.8	19	0.1	1	0.2			Good	
4	01/01/2019	31/12/2019	20.7	22.0	17.7	20	2.2	11	5.5			Good	
5	01/01/2019	31/12/2019	16.6	16.6	16.2	16	0.2	1	0.5			Good	
6	01/01/2019	31/12/2019	14.9	15.5	13.5	15	1.0	7	2.5			Good	
7	01/01/2019	31/12/2019	14.3	13.9	14.2	14	0.2	1	0.4			Good	
8	01/01/2019	31/12/2019	11.5	11.7	11.7	12	0.1	1	0.3			Good	
9	01/01/2019	31/12/2019	19.5	17.0	18.3	18	1.2	7	3.0			Good	
10	01/01/2019	31/12/2019	20.5	27.1	25.6	24	3.5	14	8.6			Good	
11	01/01/2019	31/12/2019	24.2	19.5	23.5	22	2.5	11	6.3			Good	
12	01/01/2019	31/12/2019	21.2	22.9	23.7	23	1.3	6	3.2			Good	
13													
											Overall survey -->	Good precision	

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

Site Name/ ID:	Site 8

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

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: μgm^{-3}
Mean CV (Precision):
Automatic Mean: μgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: μgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: μgm^{-3}
Mean CV (Precision):
Automatic Mean: μgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: μgm^{-3}

Jaume Targa, for AEA
Version 04 - February 2011

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements									
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	01/01/2019	31/12/2019	37.6	30.1	38.0	35	4.4	13	11.0
2	01/01/2019	31/12/2019	32.0	29.6	28.3	30	1.9	6	4.7
3	01/01/2019	31/12/2019	28.6	28.8	25.4	28	1.9	7	4.8
4	01/01/2019	31/12/2019	21.3	18.3	7.9	16	7.0	46	17.5
5	01/01/2019	31/12/2019	20.2	20.8	21.8	21	0.8	4	2.0
6	01/01/2019	31/12/2019	19.1	20.7	19.7	20	0.8	4	2.1
7	01/01/2019	31/12/2019	18.9	22.7	23.8	22	2.6	12	6.4
8	01/01/2019	31/12/2019	18.1	20.6	21.0	20	1.6	8	3.9
9	01/01/2019	31/12/2019	23.4	23.4	26.0	24	1.5	6	3.7
10	01/01/2019	31/12/2019	25.5	27.5	26.3	26	1.0	4	2.6
11	01/01/2019	31/12/2019	16.2	22.4	18.2	19	3.1	17	7.8
12	01/01/2019	31/12/2019	29.8	27.4	27.3	28	1.4	5	3.5
13									

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

Automatic Method		Data Quality Check	
Period Mean	Data Capture (%DC)	Tubes Precision Check	Automatic Monitor Data
		Good	
		Good	
		Good	
		Poor Precision	
		Good	
		Good	
		Good	
		Good	
		Good	
		Good	
		Good	
		Good	
Overall survey -->		Good precision	

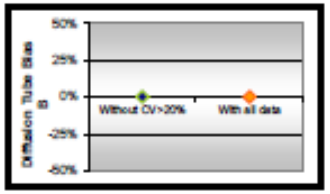
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	Site 12

Precision: 11 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	µgm^{-3}
Mean CV (Precision):	
Automatic Mean:	µgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	µgm^{-3}
Mean CV (Precision):	
Automatic Mean:	µgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (%DC)	Tubes Precision Check	Automatic Monitor Data
1	01/01/2019	31/12/2019	37.6	30.1	38.0	35	4.4	13	11.0			Good	
2	01/01/2019	31/12/2019	32.0	29.6	28.3	30	1.9	6	4.7			Good	
3	01/01/2019	31/12/2019	28.6	28.8	25.4	28	1.9	7	4.8			Good	
4	01/01/2019	31/12/2019	21.3	18.3	outlier	20	2.1	10	18.6			Good	
5	01/01/2019	31/12/2019	20.2	20.8	21.8	21	0.8	4	2.0			Good	
6	01/01/2019	31/12/2019	19.1	20.7	19.7	20	0.8	4	2.1			Good	
7	01/01/2019	31/12/2019	18.9	22.7	23.8	22	2.6	12	6.4			Good	
8	01/01/2019	31/12/2019	18.1	20.6	21.0	20	1.6	8	3.9			Good	
9	01/01/2019	31/12/2019	23.4	23.4	26.0	24	1.5	6	3.7			Good	
10	01/01/2019	31/12/2019	25.5	27.5	26.3	26	1.0	4	2.6			Good	
11	01/01/2019	31/12/2019	16.2	22.4	18.2	19	3.1	17	7.8			Good	
12	01/01/2019	31/12/2019	29.8	27.4	27.3	28	1.4	5	3.5			Good	
13													

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

Overall survey --> Good precision

(Check average CV & DC from Accuracy calculations)

Site Name/ ID: Site 12 outlier removed

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

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: μgm^{-3}
Mean CV (Precision):
Automatic Mean: μgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: μgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: μgm^{-3}
Mean CV (Precision):
Automatic Mean: μgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: μgm^{-3}

Jaume Targa, for AEA
Version 04 - February 2011

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (%DC)	Tubes Precision Check	Automatic Monitor Data
1	01/01/2019	31/12/2019	32.2	36.0	36.1	35	2.2	6	5.4			Good	
2	01/01/2019	31/12/2019	26.5	27.0	26.6	27	0.2	1	0.6			Good	
3	01/01/2019	31/12/2019	22.2	23.3	24.9	23	1.4	6	3.5			Good	
4	01/01/2019	31/12/2019	18.6	17.8	18.0	18	0.4	2	1.0			Good	
5	01/01/2019	31/12/2019	23.0	21.2	21.7	22	0.9	4	2.2			Good	
6	01/01/2019	31/12/2019	20.4	19.5	19.0	20	0.7	4	1.8			Good	
7	01/01/2019	31/12/2019	20.1	19.7	21.6	20	1.0	5	2.5			Good	
8	01/01/2019	31/12/2019	18.9	17.6	17.7	18	0.7	4	1.8			Good	
9	01/01/2019	31/12/2019	26.0	23.9	26.0	25	1.2	5	3.0			Good	
10	01/01/2019	31/12/2019	25.8	26.5	25.4	26	0.6	2	1.4			Good	
11	01/01/2019	31/12/2019	27.8	31.3	29.6	30	1.8	6	4.5			Good	
12	01/01/2019	31/12/2019	24.5	28.0	23.9	25	2.2	9	5.5			Good	
13													
										Overall survey -->		Good precision	

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

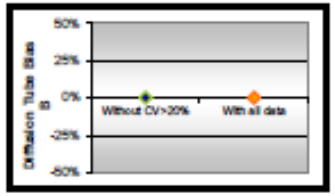
Site Name/ ID:	Site 13

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

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	µgm^{-3}
Mean CV (Precision):	
Automatic Mean:	µgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	µgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	µgm^{-3}
Mean CV (Precision):	
Automatic Mean:	µgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	µgm^{-3}



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Version 04 - February 2011

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (%DC)	Tubes Precision Check	Automatic Monitor Data
1	01/01/2019	31/12/2019	43.1	42.8	30.3	39	7.3	19	18.2			Good	
2	01/01/2019	31/12/2019	40.4	43.5	39.7	41	2.1	5	5.1			Good	
3	01/01/2019	31/12/2019	29.1	32.2	32.1	31	1.8	6	4.4			Good	
4	01/01/2019	31/12/2019	25.6	29.1	25.6	27	2.0	8	5.0			Good	
5	01/01/2019	31/12/2019	26.4	24.8	25.8	26	0.8	3	2.0			Good	
6	01/01/2019	31/12/2019	23.0	27.1	27.5	26	2.5	10	6.3			Good	
7	01/01/2019	31/12/2019	26.7	29.1	28.9	28	1.4	5	3.4			Good	
8	01/01/2019	31/12/2019	28.6	28.2	23.9	27	2.6	10	6.5			Good	
9	01/01/2019	31/12/2019	33.8	34.9	34.1	34	0.6	2	1.4			Good	
10	01/01/2019	31/12/2019	missing	30.6	30.1	30	0.3	1	2.9			Good	
11	01/01/2019	31/12/2019	40.7	26.6	27.1	31	8.0	26	19.8			Poor Precision	
12	01/01/2019	31/12/2019	31.2	31.5	34.0	32	1.5	5	3.8			Good	
13													
										Overall survey -->		Good precision	

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

(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	Site 14

Precision: 11 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	μgm^{-3}

Jaume Targa, for AEA
Version 04 - February 2011

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (%DC)	Tubes Precision Check	Automatic Monitor Data
1	01/01/2019	31/12/2019	43.1	42.8	30.3	39	7.3	19	18.2			Good	
2	01/01/2019	31/12/2019	40.4	43.5	39.7	41	2.1	5	5.1			Good	
3	01/01/2019	31/12/2019	29.1	32.2	32.1	31	1.8	6	4.4			Good	
4	01/01/2019	31/12/2019	25.6	29.1	25.6	27	2.0	8	5.0			Good	
5	01/01/2019	31/12/2019	26.4	24.8	25.8	26	0.8	3	2.0			Good	
6	01/01/2019	31/12/2019	23.0	27.1	27.5	26	2.5	10	6.3			Good	
7	01/01/2019	31/12/2019	26.7	29.1	28.9	28	1.4	5	3.4			Good	
8	01/01/2019	31/12/2019	28.6	28.2	23.9	27	2.6	10	6.5			Good	
9	01/01/2019	31/12/2019	33.8	34.9	34.1	34	0.6	2	1.4			Good	
10	01/01/2019	31/12/2019	missing	30.6	30.1	30	0.3	1	2.9			Good	
11	01/01/2019	31/12/2019	outlier	26.6	27.1	27	0.3	1	3.0			Good	
12	01/01/2019	31/12/2019	31.2	31.5	34.0	32	1.5	5	3.8			Good	
13													
										Overall survey -->		Good precision	

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

(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	Site 14 outlier removed

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

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: μgm^{-3}
Mean CV (Precision):
Automatic Mean: μgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: μgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: μgm^{-3}
Mean CV (Precision):
Automatic Mean: μgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: μgm^{-3}

Jaume Targa, for AEA
Version 04 - February 2011

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (%DC)	Tubes Precision Check	Automatic Monitor Data
1	01/01/2019	31/12/2019	43.5	44.8	43.3	44	0.8	2	2.1			Good	
2	01/01/2019	31/12/2019	40.7	39.0	37.0	39	1.9	5	4.6			Good	
3	01/01/2019	31/12/2019	30.0	31.2	29.8	30	0.8	2	1.9			Good	
4	01/01/2019	31/12/2019	26.7	29.1	27.5	28	1.2	4	3.1			Good	
5	01/01/2019	31/12/2019	26.1	24.7	26.4	26	0.9	4	2.3			Good	
6	01/01/2019	31/12/2019	24.9	24.7	23.2	24	0.9	4	2.3			Good	
7	01/01/2019	31/12/2019	26.0	25.3	25.1	25	0.5	2	1.2			Good	
8	01/01/2019	31/12/2019	24.2	24.9	24.8	25	0.4	2	0.9			Good	
9	01/01/2019	31/12/2019	31.4	31.3	30.6	31	0.4	1	1.1			Good	
10	01/01/2019	31/12/2019	35.0	missing	32.6	34	1.7	5	15.2			Good	
11	01/01/2019	31/12/2019	48.9	43.2	30.9	41	9.2	22	22.8			Poor Precision	
12	01/01/2019	31/12/2019	31.7	31.6	41.5	35	5.7	16	14.1			Good	
13													
										Overall survey -->		Good precision	

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

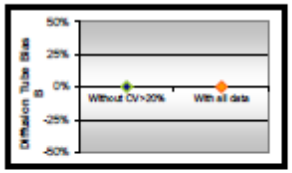
Site Name/ ID:	Site 15

Precision: 11 out of 12 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: μgm^{-3}
Mean CV (Precision):
Automatic Mean: μgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: μgm^{-3}
Mean CV (Precision):
Automatic Mean: μgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: μgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (%DC)	Tubes Precision Check	Automatic Monitor Data
1	01/01/2019	31/12/2019	43.5	44.8	43.3	44	0.8	2	2.1			Good	
2	01/01/2019	31/12/2019	40.7	39.0	37.0	39	1.9	5	4.6			Good	
3	01/01/2019	31/12/2019	30.0	31.2	29.8	30	0.8	2	1.9			Good	
4	01/01/2019	31/12/2019	26.7	29.1	27.5	28	1.2	4	3.1			Good	
5	01/01/2019	31/12/2019	26.1	24.7	26.4	26	0.9	4	2.3			Good	
6	01/01/2019	31/12/2019	24.9	24.7	23.2	24	0.9	4	2.3			Good	
7	01/01/2019	31/12/2019	26.0	25.3	25.1	25	0.5	2	1.2			Good	
8	01/01/2019	31/12/2019	24.2	24.9	24.8	25	0.4	2	0.9			Good	
9	01/01/2019	31/12/2019	31.4	31.3	30.6	31	0.4	1	1.1			Good	
10	01/01/2019	31/12/2019	35.0	missing	32.6	34	1.7	5	15.2			Good	
11	01/01/2019	31/12/2019	48.9	43.2	outlier	46	4.0	9	36.2			Good	
12	01/01/2019	31/12/2019	31.7	31.6	41.5	35	5.7	16	14.1			Good	
13													
											Overall survey -->	Good precision	

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

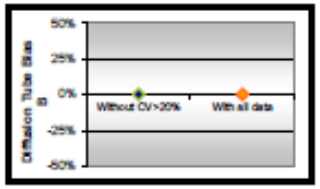
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	Site 15 outlier removed

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

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	μgm^{-3}



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Version 04 - February 2011

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (%DC)	Tubes Precision Check	Automatic Monitor Data
1	01/01/2019	31/12/2019	42.2	43.4	46.0	44	2.0	4	4.9			Good	
2	01/01/2019	31/12/2019	37.8	39.1	39.8	39	1.0	3	2.5			Good	
3	01/01/2019	31/12/2019	28.0	30.2	25.1	28	2.6	9	6.4			Good	
4	01/01/2019	31/12/2019	43.2	38.4	38.7	40	2.7	7	6.6			Good	
5	01/01/2019	31/12/2019	27.8	27.5	28.0	28	0.2	1	0.6			Good	
6	01/01/2019	31/12/2019	29.5	29.9	missing	30	0.2	1	2.0			Good	
7	01/01/2019	31/12/2019	26.8	26.6	5.4	20	12.3	63	30.6			Poor Precision	
8	01/01/2019	31/12/2019	22.9	22.3	18.1	21	2.6	12	6.5			Good	
9	01/01/2019	31/12/2019	31.8	35.6	33.3	34	1.9	6	4.7			Good	
10	01/01/2019	31/12/2019	30.4	34.8	37.4	34	3.5	10	8.7			Good	
11	01/01/2019	31/12/2019	30.5	31.9	44.8	36	7.9	22	19.6			Poor Precision	
12	01/01/2019	31/12/2019	30.8	26.1	32.4	30	3.3	11	8.1			Good	
13													
										Overall survey -->		Good precision	

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

(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	Site R1 - R3

Precision: 10 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	μgm^{-3}

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Version 04 - February 2011

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (%DC)	Tubes Precision Check	Automatic Monitor Data
1	01/01/2019	31/12/2019	42.2	43.4	46.0	44	2.0	4	4.9			Good	
2	01/01/2019	31/12/2019	37.8	39.1	39.8	39	1.0	3	2.5			Good	
3	01/01/2019	31/12/2019	28.0	30.2	25.1	28	2.6	9	6.4			Good	
4	01/01/2019	31/12/2019	43.2	38.4	38.7	40	2.7	7	6.6			Good	
5	01/01/2019	31/12/2019	27.8	27.5	28.0	28	0.2	1	0.6			Good	
6	01/01/2019	31/12/2019	29.5	29.9	missing	30	0.2	1	2.0			Good	
7	01/01/2019	31/12/2019	26.8	26.6	outlier	27	0.1	0	1.1			Good	
8	01/01/2019	31/12/2019	22.9	22.3	18.1	21	2.6	12	6.5			Good	
9	01/01/2019	31/12/2019	31.8	35.6	33.3	34	1.9	6	4.7			Good	
10	01/01/2019	31/12/2019	30.4	34.8	37.4	34	3.5	10	8.7			Good	
11	01/01/2019	31/12/2019	30.5	31.9	outlier	31	1.0	3	9.3			Good	
12	01/01/2019	31/12/2019	30.8	26.1	32.4	30	3.3	11	8.1			Good	
13													
											Overall survey -->	Good precision	

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

(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	Site R1 - R3 outlier removed

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

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	μgm^{-3}

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Version 04 - February 2011

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (%DC)	Tubes Precision Check	Automatic Monitor Data
1	01/01/2019	31/12/2019	50.6	46.1	34.1	44	8.5	20	21.1			Poor Precision	
2	01/01/2019	31/12/2019	37.1	38.2	38.3	38	0.7	2	1.7			Good	
3	01/01/2019	31/12/2019	33.9	34.6	35.3	35	0.7	2	1.7			Good	
4	01/01/2019	31/12/2019	28.0	30.2	30.0	29	1.3	4	3.1			Good	
5	01/01/2019	31/12/2019	30.6	27.6	30.0	29	1.6	5	3.9			Good	
6	01/01/2019	31/12/2019	27.3	29.8	25.9	28	2.0	7	4.9			Good	
7	01/01/2019	31/12/2019	29.5	30.0	24.6	28	3.0	11	7.3			Good	
8	01/01/2019	31/12/2019	23.4	21.6	21.5	22	1.1	5	2.7			Good	
9	01/01/2019	31/12/2019	33.8	34.6	35.3	35	0.8	2	1.9			Good	
10	01/01/2019	31/12/2019	32.2	28.1	31.3	31	2.2	7	5.4			Good	
11	01/01/2019	31/12/2019	34.3	37.0	missing	36	1.9	5	17.2			Good	
12	01/01/2019	31/12/2019	29.0	32.9	32.5	31	2.1	7	5.2			Good	
13													
											Overall survey -->	Good precision	

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

Site Name/ ID:	Site R4 - R6

Precision	11 out of 12 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	μgm^{-3}

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Version 04 - February 2011

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (%DC)	Tubes Precision Check	Automatic Monitor Data
1	01/01/2019	31/12/2019	50.6	46.1	outlier	48	3.2	7	28.8			Good	
2	01/01/2019	31/12/2019	37.1	38.2	38.3	38	0.7	2	1.7			Good	
3	01/01/2019	31/12/2019	33.9	34.6	35.3	35	0.7	2	1.7			Good	
4	01/01/2019	31/12/2019	28.0	30.2	30.0	29	1.3	4	3.1			Good	
5	01/01/2019	31/12/2019	30.6	27.6	30.0	29	1.6	5	3.9			Good	
6	01/01/2019	31/12/2019	27.3	29.8	25.9	28	2.0	7	4.9			Good	
7	01/01/2019	31/12/2019	29.5	30.0	24.6	28	3.0	11	7.3			Good	
8	01/01/2019	31/12/2019	23.4	21.6	21.5	22	1.1	5	2.7			Good	
9	01/01/2019	31/12/2019	33.8	34.6	35.3	35	0.8	2	1.9			Good	
10	01/01/2019	31/12/2019	32.2	28.1	31.3	31	2.2	7	5.4			Good	
11	01/01/2019	31/12/2019	34.3	37.0	missing	36	1.9	5	17.2			Good	
12	01/01/2019	31/12/2019	29.0	32.9	32.5	31	2.1	7	5.2			Good	
13													
											Overall survey -->	Good precision	

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

(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	Site R4 - R6 outlier removed

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

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	μgm^{-3}

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Version 04 - February 2011

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (%DC)	Tubes Precision Check	Automatic Monitor Data
1	01/01/2019	31/12/2019	36.4	37.5	39.0	38	1.3	3	3.2			Good	
2	01/01/2019	31/12/2019	32.0	32.7	31.2	32	0.7	2	1.9			Good	
3	01/01/2019	31/12/2019	31.0	31.9	29.9	31	1.0	3	2.5			Good	
4	01/01/2019	31/12/2019	21.5	23.9	22.5	23	1.2	5	3.0			Good	
5	01/01/2019	31/12/2019	27.5	26.7	26.8	27	0.5	2	1.1			Good	
6	01/01/2019	31/12/2019	25.7	26.1	27.0	26	0.6	2	1.6			Good	
7	01/01/2019	31/12/2019	27.1	27.8	24.9	27	1.5	6	3.8			Good	
8	01/01/2019	31/12/2019	24.7	24.0	24.8	24	0.5	2	1.1			Good	
9	01/01/2019	31/12/2019	31.3	33.1	30.0	31	1.6	5	3.9			Good	
10	01/01/2019	31/12/2019	31.3	33.1	30.0	31	1.6	5	3.9			Good	
11	01/01/2019	31/12/2019	17.4	20.5	21.8	20	2.3	11	5.6			Good	
12	01/01/2019	31/12/2019	26.7	27.6	28.8	28	1.1	4	2.7			Good	
13													
											Overall survey -->	Good precision	

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

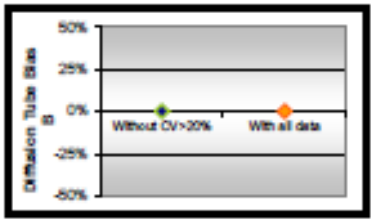
Site Name/ ID:	Site T

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

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: μgm^{-3}
Mean CV (Precision):
Automatic Mean: μgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: μgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 0 periods of data
Bias factor A
Bias B
Diffusion Tubes Mean: μgm^{-3}
Mean CV (Precision):
Automatic Mean: μgm^{-3}
Data Capture for periods used:
Adjusted Tubes Mean: μgm^{-3}



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Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (%DC)	Tubes Precision Check	Automatic Monitor Data
1	01/01/2019	31/12/2019	18.8	18.4	18.8	19	0.2	1	0.5			Good	
2	01/01/2019	31/12/2019	17.9	16.4	16.9	17	0.7	4	1.9			Good	
3	01/01/2019	31/12/2019	7.0	7.3	7.8	7	0.4	6	1.0			Good	
4	01/01/2019	31/12/2019	8.1	9.4	9.6	9	0.8	9	2.0			Good	
5	01/01/2019	31/12/2019	6.6	6.3	6.1	6	0.3	4	0.6			Good	
6	01/01/2019	31/12/2019	5.4	5.3	5.3	5	0.0	1	0.1			Good	
7	01/01/2019	31/12/2019	5.5	5.2	27.4	13	12.7	100	31.6			Poor Precision	
8	01/01/2019	31/12/2019	5.4	5.5	5.4	5	0.0	1	0.1			Good	
9	01/01/2019	31/12/2019	9.7	9.2	24.8	15	8.8	81	22.0			Poor Precision	
10	01/01/2019	31/12/2019	12.7	11.7	11.3	12	0.7	6	1.8			Good	
11	01/01/2019	31/12/2019	13.7	13.9	19.0	16	3.0	20	7.6			Poor Precision	
12	01/01/2019	31/12/2019	12.0	12.7	14.5	13	1.3	10	3.2			Good	
13													
										Overall survey -->		Poor precision	

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

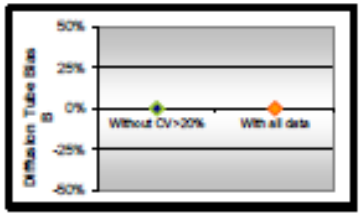
Site Name/ ID:	Site U

Precision: 8 out of 12 periods have a CV smaller than 20%

(Check average CV & DC from Accuracy calculations)

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	μgm^{-3}



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Version 04 - February 2011

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (%DC)	Tubes Precision Check	Automatic Monitor Data
1	01/01/2019	31/12/2019	18.8	18.4	18.8	19	0.2	1	0.5			Good	
2	01/01/2019	31/12/2019	17.9	16.4	16.9	17	0.7	4	1.9			Good	
3	01/01/2019	31/12/2019	7.0	7.3	7.8	7	0.4	6	1.0			Good	
4	01/01/2019	31/12/2019	8.1	9.4	9.6	9	0.8	9	2.0			Good	
5	01/01/2019	31/12/2019	6.6	6.3	6.1	6	0.3	4	0.6			Good	
6	01/01/2019	31/12/2019	5.4	5.3	5.3	5	0.0	1	0.1			Good	
7	01/01/2019	31/12/2019	5.5	5.2	outlier	5	0.1	3	1.3			Good	
8	01/01/2019	31/12/2019	5.4	5.5	5.4	5	0.0	1	0.1			Good	
9	01/01/2019	31/12/2019	9.7	9.2	outlier	9	0.4	4	3.4			Good	
10	01/01/2019	31/12/2019	12.7	11.7	11.3	12	0.7	6	1.8			Good	
11	01/01/2019	31/12/2019	13.7	13.9	outlier	14	0.1	1	1.3			Good	
12	01/01/2019	31/12/2019	12.0	12.7	14.5	13	1.3	10	3.2			Good	
13													
											Overall survey -->	Good precision	

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

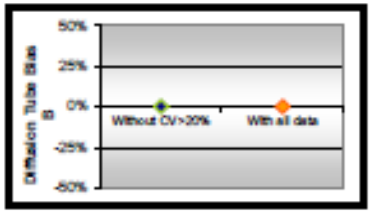
(Check average CV & DC from Accuracy calculations)

Site Name/ ID:	Site U outlier removed

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

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	μgm^{-3}

Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 0 periods of data	
Bias factor A	
Bias B	
Diffusion Tubes Mean:	μgm^{-3}
Mean CV (Precision):	
Automatic Mean:	μgm^{-3}
Data Capture for periods used:	
Adjusted Tubes Mean:	μgm^{-3}



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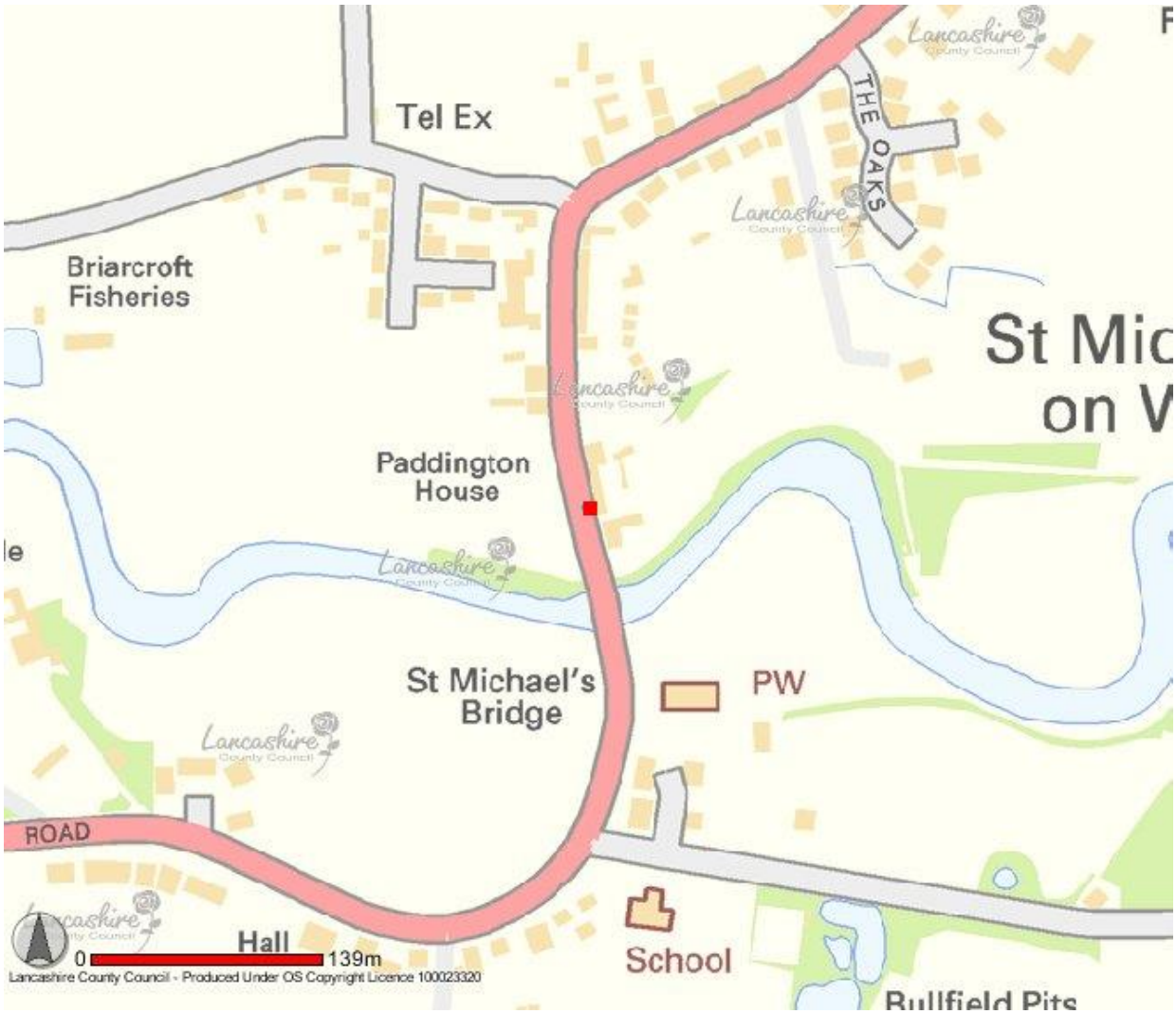
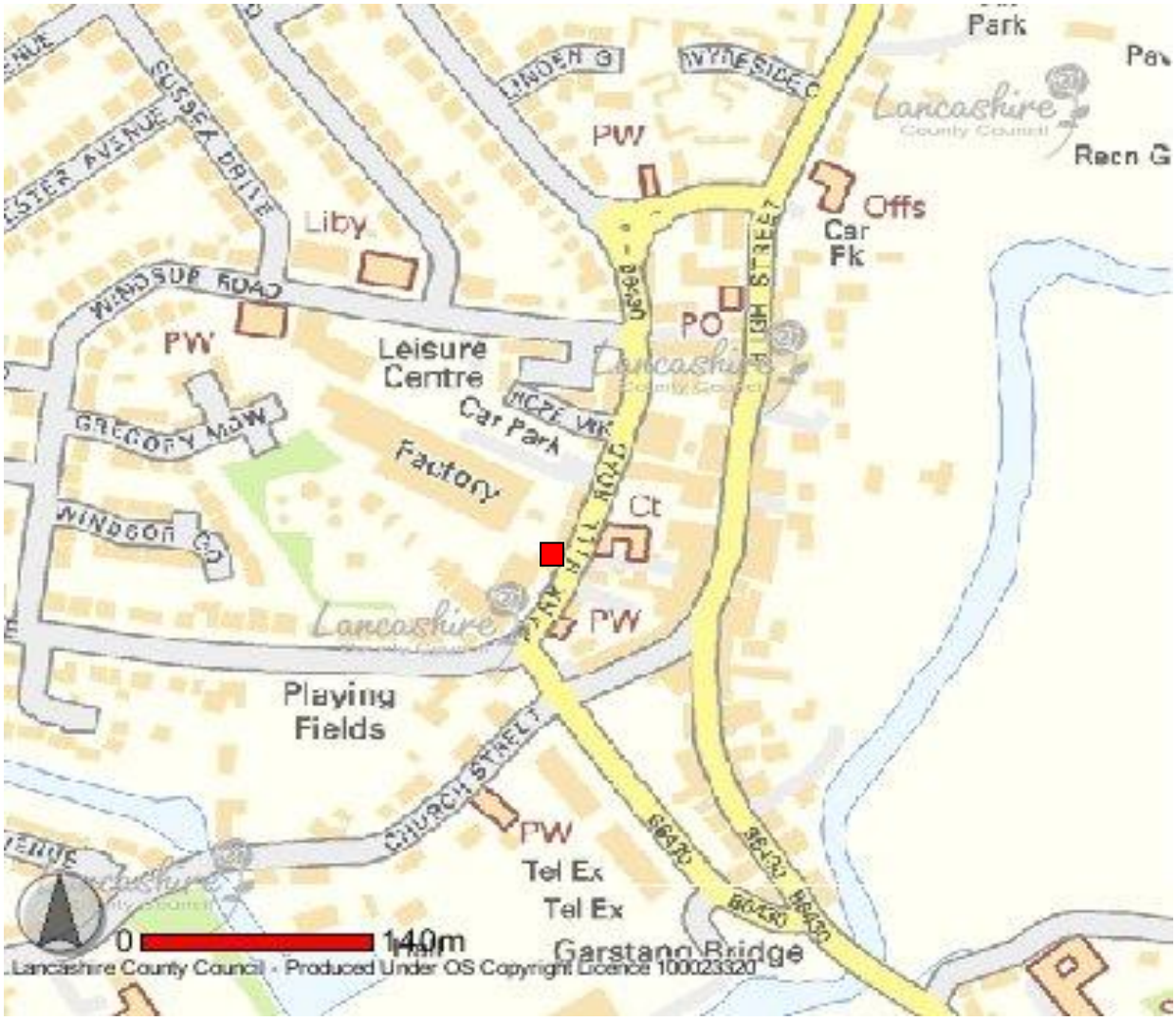
Appendix D: Map(s) of Monitoring Locations and AQMAs

Site 3
5, Bridge Row, St. Michaels, PR3 0TJ



Site 11
3, Briarwood Court, Briarwood Close, Thornton-Cleveleys, FY5 5DZ

Site 12
2 Park Hill Road, Garstang, PR3 1EL



Site 13
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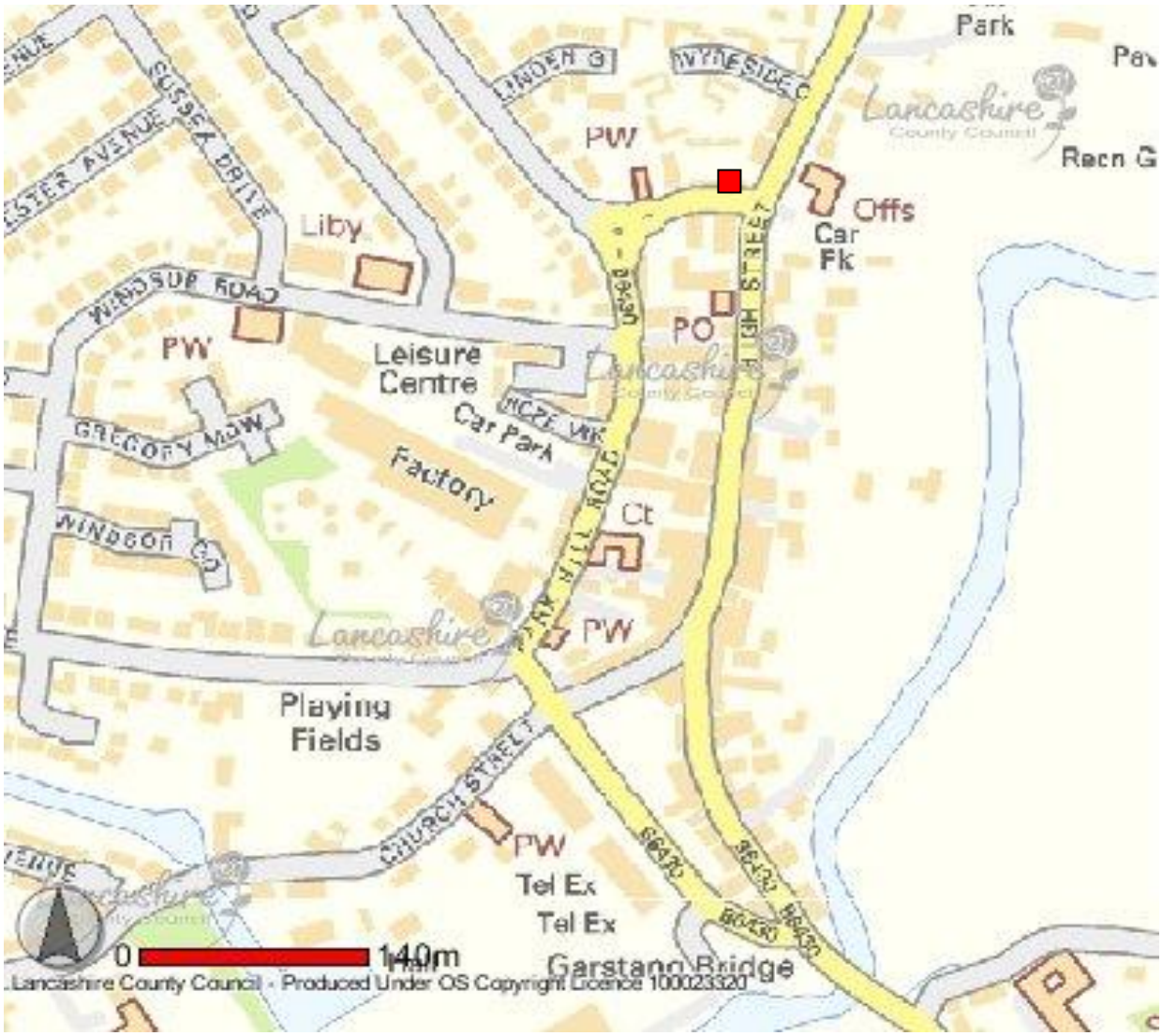
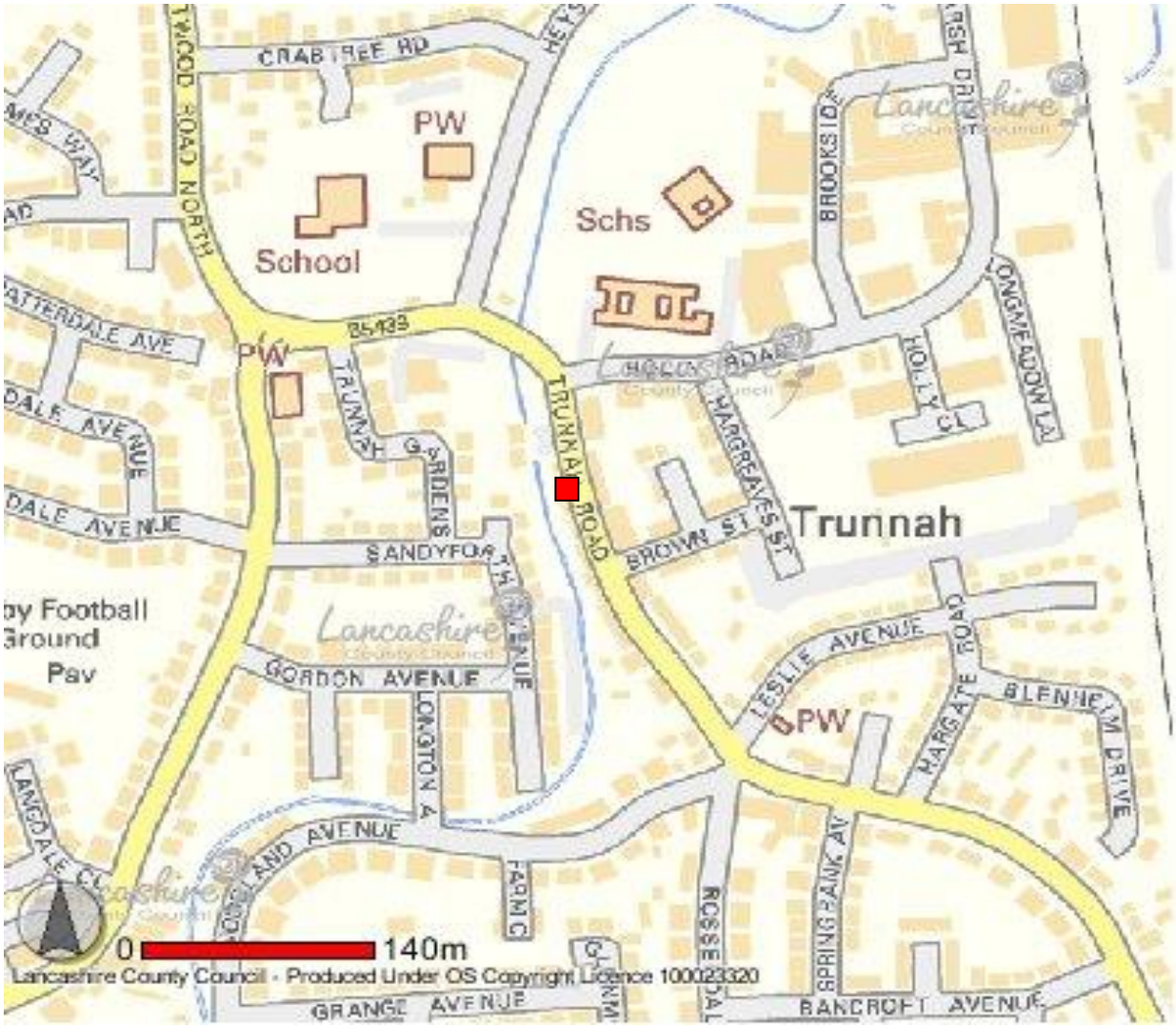


Site 14
Halifax, Breck Road, Poulton

Site 15
63 Trunnah Road, Thornton-Cleveleys, FY5 4HF

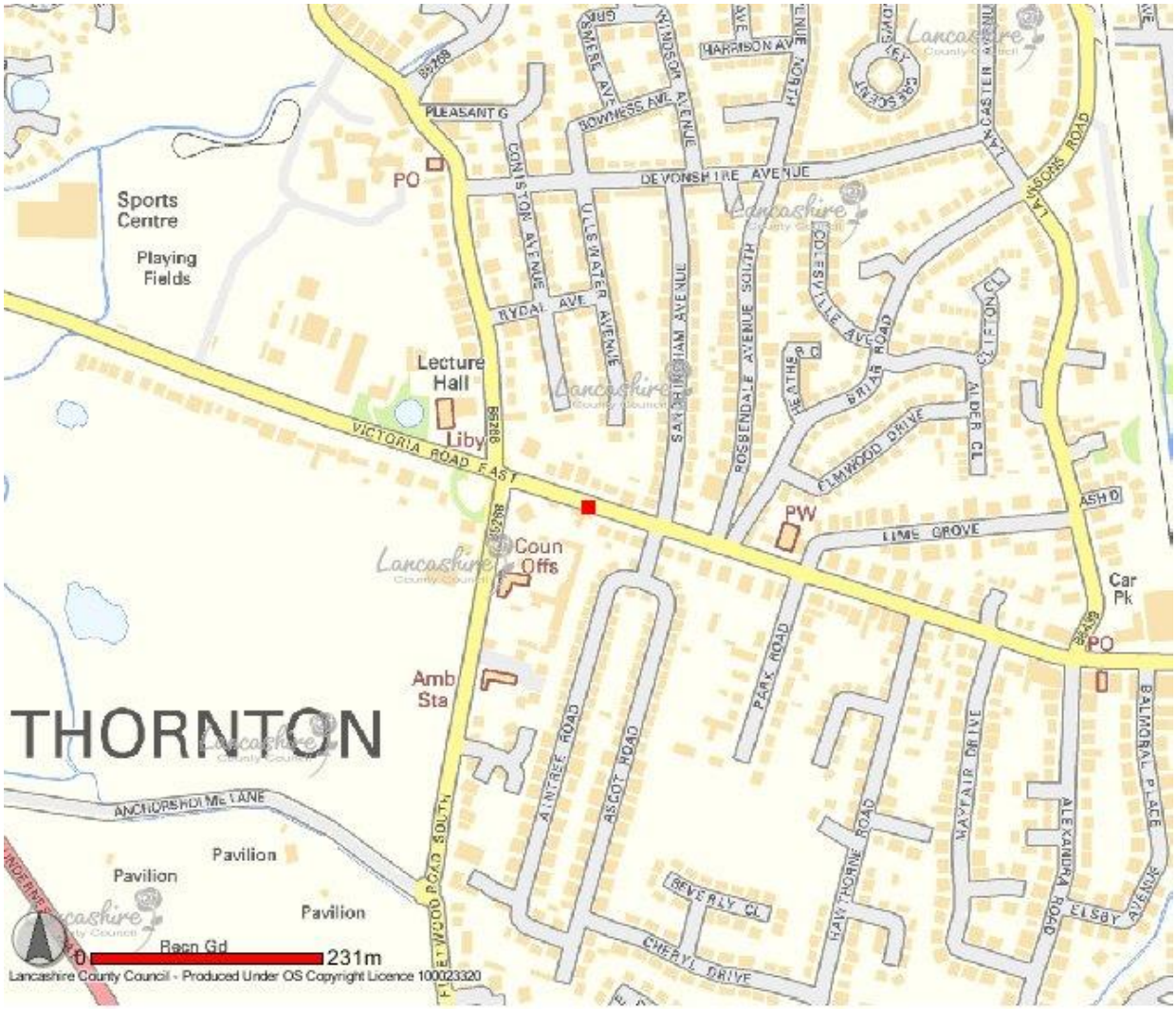


Site 16
24 Rose Fold, Thornton-Cleveleys, FY5 4NQ

Site K

22 Poulton Street, Fleetwood, FY7 6LP

Site L
153, Victoria Road East, Thornton-Cleveleys, FY5 5HH



Site M
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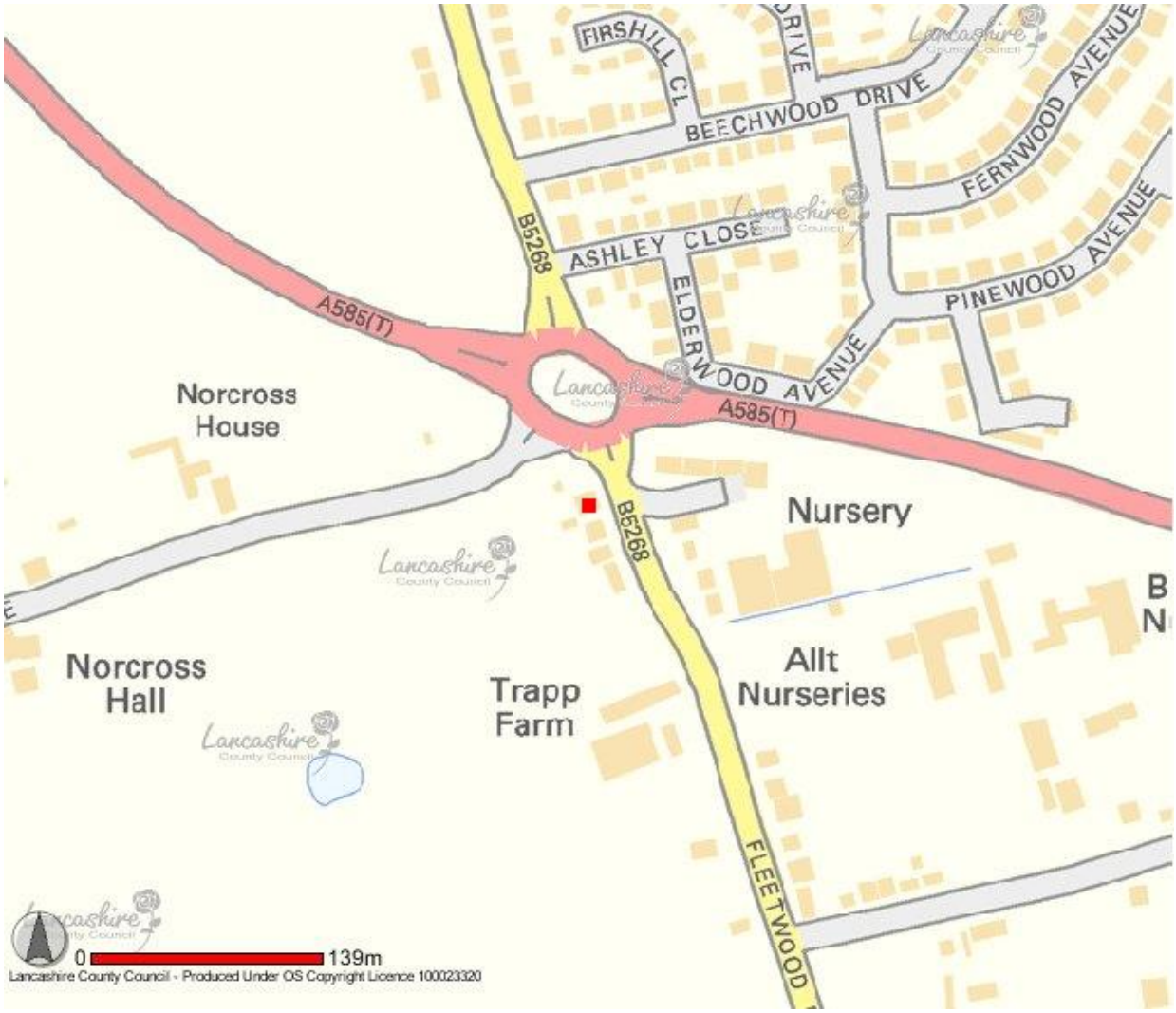
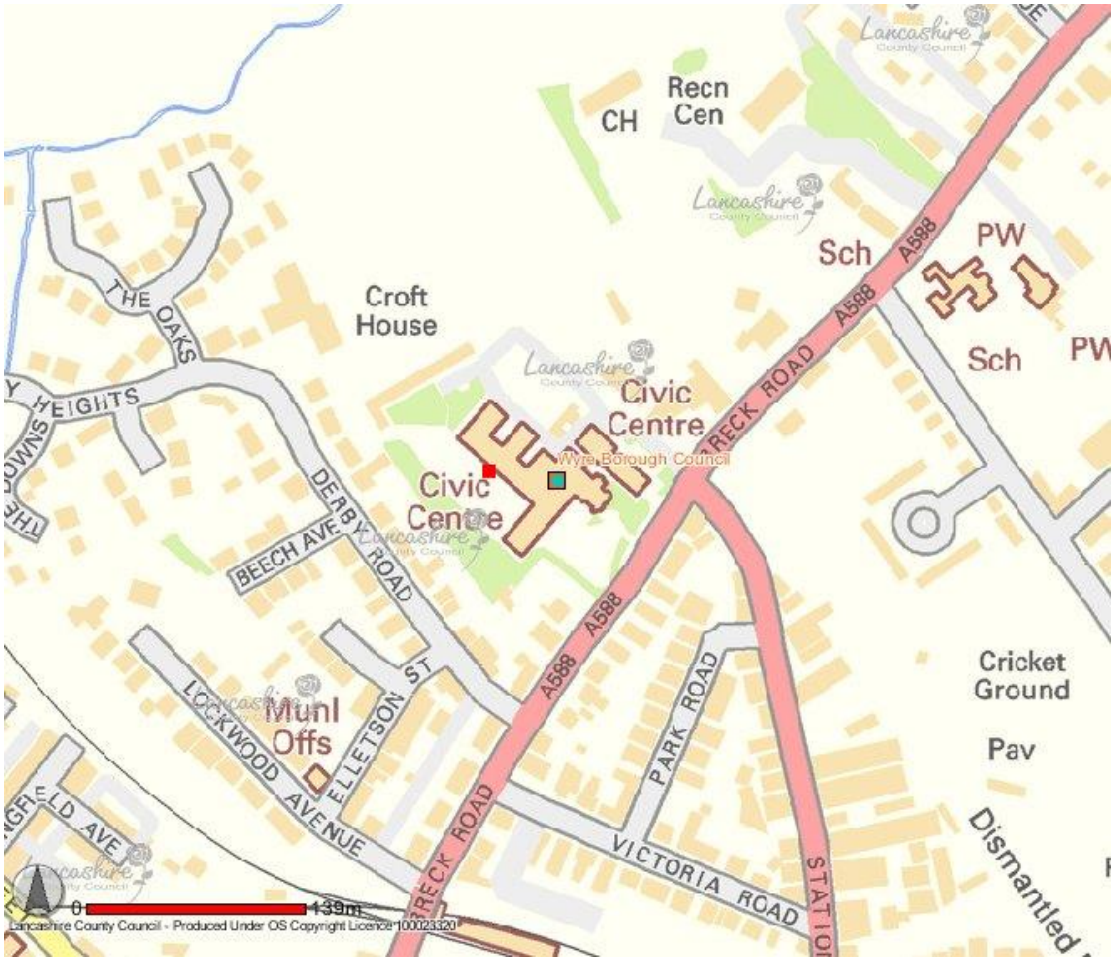
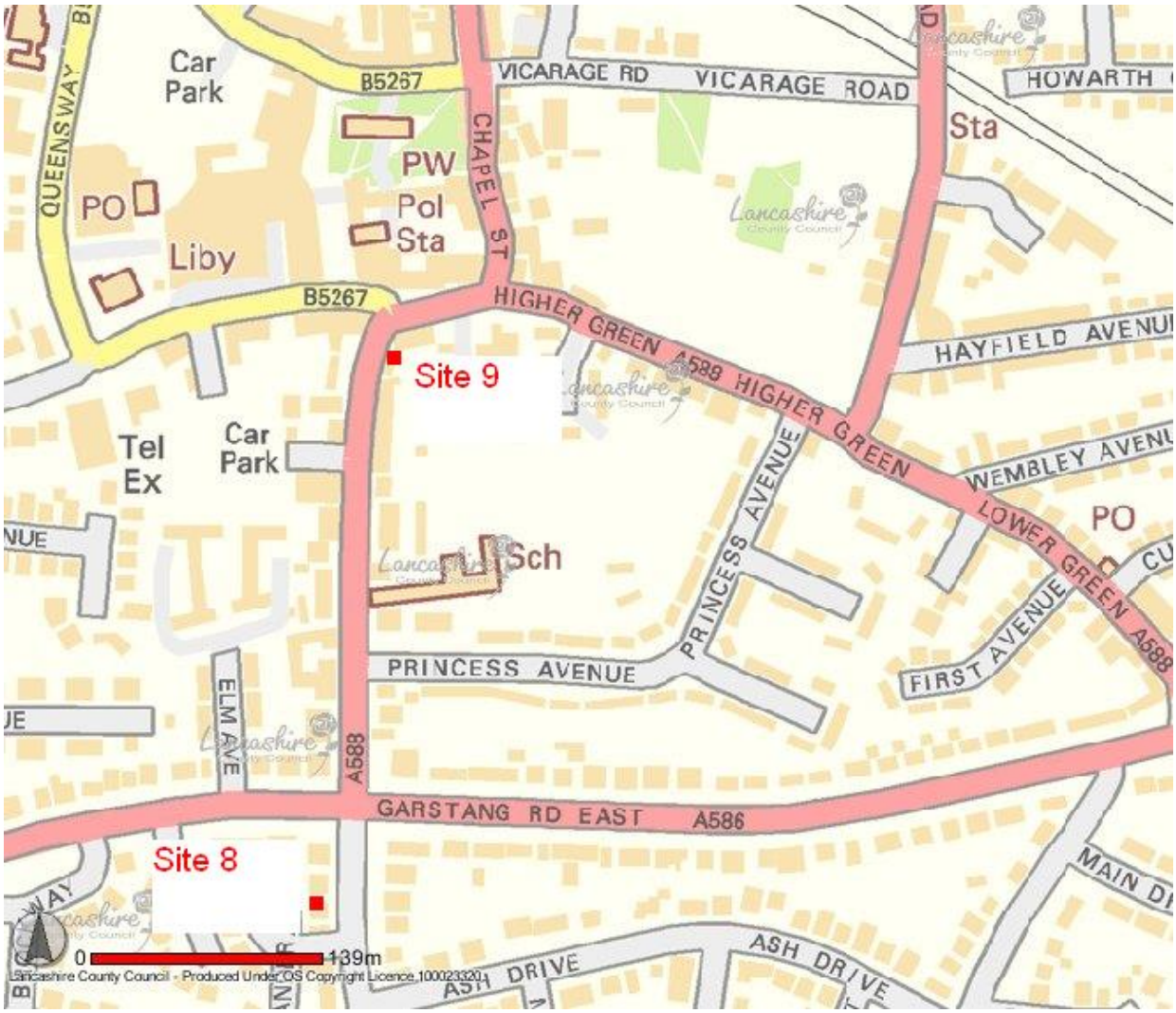


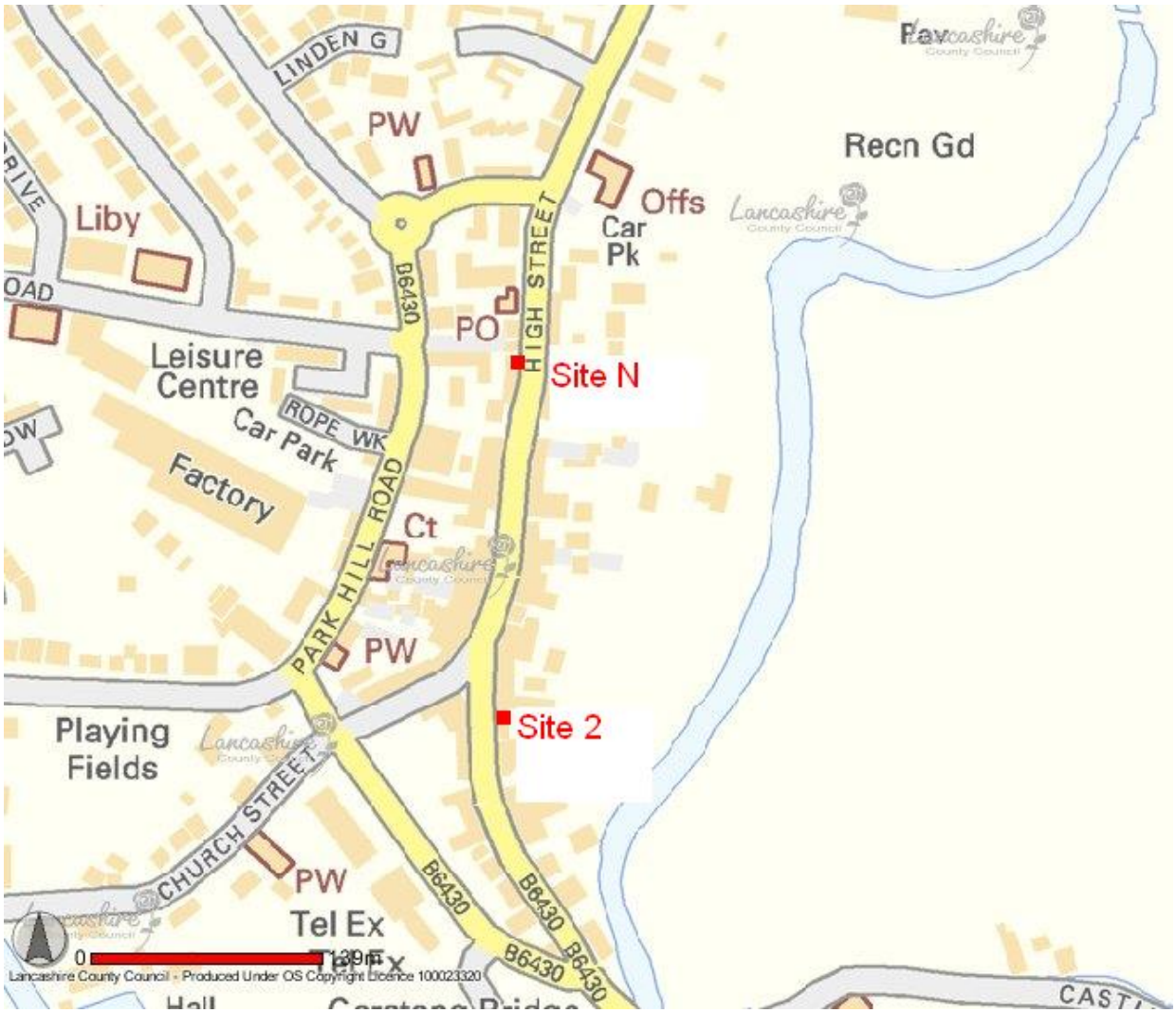
Site U
Wyre Council, Breck Road, Poulton, FY6 7PU



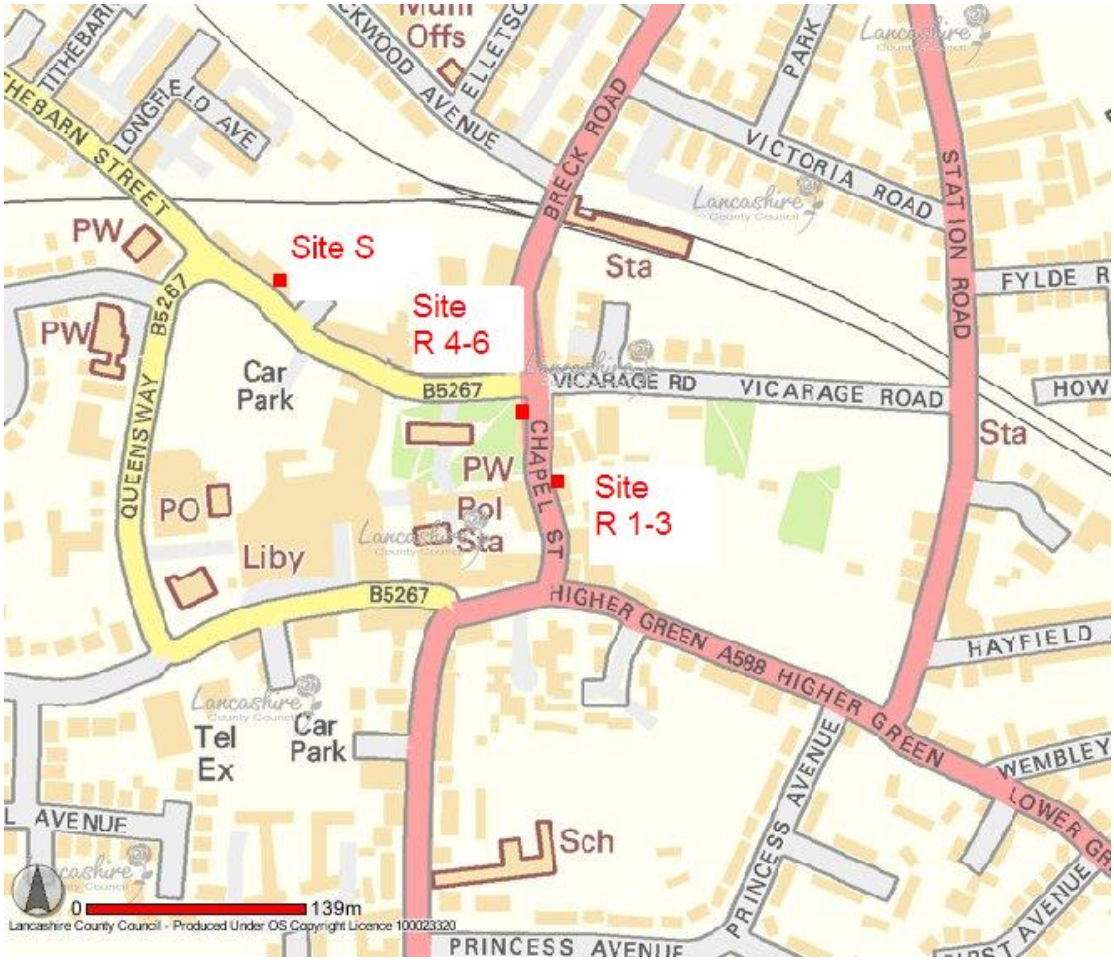
Sites 8 & 9
Site 8: 66, Hardhorn Road, Poulton, FY6 8AX
Site 9: 1A, Hardhorn Road, Poulton, FY6 7WA



Sites N & 2
Site 2 : 21A, Market Place, Garstang, PR3 1ZA
Site N : 43/44, High Street, Garstang, PR3 1EA

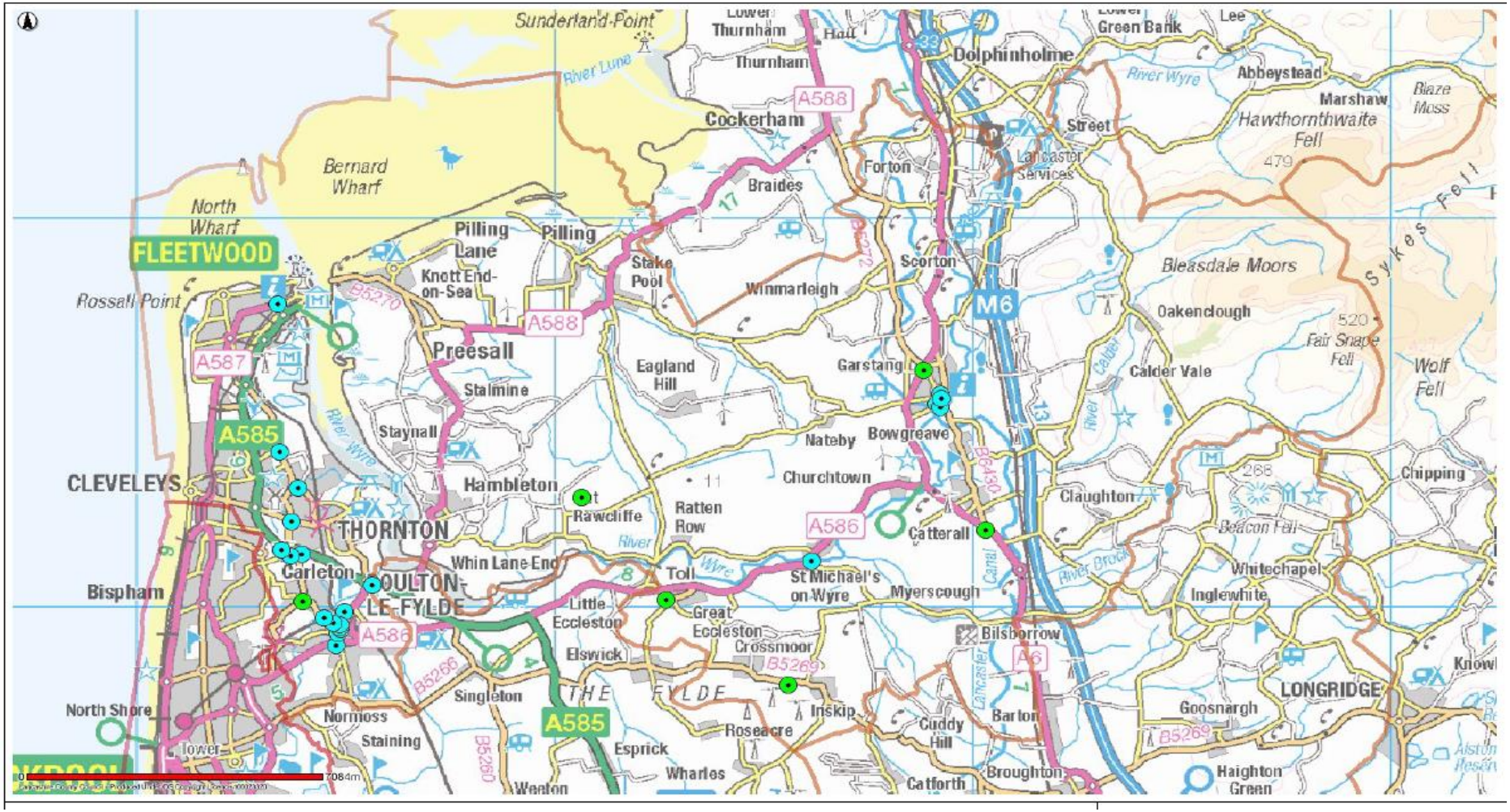


Sites R & S
Site R 1-3 : 11/13, Chapel Street, Poulton, FY6 7BQ
Site R 4-6 : Chapel Street, Poulton
Site S: 36, Tithebarn Street, Poulton, FY6 7BX



Sites T & 7
Site 7: 168 Breck Road, Poulton, FY6 7JZ
Site T: 133 Breck Road, FY6 7HJ

Map of Monitoring Locations within the Wyre District



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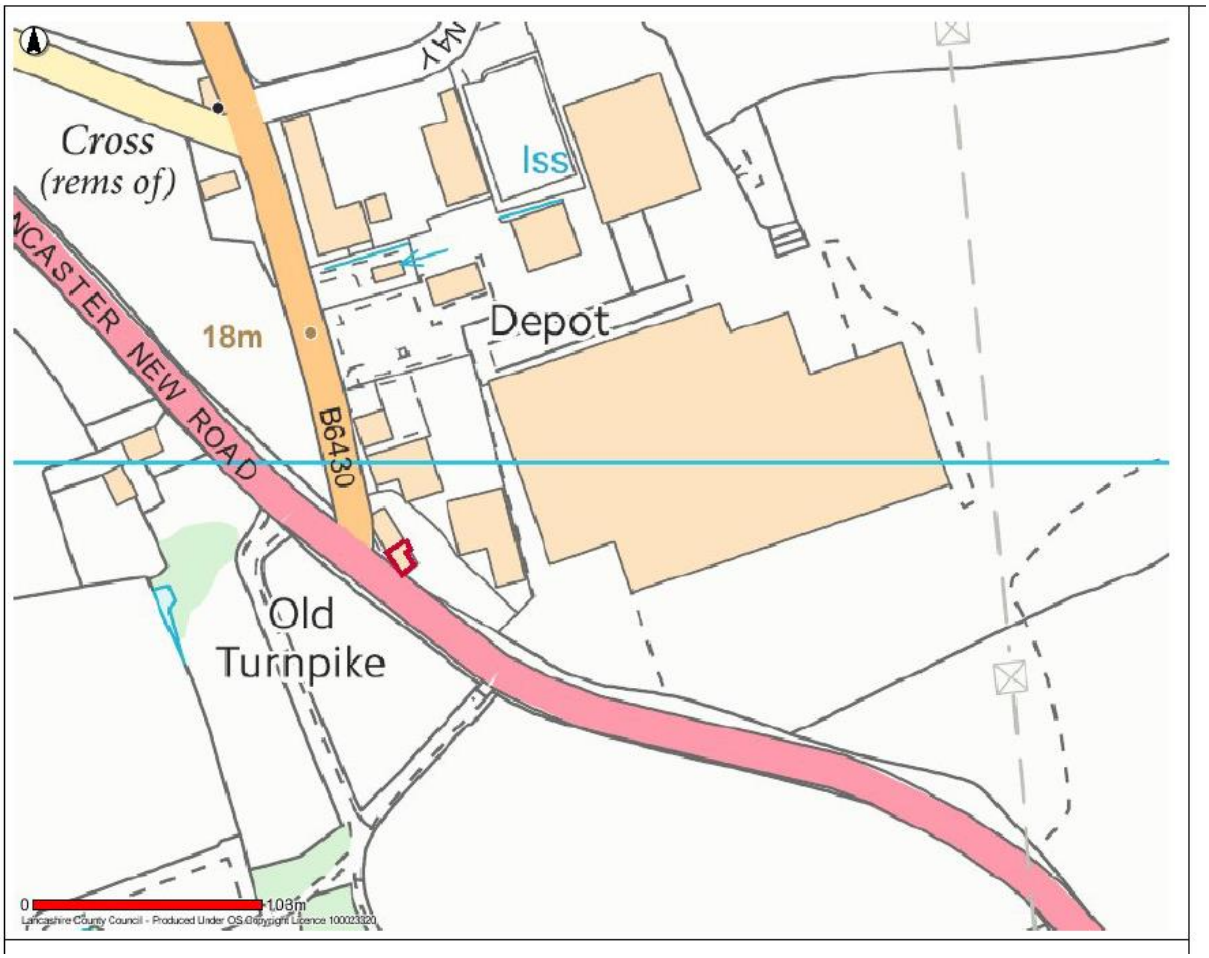
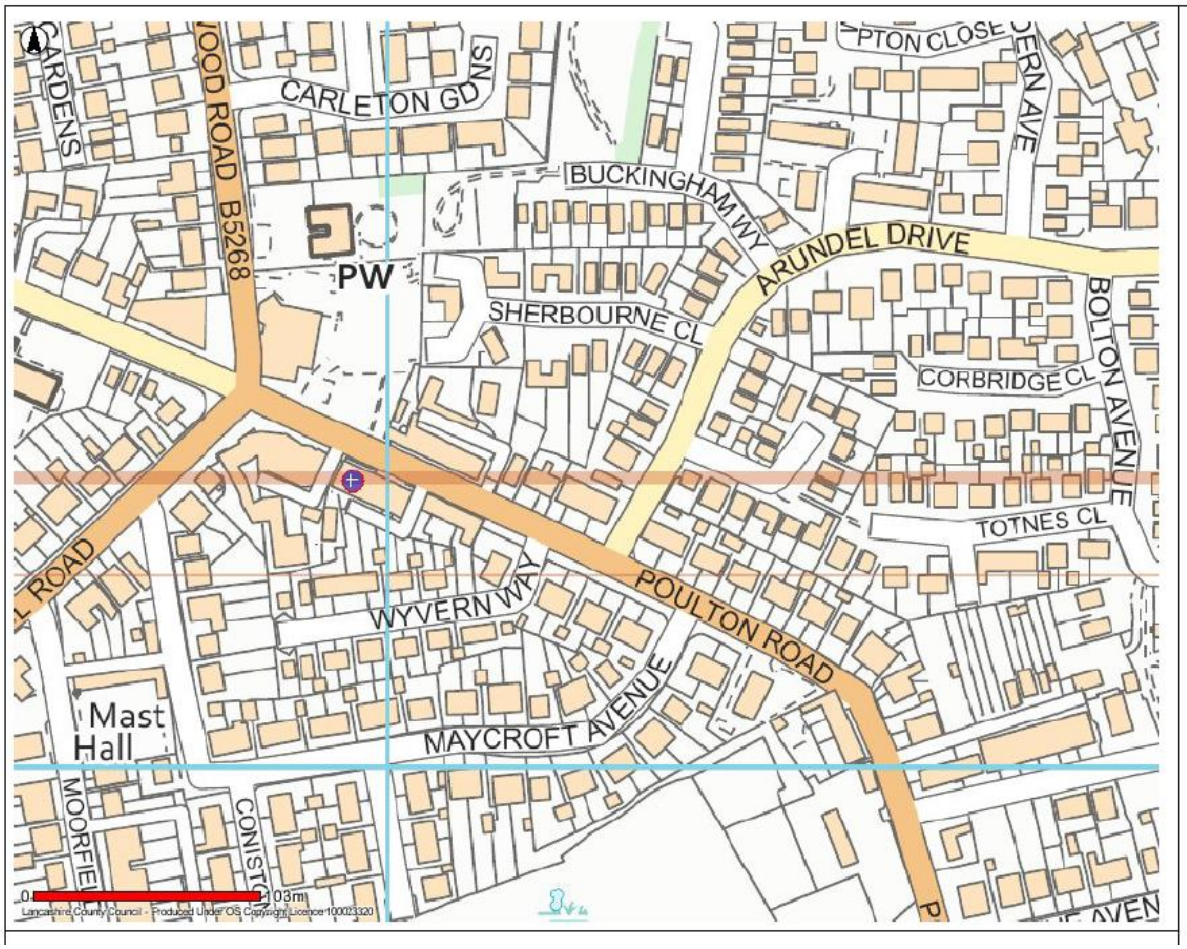
MAPS(S) OF TEMPORARY ‘TEST’ MONITORING LOCATIONS

Site 22 – Toll Bar Farm, Lancaster New Road, Cabus

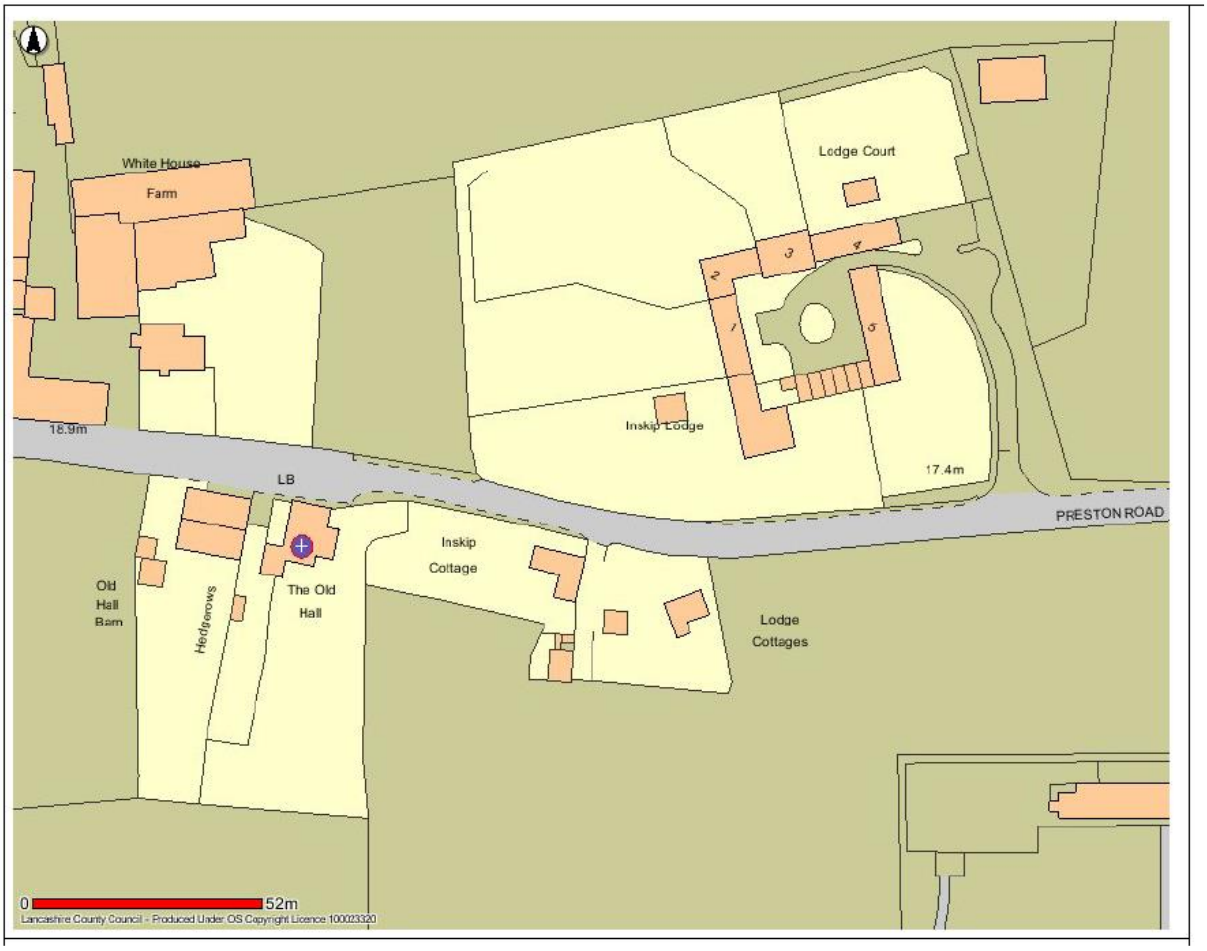


Site 23 - 11 Poulton Road, Carleton

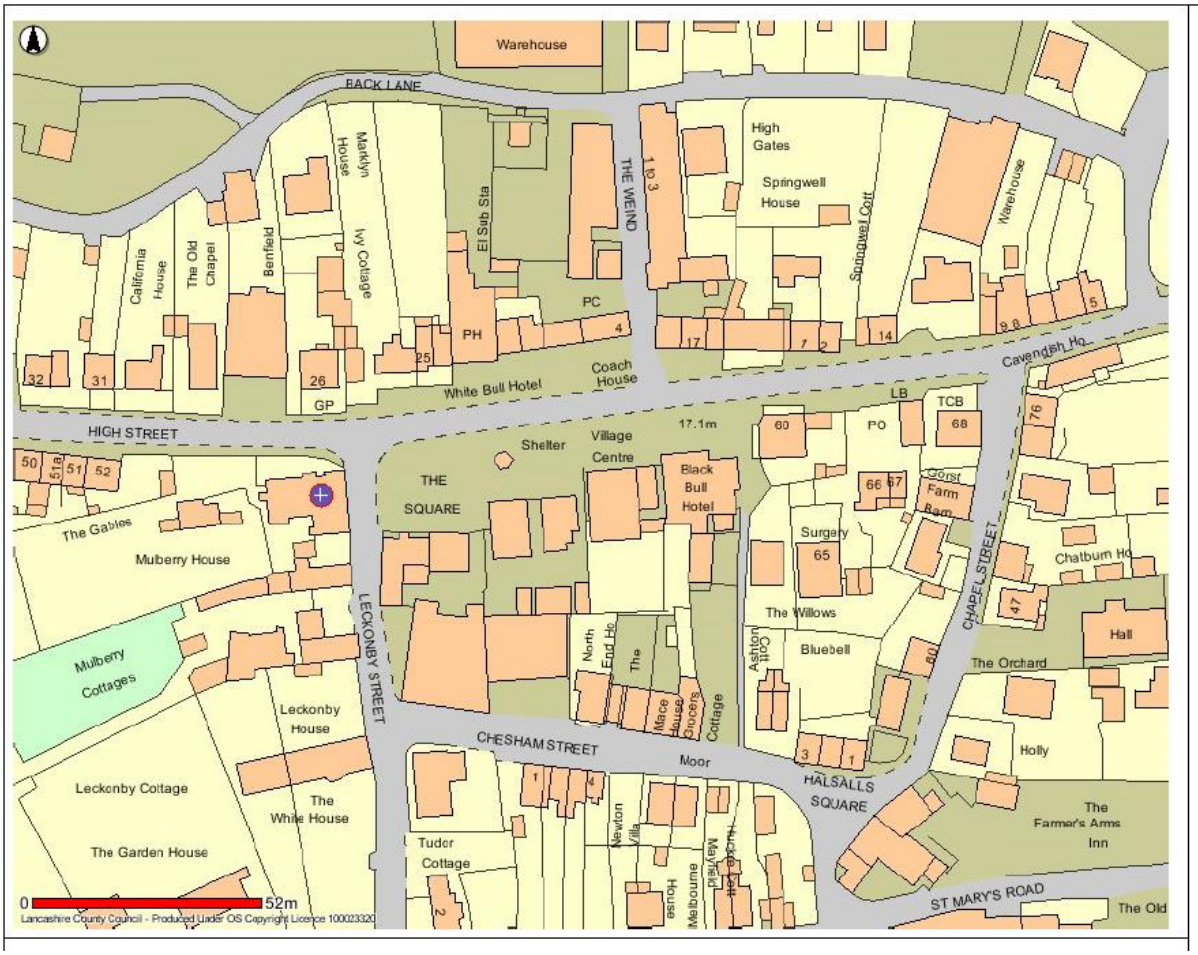


Site 24 – Croston Road Garstang, PR3 1HR

Site 25 – Old Hall, Preston Road, Inskip, PR4 0TT



Site 26 – Mulberry House, Leckonby Street, Great Eccleston, PR3 0ZD



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[6]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[6] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority 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
ASR	Air quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
LCC	Lancashire County Council

References

(1) Environmental equity, air quality, socioeconomic status and respiratory health, 2010

(2) Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

(3) Defra. Abatement cost guidance for valuing changes in air quality, May 2013

(4) Part IV of the Environment Act 1995, Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management, Technical Guidance LAQM. TG(09), February 2009, DEFRA.

(5) Local Air Quality Management, Policy Guidance PG(16), 2016, DEFRA

(6) Public Health Outcomes Framework 2013 -2017 https://www.lancashire.gov.uk/lancashire-insight/environment/monitoring-of-air-quality-and-health-impacts

(7) http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html http://laqm.defra.gov.uk/diffusion-tubes/precision.htm