



# 2021 Air Quality Annual Status Report (ASR) Barrow Borough Council

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

June 2021

## Barrow-in-Furness Borough Council

|                                |  |
|--------------------------------|--|
| <b>Local Authority Officer</b> | Alison Coward  |
| <b>Department</b>              | Public Protection Services   |
| <b>Address</b>                 | Town Hall<br>Duke Street<br>Barrow-in-Furness<br>Cumbria<br>LA14 2LD |
| <b>Telephone</b>               | 01229 876382   |
| <b>E-mail</b>                  | acoward@barrowbc.gov.uk  |
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## Executive Summary: Air Quality in Our Area

### Air Quality in the Borough of Barrow-in-Furness

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<sup>1,2</sup>.

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages<sup>3</sup>, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017<sup>4</sup>.

In the Borough of Barrow-in-Furness (the Borough), 4% of mortality is attributable to particulate air pollution, the highest in Cumbria<sup>5</sup>.

The Borough has not declared any Air Quality Management Areas (AQMA's) and NO<sub>2</sub> concentrations remain below the annual 'Air Quality Objective' of 40µg/m<sup>3</sup>. Measured background levels for NO<sub>2</sub> in the Borough have shown an encouraging steady decrease since monitoring began in the early 1990's.

NO<sub>2</sub> concentration levels across the Borough are lower than previous years due to Covid-19. Concentrations on the A590 near to Lindal-in-Furness remain the highest in the Borough, the A590 is the major road transport link into the area seeing 19498 vehicle movements each day<sup>6</sup>. However this figure, which had been increasing year-on-year, is the lowest since 2016 and the number of daily pedal cycles on this road increased 26% to 71 per day. In order to continue these trends, we need to encourage people to continue to work from home, use sustainable transport, car share, drive more efficient vehicles and reduce the number of home deliveries.

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<sup>1</sup> Environmental equity, air quality, socioeconomic status and respiratory health, 2010

<sup>2</sup> Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

<sup>3</sup> Defra. Air quality appraisal: damage cost guidance, July 2020

<sup>4</sup> Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

<sup>5</sup> Public Health England, 2018, Public Health Profiles, <https://fingertips.phe.org.uk/>

<sup>6</sup> Department for Transport: <https://roadtraffic.dft.gov.uk/manualcountpoints/57340>

## **Actions to Improve Air Quality**

Whilst air quality has improved significantly in recent decades, and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy<sup>7</sup> sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero<sup>8</sup> sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Barrow-in-Furness Borough Council declared a climate emergency on 16th July 2019 and made a commitment to reduce carbon emissions. Following the climate emergency declaration, a working group was established comprising cross party councillors and cross-departmental council officers to look at all areas of policy and delivery. The working group created a 5 year Climate Change Policy which was agreed at full council on 16th June 2020. That policy sets out the ambition for the Borough to be net zero carbon no later than 2037. The full policy can be accessed here: [Barrow Borough Councils Climate Change Policy 2020-2025](#). To achieve this, Barrow Borough Council has committed to:

1. Reduce emissions from Barrow Borough Councils estate and operations;
2. Reduce energy consumption and emissions from homes and businesses in the Borough;
3. Reduce emissions from transport;
4. Reduce consumption of resources, increasing recycling and reducing waste;
5. Increase carbon capture to offset emissions;
6. Increase public awareness around climate change.

It is also important that we raise awareness about emissions in the home which can harm health and also contribute significantly to emissions. Burning wood and coal in open fires and stoves makes up 38% of the UK's primary emissions of fine

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<sup>7</sup> Defra. Clean Air Strategy, 2019

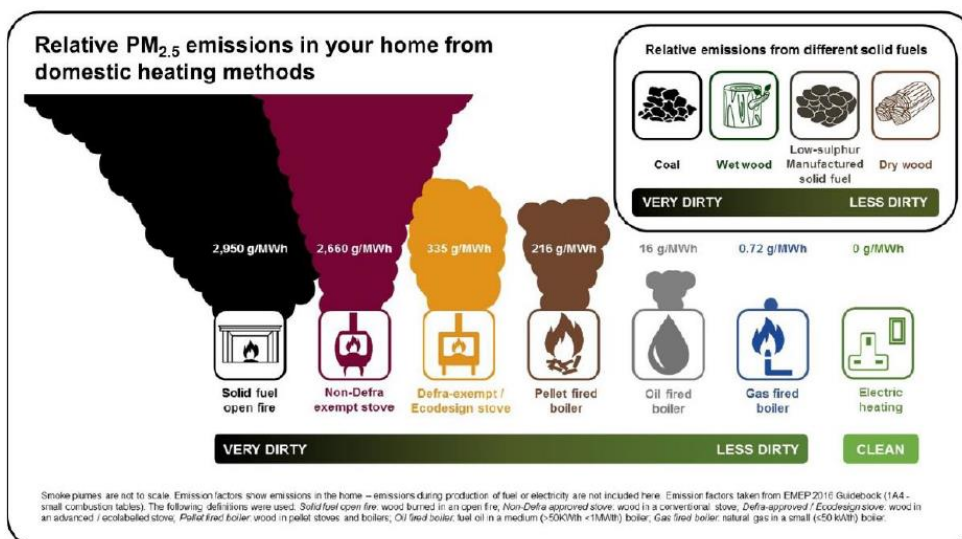
<sup>8</sup> DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

particulate matter (PM<sub>2.5</sub>)<sup>9</sup>. Local information indicating the actual use of solid fuels in the Borough is not currently available, however the housing stock of the Borough is dominated by older, terraced housing and 45% was built pre-1919, so it is safe to assume that this will also be an issue locally. The authority also regularly receives complaints in relation to smoke nuisances.

A 2018 report by the British Lung Foundation highlighted Barrow in Furness as a place with a number of health centres in areas which exceed estimated safe PM<sub>2.5</sub> concentrations<sup>10</sup>. They did this by extracting postcodes of health centres from the NHS Digital Database and then modelling 2018 concentrations, based on the Defra 2015 background maps, which are modelled at a one kilometre by one kilometre grid square resolution. Analysis of the figures show that in all cases, the contributions from domestic, institutional and commercial space heating are greatest (defined as domestic sources within or outside the grid square).

While we may not agree with this modelled data, it may be necessary to target a campaign around indoor air quality to highlight the fact that health is affected when breathing air affected by smoke, either inside or outside your home. Diagram A below shows the difference in particulate emissions inside your home from the various heating choices that are generally available.

**Diagram A – Diagram showing the difference in particulate emissions inside your home from different heating methods. (DEFRA, 2019)**



<sup>9</sup> DEFRA, 2019, Clean Air Strategy, Available: [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/770715/clean-air-strategy-2019.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/770715/clean-air-strategy-2019.pdf)

<sup>10</sup> British Lung Foundation, 2018, Toxic air at the door of the NHS, Available: <https://www.blf.org.uk/take-action/campaign/nhs-toxic-air-report>

## Barrow-in-Furness Borough Council

In addition to regulatory requirements, this authority seeks to improve air quality by scrutinising planning applications and new developments that are required to carry out an air quality assessment and where appropriate, an outline of how emissions are to be mitigated. We therefore work closely with other agencies such as Cumbria County Council, the Environment Agency and neighbouring authorities, and consult on future developments and proposals taking into consideration air quality and potential cumulative effects.

An air quality project with local schools started in November 2019, aimed at educating students about the effect of transport on public health. This included a presentation on air quality, support to create school community awareness projects and diffusion tubes were set up outside some of the schools to measure NO<sub>2</sub> throughout 2020. There was lots of interest from schools and schools were encouraged to take part in a coordinated No Idling campaign in February 2020 with social media coverage and a press release to amplify the message around the Borough. Following the outbreak of Covid-19, this project came to a halt as resources were needed elsewhere both within Barrow Borough Council and in schools.

### Pictures from No Idling Week at St Pius School:



## Conclusions and Priorities

Covid-19 is the significant factor affecting the results from 2020, with lockdowns and a move towards home working we saw less cars on the road for both business and leisure purposes.

There are still concerns regarding high traffic flow on the A590 so NO<sub>2</sub> monitoring will continue at Lindal-in-Furness. There is also a priority to monitor PM<sub>2.5</sub> in Barrow in

Furness, which means we will be seeking investment for a particulate monitor to start monitoring in 2022.

## **Local Engagement and How to Get Involved**

The general public can get involved and can comment on planning applications if they have further concerns with regards to air quality. This Authority is open and transparent to air quality issues and seeks the opinion and views of individuals or groups that have a vested concern in air quality. Feedback on the contents of this document can be sent using the contact details at the start of this report.

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## **1 Local Air Quality Management**

This report provides an overview of air quality in Barrow-in-Furness Borough during 2020. 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 Barrow-in-Furness Borough 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 Table E.1 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 the objectives.

Barrow-In-Furness Borough currently does not have any AQMAs. The Barrow Borough Local Plan 2016-2030 sets out how the authority will improve local air quality, for more information see:

<https://www.barrowbc.gov.uk/residents/planning/planning-policy/local-plan/>.

The Climate Change policy and action plan, agreed on 18<sup>th</sup> June 2020 encompass a number of initiatives which will improve air quality. See:

<https://www.barrowbc.gov.uk/residents/public-protection-services/environmental-protection/climate-change/>

For reference, a map of Barrow-in-Furness Borough Council's monitoring locations is available in Appendix D.

### 2.2 Progress and Impact of Measures to address Air Quality in Barrow-in-Furness Borough

Defra's appraisal of last year's ASR concluded that:

1. Robust and accurate QA/QC procedures were applied.
2. The diffusion tube mapping is comprehensive and clearly demonstrates the monitoring network.
3. The Council has included detailed discussion around the measures progressed this year despite having no declared AQMAs. This demonstrates the council's proactiveness and dedication to a continuous update of the local air quality approach.
4. Comments from last year's ASR have been mentioned and addressed. This is welcomed, and we encourage this to continue in future ASRs.

5. The Council is paying particularly close attention to PM<sub>2.5</sub> this is welcomed. The Public Health Outcomes Frameworks was mentioned and the fraction of mortality attributable to particulate matter, and this is encouraged.
  6. The decision to remove the Ironworks Road monitoring site is supported due to low concentrations for a number of years. As is the decision to start monitoring outside schools and the health centre.
  7. Overall the report is detailed, concise and satisfies the criteria of relevant standards. The Council should continue their good work.
- BBC Response: Comments noted, with thanks.

Barrow-in-Furness Borough Council has taken forward a number of direct measures during the current reporting year of 2020 in pursuit of improving local air quality.

Details of all measures completed, in progress or planned are set out in [Error! Reference source not found.](#)

8 measures are included within [Error! Reference source not found.](#), with the type of measure and the progress Barrow Borough Council have made during the reporting year of 2020 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within [Error! Reference source not found.](#)

Key completed measures are:

- Climate Change Policy and Action Plan created and approved;
- Schools air quality project continued with a no idling week taking place in February 2020;
- Social media coverage for a week for virtual Clean Air Day 2020;
- Low Carbon Barrow project started following successful bids to both European Structural and Investment Funds and Cumbria Local Enterprise Partnership, a project manager was hired in April 2020 to progress the project.

Barrow-in-Furness Borough Council expects the following measures to be completed over the course of the next reporting year:

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- Work to continue on the Climate Change action plan;
- Low Carbon Barrow project to progress through delivery phases, including the introduction of electric cars and supporting infrastructure to Council's pool car fleet and installing electric vehicle charging points in carparks around the Borough;
- To apply for funding for a PM<sub>2.5</sub> monitor by the end of 2021;

Barrow Borough Council's priorities for the coming year are to improve electric vehicle infrastructure across the Borough, to promote the use of electric vehicles by upgrading council fleet vehicles to electric and to start monitoring PM<sub>2.5</sub>.

The principal challenges and barriers to implementation that Barrow-in-Furness Borough Council anticipates facing are a lack of funding and the disruption caused by COVID-19.

Table 2.2 – Progress on Measures to Improve Air Quality

| Measure No. | Measure                                 | Category                                | Classification   | Year Measure Introduced | Estimated / Actual Completion Year | Organisations Involved  | Funding Source   | Defra AQ Grant Funding | Funding Status   | Estimated Cost of Measure | Measure Status | Reduction in Pollutant / Emission from Measure           | Key Performance Indicator                                     | Progress to Date   | Comments / Barriers to Implementation  |
|-------------|---|---|--|-------------------------|------------------------------------|---|--|------------------------|------------------|---------------------------|----------------|--|---|--|--|
| 1           | Climate Change Policy and Action Plan   | Policy Guidance and Development Control | Low Emissions Strategy   | 2020                    | 2025                               | Barrow Borough Council  | Some actions funded through Cumbria LEP and ESIF, listed separately as Low Carbon Barrow Project | NO                     | Partially Funded | > £10 million             | Implementation | Reduction in CO2 equivalent                              | Reduction in CO2 equivalent                                   | Policy and action plan agreed on 16th June 2020, quarterly working group meetings to oversee actions | Additional funding will be needed to implement some measures. See: <a href="https://www.barrowbc.gov.uk/residents/public-protection-services/environmental-protection/climate-change/">https://www.barrowbc.gov.uk/residents/public-protection-services/environmental-protection/climate-change/</a> The Low Carbon Barrow project is the initial focus for funding.     |
| 2           | Low Carbon Barrow                       | Other                                   | Other  | 2020                    | 2023                               | Barrow Borough Council / Art Gene   | European Structural and Investment Fund / Local Enterprise Partnership                           | NO                     | Funded           | £1 million - £10 million  | Implementation | More electric vehicles should lead to a reduction in NO2 | Reduction in CO2 equivalent                                   | Bids were successful and a project manager started in April 2021.                                    | The project includes: Carbon Neutral Piel Island, Electric Vehicle charging stations, Town Hall, Craven House and public buildings energy efficiency projects, Barrow Public Housing Improvement Scheme, Barrow home and business exemplar projects and Grant Programme, 'Extreme Views' delivering a public engagement programme and Low Carbon Demonstration Projects. |
| 3           | Zero Carbon Cumbria Partnership project | Other                                   | Other  | 2020                    | 2026                               | Over 80 organisations across Cumbria inc. district councils. Cumbria County Council and Cumbria Action for Sustainability chair the group | National lottery funding   | NO                     | Funded           | £1 million - £10 million  | Implementation | Reduction in CO2 equivalents                             | Reduction in CO2 equivalents                                  | National lottery funding bid successful and all posts recruited in Spring 2021                       | Programme includes citizens juries, low carbon food, repair cafes. See: <a href="https://cafs.org.uk/our-projects/zero-carbon-cumbria-programme/">https://cafs.org.uk/our-projects/zero-carbon-cumbria-programme/</a>  |
| 4           | Promoting electric vehicle chargepoints | Promoting Low Emission Transport        | Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging | 2020                    | 2022                               | Barrow Borough Council / Cumbria County Council   | European Structural and Investment Fund / Local Enterprise Partnership                           | NO                     | Funded           | £100k - £500k             | Implementation | More electric vehicles should lead to a reduction in NO2 | Number of EV charging points installed / Charging point usage | Project manager started in April 2021 to progress this as part of Low Carbon Barrow project.         | Further funding bids to follow once Low Carbon Barrow charge points are in place.  |

Barrow-in-Furness Borough Council

|   |  |                                       |  |        |      |   |  |    |                  |               |                |   |   |  |   |
|---|--|---------------------------------------|--|--------|------|---|--|----|------------------|---------------|----------------|---|---|--|---|
| 5 | Replacing fleet vehicles with electric vehicles              | Promoting Low Emission Transport      | Company Vehicle Procurement - Prioritising uptake of low emission vehicles | 2020   | 2022 | Barrow Borough Council                          | European Structural and Investment Fund / Local Enterprise Partnership | NO | Funded           | £100k - £500k | Implementation | More electric vehicles should lead to a reduction in NO2                    | Amount of electric vehicles and charging infrastructure | Project manager started in April 2021 to progress this as part of Low Carbon Barrow project.   | Need to ensure infrastructure is there before replacing vehicles, expected late 2021.   |
| 6 | Barrow Local Cycling and Walking Infrastructure Plan (LCWIP) | Transport Planning and Infrastructure | Cycle network  | 2020   | 2023 | Cumbria County Council / Barrow Borough Council | Active Travel fund and Towns Deal                                      | NO | Partially Funded | > £10 million | Planning       | Cycling and walking produces no NO2 emissions                               | Increased cycling and walking rates                     | Out to consultation in May 2021: <a href="https://cumbria.gov.uk/elibrary/content/intermet/538/18110/4432211123.pdf">https://cumbria.gov.uk/elibrary/content/intermet/538/18110/4432211123.pdf</a> Spring 2022 for first phase of improvements - Michaelson Bridge and Ferry Road. | Improvements to Bridge Road and Michaelson Road due to be completed by Spring 2022. Abbey Road, Roose Road and Town Centre improvements are expected to begin in 2023. Further improvements not yet funded. |
| 7 | Schools air quality project                                  | Promoting Travel Alternatives         | School Travel Plans  | 2019   | 2020 | Barrow Borough Council                          | N/A  | NO | Not Funded       |               | Aborted        | Increased walking and decreased idling should lead to reduced NO2 emissions | N/A   | 8 air quality presentations delivered to school groups from Nov 2019 - Jan 2020; diffusion tubes placed outside 4 schools in Jan 2020; 3 schools involved in no idling campaign in Feb 2020.   | Programme discontinued due to Covid-19. Diffusion tubes still placed outside schools.   |
| 8 | Burning waste social media, press releases and webpage       | Public Information                    | Via the Internet   | Oct-19 | 2020 | Barrow Borough Council                          | N/A  | NO | Not Funded       |               | Completed      | Reduction in particulates   | N/A   | Webpage, press releases and social media following increase in fires during lockdown in March/April 2020 to highlight pollution caused by burning waste.   | Completed but will find new ways of communicating with public on this issue as the issue is ongoing.  |

## 2.3 PM<sub>2.5</sub> – 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<sub>2.5</sub> (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM<sub>2.5</sub> has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Barrow-in-Furness Borough Council is taking the following measures to address PM<sub>2.5</sub>:

1. The Authority is currently looking at the options available to fully monitor PM<sub>2.5</sub> during the 2022 monitoring season at a key area of concern, i.e. where reported background concentrations were estimated at 15-20µg/m<sup>3</sup> in 2015, although the modelled data is showing 5-10µg/m<sup>3</sup> in 2019. This area covers three 1km x 1km squares including Ironworks Road, where NO<sub>2</sub> levels were monitored over 2017, 2018 and 2019 and Greengate Street which was monitored for NO<sub>2</sub> in 2019 and again in 2020, though at a different location. Data available via the UK Air website: <https://uk-air.defra.gov.uk/data/gis-mapping>
2. This Authority carefully scrutinises developments at the planning stage that may give rise to PM<sub>2.5</sub> levels. Conditions are imposed that require an appropriate assessment of air quality including PM<sub>2.5</sub> whereby appropriate mitigations measures may be required.
3. If a Pollution Prevention Control (PPC) substantial permitting variation or a new application is received, an air quality assessment may be required depended upon the specific nature of the installation.



## 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

No automatic air quality monitoring is carried out by Barrow-in-Furness Borough Council.

#### 3.1.2 Non-Automatic Monitoring Sites

Barrow-In-Furness Borough Council undertook non- automatic (passive) monitoring of NO<sub>2</sub> at seven (7) sites during 2020. Table A.2 in Appendix A shows the details of these sites.

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

### 3.2 Individual Pollutants

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

#### 3.2.1 Nitrogen Dioxide (NO<sub>2</sub>)

The measured annual mean concentrations in 2020 for NO<sub>2</sub> indicate that the objective of 40µg/m<sup>3</sup> was not exceeded at any of the monitoring locations in the Borough. The 2020 monitoring campaign for of NO<sub>2</sub> at Lindal In Furness has resulted in an annual mean which has decreased significantly to 22.0 µg/m<sup>3</sup> from 33.0 µg/m<sup>3</sup> in 2019 and 34.6 µg/m<sup>3</sup> in 2018. This can only be attributed to the lockdowns and shift to working from home caused by Covid-19 in 2020.

Barrow is the second largest settlement in Cumbria and is situated at the tip of the Furness Peninsula in the south west corner of Cumbria. Surrounded by a rural hinterland, the Borough is remote from other centres of population and services, and the sole link to the motorway network is via the A590. At 78km<sup>2</sup>, the Borough is the smallest area of any district in Cumbria, yet is the most densely populated.

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The Walney Road diffusion tube was also removed at the end of 2016 as levels were 59% below the air quality NO<sub>2</sub> objective.

The Dalton-in-Furness roadside location was removed in December 2018 because levels were nearly 40% below the objective.

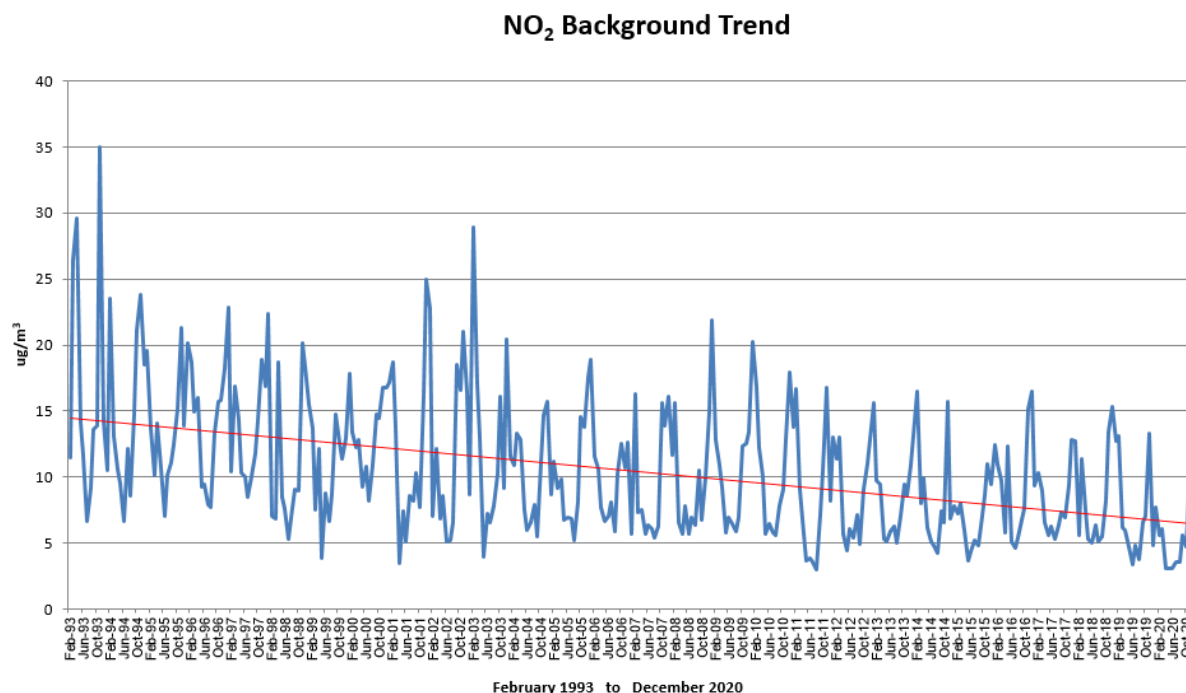
The diffusion tube on Iron Works Road was 57% below the NO<sub>2</sub> air quality objective and was removed at the end of 2019.

At the end of 2019, all diffusion tube positions were also amended to enable officers to change diffusion tubes using grabbers instead of ladders. The diffusion tube on Greengate Street (see Appendix D) was removed due to fear of tampering and moved to the junction of Greengate Street and Rawlinson Street.

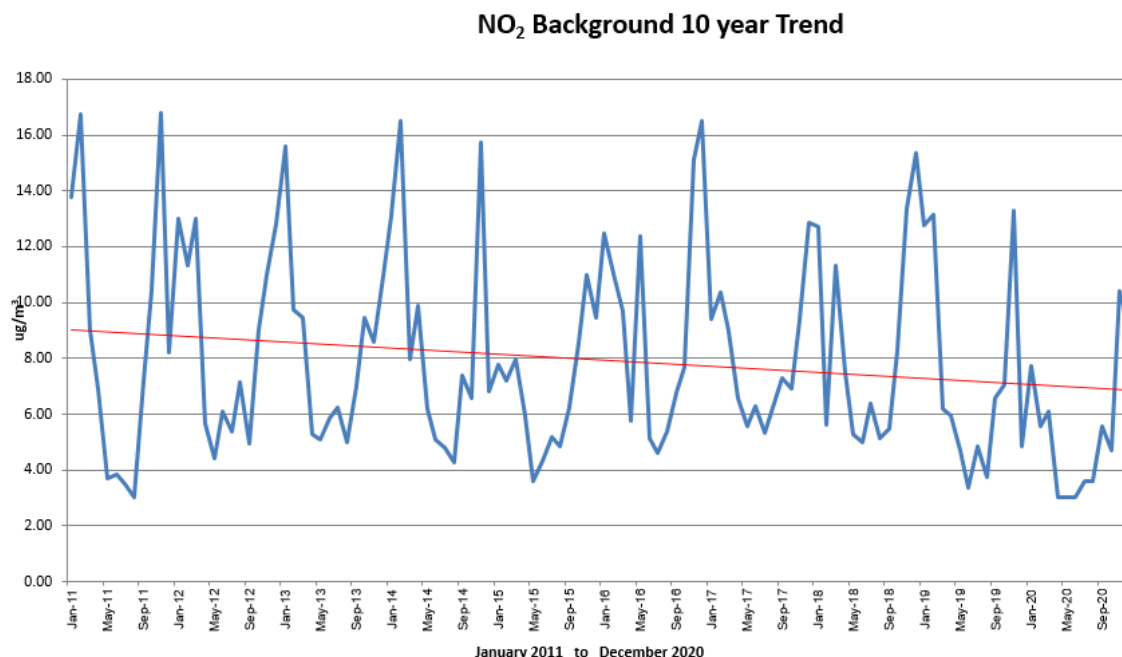
Monitoring increased to seven roadside locations in 2020 to obtain additional information on NO<sub>2</sub> concentrations outside schools (RAMS1, FURN1, PIUS1) and a new medical centre on Duke Street, Barrow in Furness (ALF1), while continuing to monitor the busiest roads in the Borough and the background location.

In 2021 the school diffusion tubes remained in place to try and get an accurate representation of levels outside schools. The tube outside the medical centre at Duke St (ALF1) was removed and a new tube placed at Ireleth Road at a busy junction in a residential area by the train station.

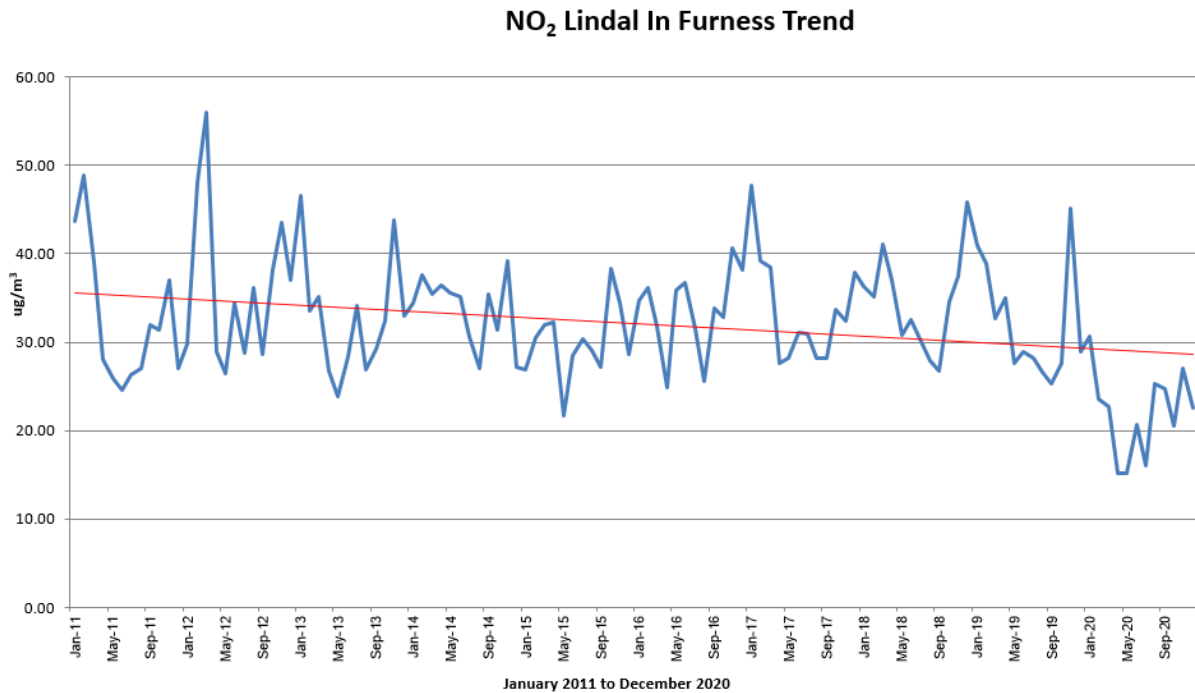
**Figure A.2:** Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Background Site (Dowdales School 1993-2020 [Bias Adjusted])



**Figure A.3:** Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Background Site (Dowdales School 2011-2020 [Bias Adjusted])



**Figure A.4:** Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Roadside Site (Lindal in Furness 2011-2020 [Bias Adjusted])



Background monitoring at the only location remaining from the original monitoring programme is shown in Figure A.2 (Dowdales School) and Figure A.3 for the 10 year trend. Both graphs indicates a decreasing trend in annual mean background NO<sub>2</sub> concentrations in the Borough. Figure A.4 shows the 10 year trend at the Lindal in Furness Roadside site, showing only a slight decrease over the long term, with 2020 much lower than the previous years due to Covid-19.

The other sites monitored in 2020 had been monitored for less than 5 years so trends have not been mapped for those sites.

Table A.3 in Appendix A compares the ratified and adjusted monitored NO<sub>2</sub> annual mean concentrations for the past 5 years with the air quality objective of 40µg/m<sup>3</sup>, following the application of bias adjustment, as required.

For diffusion tubes, the full 2020 season dataset of monthly mean values is provided in Appendix B.

**3.2.2 Particulate Matter (PM<sub>10</sub>)**

There is no monitoring of PM<sub>10</sub> concentrations carried out by Barrow-in-Furness Borough Council.

**3.2.3 Particulate Matter (PM<sub>2.5</sub>)**

There is no monitoring of PM<sub>2.5</sub> concentrations carried out by Barrow-in-Furness Borough Council.

**3.2.4 Sulphur Dioxide (SO<sub>2</sub>)**

There is no automatic or non-automatic monitoring of SO<sub>2</sub> concentrations carried out by Barrow-in-Furness Borough Council.

## Appendix A: Monitoring Results

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

| Diffusion Tube ID | Site Name                   | Site Type | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Pollutants Monitored | In AQMA? Which AQMA? | Distance to Relevant Exposure (m) (1) | Distance to kerb of nearest road (m) (2) | Tube Co-located with a Continuous Analyser? | Tube Height (m) |
|-------------------|-----------------------------|-----------|-------------------------|--------------------------|----------------------|----------------------|---------------------------------------|--|---|-----------------|
| LIND1             | Lindal                      | Roadside  | 325229                  | 475856                   | NO2                  | N/A                  | 0                                     | 2.0                                      | No  | 3.0             |
| BKGD1             | Dowdales School             | Suburban  | 322732                  | 474429                   | NO2                  | N/A                  | N/A                                   | 150.0                                    | No  | 3.0             |
| GRN2              | Greengate Street            | Roadside  | 320290                  | 469196                   | NO2                  | N/A                  | 0                                     | 2.0                                      | No  | 3.0             |
| RAMS1             | Ramsden Infants             | Roadside  | 320157                  | 469585                   | NO2                  | N/A                  | 0                                     | 2.0                                      | No  | 3.0             |
| FURN1             | Furness Academy             | Kerbside  | 320853                  | 469737                   | NO2                  | N/A                  | 0                                     | 0.0                                      | No  | 3.0             |
| PIUS1             | St Pius School              | Kerbside  | 319490                  | 471373                   | NO2                  | N/A                  | 0                                     | 0.7                                      | No  | 3.0             |
| ALF1              | Alfred Barrow Health Centre | Roadside  | 320071                  | 468957                   | NO2                  | N/A                  | 0                                     | 2.0                                      | No  | 2.8             |

Table A.3 – Annual Mean NO<sub>2</sub> Monitoring Results: Non-Automatic Monitoring (µg/m<sup>3</sup>)

| Site ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | Site Type        | Monitoring Type | Valid Data Capture for Monitoring Period (%) <sup>(1)</sup> | Valid Data Capture 2020 (%) <sup>(2)</sup> | NO <sub>2</sub> Annual Mean Concentration (µg/m <sup>3</sup> ) <sup>(3) (4)</sup> |       |       |       |      |
|---------|-------------------------|--------------------------|------------------|-----------------|---|--|---|-------|-------|-------|------|
|         |                         |                          |                  |                 |   |  | 2016  | 2017  | 2018  | 2019  | 2020 |
| LIND 1  | 325229                  | 475856                   | Roadside         | Diffusion Tube  | 100   | 100  | 32.95   | 33.15 | 34.58 | 33.0  | 22.0 |
| DALT 1  | 323235                  | 474138                   | Roadside         | Diffusion Tube  | 100   | 0  | 26.26   | 25.22 | 26.91 | N/A   | N/A  |
| WALN 1  | 319246                  | 469502                   | Roadside         | Diffusion Tube  | 100   | 0  | 16.43   | N/A   | N/A   | N/A   | N/A  |
| IRON 1  | 318986                  | 469541                   | Roadside         | Diffusion Tube  | 100   | 0  | N/A   | 16.6  | 17.02 | 17.52 | N/A  |
| BKGD 1  | 322732                  | 474429                   | Urban Background | Diffusion Tube  | 100   | 100  | 9.38  | 8.66  | 8.45  | 7.59  | 5.5  |
| GRN 1   | 320169                  | 469138                   | Roadside         | Diffusion Tube  | 100   | 0  | N/A   | N/A   | N/A   | 29.95 | N/A  |
| GRN2    | 320290                  | 469196                   | Roadside         | Diffusion Tube  | 100   | 100  | N/A   | N/A   | N/A   | N/A   | 16.3 |
| RAMS1   | 320157                  | 469585                   | Roadside         | Diffusion Tube  | 100   | 100  | N/A   | N/A   | N/A   | N/A   | 10.5 |
| FURN1   | 320853                  | 469737                   | Kerbside         | Diffusion Tube  | 100   | 100  | N/A   | N/A   | N/A   | N/A   | 11.5 |
| PIUS1   | 319490                  | 471373                   | Kerbside         | Diffusion Tube  | 100   | 100  | N/A   | N/A   | N/A   | N/A   | 11.1 |
| ALF1    | 320071                  | 468957                   | Roadside         | Diffusion       | 100   | 100  | N/A   | N/A   | N/A   | N/A   | 10.9 |

|  |  |  |  |      |  |  |  |  |  |  |  |
|--|--|--|--|------|--|--|--|--|--|--|--|
|  |  |  |  | Tube |  |  |  |  |  |  |  |
|--|--|--|--|------|--|--|--|--|--|--|--|

- Diffusion tube data has been bias corrected
- Annualisation has been conducted where data capture is <75%

**Notes:** Exceedances of the NO<sub>2</sub> annual mean objective of 40µg/m<sup>3</sup> are shown in **bold**.

NO<sub>2</sub> annual means exceeding 60µg/m<sup>3</sup>, indicating a potential exceedance of the NO<sub>2</sub> 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 Technical Guidance LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.



## Appendix B: Full Monthly Diffusion Tube Results for 2020

Table B.1 – NO<sub>2</sub> Monthly Diffusion Tube Results - 2020

| Site ID | X OS Grid Ref (Easting) | Y OS Grid Ref (Northing) | NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> ) |      |      |      |      |      |      |      |      |      |      |      |             |  |   |
|---------|-------------------------|--------------------------|--|------|------|------|------|------|------|------|------|------|------|------|-------------|--|---|
|         |                         |                          | Jan  | Feb  | Mar  | Apr  | May  | Jun  | Jul  | Aug  | Sep  | Oct  | Nov  | Dec  | Annual Mean |  |   |
|         |                         |                          |  |      |      |      |      |      |      |      |      |      |      |      | Raw Data    | Bias Adjusted (0.93) and Annualised <sup>(1)</sup> | Distance Corrected to Nearest Exposure <sup>(2)</sup> |
| LIND1   | 325229                  | 475856                   | 37.9   | 29.1 | 28.0 | 18.8 | 18.8 | 25.5 | 19.7 | 31.3 | 30.5 | 25.3 | 33.4 | 27.8 | 27.2        | 22.0   |   |
| BKGD1   | 322732                  | 474429                   | 9.5  | 6.9  | 7.5  | 3.8  | 3.8  | 3.8  | 4.4  | 4.4  | 6.9  | 5.8  | 12.9 | 11.4 | 6.7         | 5.5  |   |
| GRN2    | 320290                  | 469196                   | 33.9   | 19.5 | 22.9 | 11.9 | 11.9 | 14.2 | 16.3 | 17.2 | 20.0 | 21.1 | 25.0 | 27.6 | 20.1        | 16.3   |   |
| RAMS1   | 320157                  | 469585                   | 21.0   | 15.2 | 15.3 | 7.1  | 7.1  | 7.5  | 8.2  | 9.2  | 12.1 | 13.4 | 18.6 | 20.4 | 12.9        | 10.5   |   |
| FURN1   | 320853                  | 469737                   | 22.1   | 16.3 | 14.4 | 8.5  | 8.5  | 9.0  | 9.2  | 11.3 | 13.9 | 14.6 | 20.7 | 21.5 | 14.2        | 11.5   |   |
| PIUS1   | 319490                  | 471373                   | 19.2   | 14.3 | 15.2 | 7.8  | 7.8  | 10.3 | 8.1  | 11.8 | 14.5 | 14.3 | 21.3 | 20.4 | 13.8        | 11.1   |   |
| ALF1    | 320071                  | 468957                   | 20.7   | 16.2 | 16.2 | 7.2  | 7.2  | 7.2  | 7.1  | 10.1 | 12.0 | 13.7 | 21.0 | 22.9 | 13.5        | 10.9   |   |

(1) See Appendix C for details on bias adjustment factor

(2) Distance corrected to nearest relevant public exposure.

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**

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

### New or Changed Sources Identified Within the Borough of Barrow-in-Furness During 2020

Barrow-in-Furness Borough Council has not identified any new sources relating to air quality within the reporting year of 2020.

### QA/QC of Diffusion Tube Monitoring

#### Factor from Local Co-location Studies (if available)

There are no local co-location studies therefore the national NO<sub>2</sub> bias factor has been used (see below):

#### Diffusion Tube Bias Adjustment Factors

- The laboratory supplying and analysing the nitrogen dioxide diffusion tubes is Gradko Environmental Ltd.
- The preparation method used by the laboratory is 20% TEA /Water, analyses are carried out using UV spectrophotometry.
- The current bias factor of **0.81** has been applied to the annual mean values of diffusion tube analyses for each monitoring location. The factor was obtained from the Review and Assessment web-site: <https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html> The spreadsheet version number is 03/21.

#### Discussion of Choice of Factor to Use

The national NO<sub>2</sub> bias factor was obtained from the National Diffusion Tube Bias Adjustment Spreadsheet provided by Defra LAQM, as there is no co-location study.

#### Adherence with the 2020 Diffusion Tube Monitoring Calendar

Monitoring has been completed in adherence with the 2020 Diffusion Tube Monitoring Calendar, although diffusion tubes were left out for 2 months (April & May) due to the first Covid-19 lockdown for all sites and were left out for another 2 months (July & Aug) at the Dowdales site (BKGD1) due to access issues, which have now been resolved.

#### PM Monitoring Adjustment

Barrow-in-Furness Borough Council does not undertake any particulate matter monitoring.

## Short-term to Long-term Data adjustment

No short-term to long-term data adjustments are necessary as datasets for the diffusion tube monitoring were for a complete 12 month period.

## QA/QC of automatic monitoring

Barrow-in-Furness Borough Council does not undertake any automatic monitoring.

## QA/QC of diffusion tube monitoring

- **Tube Precision**

The precision results for Gradko Environmental (A division of Gradko International Ltd.) are stated as **GOOD** on the following website:

<https://laqm.defra.gov.uk/diffusion-tubes/precision.html>

- **WASP Results**

Information obtained from Gradko Environmental states the laboratory has taken part in the WASP proficiency scheme since it's inception, and has maintained the highest ranking of 'Satisfactory'. See Table Below for more information.

Table 1: Laboratory AIR-PT Round Results & Gradko NO<sub>2</sub> Proficiency Scheme 2020

Table 1: Laboratory summary performance for AIR NO<sub>2</sub> PT rounds AR0030, 31, 33, 34, 36, 37, 39 and 40

The following table lists those UK laboratories undertaking LAQM activities that have participated in recent AIR NO<sub>2</sub> PT rounds and the percentage (%) of results submitted which were subsequently determined to be **satisfactory** based upon a z-score of  $\leq \pm 2$  as defined above.

| AIR PT Round                                     | AIR PT AR030            | AIR PT AR031     | AIR PT AR033       | AIR PT AR034              | AIR PT AR036            | AIR PT AR037    | AIR PT AR039       | AIR PT AR040             |
|--|-------------------------|------------------|--------------------|---------------------------|-------------------------|-----------------|--------------------|--------------------------|
| Round conducted in the period                    | January – February 2019 | April – May 2019 | July – August 2019 | September – November 2019 | January – February 2020 | May – June 2020 | July – August 2020 | September – October 2020 |
| Aberdeen Scientific Services                     | 75 %                    | 100 %            | 100 %              | 100 %                     | 100 %                   | NR [4]          | NR [4]             | 100 %                    |
| Cardiff Scientific Services                      | NR [3]                  | NR [3]           | NR [3]             | NR [3]                    | NR [3]                  | NR [4]          | NR [4]             | NR [3]                   |
| Edinburgh Scientific Services                    | 100 %                   | NR [2]           | 100 %              | 25 %                      | 50 %                    | NR [4]          | NR [4]             | 100 %                    |
| SOCOTEC  | 87.5 % [1]              | 100 % [1]        | 100 % [1]          | 100 % [1]                 | 100 % [1]               | NR [4]          | NR [4]             | 100 % [1]                |
| Exova (formerly Clyde Analytical)                | NR [3]                  | NR [3]           | NR [3]             | NR [3]                    | NR [3]                  | NR [4]          | NR [4]             | NR [3]                   |
| Glasgow Scientific Services                      | 100 %                   | 100 %            | 100 %              | 50 %                      | 100 %                   | NR [4]          | NR [4]             | 100 %                    |
| Gradko International                             | 75 %                    | 100 %            | 100 %              | 100 %                     | 75 %                    | NR [4]          | NR [4]             | 75 %                     |
| Kent Scientific Services                         | NR [3]                  | NR [3]           | NR [3]             | NR [3]                    | NR [3]                  | NR [4]          | NR [4]             | NR [3]                   |
| Kirklees MBC                                     | NR [3]                  | NR [3]           | NR [3]             | NR [3]                    | NR [3]                  | NR [4]          | NR [4]             | NR [3]                   |
| Lambeth Scientific Services                      | 50 %                    | 100 %            | 50 %               | 100 %                     | 100 %                   | NR [4]          | NR [4]             | 100 %                    |
| Milton Keynes Council                            | 100 %                   | 100 %            | 50 %               | 100 %                     | 100 %                   | NR [4]          | NR [4]             | 25 %                     |
| Northampton Borough Council                      | NR [3]                  | NR [3]           | NR [3]             | NR [3]                    | NR [3]                  | NR [4]          | NR [4]             | NR [3]                   |
| Somerset Scientific Services                     | 100 %                   | 100 %            | 100 %              | 100 %                     | 100 %                   | NR [4]          | NR [4]             | 100 %                    |
| South Yorkshire Air Quality Samplers             | 100 %                   | 100 %            | 100 %              | 75 %                      | 100 %                   | NR [4]          | NR [4]             | 100 %                    |
| Staffordshire County Council                     | 100 %                   | 75 %             | 75 %               | 75 %                      | 100 %                   | NR [4]          | NR [4]             | 50 %                     |
| Tayside Scientific Services (formerly Dundee CC) | 100 %                   | NR [2]           | 100 %              | NR [2]                    | 100 %                   | NR [4]          | NR [4]             | 100 %                    |
| West Yorkshire Analytical Services               | 100 %                   | 100 %            | 100 %              | 50 %                      | 100 %                   | NR [4]          | NR [4]             | NR [2]                   |

[1] Participant subscribed to two sets of test results (2 x 4 test samples) in each AIR PT round.

[2] NR, No results reported.

[3] Cardiff Scientific Services, Exova (formerly Clyde Analytical), Kent Scientific Services, Kirklees MBC and Northampton Borough Council; no longer carry out NO<sub>2</sub> diffusion tube monitoring and therefore did not submit results.

[4] Round was cancelled due to pandemic.

For more information the AIR-PT scheme, please visit the following website:

<https://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html>.

## Appendix D: Map(s) of Monitoring Locations

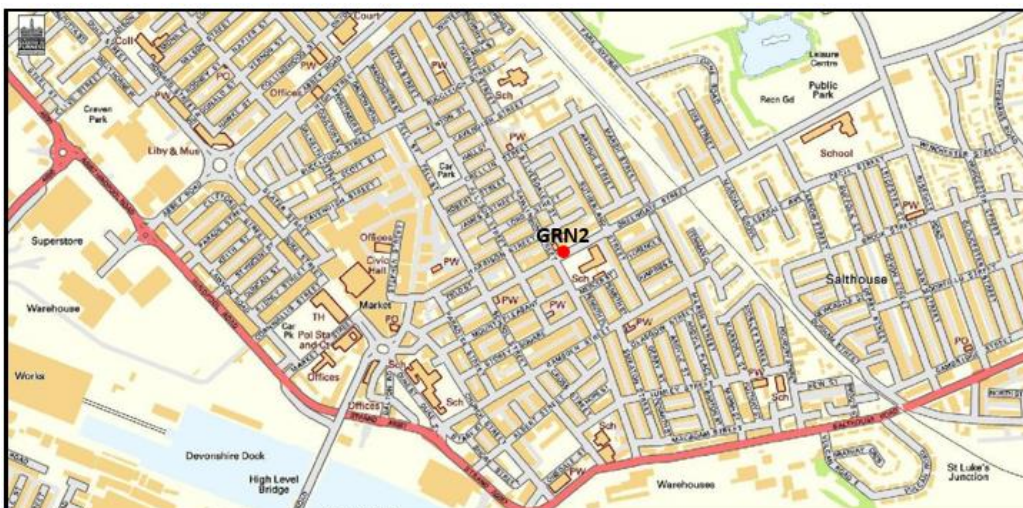
### Lindal (LIND 1) – Ulverston Road:



### Dowdales School (BKGD1) – Background:



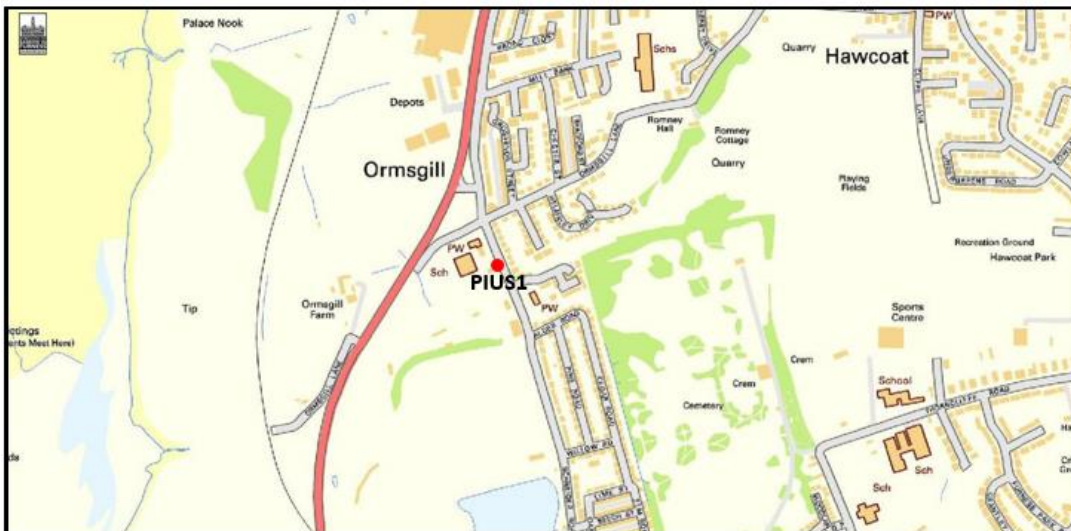
### Greengate Street (GRN2):



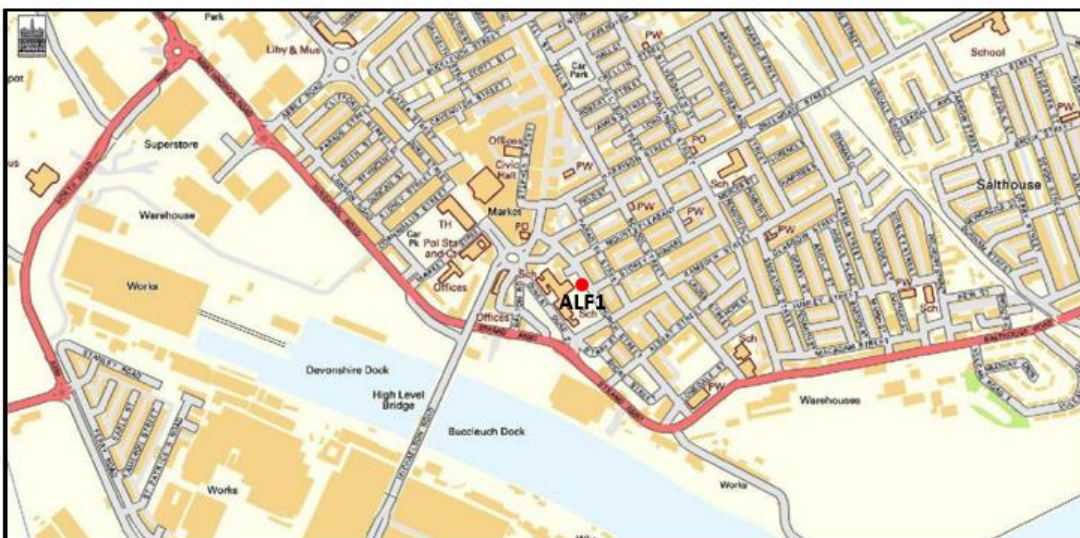
**Ramsden Infants (RAMS1):**



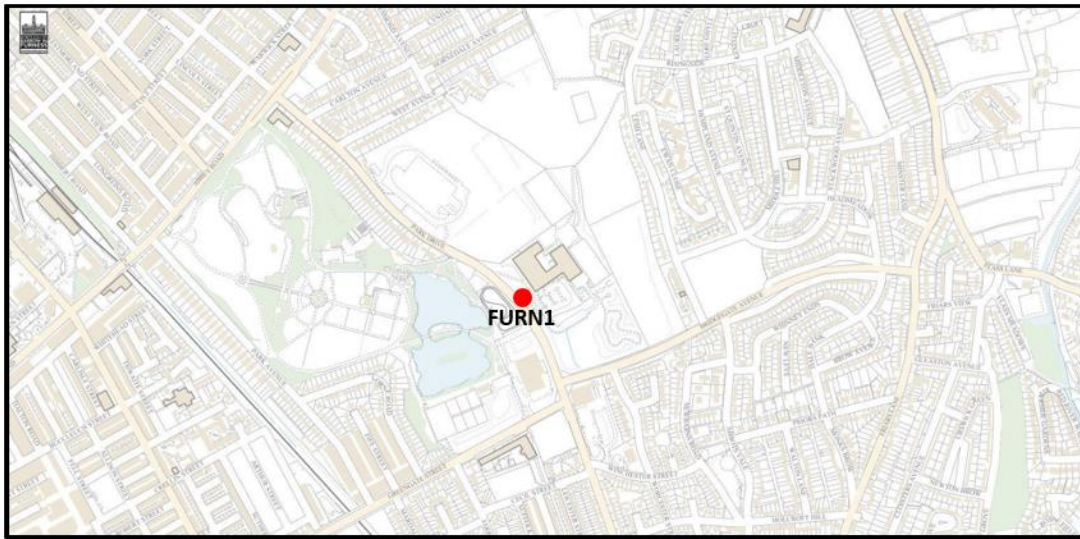
**St Pius School (PIUS1):**



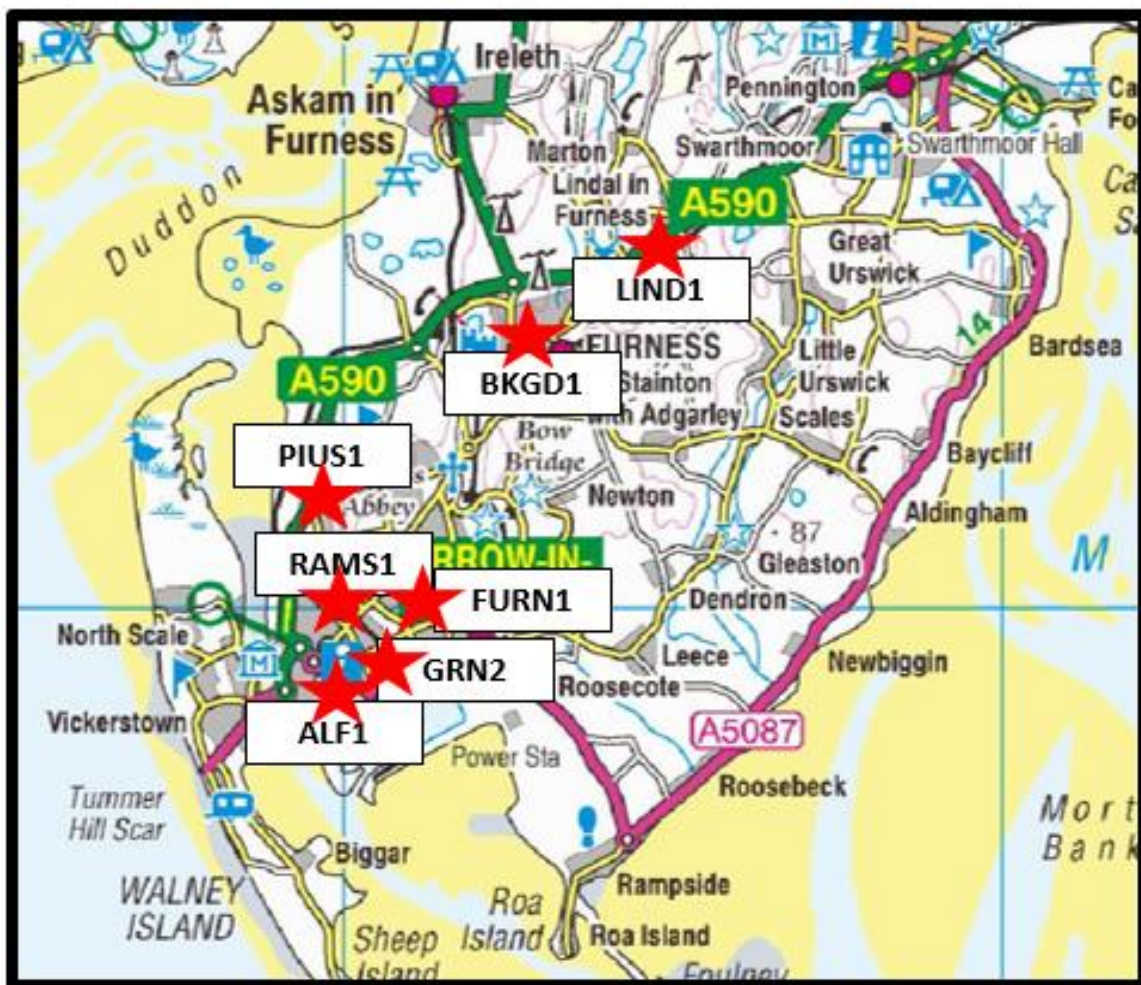
**Alfred Barrow Health Centre (ALF1):**



Furness Academy (FURN1):



Map showing all diffusion tube locations in the Borough of Barrow-in-Furness



## Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England<sup>11</sup>

| Pollutant                              | Air Quality Objective: Concentration                                | Air Quality Objective: Measured as |
|--|---|------------------------------------|
| Nitrogen Dioxide (NO <sub>2</sub> )    | 200µg/m <sup>3</sup> not to be exceeded more than 18 times a year   | 1-hour mean                        |
| Nitrogen Dioxide (NO <sub>2</sub> )    | 40µg/m <sup>3</sup>   | Annual mean                        |
| Particulate Matter (PM <sub>10</sub> ) | 50µg/m <sup>3</sup> , not to be exceeded more than 35 times a year  | 24-hour mean                       |
| Particulate Matter (PM <sub>10</sub> ) | 40µg/m <sup>3</sup>   | Annual mean                        |
| Sulphur Dioxide (SO <sub>2</sub> )     | 350µg/m <sup>3</sup> , not to be exceeded more than 24 times a year | 1-hour mean                        |
| Sulphur Dioxide (SO <sub>2</sub> )     | 125µg/m <sup>3</sup> , not to be exceeded more than 3 times a year  | 24-hour mean                       |
| Sulphur Dioxide (SO <sub>2</sub> )     | 266µg/m <sup>3</sup> , not to be exceeded more than 35 times a year | 15-minute mean                     |

<sup>11</sup> The units are in microgrammes of pollutant per cubic metre of air (µg/m<sup>3</sup>).



## Appendix F: Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional and national scales.

COVID-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in the 2021 reporting year. Recognising this, Defra provided various advice updates throughout 2020 to English authorities, particularly concerning the potential disruption to air quality monitoring programmes, implementation of Air Quality Action Plans (AQAPs) and LAQM statutory reporting requirements. Defra has also issued supplementary guidance for LAQM reporting in 2021 to assist local authorities in preparing their 2021 ASR. Where applicable, this advice has been followed.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention, most notably in relation to emissions of air pollutants arising from road traffic. The vast majority (>95%) of AQMAs declared within the UK are related to road traffic emissions, where attainment of the annual mean objective for nitrogen dioxide (NO<sub>2</sub>) is considered unlikely. On 23rd March 2020, the UK Government released official guidance advising all members of public to stay at home, with work-related travel only permitted when absolutely necessary. During this initial national lockdown (and to a lesser extent other national and regional lockdowns that followed), marked reductions in vehicle traffic were observed; Department for Transport (DfT) data<sup>12</sup> suggests reductions in vehicle traffic of up to 70% were experienced across the UK by mid-April, relative to pre COVID-19 levels.

This reduction in travel in turn gave rise to a change of air pollutant emissions associated with road traffic, i.e. nitrous oxides (NO<sub>x</sub>), and exhaust and non-exhaust particulates (PM). The Air Quality Expert Group (AQEG)<sup>13</sup> has estimated that during the initial lockdown period in 2020, within urbanised areas of the UK reductions in NO<sub>2</sub> annual mean concentrations were between 20 and 30% relative to pre-pandemic levels, which represents an absolute reduction of between 10 to 20µg/m<sup>3</sup> if

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<sup>12</sup> Prime Minister's Office, COVID-19 briefing on the 31<sup>st</sup> of May 2020

<sup>13</sup> Air Quality Expert Group, Estimation of changes in air pollution emissions, concentrations and exposure during the COVID-19 outbreak in the UK, June 2020

expressed relative to annual mean averages. During this period, changes in PM<sub>2.5</sub> concentrations were less marked than those of NO<sub>2</sub>. PM<sub>2.5</sub> concentrations are affected by both local sources and the transport of pollution from wider regions, often from well beyond the UK. Through analysis of AURN monitoring data for 2018-2020, AQEG have detailed that PM<sub>2.5</sub> concentrations during the initial lockdown period are of the order 2 to 5µg/m<sup>3</sup> lower relative to those that would be expected under business-as-usual conditions.

As restrictions are gradually lifted, the challenge is to understand how these air quality improvements can benefit the long-term health of the population.

## **Impacts of COVID-19 on Air Quality within the Borough of Barrow-in-Furness**

- Reductions of NO<sub>2</sub> concentrations of 36% were experienced at the Lindal A590 roadside diffusion tube monitoring site (LIND1) between April and June 2020, as compared to concentrations found between April and June 2019. The reduction in annual mean concentration relative to 2019 was 33%, which shows what could be achievable in that area.
- The A590 is the major road transport link into the area seeing 19498 vehicle movements each day<sup>14</sup>. However this figure, which had been increasing year-on-year, is 14% lower than 2019 and the number of daily pedal cycles on this road increased 26% since 2019 to 71 per day.
- Reductions of NO<sub>2</sub> concentrations of 24% were experienced at the Dowdales background diffusion tube monitoring site (BKGD1) between April and June 2020, as compared to concentrations found between April and June 2019. The reduction in annual mean concentration relative to 2019 was 28%, which shows how low levels could get with a drop in road traffic.

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<sup>14</sup> Department for Transport: <https://roadtraffic.dft.gov.uk/manualcountpoints/57340>

## Opportunities Presented by COVID-19 upon LAQM within the Borough of Barrow-in-Furness

A consideration of Cycle Lanes within Barrow was made a priority, with Cumbria County Council being successful in an Active Travel funding bid for improvements to Michaelson Bridge and Ferry Road, however this may have also happened without Covid-19 as work on the Local Cycling and Walking Infrastructure Plan (LCWIP) had already started.

## Challenges and Constraints Imposed by COVID-19 upon LAQM within the Borough of Barrow-in-Furness

- As with previous years, a national bias adjustment factor has been utilised to adjust the diffusion tube results for 2020. Within 2019 there were 27 co-location studies that were utilised to calculate the bias factor for the laboratory and preparation method used. For 2020, this number has reduced to 18 studies. There is therefore the potential for there to be a greater degree of uncertainty associated with the resultant annual mean NO<sub>2</sub> concentrations in 2020 than in previous years. **Medium Impact**
- During 2020, access to a number of diffusion tube monitoring sites was restricted due to their locations on residential buildings or schools. Therefore, tubes were left out for two exposure periods between April to June for all sites and for three exposure periods for the background site. This has affected data capture within 2020. **Medium Impact**
- Owing to the reallocation of Council resources during 2020, the development and implementation of the Climate Change Action Plan has been delayed. Current estimates are that the electric vehicle infrastructure project and moving the fleet to electric vehicles should now be completed by early 2022. **Small Impact**

The impacts as presented above are aligned with the criteria as defined in **Error! Reference source not found.**, with professional judgement considered as part of their application.

Table F 1 – Impact Matrix

| Category   | Impact Rating: None  | Impact Rating: Small   | Impact Rating: Medium   | Impact Rating: High  |
|--|--|--|---|--|
| Automatic Monitoring – Data Capture (%)            | More than 75% data capture   | 50 to 75% data capture   | 25 to 50% data capture  | Less than 25% data capture   |
| Automatic Monitoring – QA/QC Regime                | Adherence to requirements as defined in LAQM.TG16                          | Routine calibrations taken place frequently but not to normal regime. Audits undertaken alongside service and maintenance programmes | Routine calibrations taken place infrequently and service and maintenance regimes adhered to. No audit achieved | Routine calibrations not undertaken within extended period (e.g. 3 to 4 months). Interruption to service and maintenance regime and no audit achieved                        |
| Passive Monitoring – Data Capture (%)              | More than 75% data capture   | 50 to 75% data capture   | 25 to 50% data capture  | Less than 25% data capture   |
| Passive Monitoring – Bias Adjustment Factor        | Bias adjustment undertaken as normal                                       | <25% impact on normal number of available bias adjustment colocation studies (2020 vs 2019)  | 25-50% impact on normal number of available bias adjustment studies (2020 vs 2019)                              | >50% impact on normal number of available bias adjustment studies (2020 vs 2019) and/or applied bias adjustment factor studies not considered representative of local regime |
| Passive Monitoring – Adherence to Changeover Dates | Defra diffusion tube exposure calendar adhered to                          | Tubes left out for two exposure periods  | Tubes left out for three exposure periods   | Tubes left out for more than three exposure periods  |
| Passive Monitoring – Storage of Tubes              | Tubes stored in accordance with laboratory guidance and analysed promptly. | Tubes stored for longer than normal but adhering to laboratory guidance  | Tubes unable to be stored according to be laboratory guidance but analysed prior to expiry date                 | Tubes stored for so long that they were unable to be analysed prior to expiry date. Data unable to be used   |
| AQAP – Measure Implementation                      | Unaffected   | Short delay (<6 months) in development of a new AQAP, but is on-going  | Long delay (>6 months) in development of a new AQAP, but is on-going  | No progression in development of a new AQAP  |

## 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 <sub>2</sub>   | Nitrogen Dioxide  |
| NO <sub>x</sub>   | Nitrogen Oxides   |
| PM <sub>10</sub>  | Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less   |
| PM <sub>2.5</sub> | Airborne particulate matter with an aerodynamic diameter of 2.5µm or less   |
| QA/QC             | Quality Assurance and Quality Control   |
| SO <sub>2</sub>   | Sulphur Dioxide   |

## References

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- Public Health Outcomes Framework – Public Health England (updated quarterly)
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