

## Air Quality Monitoring

### Plan 2023/2025

#### Air Quality Monitoring

##### What parameters are we testing?

We currently monitor sites in Douglas and surrounding area for Nitrogen Dioxide. The results from these sites can be found on the government site using the link below.

<https://www.gov.im/media/1379877/air-quality-monitoring-data-april-2023.pdf>

We are looking at testing the levels of sulphur dioxide, nitrogen dioxide and particulate matter in ambient air.

##### Why are we extending air quality monitoring on the Isle of Man?

There is an action in Our Island Plan to undertake a trial for year round air quality monitoring:

[An environment we can be proud of \(islandplan.im\)](#)

The monitoring will define and establish objectives for air quality and to avoid, prevent or reduce harmful effects on human health and the environment.

To assess the air quality on the Isle of Man based on common methods and criteria used in the UK and Europe.

To obtain information on air quality in order to help combat air pollution and nuisance and to monitor long-term trends and improvements resulting from any potential government and Community measures.

Maintaining air quality where it is good and improving it in other cases.

Promoting increased cooperation between government, business community and the public in reducing air pollution.

Ensuring that such information on air quality is made available to the public.

##### How did we choose the sites?

In order to ensure that the information collected on air pollution was sufficiently representative and comparable across the Community, it was important that a standardised measurement technique and common criteria for the number and location of sites are used, for the assessment of air quality.

This is to help ensure that the air quality status is maintained where it is already good, or improved.

Any actions, which may be required, can then be discussed, agreed by interested parties and implemented in order to comply with limits, when assessing the result values and critical levels.

This should help to attain the target values and long-term objectives in the UK and Europe.

It is worth noting that the risk posed by air pollution to vegetation and natural ecosystems is most important in places away from urban areas too. The assessment of such risks and the compliance with critical levels for the protection of vegetation should also focus on places away from built-up areas. NO<sub>2</sub> and SO<sub>2</sub> are greenhouse gases and their increased emissions have an impact on Climate Change.

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#### The tests

##### Two continuous monitors

Two continuous monitors will stay in situ at one site for one month and will primarily be used to measure the level of particulate matter (PM). There are two sizes of particulate matter, which are of interest. These sizes are fine particulate matter (PM<sub>2.5</sub>) and PM<sub>10</sub>. Only these two sizes will be monitored.

After one month, the two monitors will be moved to two new sites for a further month and so on.

This will be done in a random order.

##### Why these two sizes of particulates?

The growing awareness of both PM<sub>10</sub> and PM<sub>2.5</sub> is largely associated with the potential damaging effects they can have on the human body. The World Health Organisation (WHO) believes particles are affecting more people worldwide than any other pollutant.

Primary health effects include damage to the respiratory and cardiovascular systems. Due to the small size of PM<sub>10</sub> and PM<sub>2.5</sub> particles, they can penetrate the deepest parts of the lungs as well as access the gas exchange regions of the lung via diffusion.

It is important to note that the duration of exposure is also a significant factor to consider, as even short-term exposure to particulate matter can have detrimental effects on the body.

Because of the damaging health effects from PM<sub>10</sub> and PM<sub>2.5</sub> the WHO recommend the following exposure limits

<b>PM<sub>2.5</sub></b>
10µgm <sup>3</sup> Annual Mean
24µgm <sup>3</sup> 24 Hour Mean
<b>PM<sub>10</sub></b>
20µgm <sup>3</sup> Annual Mean
50µgm <sup>3</sup> 24 Hour Mean

#### Diffusion Tubes

Both Nitrogen dioxide (NO<sub>2</sub>) diffusion tubes and Sulphur dioxide (SO<sub>2</sub>) diffusion tubes will be put at various sites around the Island for one month. (See calendar below for dates).

**Nitrogen dioxide** (NO<sub>2</sub>) diffusion tubes provide long-term monitoring options with detection limits in the low parts per billion to parts per million range.

These cost effective devices do not require specialist skills or time commitment and give an efficient method for air quality monitoring.

##### Sources of Nitrogen oxides:

- Fuel combustion – power stations, off road equipment, vehicles, (in-vehicle concentrations of NO<sub>2</sub> may be higher than measured ambient levels).
- Biomass burning.
- Natural processes.

##### Potential implications of Nitrogen oxides pollution:

- Involved in ground-level Ozone formation.
- Respiratory effects.
- Aggravation of heart disease symptoms.

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**Sulphur dioxide** (SO<sub>2</sub>) diffusion tubes are a simple means of monitoring. The tubes are designed for long-term monitoring, and offer measurement of Sulphur dioxide in the low parts per billion to parts per million range and are cost effective.

**Sources of Sulphur dioxide pollution:**

- Fossil fuel combustion – industry, power generation, vehicles.
- Domestic boilers or fires.
- Natural fires.

**Potential implications of Sulphur dioxide pollution:**

- Harmful to plants – reduced crop yields.
- Involved in acid rain formation – damage to buildings, forests.
- Adverse effects on the respiratory system.

**Results**

In order to facilitate the handling and comparison of air quality information, data could be made available to all interested parties in a standardised form.

The dissemination of air quality information will assist interested parties in understanding better the impacts of air pollution and develop appropriate policies, when shared e.g. with the relevant government departments

Up-to-date information, on the concentrations of all regulated pollutants in ambient air, could also be readily available to share with the public via the Government website.

**Calendar of the Tubes 2023**

<b>October</b>	4 October	1 November	4
<b>November</b>	1 November	6 December	5
<b>December</b>	6 December	3 January	4

Details

- The start and end dates of the exposure months are on **Wednesdays** and exposure periods still consist of 4 or 5 whole weeks, i.e. 28 or 35 days.
- Tubes should be changed on the specified date. If not tubes may be changed within  $\pm 2$  days of the due date.