



## Air Quality in Scotland

Welcome to the 19<sup>th</sup> Scottish Air Quality Database (SAQD) stakeholder's newsletter. This newsletter is produced on behalf of the Scottish Government by Ricardo and is designed to provide regular updates and news regarding the SAQD and local air quality matters to all stakeholders. This may include; updates to the network; new information on air quality issues; updates on changes in policy and procedures; new initiatives and events; technical reports; and how to access data using the Air Quality in Scotland website.

If you have any information which you think would be beneficial to include in a future newsletter, please email us at [aq-monitoring-scotland@ricardo.com](mailto:aq-monitoring-scotland@ricardo.com).

### NEWS

#### **Scottish Air Quality Database and Website Project Annual Seminar 2023 – recordings now available**

The Scottish Air Quality Annual Seminar 2024, run by the Scottish Government as part of the Scottish Air Quality Database and Website project, was carried out over three 2-hour long webinars on Wednesday 13th, 20th and 27th March 2022, between 13:00 and 15:00 GMT.

A number of very interesting speakers took part talking on subjects such as:

- Up in Smoke: Why we must rethink Wood burning stoves (Dr James Heydon, Uni of Nottingham)
- Forth Environmental Resilience Array Project (Dr Heather Price)
- Air Pollution Footprint Tool (Ella Wingard, Ricardo)
- Transport Scotland's Remote Sensing Monitoring Programme (Derek McCready)
- Air Pollution Assessment Service (APAS) – Delivering the CAFS Regional Air Quality Model (Mark Williams SEPA)
- Scenario Modelling Tools (Dr Scott Hamilton, Ricardo)

In addition, we also secured a presentation from Professor Sir Stephen Holgate.

The webinar recordings from these 3 dates are now available on the [Seminars](#) page.

#### **Fully ratified 2023 dataset and annual statistics reports now available on the website**

Please be advised that the Fully ratified 2023 datasets are now available on the website for all SAQD sites. The statistics and data can be accessed via the data selector tool (<https://www.scottishairquality.scot/data/data-selector>) and also the individual site statistics pages (i.e. <https://www.scottishairquality.scot/latest/site-info/WLN4>). In addition the 2023 local authority annual statistics reports are also now available on the website here <https://www.scottishairquality.scot/laqm/statistics>. If you have any issues accessing the data or have any queries regarding the data please contact any of the Ricardo team.

An issue that was highlighted regarding the data outputs from the data selector tool has now been resolved for the 2023 dataset. Previously when a user asked for an hourly dataset for the whole of 2023 using the data selector tool (<https://www.scottishairquality.scot/data/data-selector>), dates and times when no data was monitored were not included in the dataset (ie. As a "no data" output). This was fixed on the 24<sup>th</sup> May 2024. This issue did not previously affect the statistics provided in any other parts of the website or statistics reports. If you have any queries regarding this please let David Hector know.

## New SAQD Annual Statistics Report 2024

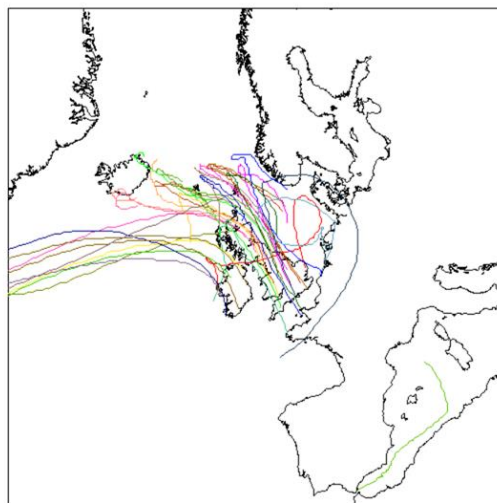
The Scottish Government has created a new annual report that focuses on compiling all the SAQD automatic monitoring sites annual statistics for 2023. This report will be produced annually once the SAQD dataset is fully ratified. An interim dynamic report containing embedded data from which the report tables, plots and graphs are generated can be accessed [here](#). The embedded data allows the reader a level of interaction with some of the report findings, providing additional insight. This approach enables a more easily navigable and streamlined report providing an concise and intuitive reader experience.

## Iceland Volcanic Eruption causes SO<sub>2</sub> pollution Episode across Scotland

Elevated levels of SO<sub>2</sub> were measured across Scotland on Friday the 31<sup>st</sup> of May. Initial investigations indicate that the elevated concentrations were a result of the recent Icelandic volcanic eruption along with northerly air masses transporting the emissions from the eruption to the British Isles. Elevated concentrations were also seen in Northern Ireland. Measured concentrations and the air pollution forecast are available on the Air Quality in Scotland website. You can track SO<sub>2</sub> (or other pollutant) concentrations across Scotland using the pollution graphs (<https://www.scottishairquality.scot/latest/pollutant-site-graphs>). In Addition, the AQ Scotland App will also provide you with this information along with alert services that will notify you when levels are elevated in your area or are forecast to be elevated. You can also register to the know and Respond facility on the website which will provide you with forecast alerts by text, voicemail and email.

The following diagram shows the prior movement of airmasses seen over Scotland on Friday the 31<sup>st</sup> of May.

Airmass back trajectories for 96 hours  
upto 12:00 Friday 31-05-2024



## Diffusion Tube Data Training to Local Authorities – written by SEPA

SEPA has recently provided three identical training sessions to local authorities on Defra's Diffusion Tool Data Processing Tool ([DTDP Tool](#)). This has been designed to assist local authorities with their calculations of annual mean NO<sub>2</sub> concentration from raw monthly diffusion tube data, by consolidating previous Local Air Quality Management (LAQM) tools for processing diffusion tube monitoring data into a single tool. In addition, it facilitates the reporting of diffusion tube data, through alignment of the output result tables with the Annual Progress Reporting (APR) template requirements.

The tool also provides an output table which can be directly uploaded into the [LAQM Portal](#) via the new Diffusion Tube Data Entry System (DTDES), which is part of the annual submission requirements for English (including London), Scottish and Welsh local authorities.

A demonstration [video](#) is also available on the Air Quality Hub which may be useful for authorities using the tool for the first time. There is also an [FAQ document](#) on the Hub to help with using the tools. If you have any questions on the tool, please contact SEPA at: [airquality@sepa.org.uk](mailto:airquality@sepa.org.uk).

## **LAQM Policy Guidance Update**

[Cleaner Air for Scotland 2 - Towards a Better Place for Everyone \(CAFS2\)](#) was published in July 2021, setting out the air quality policy framework in Scotland to 2026. Amongst the wide range of actions included in the strategy is a commitment to review the LAQM policy guidance.

In November 2021, Environmental Standards Scotland (ESS) announced its first investigation would consider air quality and subsequently three of the six recommendations made by ESS were to strengthen the effectiveness of the LAQM regime. The revisions made to the LAQM policy guidance in 2023 (through LAQM PG (S) 23) incorporated the ESS recommendations to strengthen the LAQM regime and only covered sections concerning the local authority duties surrounding LAQM. The 2024 update contains further updates to the local authority duties surrounding LAQM and provides fully updated information on air quality-related policy areas.

The revised LAQM PG (S) 24 was published during May 2024 and can be found on the Air Quality in Scotland website at: [News & Reports \(scottishairquality.scot\)](#). If you have any questions on the revised guidance, please contact SEPA at: [airquality@sepa.org.uk](mailto:airquality@sepa.org.uk).

## **SCOTTISH ENVIRONMENT PROTECTION AGENCY – Written by SEPA**

### **East Renfrewshire Council Schools Engagement – Data Collection and Visualisation**

SEPA's air quality monitors have been installed at schools across the East Renfrewshire Council area since December 2023 as part of a collaborative project to raise awareness of local air quality and support safer streets, active travel and anti-idling initiatives around the school gates.

The data collected to date has shown some very interesting information which has been presented to the schools and been used to support school assemblies where the importance of air quality to “the growing lung and our wider environment” is addressed. The data has also been used to encourage the work of pupil and parent committees in the promotion of active travel, introduction of walking busses, creation of parent parking pledges and establishing new “walk to school routes”.

Data from the various monitoring locations has identified specific emissions trends and in addition to the expected peaks of pollution during pick-up and drop-off times the schools have seen the slow dispersal rates of the pollutants due to settled weather and possible impacts this might have on air quality during playtime.

This data will be made publicly available through an on-line visualisation tool, developed by SEPA (shown below), which allows pupils, families and local residents to look at the air quality data recorded and explore some of the potential causes and drivers of local air pollution. To date, six schools have taken part in the programme, with the on-line tool displaying both the data collected outside each school and the banners that they have created to highlight local issues. In addition, the schools are also participating in the SEPA-funded Our Amazing Air learning package which is delivered by the Glasgow Science Centre (GSC) as part of their Learning Lab series ([Learning Lab | Glasgow Science Centre](#)).

Further data and information will be added to the site, and the on-line visualisation tool will be available at: ([Home | Scotland's environment web](#)). For further information please contact: Richard Mowat at East Renfrewshire Council or Colin Gillespie at SEPA.

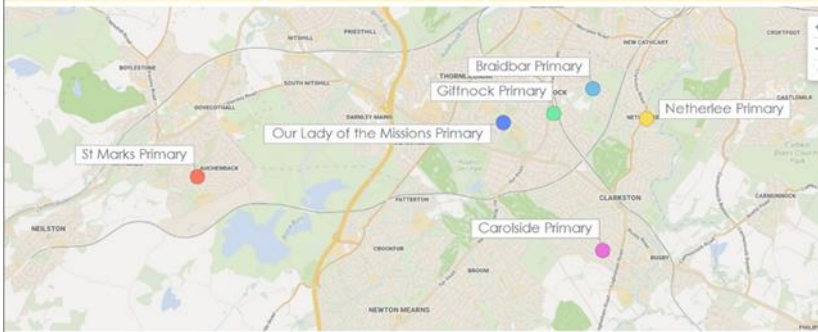
# East Renfrewshire Schools Project - Air Quality

Select a School to begin:

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Click the title above to return to the homepage at any time.

This project employs low cost air quality sensors to measure Nitrogen Dioxide (NO<sub>2</sub>) across primary schools in East Renfrewshire.



## The Air Quality (AQ) Sensors

The sensors are located at the front gates of each school in order to determine the impact of car traffic on air quality at the beginning and end of the school day. Although these sensors are not as accurate as static automatic monitors, they are still able to provide useful information about changes in local air quality.

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

The main source of elevated NO<sub>2</sub> emissions near to schools is typically from vehicle emissions. These emissions are higher when there is more traffic, and idling vehicles in particular can cause a localised build up of NO<sub>2</sub>. Breathing air that contains high concentrations of NO<sub>2</sub> over extended periods of time can contribute to the development of respiratory disease and aggravate existing conditions.



## Local Authority Activities

### City of Edinburgh Council Updates

There have been a number of changes in The City of Edinburgh Council's (CEC) air quality monitoring network implemented in recent months.

### Low Emission Zone

As with the other major cities in Scotland, Edinburgh approved a LEZ in the city centre in May 2022. The aim of the LEZ is to stop the most polluting vehicles from entering the zone, to protect public health and to encourage the switch to compliant vehicles. In recent months new signage and camera infrastructure have been completed, there have also been minor changes to street layouts and signals around the LEZ boundary to make the implementation as smooth as possible. Enforcement of the LEZ begins on the 1<sup>st</sup> June 2024.

As part of a rationalization plan for the automatic monitoring network, the Glasgow Road site was decommissioned and a new site, Drumsheugh Place, installed on the LEZ boundary to help monitor the implementation of the LEZ. This area was highlighted by modelling undertaken by SEPA and CEC under the National Modelling Framework (NMF) used in the initial assessment of the LEZ. In addition to this, CEC will monitor and evaluate the LEZ against objectives agreed by the council's

Transport and Environment Committee, to include:

- measuring the impact of traffic across the city as driver's change their behaviour
- checking that the LEZ is working towards the goals we have set for air quality, climate change and traffic.

Further information can be found [here](#).

### Air Quality Management Areas

In March 2024 CEC revoked the Inverleith Row Air Quality Management Area (AQMA) for annual mean nitrogen dioxide. The NO<sub>2</sub> concentration had complied with the air quality strategy objectives for a number of years. The NMF modelling undertaken for the development of the LEZ also predicted a sustained reduction of NO<sub>2</sub>.

At the same time the St John's Road AQMA was amended, removing the designation for the NO<sub>2</sub> hourly mean objective. The AQMA at St John's Road remains in place for the NO<sub>2</sub> annual mean objective, although concentrations are on a downward trend and have been below the objectives for a number of years. We hope to revoke the AQMA completely in the near future if this trend continues.

Although monitoring has been reduced, CEC will continue to monitor air quality and implement measures designed to reduce air pollution in the city.

## SAQD QAQC ACTIVITIES

Ricardo will start the Summer six monthly audits in June. Auditors will contact you prior to the audit to arrange the visit. An audit summary will be provided after the visit has been completed. If you have not received an audit summary, or are unclear on any of the recommended actions, please contact either the auditor who undertook the visit or [aq-monitoring-scotland@ricardo.com](mailto:aq-monitoring-scotland@ricardo.com). Could you please then pass these on to your ESU's in advance of the service so that any issues can be investigated. If you would like to have any refresher LSO training, or if you have any new LSO's who require training then please let the auditor know when they send through the initial email.

## QUESTION AND ANSWERS SECTION

This section will provide answers to frequently asked questions that relate to different aspects of LAQM ranging from Local Site Operator (LSO) duties to advanced data analysis queries. If you have a question you would like to be answered in this section, please contact [aq-monitoring-scotland@ricardo.com](mailto:aq-monitoring-scotland@ricardo.com).

*Q: What do I need to do/ who do I need to inform when opening or closing a monitoring site?*

If commissioning a new site or moving an existing site, firstly confirm with the Scottish Government that it is ok for the site will be included within the Scottish Air Quality database and Website.

Once confirmed, contact the Ricardo team at [aq-monitoring-scotland@ricardo.com](mailto:aq-monitoring-scotland@ricardo.com) - we need the following details:

- The site name – our naming convention is LA, then road, area, town name. If the site is a roadside it might be appropriate to include the road name. We will always confirm the name before publishing on the website.
- Pollutants and analyser makes and models

- Site coordinates
- Site type
- Site description
- Communications details e.g. weblogger, direct comms via modem or router together with IP or mobile numbers or logger provider
- Equipment Support Unit details
- Start date

Once we receive confirmation that the site is up and running we will carry out a commissioning audit to confirm everything is working as it should. Only then will we publish the data on the Air Quality in Scotland website.

If closing a site, contact the Ricardo team at [aq-monitoring-scotland@ricardo.com](mailto:aq-monitoring-scotland@ricardo.com) as soon as possible with the proposed end date. Ricardo will carry out a decommissioning audit to provide a final QAQC point for data ratification purposes.

*Q: If I have a sensor and I want to report the data in my APR do I need to do any data processing?*

As with reference analysers and nitrogen dioxide diffusion tubes you need to apply QAQC to ensure that the measurements are meeting the relevant Data Quality Objectives for their intended use whether that's reference or indicative measurements. For example, carrying out regular calibrations of reference NOx analysers, flow checks of PM analysers or triplicate co-locations of diffusion tubes...and then the application of the relevant corrections to the data, whether that be through full data ratification processes for reference data or bias correction of tube data. This is an oversimplification of course, but if we're applying QAQC regimes to "conventional" air quality monitoring methods then why would this not be the case for low-cost sensors? So similarly to diffusion tubes, what we want to do is link the sensor data back to what we know are more accurate measurements through co-locations at reference sites. Only then can you apply

correction factors and actually make an assessment of the quality of the measurements e.g. whether the measurements are in fact indicative, in which case you can report these concentrations in the same way you do diffusion tube data. If it's determined that the sensors measurements are not in fact indicative then it may be more appropriate to only report relative concentrations, so for example, report diurnal plots or report that concentrations are likely higher at location x compared to location y. It would be problematic to report absolute concentrations in this case because the associated measurement uncertainties are too high.

So how many co-locations? Well at least one per year but the more the better as then you can more closely track how the sensor response is changing over time. It's important to highlight that for MCERTS-indicative PM sensors, it is a requirement within the certificate to carry out an initial co-location and then further annual co-locations to ensure the measurements are indicative. But there's more...the corrections for offset and slope need to be applied to the sensor data and the datasets need to be reviewed: removing spurious data e.g., spikes due to high relative humidity, high noise, instrument faults; comparing the sensor data to nearby reference sites; correcting for sensor drift etc, etc, etc - there's a degree of data ratification as well.

## STAY CONNECTED

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