
Department of
Agriculture, Environment
and Rural Affairs
www.daera-ni.gov.uk
Air Pollution in
Northern Ireland 2018

# Contents



## Tables



## Figures

# 1. Report Highlights

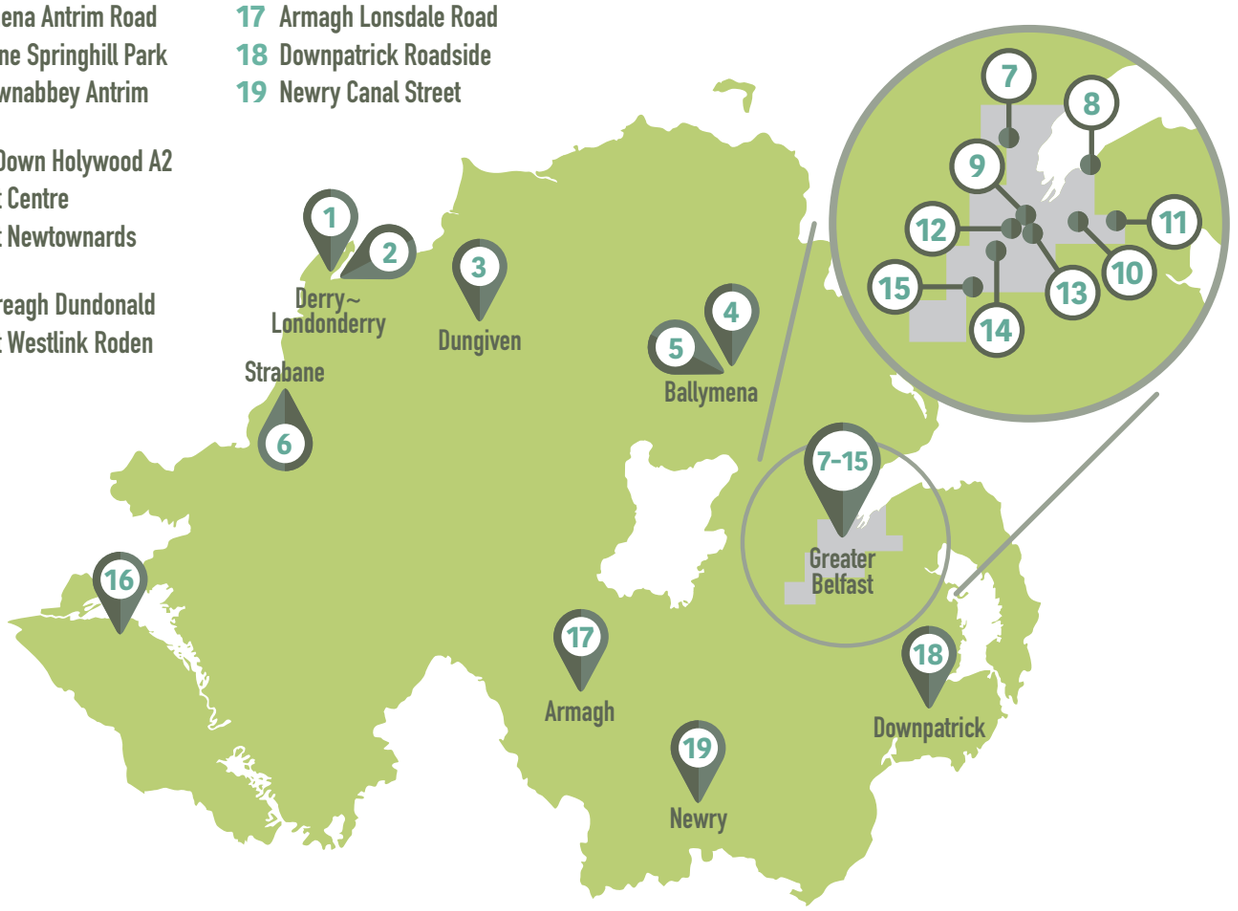
This is the seventeenth in a series of annual reports on air quality in Northern Ireland. It has been written and produced by Ricardo Energy & Environment, on behalf of the Department of Agriculture, Environment and Rural Affairs (DAERA).

The key purpose of this report is to summarise air quality monitoring results for Northern Ireland in 2018, in order to inform the public, government and wider air quality community in Northern Ireland. This report also contains useful information on air quality policy and legislation as well as on sources of pollution. Figure 1.1 shows the locations of all the automatic air quality monitoring sites in Northern Ireland that were in operation during part or all of 2018.

**Fig. 1.1: Air Quality Monitoring Stations**

1 Londonderry Rosemount
2 Londonderry Dale's Corner
3 Limavady Dungiven
4 Ballymena Ballykeel
5 Ballymena Antrim Road
6 Strabane Springhill Park
7 Newtownabbey Antrim Road
8 North Down Holywood A2
9 Belfast Centre
10 Belfast Newtownards Road
11 Castlereagh Dundonald
12 Belfast Westlink Roden Street
13 Belfast Ormeau Road
14 Belfast Stockman's Lane
15 Lisburn Dunmurry Seymour Hill
16 Lough Navar
17 Armagh Lonsdale Road
18 Downpatrick Roadside
19 Newry Canal Street

19 sites operating in 2018. No sites closed down in 2017 or 2018.



Derry/Londonderry City Centre

This report has been compiled from data supplied by Northern Ireland's network of automatic monitoring stations (Figure 1.1). Some of these are run on behalf of the Department, while others are managed by district councils, via the Local Air Quality Management framework, for which the Department provides funding support.

This report reviews the pollutants monitored and highlights exceedances of air quality objectives. It also highlights emerging trends in air quality over time. Each edition of the report takes an issue to examine in-depth, and this year's focus is on DAERA's new mobile phone app, developed to help keep the public informed on air quality in Northern Ireland.

Air quality in Northern Ireland has improved substantially in recent decades. In particular, concentrations of sulphur dioxide, a pollutant associated with coal and oil combustion, have declined significantly over the past twenty years. However, some pollutants in some parts of Northern Ireland continue to exceed air quality objectives. A continued effort to reduce air pollution is therefore important, together with monitoring to assess progress and to provide sound, science-based input into policy development.

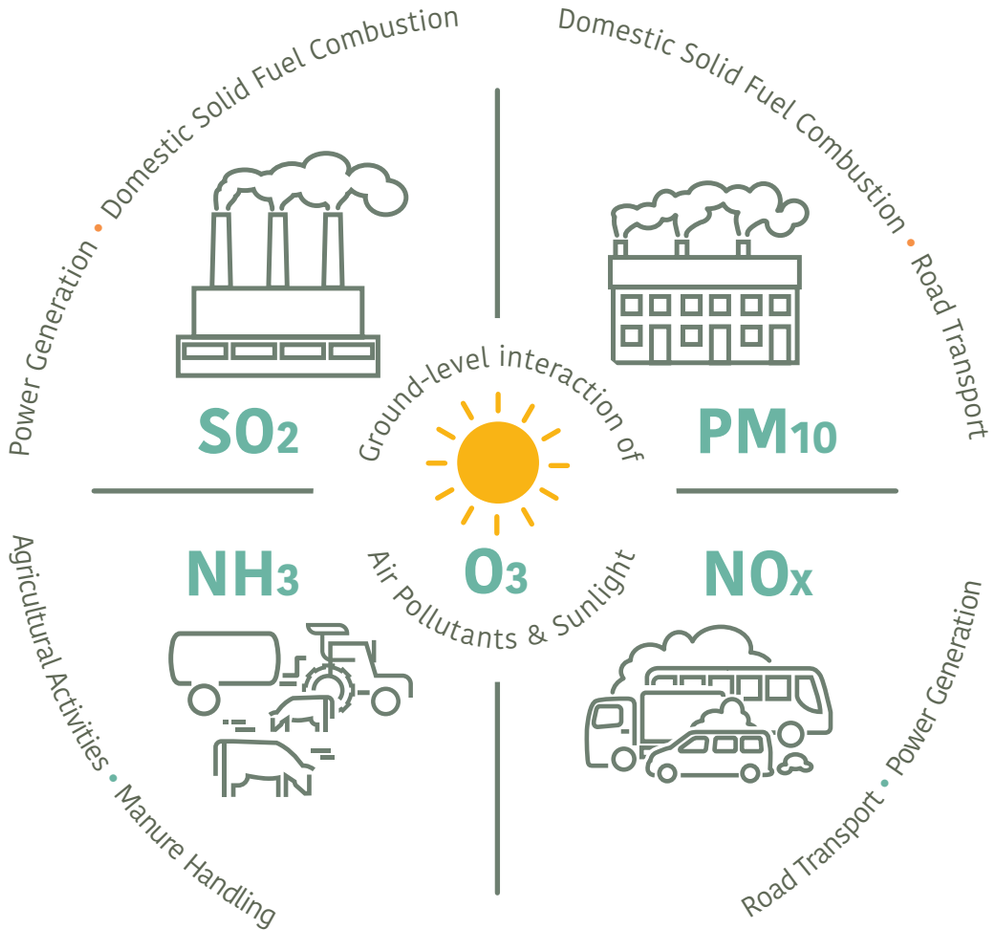
Concentrations of sulphur dioxide, a pollutant associated with coal and oil combustion, have declined significantly over the past twenty years.

# 2. Sources of Air Pollution in NI

## Figure 2.1 illustrates the most significant air pollutants for our region, and provides information on their sources:

- Nitrogen oxides ($NO_x$, which includes nitrogen monoxide NO and nitrogen dioxide $NO_2$): from combustion of fuels, most importantly in transport and energy generation. The NOx emitted by road transport, however, poses more of a problem because it leads to increased concentrations of $NO_2$ at ground level in busy streets where people are present.
- Sulphur dioxide, $SO_2$: a pollutant produced during combustion of fuels containing sulphur (such as coal), particularly from power generation, industry, and household heating.
- Particulate matter, $PM_{10}$ and $PM_{2.5}$: by-products of burning fuels, in particular solid fuels (e.g. domestic wood and coal burning), industrial combustion and road transport. Half of the PM produced from road transport is from fuel combustion, while the other half is from tyre and brake wear and road dust.
- Ground-level ozone, $O_3$: a secondary pollutant, formed by the interaction of other air pollutants in the presence of sunlight.
- Ammonia, $NH_3$: a gas that is emitted from waste and agricultural activities – in particular, manure handling, storage and spreading.

**Figure 2.1: Main Sources of Air Pollution**



# 3. Legislation and Policy: What Can Be Done

During 2018, the management of air quality in Northern Ireland was based on the requirements of European Union (EU) Air Quality Directives, and on the 2007 UK Air Quality Strategy. These requirements are incorporated (or 'transposed') into Northern Ireland's own legislation by statutory measures, forming the basis of a strong framework for managing air quality.

## The European Union

Whist this report relates to the 2018 year, at the time of writing (early 2020), the UK had left the EU. As such, and to provide information to the public, this section on the current status of EU air quality legislation has been included.

A target to improve air quality exists in the Northern Ireland Executive's Draft Programme for Government

The UK left the European Union (EU) on 31st January 2020 and is in a transition period until 31st December 2020. During the transition period the trading relationship between the EU and UK will remain the same and current EU rules, including those on air quality, will continue to apply.

During 2018 (the period covered by this report) the following Directives were still applicable in Northern Ireland:

- Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe (the Air Quality Directive), which relates to sulphur dioxide, oxides of nitrogen, particulate matter, lead, carbon monoxide, benzene and ozone in ambient air; and
- Directive 2004/107/EC (the Fourth Daughter Directive) relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons (PAH) in ambient air.

Newcastle, Co. Down

## The Air Quality Standards Regulations (Northern Ireland) 2010

These Regulations transposed the provisions of the above Directives into Northern Ireland's own legislation. As well as the EU limit values and non-mandatory target values for ambient concentrations of pollutants, the Regulations set out requirements for ambient air quality monitoring, including the number of monitoring sites required, siting criteria and acceptable methodology. They also identify the duties of Northern Ireland's Government Departments in relation to achieving limit and target values. It is the responsibility of DAERA to inform the public about air quality in the region, particularly with regard to warning the public when information and alert thresholds are exceeded.

## The Air Quality Strategy for England, Scotland, Wales and Northern Ireland

The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, first published in 1997 and updated in 2007, provides a comprehensive framework for tackling air pollution. It was established on the basis of strong scientific evidence and a science-based understanding of the effects of air pollutants on health and the environment. The Strategy sets objectives to be met within the UK for a suite of pollutants. The scientific basis, the objectives set, and provisions contained within the Strategy are closely associated with the corresponding standards set within European Air Quality Directives, as listed above. The Strategy's provisions for some pollutants differ from those in the Directives, with these differences relating to scientific evidence and expert opinion that is specific to the UK situation. However, all the Air Quality Strategy objectives are at least as stringent as the corresponding limit values in the Air Quality Directive or 4th Daughter Directive. The full Air Quality Strategy and its technical annexes are available online and can be downloaded from https://www.gov.uk/government/publications/the-air-quality-strategy-for-england-scotland-wales-and-northern-ireland-volume-1.

**Table 3.1:** Air Quality Management Areas in Northern Ireland

| District Council | Number of AQMAs | Pollutant that triggered designation | Sources |
|---|---|---|---|
| Antrim and Newtownabbey Borough Council | 1 | Nitrogen dioxide | Road traffic |
| Armagh City, Banbridge and Craigavon Borough Council[1] | 1 | Nitrogen dioxide | Road traffic |
| Belfast City Council | 4 | Nitrogen dioxide | Road traffic |
| Causeway Coast and Glens Borough Council | 1 | Nitrogen dioxide | Road traffic |
| Derry City and Strabane District Council | 4 (plus 4 more which were revoked during 2018) | Nitrogen dioxide | Road traffic |
| Fermanagh and Omagh District Council | 0 | - | - |
| Lisburn and Castlereagh City Council | 1 | Nitrogen dioxide | Road traffic |
| Mid and East Antrim Borough Council | 2 | Nitrogen Dioxide (1) and $PM_{10}$ (1) | $NO_2$: Road traffic $PM_{10}$: Domestic Heating |
| Mid Ulster District Council | 3 | Nitrogen dioxide | Road traffic |
| Newry Mourne and Down District Council | 2 | Nitrogen dioxide (1) and $PM_{10}$ (1) | Road traffic |
| North Down and Ards District Council | 0 | - | - |

## Local Air Quality Management

Local Air Quality Management (LAQM) provides the framework under the Environment Order (NI) 2002, within which air quality is managed by the 11 district councils in Northern Ireland. LAQM requires district councils to review and assess a range of air pollutants against the objectives set by the UK Air Quality Strategy, using a range of monitoring, modelling, observations and corresponding analyses. For locations where objectives are not expected to be met by the relevant target date, district councils are required to declare an Air Quality Management Area (AQMA), and (along with relevant authorities), to develop an Action Plan addressing the problem. In 2018 there were 19 AQMAs in Northern Ireland, as shown in Table 3.1. Nine councils have AQMAs: of these, seven have AQMAs for $NO_2$ only, and two have AQMAs for $PM_{10}$ and $NO_2$. There are no AQMAs in place for any other pollutants, in Northern Ireland.

[1]In February 2018, Armagh City, Banbridge and Craigavon Borough Council redefined their AQMA to encompass the whole borough, replacing the two previous AQMAs.

# 4. Air Quality Monitoring Results for 2018

## Monitoring in Northern Ireland/ Key Findings

A wide range of air quality monitoring is carried out in Northern Ireland. Some monitoring sites are run as part of UK-wide monitoring networks; others are operated by district councils in order to meet local objectives.

The Air Quality Directive requires Member States to be divided into 'zones' for reporting purposes. Northern Ireland comprises two reporting zones – the 'Belfast Metropolitan Urban Area' agglomeration (the conurbation of Greater Belfast), and the 'Northern Ireland' zone (the rest of the region). The Directive then specifies how many monitoring sites (or 'stations') are needed in each zone (based on its size and population). Only sites which meet the stringent siting criteria of the Directive may be used for reporting to the European Commission. The Directive siting criteria are different from those used for LAQM: for example, sites located close to major road junctions are used in LAQM but must not be used for Directive compliance monitoring purposes. There are also different criteria regarding relevant public exposure.

The following pollutants were monitored in Northern Ireland during 2018:

- Carbon monoxide (CO);
- Oxides of nitrogen (NOx), comprising nitric oxide (NO) and nitrogen dioxide ($NO_2$);
- Sulphur dioxide ($SO_2$);
- Particles (as $PM_{10}$, $PM_{2.5}$, and black carbon);
- Ozone ($O_3$);
- Benzene;
- Polluting elements – including lead, arsenic, cadmium, nickel and mercury; and
- Polycyclic Aromatic Hydrocarbons (PAHs).

There were 19 automatic air quality monitoring stations that operated for all of 2018 in Northern Ireland. Each was equipped with continuous monitoring equipment for one or more of the pollutants for which automatic methods are used: CO, NOx, $SO_2$, $PM_{10}$, $PM_{2.5}$ and $O_3$. These sites (shown previously in Figure 1.1) provide hourly information on a wide range of pollutants. Data from the continuous monitoring sites are communicated rapidly to the public via the website www.airqualityni.co.uk. Public warnings are issued when levels approach or reach 'high' levels as defined by the Daily Air Quality Index (see https://uk-air.defra.gov.uk/air-pollution/daqi for an explanation of this Index).

Seven of the automatic monitoring sites (Armagh Lonsdale Road, Ballymena Antrim Road, Ballymena Ballykeel, Belfast Centre, Belfast Stockman's Lane, Londonderry Rosemount and Lough Navar) were part of the UK's national monitoring network and were used to assess compliance with the Air Quality Directive. Non-automatic monitoring techniques are used for benzene, metallic pollutants, black carbon and PAHs. Some of these measurements are used to assess compliance with the Air Quality Strategy, the Air Quality Directive and Fourth Daughter Directive.

## The Volatile Correction Model

Three of Northern Ireland's ten $PM_{10}$ monitoring sites used a Tapered Element Oscillating Microbalance (TEOM) to measure $PM_{10}$ during 2018. The relatively high operating temperature of the TEOM (necessary to prevent condensation on the filter) can result in the loss of volatile components of the particulate matter sampled, causing under-estimation of the $PM_{10}$ concentration. However, the data have been corrected for this using the Volatile Correction Model (VCM) developed by King's College, London. The VCM uses data from Filter Dynamic Measurement Systems (FDMS) $PM_{10}$ analysers in the region, which measure both the volatile and non-volatile fractions, to calculate an appropriate correction based on the location of the instrument and the period of the measurements. The resulting corrected measurements have been demonstrated as equivalent to the European reference method. For more information, visit the Volatile Correction Model page[2]. The TEOM $PM_{10}$ data presented in this report have been corrected to gravimetric equivalent using the VCM. This issue only arises for $PM_{10}$: there is at present no requirement to correct TEOM measurements of $PM_{2.5}$, and in any case all of Northern Ireland's $PM_{2.5}$ monitoring sites used other methods in 2018.

## Upgrade of PM Monitoring Instruments in 2018

The FDMS instrument has been used to measure $PM_{10}$ and $PM_{2.5}$ at many of Northern Ireland's monitoring sites, including those which are part of the national monitoring network. However, many of these instruments were approaching the end of their useful lives and reaching the point at which they would no longer have manufacturer's support. The Environment Agency therefore began a programme of upgrades, replacing old FDMS with new instruments of different types. The FDMS at Lough Navar was replaced in the summer of 2018 – the first such replacement in Northern Ireland. The replacement instrument was a Fidas; an optical device which measures both $PM_{10}$ and $PM_{2.5}$. Therefore, as of the summer of 2018, Lough Navar has reported both these particulate fractions. Belfast Centre and Derry Rosemount subsequently had their FDMS upgraded in 2019, and finally Armagh Lonsdale Road in early 2020.

[2] http://www.volatile-correction-model.info/

## Key Results for 2018

This section summarises key monitoring results from 2018, including compliance with EU limit values and the corresponding Air Quality Strategy (AQS) objectives. Further information is provided on the Northern Ireland Air website.

**Carbon Monoxide** was monitored using an automatic instrument at one site – Belfast Centre. The results were well within the EU limit value and AQS objective for this pollutant and have been for many years.

**Benzene** was monitored at one site, Belfast Centre, which met the annual mean EU limit value and AQS objective (for the running annual mean) in 2018, as it has for many years.

**Metallic and Other Polluting Elements** including lead, arsenic, cadmium and nickel – were monitored using non-automatic techniques at Belfast Centre, as part of the Heavy Metals Network. The results for 2018 were within the annual mean EU limit value and AQS objective for lead, and within the EU annual mean target values for arsenic, cadmium and nickel.

Although no limit values or objectives were exceeded, there was an elevated lead measurement in 2018. Lead (Pb) is measured as a four-weekly mean; four-weekly mean concentrations at Belfast Centre are typically less than 5 ng $m^{-3}$ and rarely exceed 10 ng $m^{-3}$. However, over the four-week measuring period 22nd August to 19th September 2018, a mean concentration of 212 ng $m^{-3}$ was measured. The cause of this isolated high measurement is not certain, though the measurement period coincided with a serious building fire in the city centre. However, despite the high measurement for the above period, the annual mean Pb concentration at Belfast Centre (20 ng $m^{-3}$) remained well within the AQS objective (250 ng $m^{-3}$) and EU limit value (500 ng $m^{-3}$).

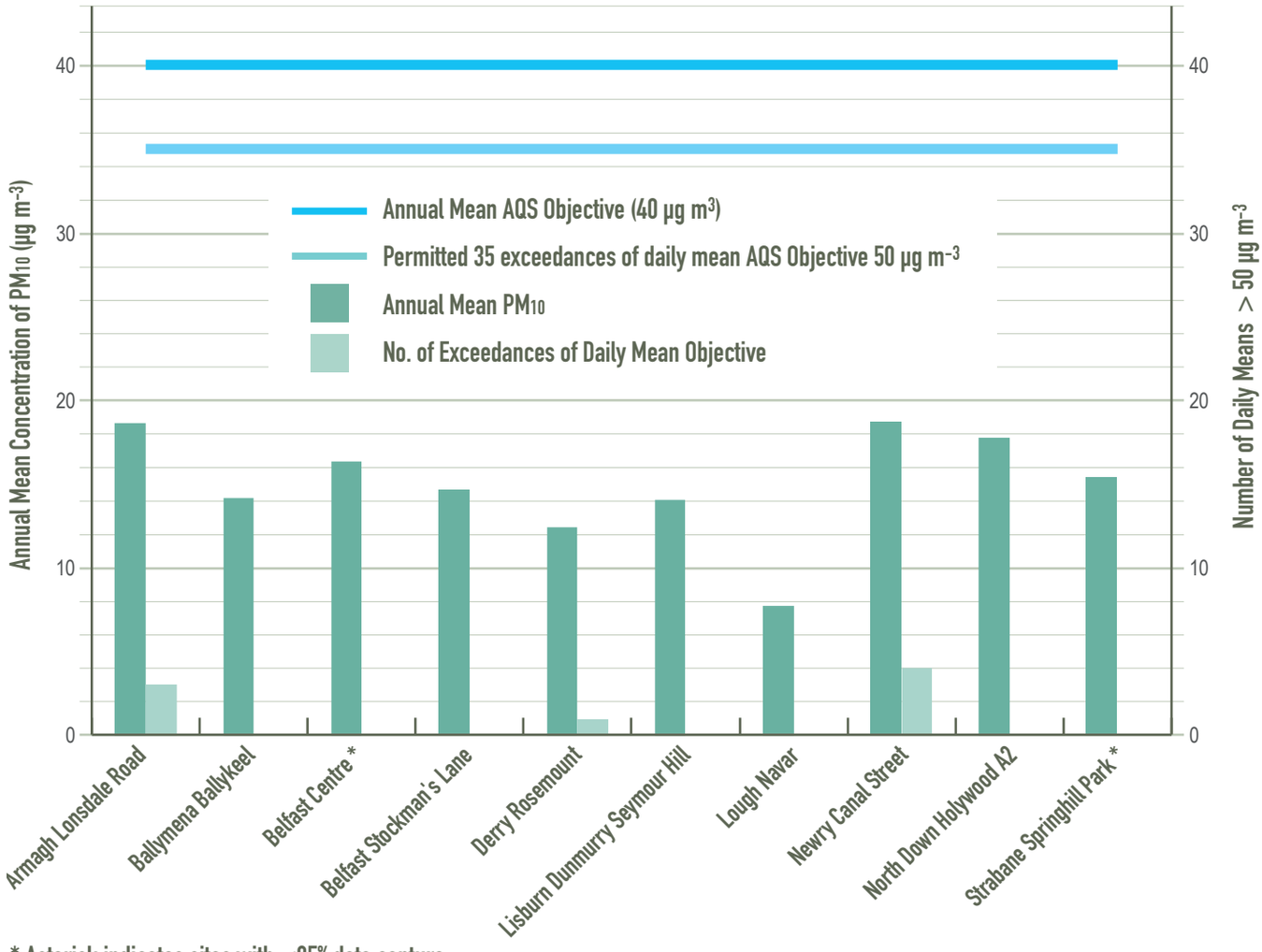
**Sulphur Dioxide** was monitored at five automatic sites during 2018. All sites met the EU limit values for $SO_2$ (1-hour and 24-hour mean), and the AQS objective for the 15-minute mean.

Carbon monoxide, benzene, sulphur dioxide, lead, arsenic, cadmium and nickel were within applicable limit and target values where monitored in Northern Ireland during 2018

**Particulate Matter $PM_{10}$**. Particulate matter as $PM_{10}$ was monitored at ten locations in 2018. Figure 4.1 shows the annual mean $PM_{10}$ concentrations (shown by the darker green bars), and the number of exceedances of the daily mean limit value and objective (shown by the lighter green bars). Three of these sites (Ballymena Ballykeel, North Down Holywood A2 and Lisburn Dunmurry Seymour Hill) used the TEOM instrument, so data from these sites have been corrected to the gravimetric equivalent using the King's College Volatile Correction Model as explained earlier in this section. All sites met the limit value and objective of 40 µg $m^{-3}$ for annual mean $PM_{10}$, and no sites exceeded the daily mean limit value and objective of 50 µg $m^{-3}$ on more than the maximum permitted 35 occasions during the year (after VCM correction if applicable).

**Particulate matter $PM_{2.5}$**. Fine particulate matter as $PM_{2.5}$ was monitored (using the FDMS analyser) at Belfast Centre and at Derry Rosemount throughout 2018. Both sites reported annual mean $PM_{2.5}$ concentrations well below the EU Stage 1 limit value of 25 µg $m^{-3}$ (which had to be met by 1st Jan 2015). Levels were also below the EU Stage 2 limit value of 20 µg $m^{-3}$ (which had to be achieved by 1st Jan 2020). As explained above, Lough Navar began monitoring $PM_{2.5}$ part way through the year. Its first valid annual mean for $PM_{2.5}$ will therefore be reported in the 2019 report.

**Figure 4.1:** Annual Mean $PM_{10}$ Concentrations and Exceedances of Daily Mean Objective, 2018




* Asterisk indicates sites with <85% data capture

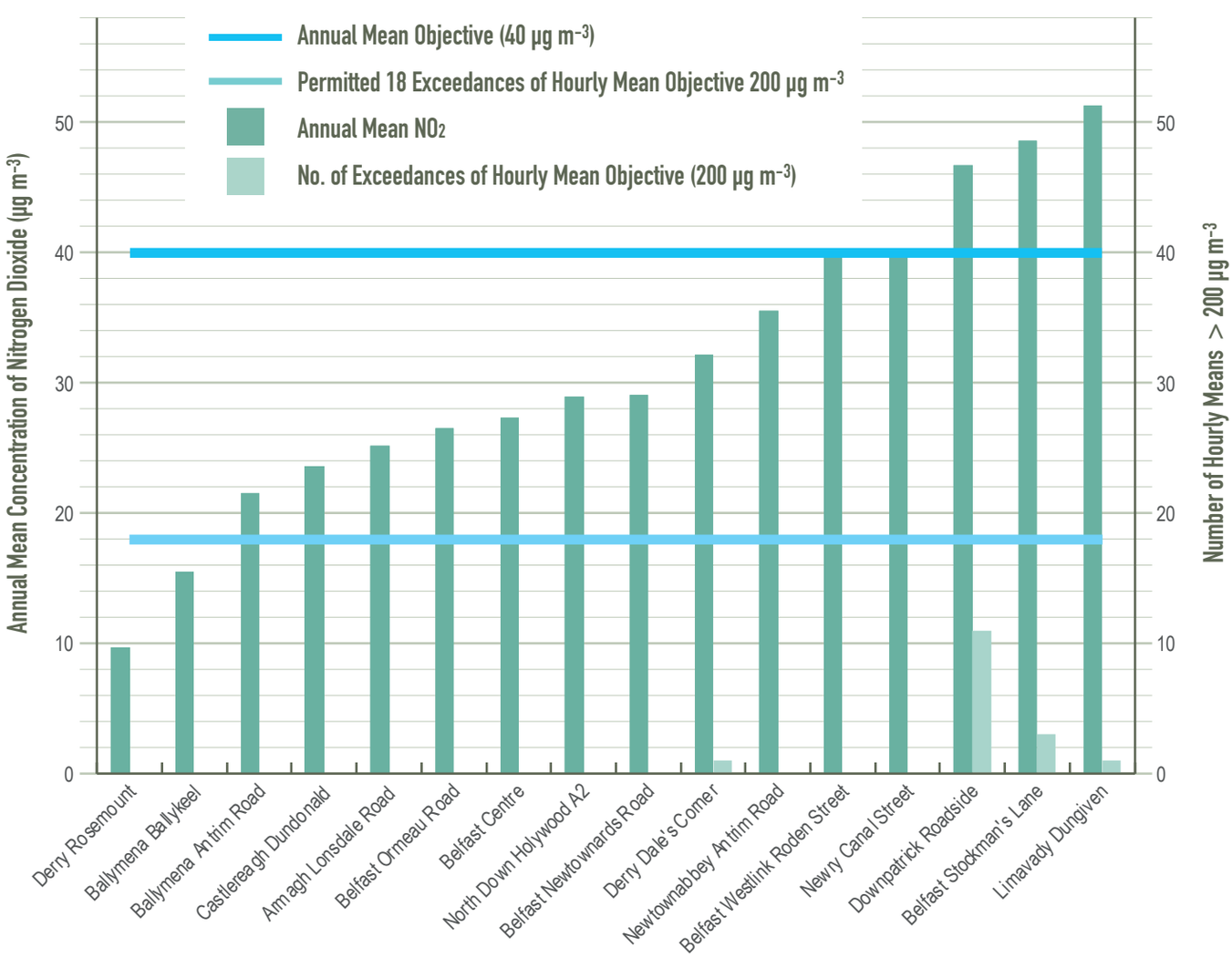
**Nitrogen Dioxide** was monitored using automatic analysers at 16 sites during 2018. Figure 4.2 shows the annual mean $NO_2$ concentrations (shown by the darker green bars), and the number of exceedances of the hourly mean objective (shown by the lighter green bars).

Three sites exceeded the AQS objective for annual mean $NO_2$ concentration (40 µg $m^{-3}$). These were as follows: Downpatrick Roadside (47 µg $m^{-3}$), Belfast Stockman's Lane (49 µg $m^{-3}$), and Limavady Dungiven (51 µg $m^{-3}$). All three of the above are traffic-related sites beside major or busy roads.

No sites exceeded the hourly mean limit value of 200 µg $m^{-3}$ on more than the permitted 18 occasions. Where data capture is less than 85%, exceedance of the hourly mean objective is judged on whether the 99.8$^{th}$ percentile of hourly values has exceeded 200 µg $m^{-3}$ rather than the number of hourly means above the objective. However, this was not the case for any sites in 2018.

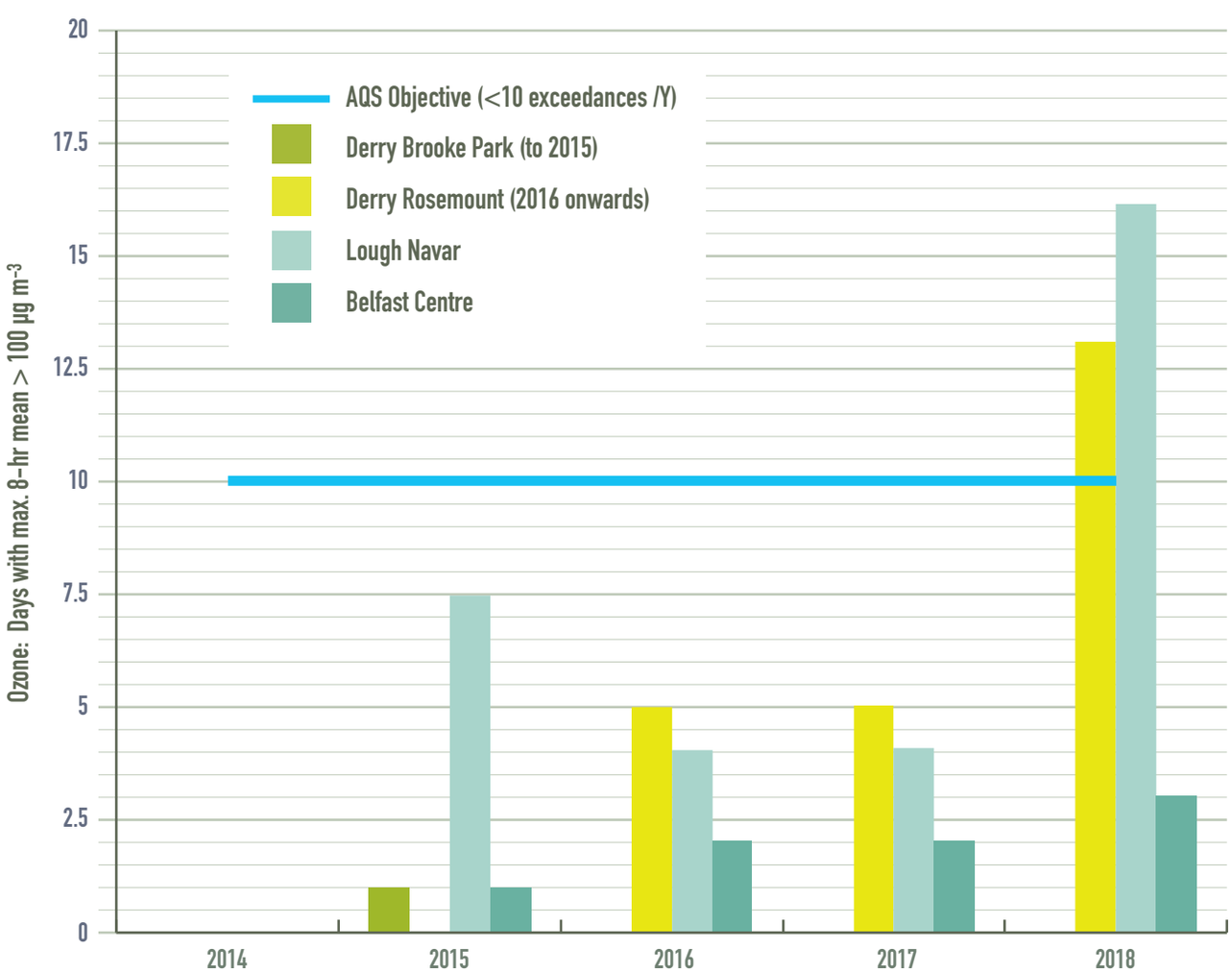
Belfast Stockman's Lane is affiliated into the national network which is used for monitoring compliance with the Air Quality Directive. This site falls within the Belfast Metropolitan Urban Area reporting zone, which in 2018 and previous years has been identified as non-compliant with the EU Directive limit value for annual mean $NO_2$ (also 40 µg $m^{-3}$). None of the other sites that exceeded the AQS objective for this pollutant are used for Directive compliance monitoring.

**Figure 4.2:** Annual Mean $NO_2$ Concentrations and Exceedances of Hourly Objective, 2018



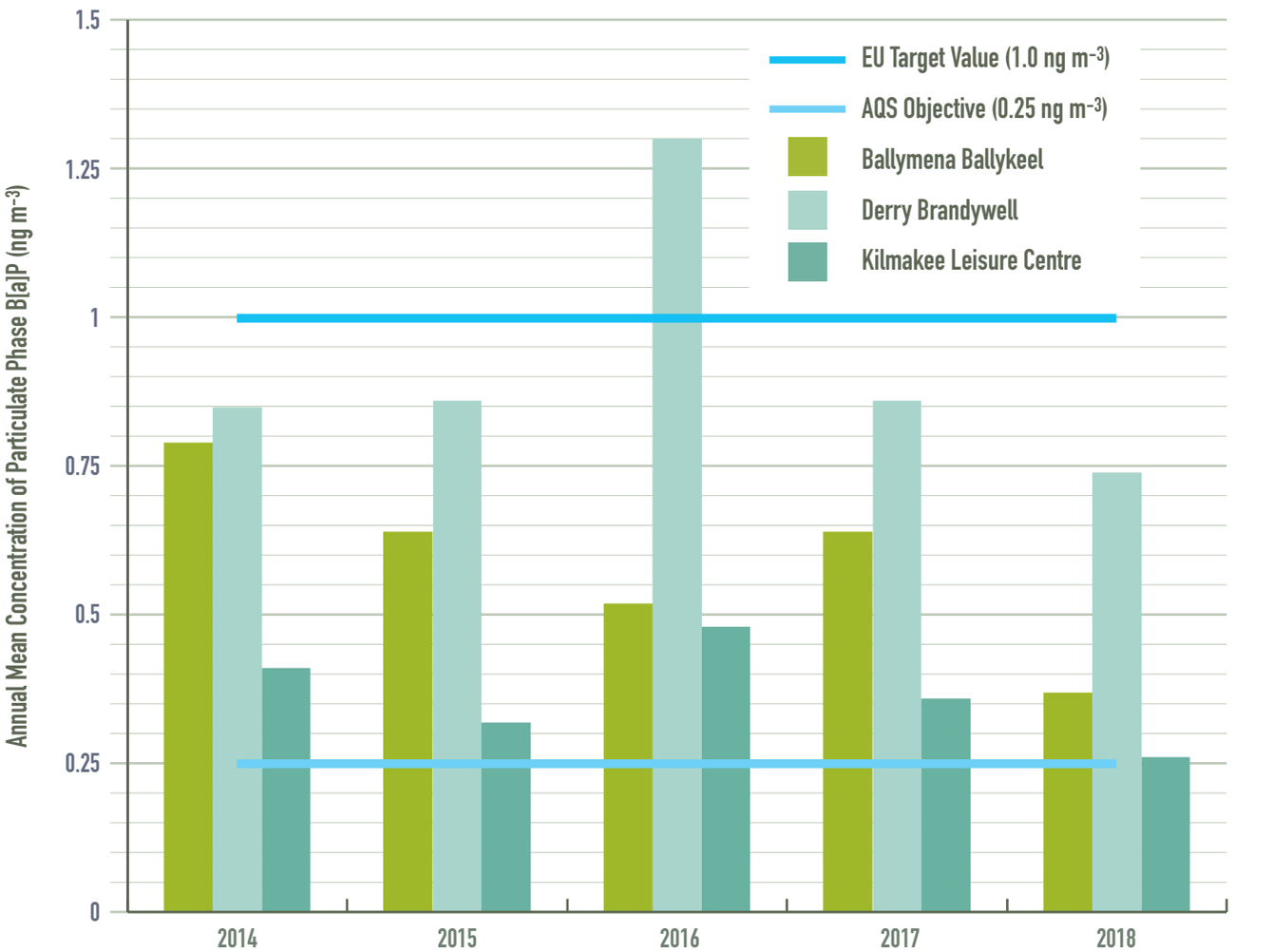
**Ozone** was monitored at Belfast Centre, Derry Rosemount, and the rural Lough Navar site. No sites exceeded the EU target value for human health of 120 µg $m^{-3}$ (for the maximum daily 8-hour mean) on more than the permitted 25 days. Two sites, Derry Rosemount and Lough Navar, however, exceeded the more stringent AQS objective of 100 µg $m^{-3}$ on more than the permitted 10 days in 2018 (Figure 4.3). Unlike some other pollutants, levels of ozone ($O_3$) in Northern Ireland do not appear to be decreasing but remain variable from year to year. Ozone exceedances happen in some years but not others (for example, there were none in 2014). The reasons for this relate to how ozone is formed: it is a 'secondary' pollutant – that is, it is formed by reactions involving other pollutants, in the presence of sunlight, and over several hours. This means that the number of ozone exceedances in any given year depends substantially on weather conditions. There is also evidence that the 'hemispheric background' concentration of $O_3$ has increased since the 1950s due to the contribution from global human activities. $O_3$ exceedances therefore remain possible in future. Ozone is also a 'transboundary' pollutant: once formed it may persist for several days and be transported over long distances. This means that much of the ozone measured in a particular area may have been generated elsewhere, and so it is more difficult to reduce concentrations by local action.

**Figure 4.3:** Ozone - Days with Maximum 8-Hour Mean >100 µg $m^{-3}$ for Five Years 2014-2018



**Polycyclic Aromatic Hydrocarbons (PAHs)** were monitored at three sites in 2018; Ballymena Ballykeel, Derry Brandywell and Kilmakee Leisure Centre in Dunmurry. All are part of the UK PAH Monitoring Network. The network measures a range of PAH compounds, but one species in particular, benzo[a]pyrene (B[a]P), is used as a 'marker' for PAH compounds and is the subject of an AQS objective and EU target value. Figure 4.4 shows the annual mean concentrations at these three sites over the past five years. No site exceeded the EU target value of 1 ng $m^{-3}$ for annual mean B[a]P concentration during 2018 (which was to be met by 31st Dec 2012). All three sites continue to exceed the more stringent AQS annual mean objective of 0.25 ng $m^{-3}$ for this PAH species, which was to have been achieved by 31st Dec 2010. However, the annual mean at Kilmakee Leisure Centre was 0.26 ng $m^{-3}$ so this site exceeded the AQS objective by a very small margin.

**Figure 4.4:** Annual Mean Concentrations of Benzo[a]pyrene for Five Years 2014-2018



## Summary

EU limit values, target values and corresponding AQS objectives, have been met by the due dates for the following pollutants in Northern Ireland –

- Particulate matter as $PM_{10}$ and $PM_{2.5}$
- Carbon monoxide
- Benzene
- Sulphur dioxide
- The elements lead, arsenic, cadmium and nickel.

However, three monitoring sites with sufficient data for a valid annual mean did not meet the limit values and objectives for nitrogen dioxide in 2018; Belfast Stockman's Lane, Downpatrick Roadside, and Limavady Dungiven. All are traffic-related sites. One site, Belfast Stockman's Lane, was used for assessment of compliance with the Air Quality Directive. This site falls within the Belfast Metropolitan Urban Area reporting zone, which in previous years has been identified as non-compliant with the EU Directive limit value for annual mean $NO_2$ (40 µg $m^{-3}$), on the basis of measured or modelled data. Belfast Urban Area is not alone in this respect: many parts of the UK, and other Member States of Europe, have reported similar exceedances.

Two sites, Lough Navar and Derry Rosemount, exceeded the AQS objective for ozone in 2018. Ozone concentrations are affected by both long-range, local and meteorological factors. This pollutant can therefore vary considerably from year to year.

No site exceeded the EU target value for benzo[a] pyrene. However, all three sites where this pollutant is monitored continue to exceed the more stringent AQS objective, although in the case of one site (Kilmakee Leisure Centre), by a very small margin.

Unusually high ambient concentrations of lead were measured at Belfast Centre over the measurement period 22nd August to 19th September 2018. However, although this resulted in a higher than normal annual mean, no limit values or objectives were exceeded.

# 5. Air Quality Changes Over Time

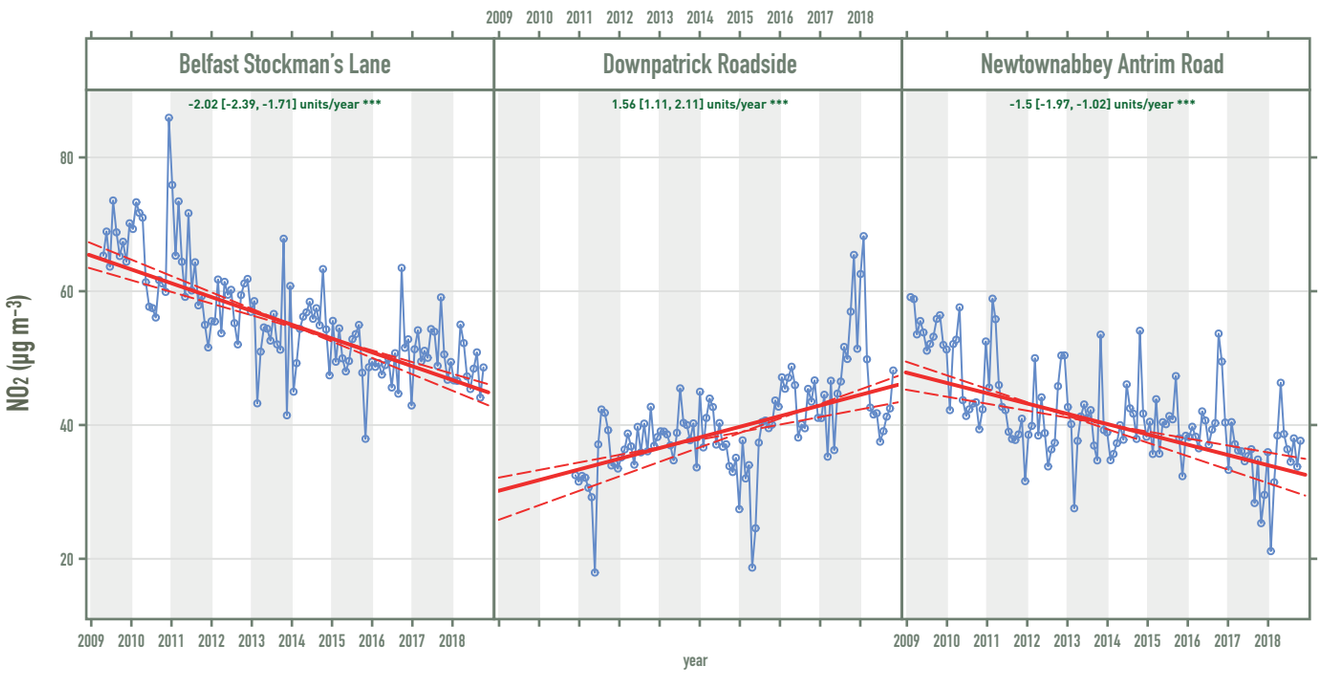
This section looks at how $NO_2$ in Northern Ireland has changed in recent years, as this pollutant is responsible for most of the exceedances of AQS objectives that occur in Northern Ireland. This year's report investigates trends based on three long-running roadside sites, which have exceeded the annual mean AQS objective for $NO_2$ within the last five years;

- Belfast Stockman's Lane
- Newtownabbey Antrim Road
- Downpatrick Roadside

All three of these sites have been in operation for a minimum of eight consecutive years, which is sufficient to assess long-term trends at a monitoring site. Limavady Dungiven and Newry Canal Street have not been included here, despite both being long-term monitoring sites and having reported exceedances in the past five years. This is because there are long gaps in their datasets making them less suitable for analysing long-term trends. Previous reports in this series have also featured Belfast Newtownards Road and Belfast Ormeau Road: however, it is now over five years since their last exceedance of any $NO_2$ limit values or objectives.

Trend analysis has been carried out using Openair: a free, open-source software package of tools for analysis of air pollution data. Openair was developed by King's College London with the University of Leeds. For more information on this package please see http://www.openair-project.org/. Here, the Openair 'TheilSen' tool, based on the Theil-Sen statistical method, has been used to determine trends in pollutant concentrations over several years. The trend analysis is based on monthly mean pollutant concentrations, calculated here from hourly mean data. Openair includes an option to 'de-seasonalise' the data – i.e. to make statistical modifications the plotted data to remove the influence of seasonal cycles, thus providing a clearer indication of the overall trend over the relevant time. The 'de-seasonalise' option has been used here, where appropriate. When this option is used Openair also fills any gaps in the dataset by a linear interpolation method; therefore, the datasets shown in these plots appear uninterrupted, though this is not necessarily the case. The Openair Theil-Sen trend graphs for the three sites are presented in Figure 5.1. The trend is shown as a solid red line, with its 95% confidence intervals as dotted red lines. The trend is given at the top of each graph in green, with confidence intervals shown in square brackets. The trend is given as units (i.e. $\mu g\ m^{-3}$) per year, over the period shown. This may be followed by a symbol, with '+' indicating that the trend is statistically significant at the 0.1 level, '*' indicating significance at the 0.05 level, '**' indicating significance at the 0.01 level, and '***' indicating significance at the 0.001 level.

**Figure 5.1:** Trends in $NO_2$ At Selected Monitoring Stations



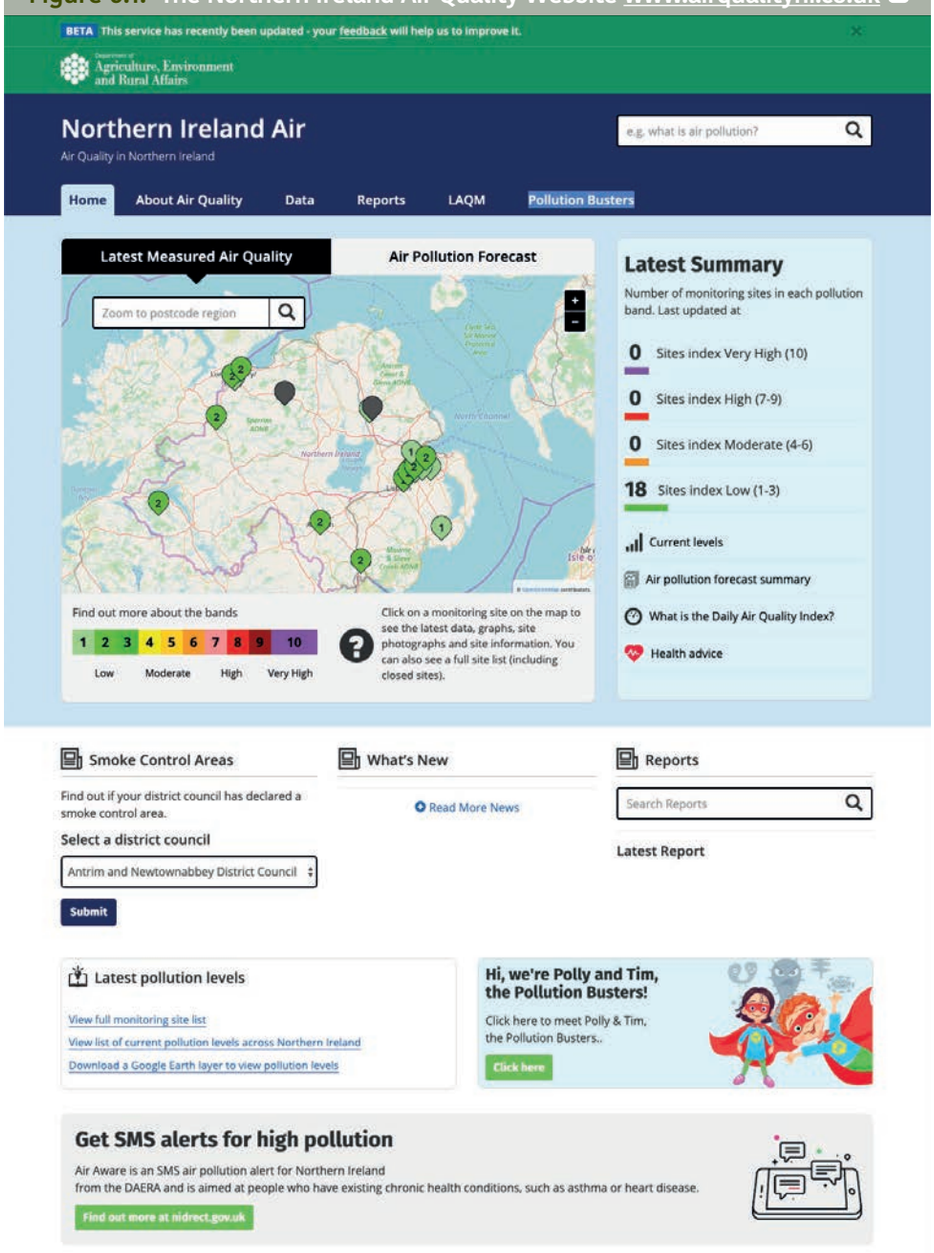

Of the three sites shown in Figure 5.1, two sites, Belfast Stockman's Lane and Newtownabbey Antrim Road, show downward trends which are statistically significant at the 0.001 level. (It should be noted that in 2010 the monitoring station at Newtownabbey Antrim Road was moved back from the road, such that the distance from the inlet to the kerb increased from 1m to 3m. Although the Borough Council reported a decrease following this change, it does not account for the long-term decrease in $NO_2$ concentration apparent from 2009.) The monitoring site at Belfast Stockman's Lane has consistently measured $NO_2$ concentrations above the annual mean AQS objective, however the trend indicates that $NO_2$ is decreasing by on average 2.0 µg $m^{-3}$ per year. If the downward trend continues at this rate, the site should meet the annual mean AQS objective in future years.

The site at Downpatrick has consistently exceeded the AQS objective for annual mean $NO_2$ since 2016. The trend analysis in Figure 5.1 indicates an upward trend in $NO_2$ concentration of 1.6 µg $m^{-3}$ per year at this site, statistically significant at the 0.001 level. The District Council's 2018 Updating and Screening Assessment has identified the need to carry out a Detailed Assessment of $NO_2$ around this monitoring site.

# 6. Website Updates and New Air Quality App

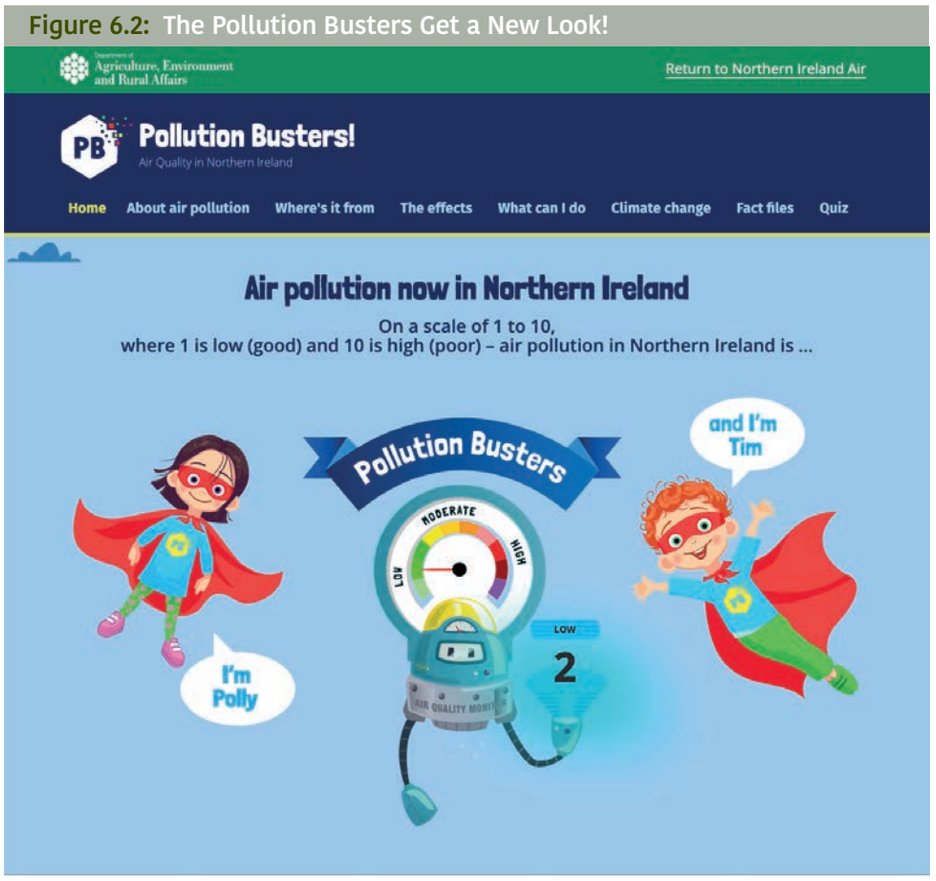
For many years, the Northern Ireland Air Quality Website has provided the public with access to near-real time air quality monitoring data, air quality forecasts, background information about air quality, and library of air quality reports from District Councils.

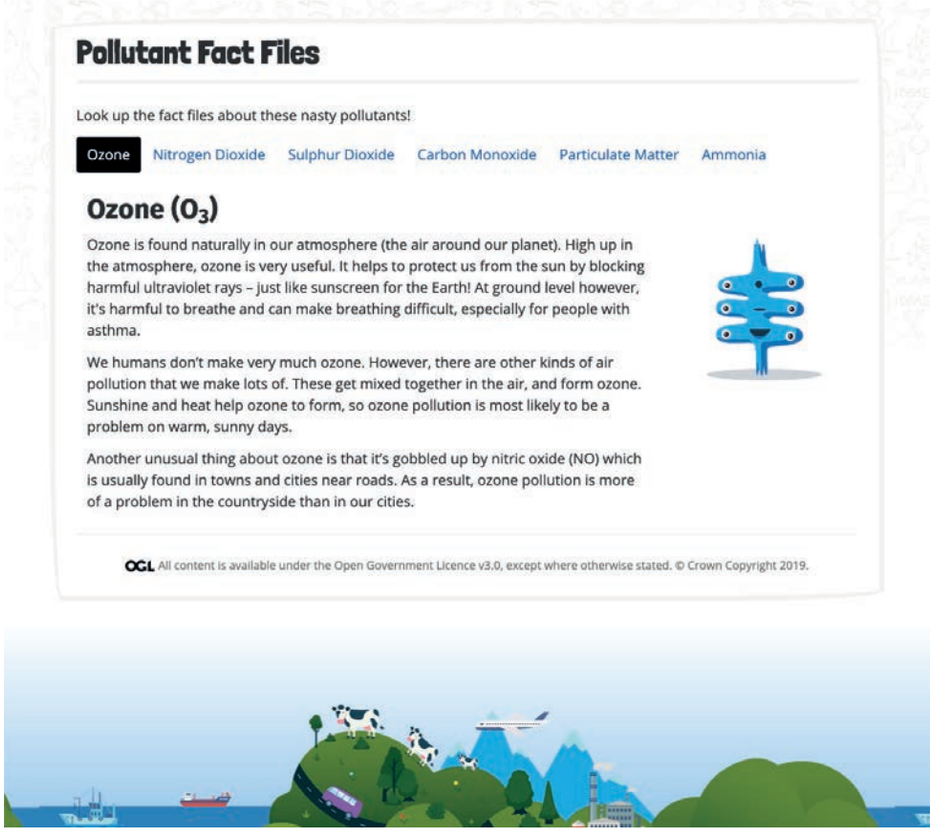
**Figure 6.1:** The Northern Ireland Air Quality Website www.airqualityni.co.uk




This website, at www.airqualityni.co.uk, has recently been updated and given a new look – Figure 6.1.

**Figure 6.2: The Pollution Busters Get a New Look!**





Among the changes was a re-vamp for the children's information area, 'Pollution Busters' – shown in Figure 6.2.

New in 2020, DAERA has also launched the Northern Ireland Air Quality App. Free to download, this app is available for both iPhone and Android, and will help keep members of the public updated about air quality in Northern Ireland.

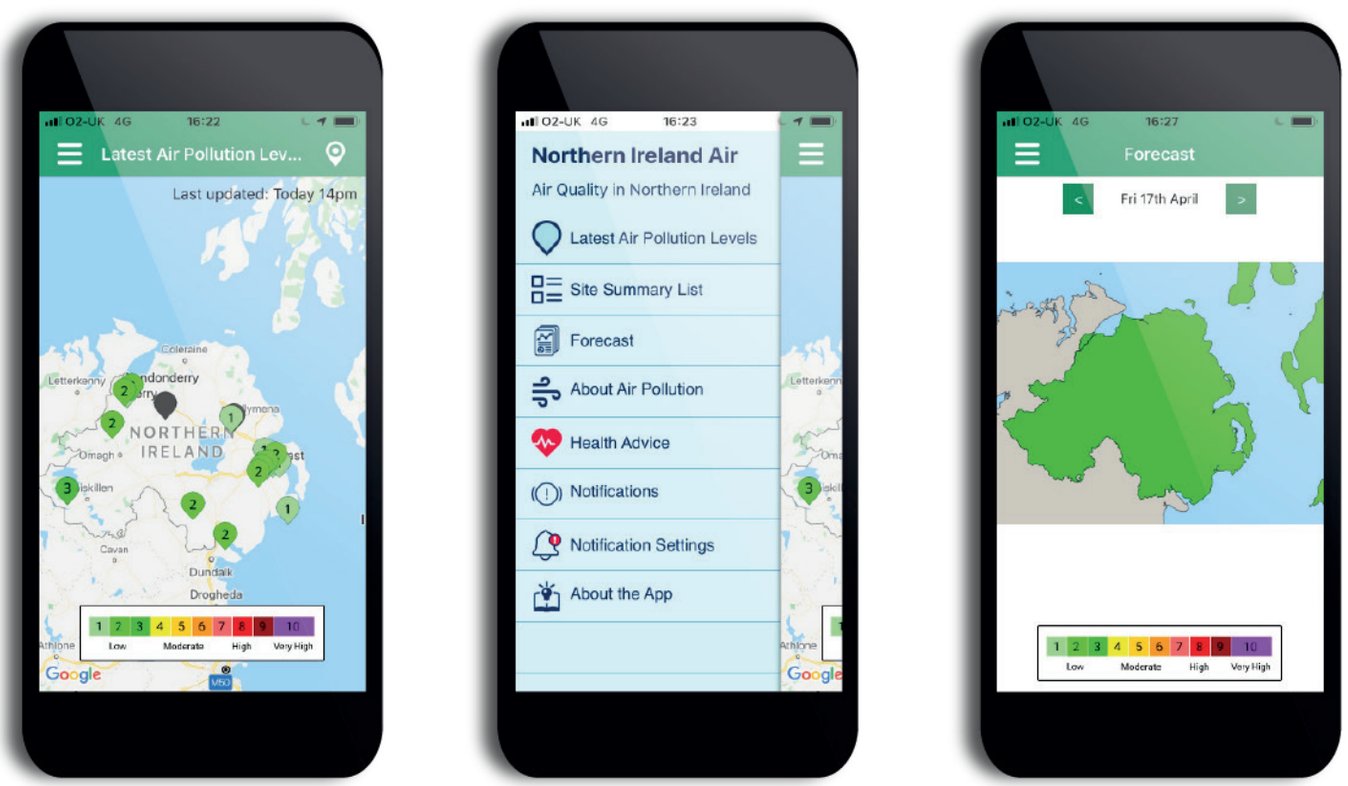
The app – shown in Figure 6.3 - provides:

- Easy access to the latest pollution levels from the monitoring sites when out and about.
- A colour-coded map showing the air pollution forecasts.
- Approved health advice based on the pollution levels.

Users can also subscribe to free alerts when air pollution is forecast to go into the 'moderate', 'high' and 'very high' bands. They can choose from the following alerts and notifications, to select the air quality information that is most useful to them:

- Smart device notification which alerts them when monitoring sites become elevated in areas of interest to them.
- Daily pollution text and/or smart device notification which alerts them if elevated pollution levels are forecast in their areas.

**Figure 6.3: Northern Ireland Air Quality App**



# 7. Measures, Initiatives and Reports

This section highlights some of the measures and initiatives taking place in Northern Ireland, which are expected to deliver improvements in air quality.

**Environment Strategy for Northern Ireland:** DAERA is currently developing an Environment Strategy which aims to improve the quality of the environment in Northern Ireland and enable people to avail of the health benefits from engaging with their environment. In the first instance, DAERA engaged with stakeholders to produce the Environment Strategy for Northern Ireland Public Discussion Document. Under the theme of Environmental Quality, the Public Discussion Document covers air quality, in particular focussing on $NO_2$, $PM_{10}$ and ammonia. DAERA invited the public to express their views on the issues outlined in the Public Discussion Document and officials are currently reviewing the responses. The draft Strategy will take into consideration the responses received and, will be published for formal public consultation once it receives Executive approval.

**The Clean Air Strategy:** The Clean Air Strategy, published in January 2019 by the UK Department for Environment, Food and Rural Affairs (Defra), sets out a number of objectives to improve air quality across the UK. Section 9.5 of the Clean Air Strategy covers air pollution in Northern Ireland. Additionally, DAERA has been working on developing a draft Clean Air Strategy for Northern Ireland. This work involves close collaboration with other departments and officials continue to work together to finalise the draft discussion document on the Clean Air Strategy. The discussion document will be issued to a public consultation to seek views on a wide range of matters.


Belfast's Rapid Transport ('Glider')

**Northern Ireland Programme for Government:** This framework includes an indicator to monitor progress in improving air quality across Northern Ireland to support Outcome 2: "We live and work sustainably - protecting the environment" - one of the twelve higher level government outcomes. The measure for the indicator is based on annual mean nitrogen dioxide concentrations monitored across ten roadside sites in Northern Ireland, which have been chosen according to availability and reliability of long-term datasets. The 2018-2019 Outcomes Delivery Plan published by the Northern Ireland Civil Service (NICS) outlines key measures being taken across government to reduce car use by encouraging active travel and uptake of public transport.

**Ammonia Reduction:** Northern Ireland is a relatively high contributor to ammonia, in 2017 accounting for 12% of the United Kingdom's total ammonia emissions. The agriculture sector is responsible for the majority of ammonia emissions in Northern Ireland and emissions have been increasing every year since 2010. In 2017 agriculture accounted for 96% of the ammonia emissions in Northern Ireland. DAERA is working with stakeholders to develop a comprehensive approach to ammonia that achieves sustained and tangible reductions in ammonia emissions, while facilitating the sustainable development of a prosperous agri-food sector.

**Belfast Rapid Transport ('Glider'):** To encourage people to use alternative travel methods, the Department for Infrastructure developed Belfast Rapid Transport (BRT) and launched the new Glider service, operated by Translink in September 2018. This first phase links East Belfast, West Belfast and the Titanic Quarter via the city centre and has proven very attractive with 35% growth in passenger numbers equating to 45,000 extra passenger journeys. This patronage demonstrates a significant modal shift from the private car to public transport with positive air quality benefits. Each 'Glider', having capacity for up to 105 people, is powered by hybrid diesel/electric engines achieving a 10% to 40% improvement in fuel efficiency when compared with other Metro buses (dependent on vehicle type) and a 90% improvement in emissions (reduction in $NO_x$ and particulate matter emissions). Phase 2 of the BRT network, to cover North and South Belfast and connect Queens University and the City Hospital, is included in the Belfast Region City Deal with the Minister determined to ensure maximum environmental and air quality benefits from any future extension.

# Where to find out more on air quality

The Northern Ireland Air Quality Website at www.airqualityni.co.uk provides information covering all aspects of air pollution in Northern Ireland.

DAERA's website at https://www.daera-ni.gov.uk/ provides links to information on a range of environmental issues including biodiversity, waste and pollution. DAERA's 'Protect the Environment' web page at https://www.daera-ni .gov. uk/topics/protect-environment covers air quality, climate change and local environmental issues including noise.

National and local air quality forecasts are available from:

- The Air Pollution Recorded Helpline on freephone 0800 556677;
- The Defra UK Air Information Resource (UK-AIR) at http://uk-air.defra.gov.uk/
- The Northern Ireland Air Quality website www.airqualityni.co.uk.

For information on air quality issues in your local area please contact the Environmental Health Department of your district council.

Department of Agriculture, Environment and Rural Affairs
www.daera-ni.gov.uk

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