Lisburn & Castlereagh City Council

2023 Air Quality Progress Report

In fulfillment of Environment (Northern Ireland) Order 2002
Local Air Quality Management

June 2023

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Executive Summary

The Air Quality Strategy has established the framework for air quality management in the UK. Local Authorities have a duty under the Environment Act 1995 and subsequent regulations to review and assess air quality in their areas on a periodic basis so as to identify all areas where the air quality objectives are being or are likely to be exceeded. A phased approach has been adopted for the review and assessment process so that the level of assessment undertaken is commensurate with the risk of an exceedence of an air quality objective.
An updating and screening assessment (USA) is required to be prepared every three years by all local authorities in the UK with two interim progress reports. The last updating and screening assessment of air quality was undertaken in 2021, this is the 2023 progress report for Lisburn and Castlereagh City Council (LCCC) and has been completed using the recommended template. The report is fully compliant with the applicable policy and technical guidance.

This report identified no exceedances with relevant exposure, of the Air Quality Strategy objectives during 2022 for any of the pollutants assessed. NO_2 levels due to vehicle emissions is still the main source of concern within Lisburn & Castlereagh City Council (LCCC), as it has several main commuter belts into Belfast City centre. The real-time analyser with good data capture and accurate results showed a continuing decrease of NO_2 in 2022 from the 2019 pre pandemic levels, and the NO_2 tubes within the AQMA also continued to show a decrease. The new rapid transport system completed in 2018 and passes through the AQMA grew in popularity pre COVID 19 pandemic. In 2022 this has remain a popular method of commuting to the city centre, contributing to the reduction of vehicle emissions in this area.
LCCC launched a new initiative in 2019 in primary schools “Engine off Prevent the Cough”, educating pupils and parents to the harmful emissions from vehicles with the emphasis on idling engines outside schools, unfortunately it was not run in 2020 due to COVID 19, it was re-run in 2022 although uptake has been slow LCCC is committed to encouraging participation. The Blaris Greenway walking and cycling path completed in 2020 is now established and links Sprucefield Shopping Centre

with the city centre, encouraging cycling and walking, and an alternative method of accessing the city centre with parking facilities are constructed at Blaris Road. Monitoring is set to continue within the AQMA and throughout the Council area using NO_2 tubes to ascertain further trends. In 2023 the AQMA within Dundonald remains in place, a continuing trend and consistent reduction of NO_2 is now being established, if this continues the AQMA will be reviewed in 2024.

Table of Contents

List of Tables

List of Figures

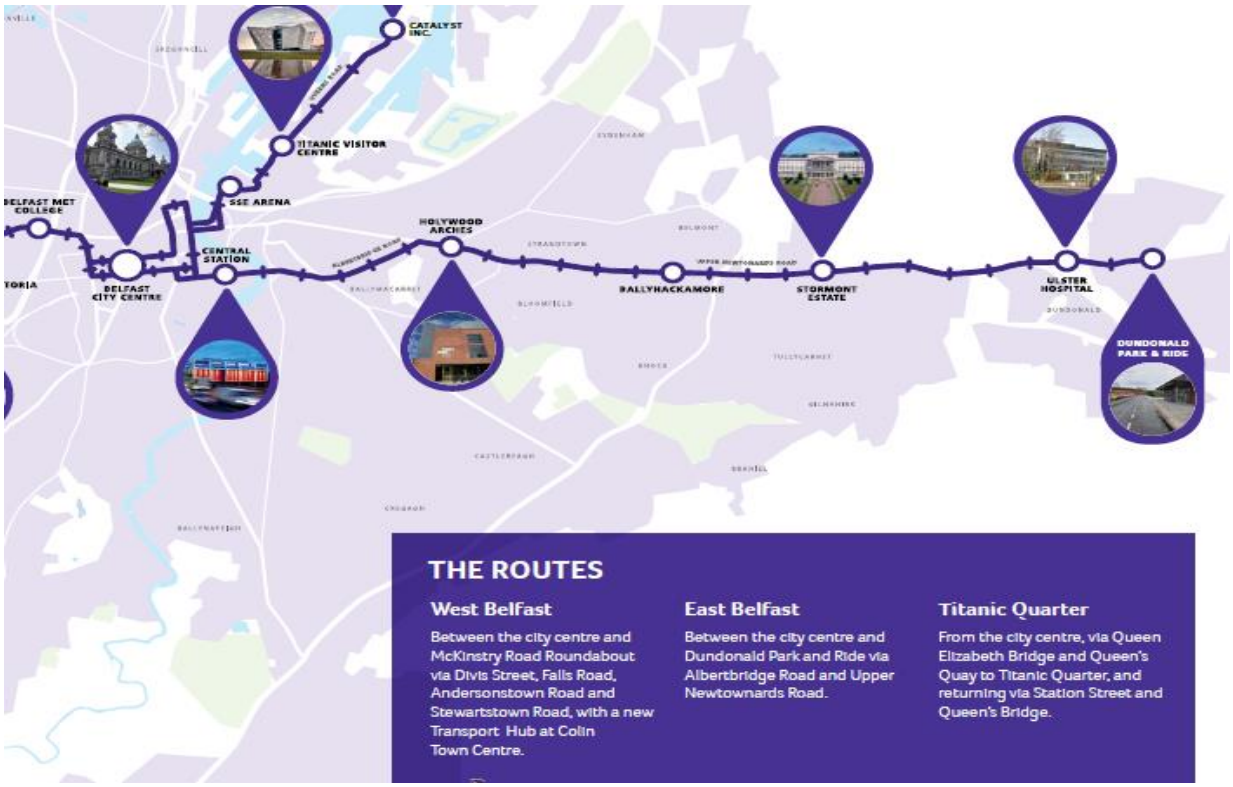
Appendices

1.1 Description of Local Authority Area

LCCC has a population of 149,106 and an area of approximately 200 square miles. The area is of urban rural character and the predominant wind direction is from the Southwest. It is bounded by a number of other council areas and has the largest boundary with Belfast City Council. This has made LCCC a very popular residential area due to the ease of the commute to Belfast City Centre. There are several main arterial routes into Belfast City centre through LCCC, and the Council was located within Belfast Metropolitan Transport plan. (www.infrastructure-ni.gov.uk/publications/belfast-metropolitan-transport-plan). Dundonald to the East fell within the New Belfast Rapid transport network, this was completed in September 2018, introducing a designated bus lane through Dundonald Village into Belfast City and a new hybrid Glider Bus. The network is now established as a popular source of transport to the city centre from the Park & Ride facility in Dundonald. Road transport remains the main source of air pollution, however solid fuel use as a secondary fuel is still quite common in the Lisburn area.

Figure 1.1 Map showing position of LCCC within Northern Ireland

Figure 1.2 Map of the Rapid transport route (glider bus) from Dundonald



1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in the Environment (Northern Ireland) Order 2002, the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 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 exceedences are considered likely, the local authority must then 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.

For Local Authorities in Northern Ireland, Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the LAQM process.

They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM **in Northern Ireland** are set out in the Air Quality Regulations (Northern Ireland) 2003, Statutory Rules of Northern Ireland 2003, no. 342, and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre µg/m^3 (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 – Air Quality Objectives included in Regulations for the purpose of LAQM in Northern Ireland

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 µg/m^3	Running annual mean	31.12.2003
	3.25 µg/m^3	Running annual mean	31.12.2010
1,3-butadiene	2.25 µg/m^3	Running annual mean	31.12.2003
Carbon monoxide	10 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.50 µg/m^3	Annual mean	31.12.2004
	0.25 µg/m^3	Annual mean	31.12.2008
Nitrogen dioxide	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 µg/m^3	Annual mean	31.12.2005
Particulate matter (PM_{10}) (gravimetric)	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m^3	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

LCCC is one of 11 councils in Northern Ireland, following the amalgamation of local authorities in 2015. The following reports have previously been submitted and can be found on the DAERA website [District Council Reports - Northern Ireland Air (airqualityni.co.uk)]

2015 - Update and Screening Assessment

2016 - Progress report

2017 - Progress report

2018 - Update and Screening Assessment

2019 - Progress report (not presently on website)

2020 - Progress report

2021 - Update and Screening Assessment

2022 - Progress report

Figure 1.3 – Map of AQMA Location within LCCC

AQMA No's 2,6,10,1,5,7 Normandy Court Dundonald BT16 2LA

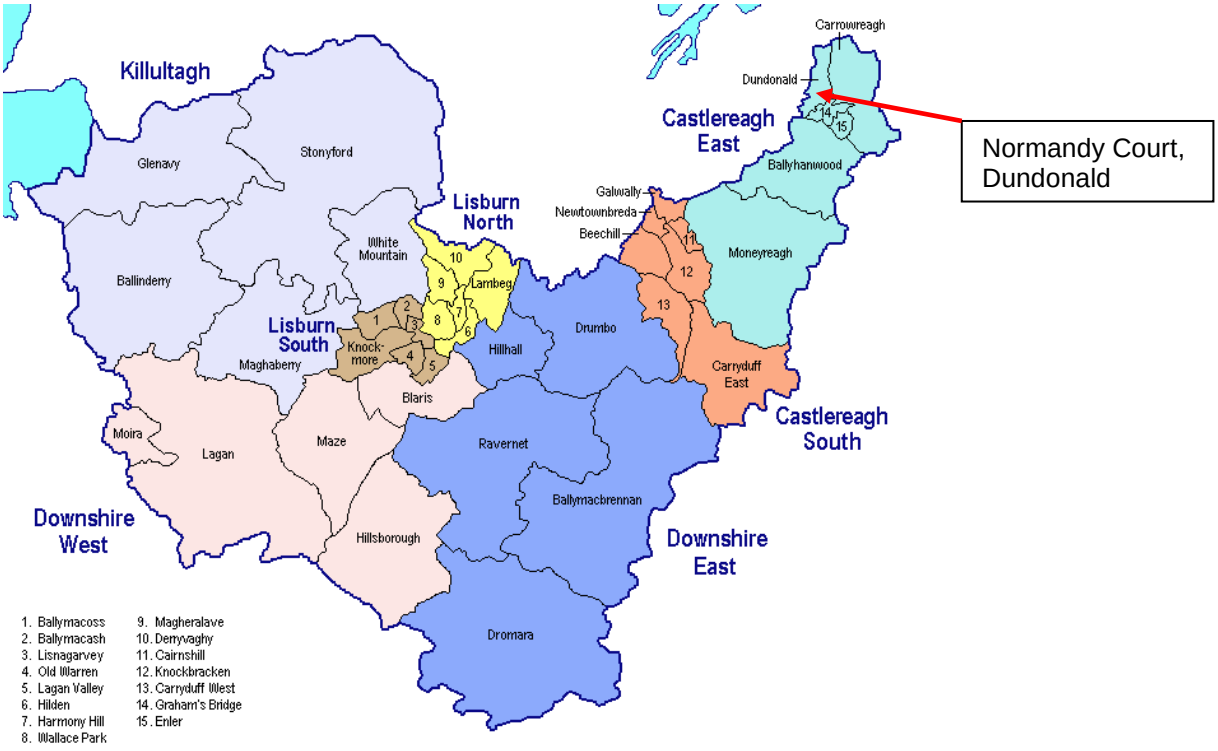
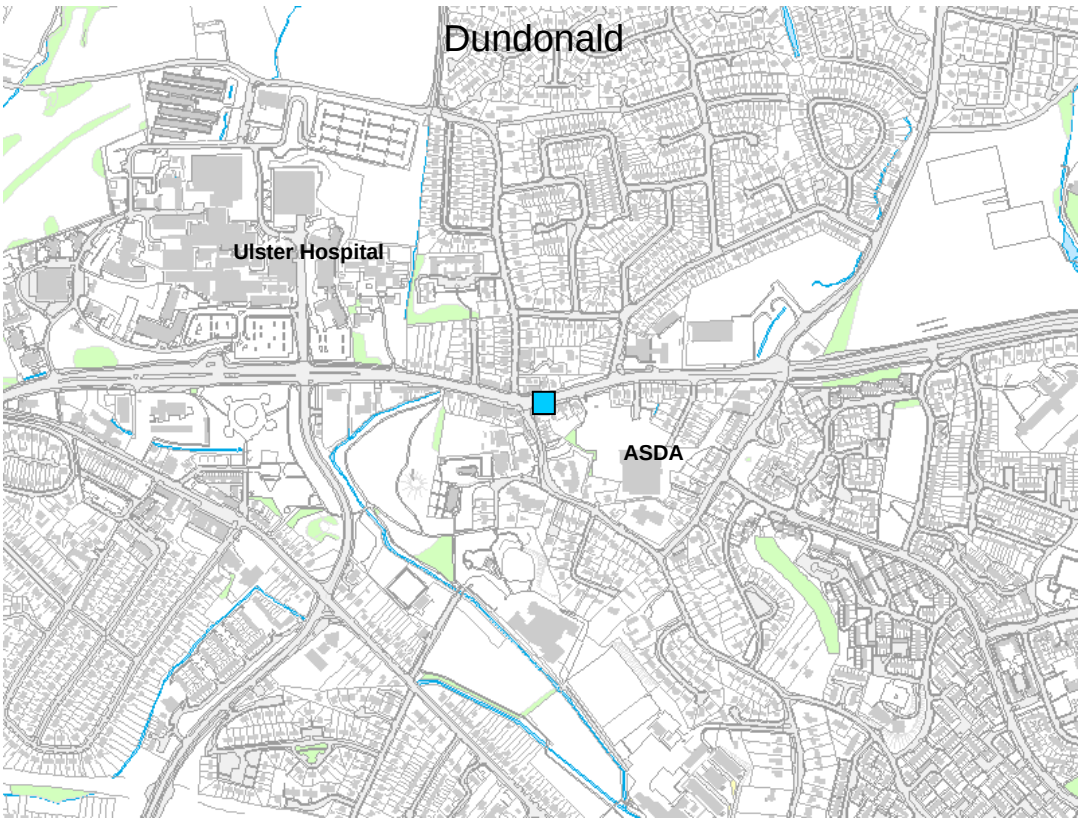


Figure 1.4 Map showing position of AQMA in Dundonald Village



Normandy Court A20 Upper Newtownards Road, Dundonald

Figure 1.5 Ariel photograph showing position of AQMA in Dundonald Village

Figure 1.6 Photograph showing position of Normandy Court within AQMA

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

LCCC has two automatic monitoring sites.

Kilmakee Activity Centre Seymour Hill

Measuring SO_2 and PM_{10},$PM_{2.5}$ this site also houses a Defra network PAH and black carbon monitor and therefore meets the requirements for the AURN specifications, in May 2022 this site was also chosen for a TOMPS monitor extending the UK network into Northern Ireland. The available data is included in this report.

Dundonald

Measuring NOx using a chemiluminescence analyser, this site is within 30m of an AQMA. A co-location study for the NO_2 diffusion tubes is also carried out at this site. Results from this study were submitted to the national data base for 2022 to be included in the March 2023 data. The available data is included in this report.

Manual calibrations are carried out every two weeks by the Local Air Quality officer. AQDM (Air Quality Data Management) are employed to ratify and validate the data. A specialist engineer is employed to service and maintain the sites as required. The 2022 results and correction factors are detailed in Appendix A.

Map(s) of Automatic Monitoring Sites

Figure 2.1 - Position of Automatic monitoring sites within LCCC

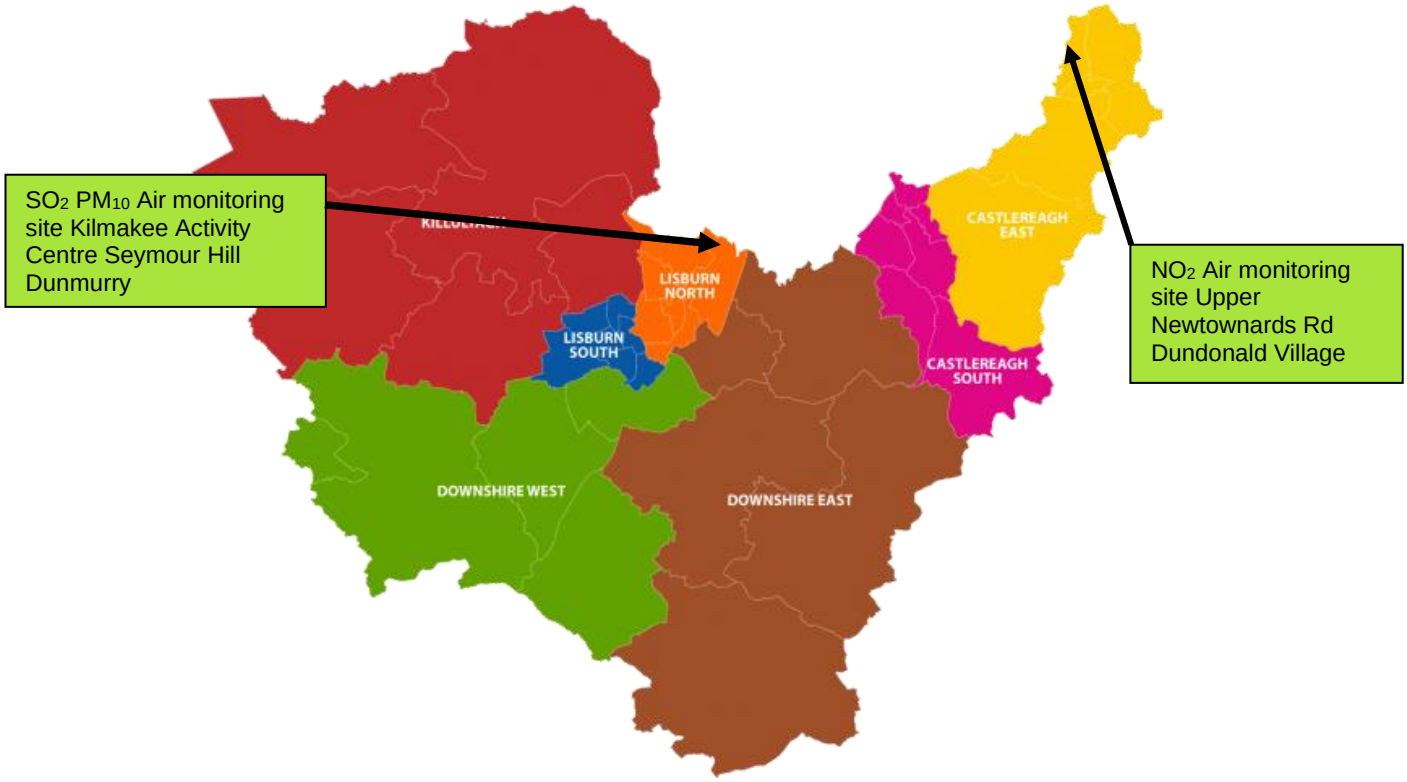


Figure 2.2 Position of Air monitoring site in Seymour Hill

Kilmakee Activity Centre Seymour Hill

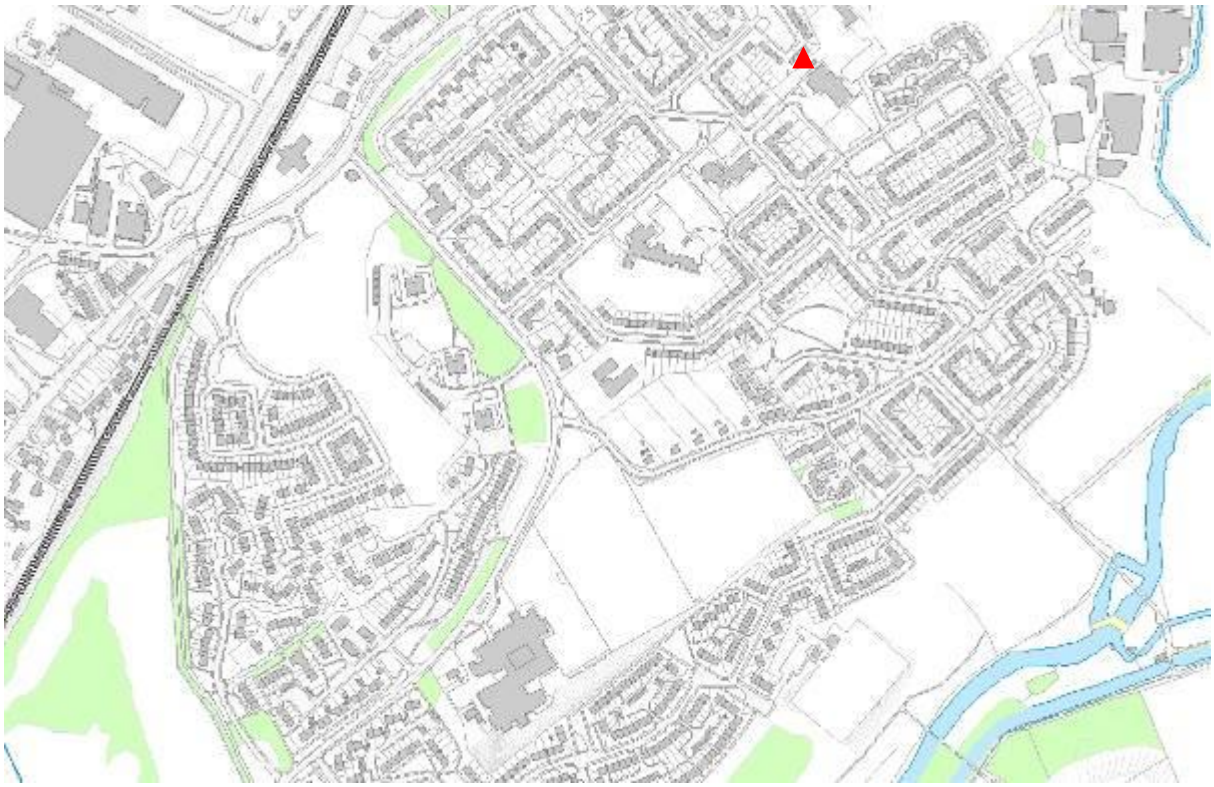


Figure 2.3 Position of Automatic Monitoring Site at Kilmakee Activity Centre

Figure 2.4 Picture of Automatic Monitoring Stations at Kilmakee Activity Centre

Figure 2.5 Position of automatic monitoring site in Dundonald Village

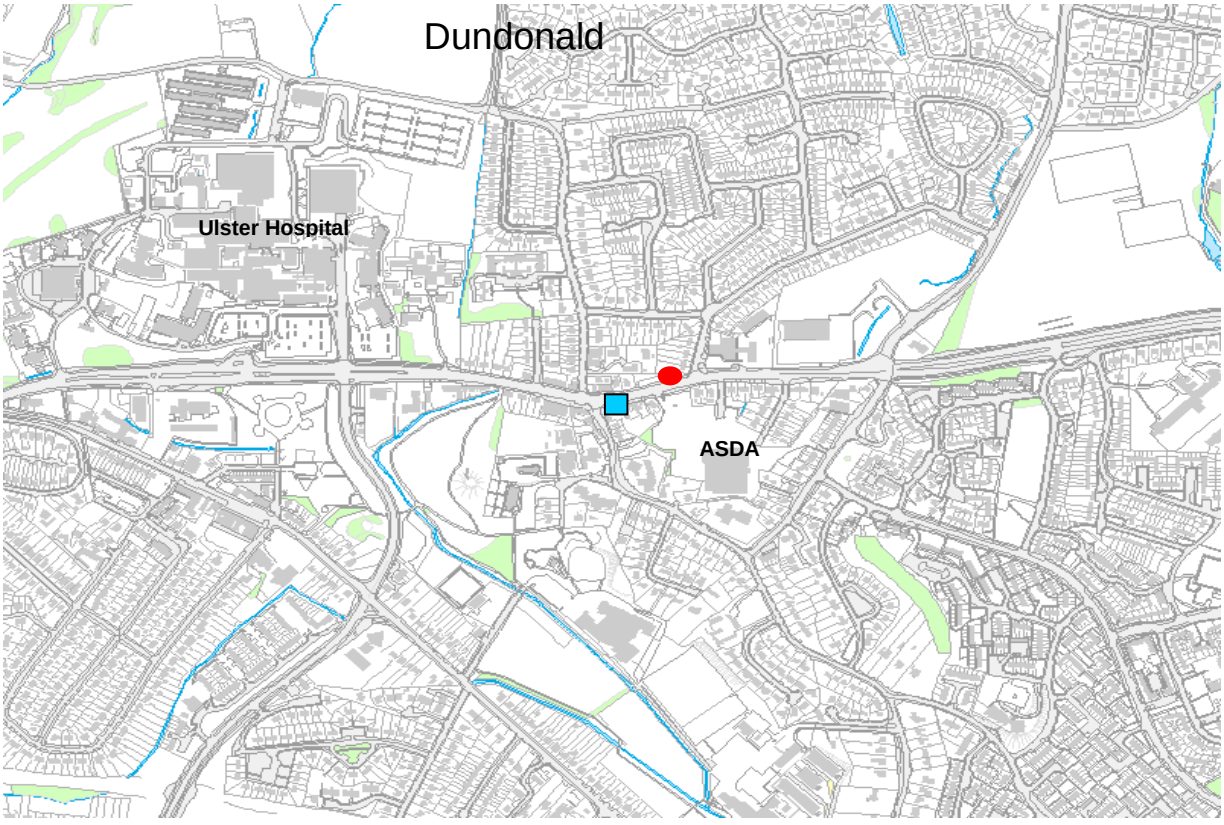


Figure 2.6 Picture of Automatic Monitoring Station in Dundonald Village

Table 2.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	Irish Grid Reference	Irish Grid Reference	Inlet Height (m)	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
	Kilmakee Activity Centre	Urban Background	E328956	N367973	**2.5**	PM_{10}, $PM_{2.5}$ SO_2	NO	FIDAS 200 UV Analyser	YES 10m	N/A	YES
	Dundonald Village	Roadside	E342016	N374041	**2.5**	NOX	NO	Chemiluminescence	YES 22m	3M	YES (30m from AQMA)

2.1.2 Non-Automatic Monitoring Sites

In 2022 LCCC had 25 passive monitoring NO_2 diffusion tubes, at 18 roadside and background sites and a co-location study at the automatic station in Dundonald. Most are positioned along the main arterial routes into Belfast, there are triplicate tubes at the co-location site in Dundonald and to enable more accurate results triplicate tubes are also positioned on the façade of Normandy Court within the AQMA and the Newtownbreda Road site where the highest results have been recorded within the council area

In 2019 the following sites were identified through monitoring and planning applications and established to assist in future air quality assessments.

1. Blaris Road/Green/Drive – A number of new houses have been built in this area adjacent to the M1 motorway with future plans for further residential developments and link road to a new train halt.
2. Knockmore Road – A new road layout completed in 2022 also leading to the proposed new train halt.

A new site in 2020 was also established at Cairnshill Park & Ride as there were plans to extend the facility.

Results from the co-location study at the automatic station in Dundonald, were submitted into the national data base

The diffusion tube studies for the past five years do not show any particular trends outside of the AQMA (See Fig. 2.18)

The NO_2 diffusion tubes were supplied and analysed by Gradko Environmental.

Details of the QA/QC for the diffusion tubes and the reason for the use of the bias adjustment factor can be found in Appendix A

Below are maps showing the locations of the diffusion tube sites in 2022.

Figure 2.7 – Map(s) of Non-Automatic Monitoring Sites

Distribution of NO_2 diffusion tubes within Council area

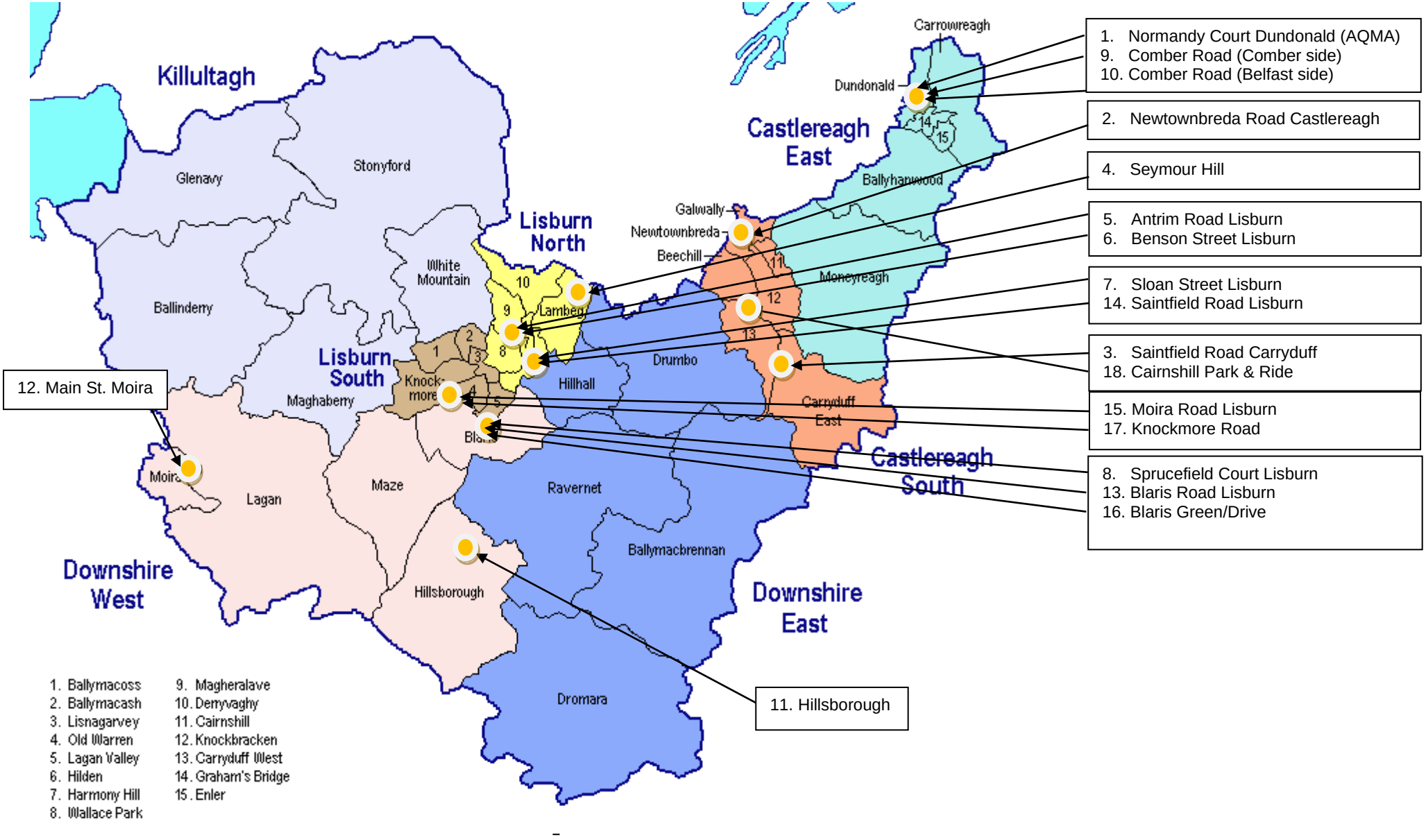


Figure 2.8 Position of tube 1. Dundonald village in AQMA(Normandy Court), and Comber Road Dundonald (tubes 9,10)

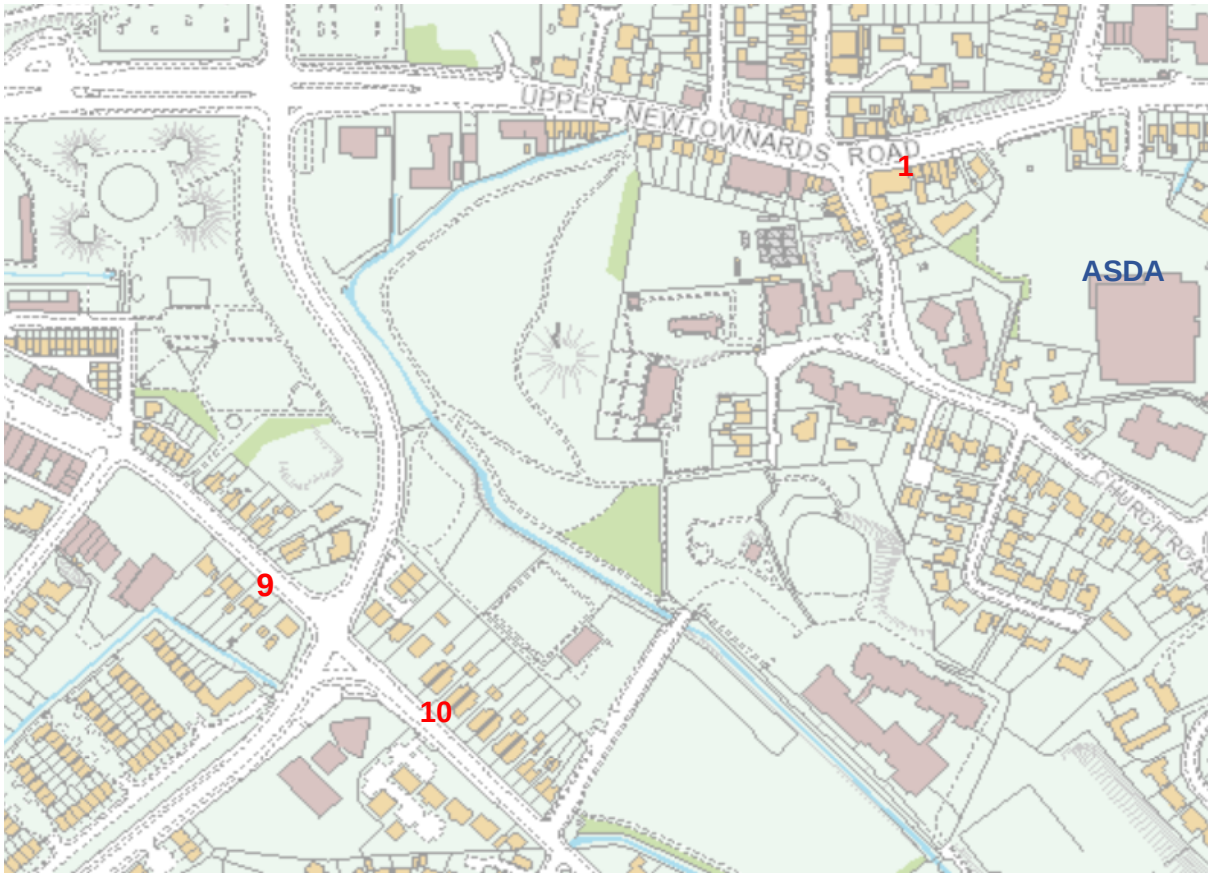


Figure 2.9 Picture of NO_2 Tubes in AQMA Normandy Court Dundonald

Figure2.10 Position of tube 2 Castlereagh area (Newtownbreda Road)

Figure2.11 Position of tube 3 Saintfield Road Carryduff

Figure2.12 Position of tube 4 Seymour Hill

Figure 2.13 Position of tubes in Lisburn City

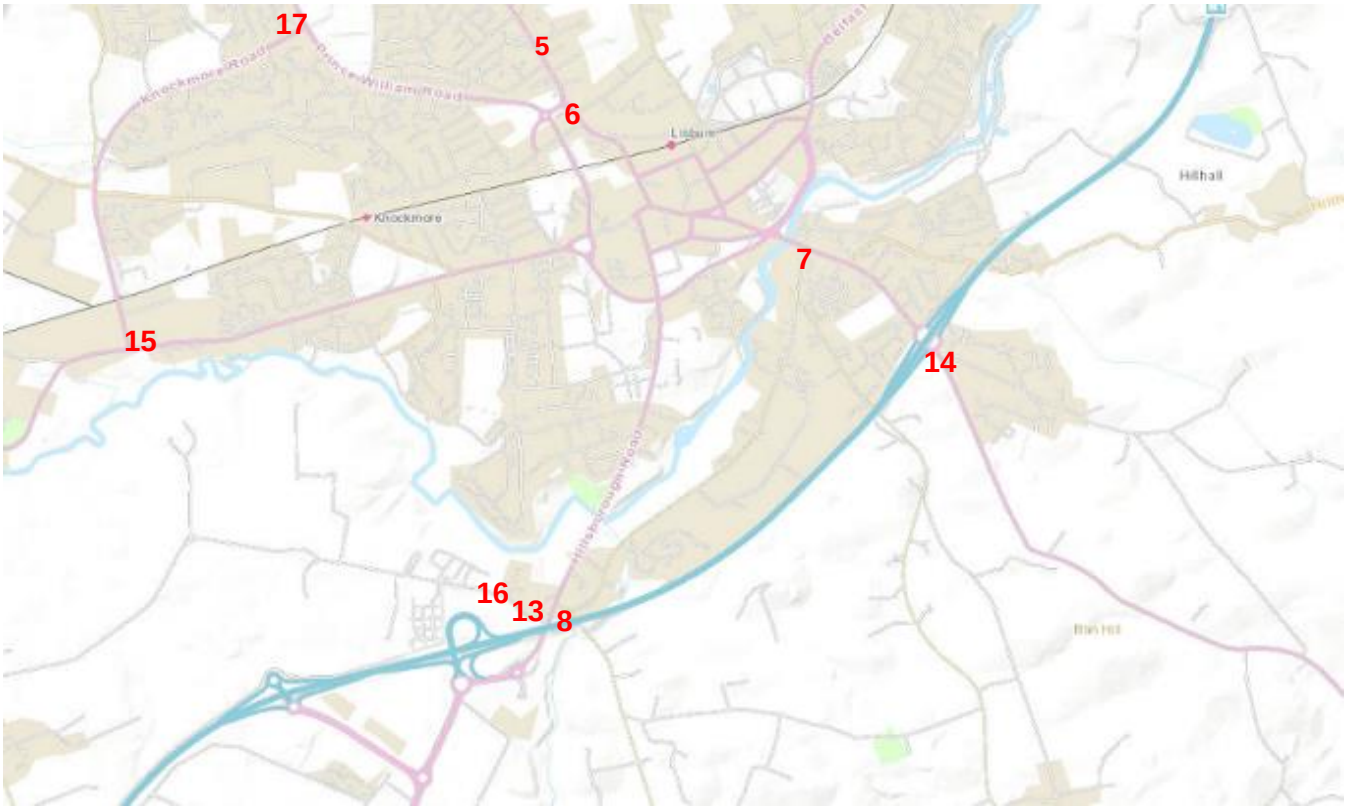


Figure 2.13.1 Position of tubes 5,6 (Antrim Rd, Benson St.)in Lisburn City

Figure 2.13.2 Position of tubes 7 Sloan Street in Lisburn City

Figure 2.13.3 Position of tubes 8,13,16,(Sprucefield Ct. Blaris Road, Blaris Green/Drive) in Lisburn City

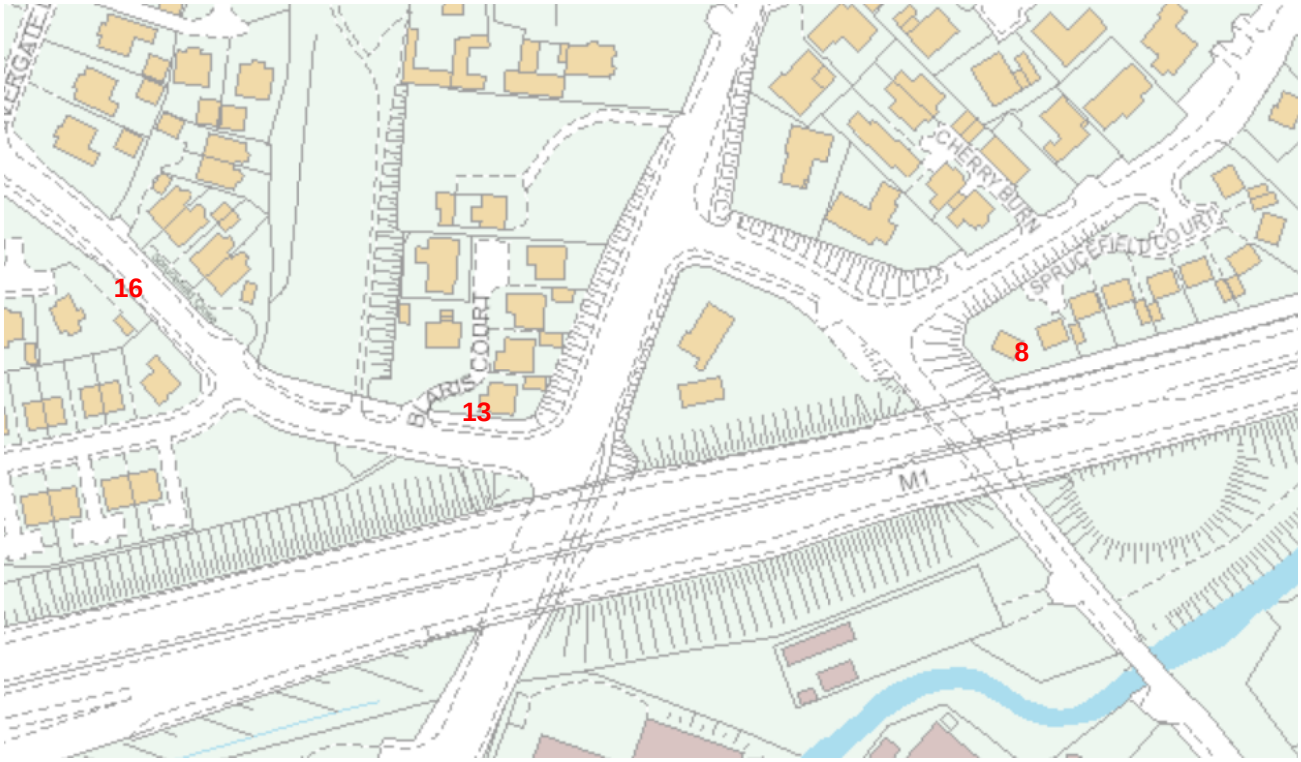


Figure 2.13.4 Position of tubes 14, Saintfield Road in Lisburn City

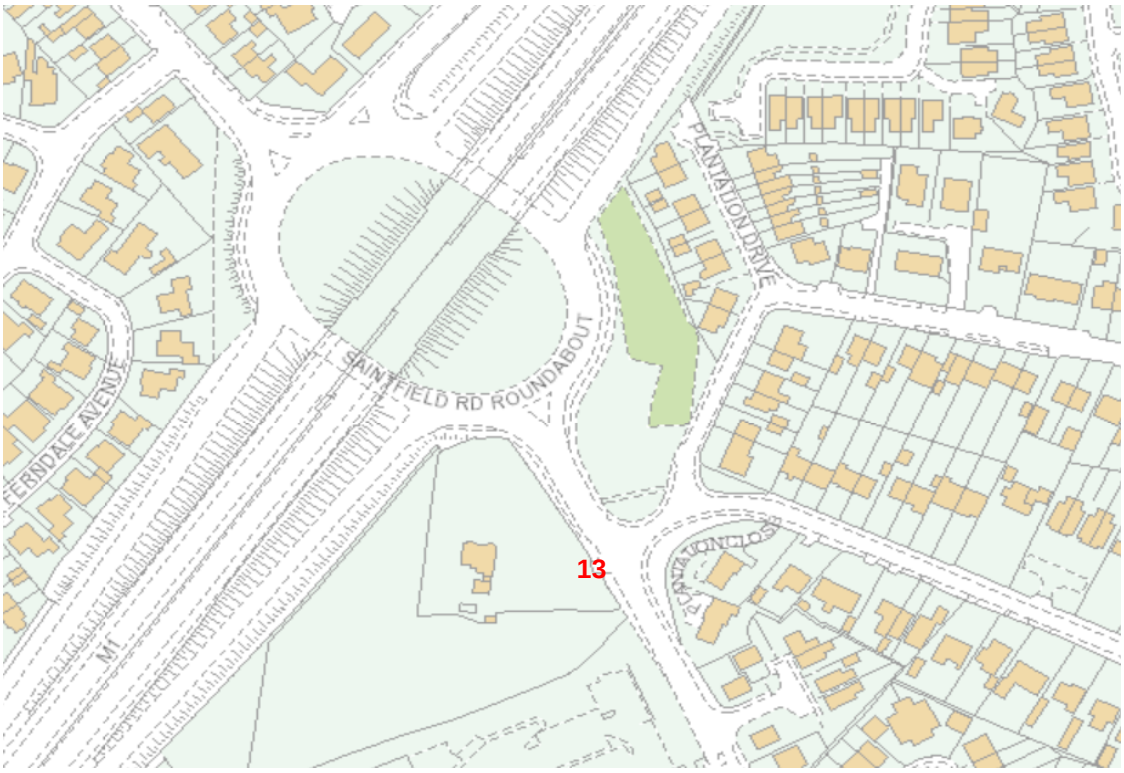


Figure 2.13.5 Position of tubes 15, Moira Road in Lisburn City

Figure 2.13.6 Position of tubes 17, Knockmore Road junction Road in Lisburn City

Figure 2.14 Map of tube 11 in Ballynahinch Street Hillsborough

Figure 2.15 Position of tube 12 in Main Street Moira

Figure 2.16 Position of tube no.18 Cairnshill Park & Ride

Table 2.2 – Details of Non- Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
1	Normandy Court Dundonald (AQMA)	Roadside	341991	374013	3m	NO_2	Yes	No	Yes (0m)	0.5m	Yes
2	Newtownbreda Road Castlereagh	Roadside	335246	370061	2.5m	NO_2	No	No	Yes (7m)	2.5m	Yes
3	Saintfield Road Carryduff	Roadside	336832	365625	2m	NO_2	No	No	Yes (70m)	10m	Yes
4	Seymour Hill	Background	328585	368117	2.5m	NO_2	No	No	No (50m)	100m	No
5	Antrim Rd Lisburn	Roadside	326313	364621	2.5m	NO_2	No	No	Yes (7m)	1m	Yes
6	Benson Street Lisburn	Roadside	326090	364619	2m	NO_2	No	No	Yes (0.1m)	Yes	Yes
7	Sloan Street Lisburn	Roadside	327236	364102	2.5m	NO_2	No	No	Yes (1.5m)	2m	Yes
8	Sprucefield Court Lisburn	Roadside	327586	363586	2m	NO_2	No	No	Yes (1m) Façade of garage adjacent to house from road	15m	Yes
9	Comber Road (Comber side)	Roadside	341731	373666	2.5m	NO_2	No	No	Yes (4m)	1.5m	Yes

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
10	Comber Road (Belfast side)	Roadside	341622	373759	2.5m	NO_2	No	No	Yes (4m)	1.5m	Yes
11	Hillsborough	Roadside	324404	358876	2m	NO_2	No	No	Yes (0.1m)	1m	Yes
12	58-62 Main Street, Moira	Roadside	314994	360589	3m	NO_2	No	No	Yes (4m)	1.5m	Yes
13	Blaris Road Lisburn facade	Roadside	325993	362462	2m	NO_2	No	No	Yes (0m)	5.5m	Yes
14	Saintfield Road Lisburn	Roadside	327810	363609	2.5m	NO_2	No	No	Yes (4m)	1.5m	Yes
15	Moira Road Lisburn	Roadside	324169	363671	2.5m	NO_2	No	No	Yes (4m)	1.5m	Yes
16.	Blaris Green/Drive	Roadside	325883	362501	2.5m	NO_2	No	No	Yes (7m)	1m	Yes
17.	Knockmore Road	Roadside	324883	365180	2.5m	NO_2	No	No	Yes (19m)	1.5m	Yes
18.	Cairnshill Park & Ride	Roadside	335702	368362	2.5m	NO_2	No	No	Yes (7m)	1.5m	Yes
19 (triplicate)	Co-located tubes at Dundonald Automatic site	Roadside	342016	374041	2.5m	NO_2	No	Yes	Yes (22m)	3m	Yes

Sites in purple were new in 2019

Sites in orange were new in 2020

2.2 Comparison of Monitoring Results with Air Quality Objectives

No exceedances of the AQS objectives have been identified from the monitoring data collected since the 2022 Update and Screening Assessment. All monitored pollutant concentrations outside of the AQMA have been below their respective air quality objective limits at relevant exposure. In the following section results are presented for NO_2 at the automatic and diffusion tube sites and compared with the objective.

2.2.1 Nitrogen Dioxide (NO_2)

In the following section results are presented for NO_2 at the automatic and diffusion tube sites and compared with the objective. There was a significant reduction in monitored NO_2 results in 2020 due to the COVID pandemic, although in 2022 levels have increased, they have not returned to pre-pandemic levels. All sites were below the AQS objective.

Automatic Monitoring Data

Table 2.3 presents the annual mean concentrations of NO_2 determined at the automatic site in 2022 from the hourly measurements.

Table 2.3 – Results of Automatic Monitoring for NO_2: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period	Valid Data Capture 2022	Annual Mean Concentration (µg/m^3)				
					2018	2019	2020	2021	2022
Castlereagh Dundonald	Roadside	N (within 30M)	N/A	98.1%	24	22	17	19	19

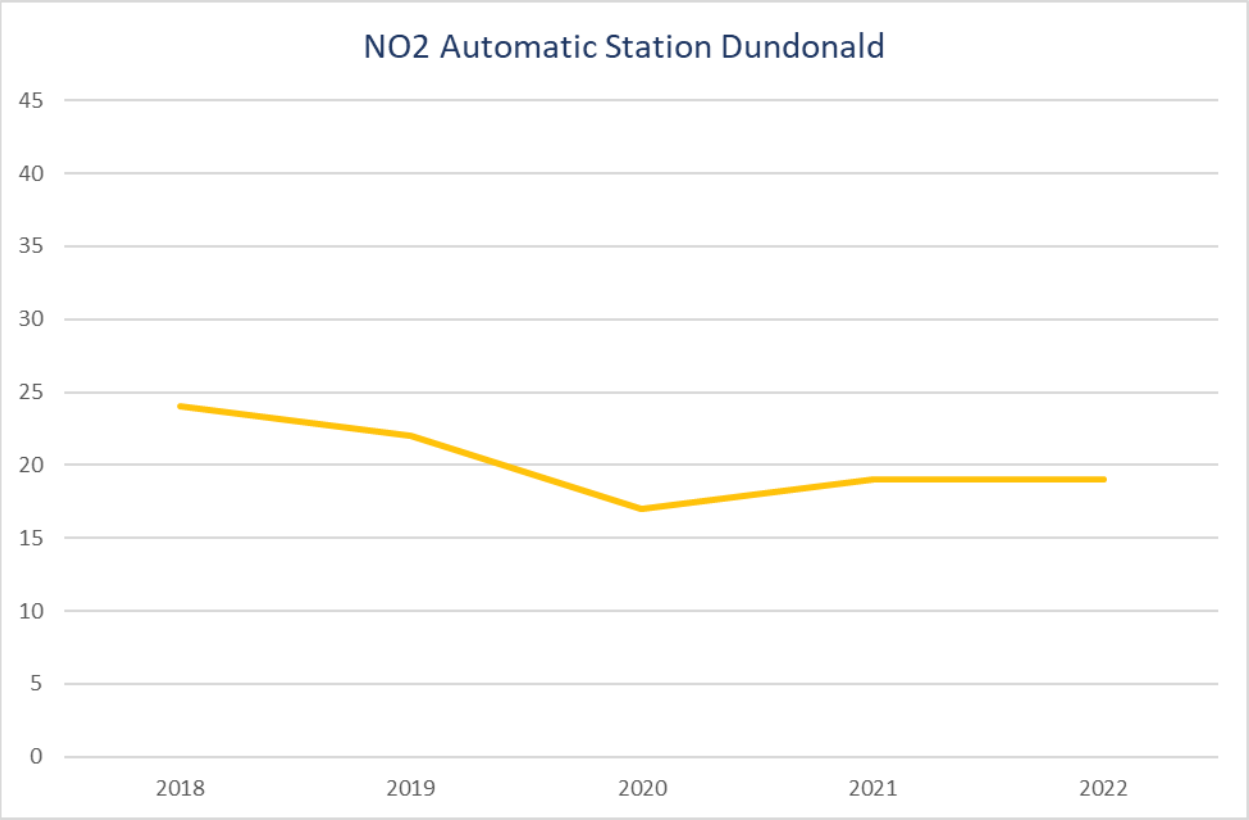
Table 2.4 – Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2022 % [b]	Number of Hourly Means > 200µg/m^3				
					2018	2019	2020	2021	2022
Castlereagh Dundonald	Roadside	N (within 30M)	N/A	98.1%	0	0	0	0	0

Trends in Annual Mean NO_2 Concentrations Measured at Automatic Monitoring Sites

The automatic station was installed in Dundonald in 2008 because of high results from NO_2 tubes at the Upper Newtownards Road site at Normandy Court. Results have shown a steady reduction since 2015, probably due to the introduction of the new Rapid Transport System through Dundonald village. The pandemic in 2020 also significantly contributed to the reduction of NO_2 at Normandy Court, Dundonald.This reduction has remained in 2022 and not returned to pre pandemic levels.

Figure 2.17 Trend in annual mean NO_2 at Dundonald Automatic site



Diffusion Tube Monitoring Data

Results at the NO_2 diffusion tube sites, situated within the council area are shown below in Table 2.5. They are sited in accordance with the technical guidance LAQM.TG (16).

A diffusion tube co-location study has been undertaken at the Dundonald automatic monitoring station site. The results of this study have been submitted to the national data-base. The 2022 the local bias was **0.81.** As in previous years a decision has been made to apply the national bias adjustment factor of **0.83,** as based on 27 studies this was deemed to be a more realistic figure. All diffusion tube sites have been found to be below the objective at relevant exposure. Monitoring has continued at the new sites identified in 2019 at Blaris Road/Green due to new residential developments now completed next to the M1 motorway, and at Knockmore Road where a new road junction has been constructed. A new site was established in 2020 at the entrance of Cairnshill Park & Ride next to residential properties as plans to extend this site were under discussion.

The Normandy Court Dundonald NO_2 tube site within the AQMA has continued to show a reduction since the completion of the Park & Ride in Dundonald 2014, and the new Glider Rapid Transport Network completed in September 2018. There was also a significant reduction in monitored NO_2 results in 2020 due to reduced traffic volumes during the COVID pandemic, in 2022 levels have increased but have not returned to pre-pandemic levels.

All NO_2 diffusion tube sites were below the AQS objective.

Trends for the 18 diffusion tube sites within the Council area are shown in Figure 2.18

Details of the QA/QC for the diffusion tubes and the reason for the use of the bias adjustment factor **0.83** can be found in Appendix A

Table 2.5 – Results of NO_2 Diffusion Tubes 2022

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2022 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.83) 2022 (μg/m^3)
1	Normandy Court Dundonald (AQMA)	Roadside	Y	triplicate	12 months	N/A	N	24
2	Newtownbreda Road Castlereagh	Roadside	N	triplicate	12 months	N/A	Y	29
3	Saintfield Road Carryduff	Roadside	N	single	12 months	N/A	N	12
4	Seymour Hill	Background	N	single	12 months	N/A	N	14
5	Antrim Rd Lisburn	Roadside	N	single	12 months	N/A	N	21
6	Benson Street Lisburn	Roadside	N	single	12 months	N/A	N	20
7	Sloan Street Lisburn	Roadside	N	single	10 months	N/A	N	25
8	Sprucefield Court Lisburn	Roadside	N	single	12 months	N/A	N	28
9	Comber Road (Comber side)	Roadside	N	single	12 months	N/A	N	20
10	Comber Road (Belfast side)	Roadside	N	single	11 months	N/A	N	19

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2022 (Number of Months or %)	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.83) 2022 (μg/m^3)
11	Hillsborough	Roadside	N	single	12 months	N/A	N	19
12	58-62 Main Street Moira	Roadside	N	single	12 months	N/A	N	20
13a	Blaris Road Lisburn facade	Roadside	N	single	12 months	N/A	Y	30
14	Saintfield Road Lisburn	Roadside	N	single	11 months	N/A	N	28
15	Moira Road Lisburn	Roadside	N	single	12 months	N/A	N	17
16.	Blaris Green/Drive	Roadside	N	single	12 months	N/A	N	30
17.	Knockmore Road	Roadside	N	single	12 months	N/A	N	29
18	Cairnshill Rark & Ride	Roadside	N	single	12 months	N/A	N	23
19	Co-located tubes at Dundonald Automatic site	Roadside	N	triplicate	11 months	N/A	N	24

Sites in purple were new in 2019

Sites in orange were new in 2020

Table 2.6 – Results of NO_2 Diffusion Tubes (2018 to 2022)

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) μg/m³				
			2018 (Bias Adjustment Factor =0.93)	2019 (Bias Adjustment Factor = 0.92)	2020 (Bias Adjustment Factor = 0.81)	2021 (Bias Adjustment Factor = 0.84)	2022 (Bias Adjustment Factor = 0.83)
1	Normandy Court Dundonald (AQMA)	Roadside	34	31	23	26	24
2	Newtownbreda Road Castlereagh	Roadside	38	37	33	30	29
3	Saintfield Road Carryduff	Roadside	23	17	11	14	12
4	Seymour Hill	Roadside	18	17	17	15	14
5	Antrim Rd Lisburn	Roadside	30	27	20	21	21
6	Benson Street Lisburn	Roadside	28	26	18	19	20
7	Sloan Street Lisburn	Roadside	32	28	23	25	25
8	Sprucefield Court Lisburn	Roadside	38	34	26	29	28
9	Comber Road (Comber side)	Roadside	25	24	18	18	20
10	Comber Road (Belfast side)	Roadside	28	23	17	18	19
11	Hillsborough	Roadside	29	25	20	19	19
12	58-62 Main Street Moira	Roadside	29	26	20	21	20
13	Blaris Road Lisburn facade	Roadside		31[a]	24	30	30
14	Saintfield Road Lisburn	Roadside	33	29	23	26	28

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) μg/m^3				
			2018 (Bias Adjustment Factor =0.93)	2019 (Bias Adjustment Factor = 0.92)	2020 (Bias Adjustment Factor = 0.81)	2021 (Bias Adjustment Factor = 0.84)	2022 (Bias Adjustment Factor = 0.83)
15	Moira Road Lisburn	Roadside	25	23	17	20	17
16	Blaris Green/Drive	Roadside		27	23	29	30
17	Knockmore Road	Roadside		32	24	30	29
18	Cairnshill Park & Ride	Roadside			20	25	23
19 (triplicate)	Co-located tubes at Dundonald Automatic site	Roadside	30	26	19	21	24

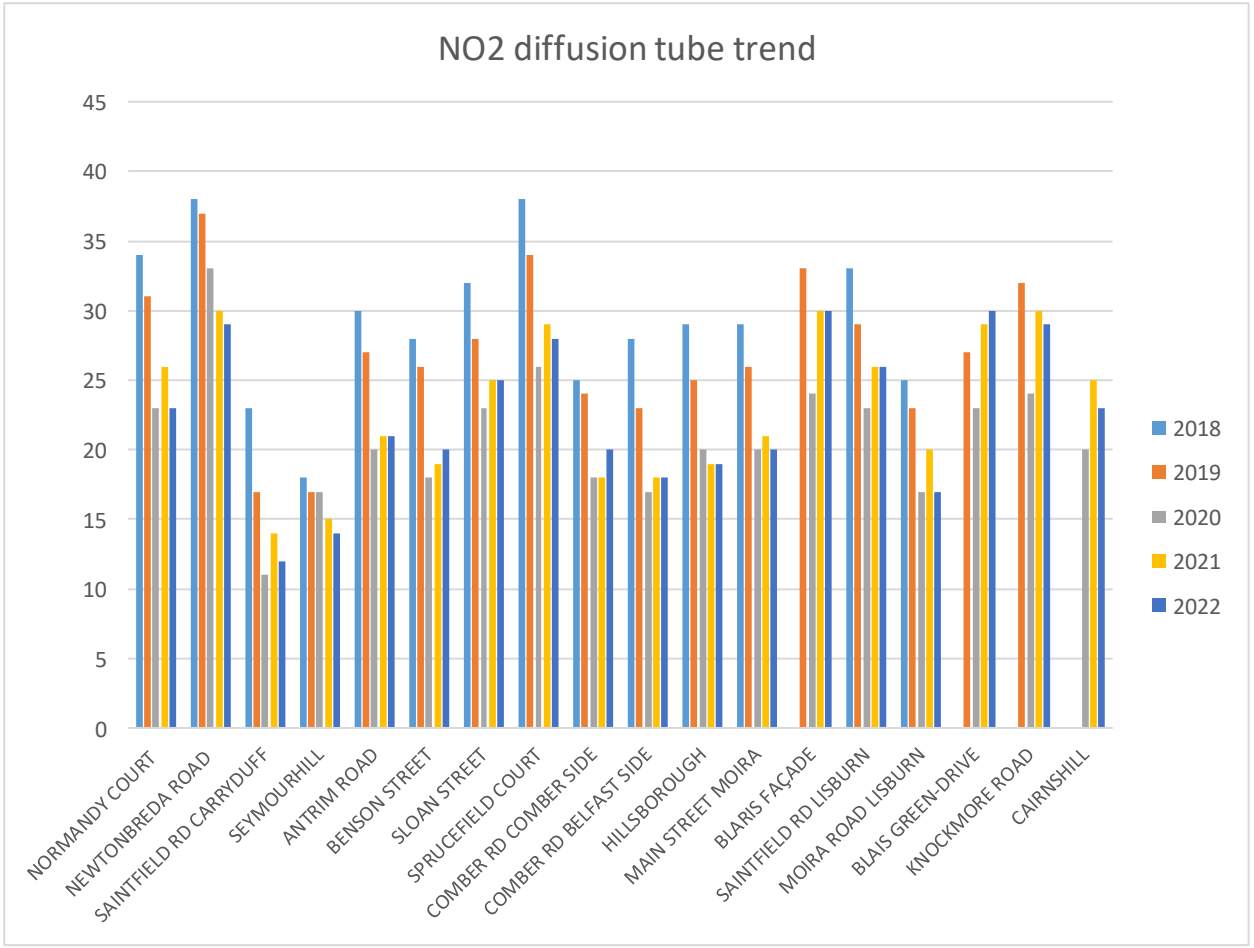
[a] This site has been "annualised" as in Boxes 7.9 and 7.10 of LAQM.TG16, as full calendar year data capture was less than 75%

Sites in purple were new in 2019

Site in orange was new in 2020

Figure 2.18 – Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites

Due to reduced traffic volumes during COVID in 2020 the results were reduced at all sites, Normandy Court and Newtownbreda sites have continued to show a trend in reduction. All sites have continued to show a reduction since pre pandemic levels in 2019.



2.2.2 Particulate Matter (PM_{10})

Automatic monitoring of PM_{10} in 2022 was undertaken at Kilmakee Activity Centre, Rowan Drive, Seymour Hill situated between Lisburn City and Belfast City.

This location is also the site for the AURN PAH, Black Carbon monitors and a new TOMPS monitor, chosen due to the high use of secondary solid fuel use.

Before 2021 PM_{10} measurements were recorded using a TEOM instrument, in 2021 this instrument was upgraded to a FIDAS 200 which also measures $PM_{2.5}$, the results are ratified and adjusted accordingly by AQDM, the data management company.
Summaries of this data, with regard to annual and hourly mean objectives, are presented below.

All results remain below the AQS objective.

Table 2.7 – Results of Automatic Monitoring for PM_{10}: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA ?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2022 % [b]	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration (µg/m^3)				
						2018	2019	2020	2021	2022
Kilmakee Activity Centre (PM_{10})	Urban Background	N	N/A	92.7%	Y	14	14	12	14	12

Figure 2.5 – Trends in Annual Mean PM_{10} Concentrations

PM_{10} has remained consistently low in Dunmurry

Table 2.8 – Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2022 % [b]	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m^3				
						2018	2019	2020	2021	2022
Kilmakee Activity Centre (PM_{10})	Urban Background	N	N/A	92.7%	Y	0	0	0	0	0

2.2.3 Sulphur Dioxide (SO_2)

In 2012 LCCC installed an SO_2 automatic site at Kilmakee Activity Centre alongside the particulate and PAH monitors. This site was chosen due to; high PAH results in the area and across Northern Ireland compared to the rest of the UK, secondary high solid fuel use in the area, and as it is adjacent to relevant exposure. There were no exceedances of the AQS objective in 2022.

The data has been fully ratified by AQDM., there were two equipment failures in 2022 due to the analyser coming to end of life, the analyser was replaced at the beginning of 2023.

Details of the QA/QC are available in Appendix A

Table 2.9 – Results of Automatic Monitoring for SO_2: Comparison with Objectives

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2023 % [b]	Number of exceedances:		
					15-minute Means > 266µg/m^3	1-hour Means > 350µg/m^3	24-hour Means > 125µg/m^3
Kilmakee Activity Centre Dunmurry	Urban Background	N	N/A	79.6%	0	0	0

Figure 2.6 – Trends in SO_2 Concentrations

Results have remained very low at this site.

2.2.4 Benzene

Benzene monitoring was not undertaken in 2022. LCCC review all relevant planning applications and all air quality assessments received, no major changes have been identified requiring a further assessment of Benzene. LCCC borders Belfast City Council with the largest population and traffic flows within Northern Ireland, Benzene has been monitored in Belfast since 2002 and remains well below the objective of 3.25 ug/m^3

Table 2.10 - Results of Monitoring for benzene: Annual Mean Concentrations for the Belfast Centre Site 2017 – 2021.

Site ID	Site type	Within AQMA? Which AQMA?	Valid Data Capture 2021%	Running annual mean concentrations (µg/m^3)				
				2017	2018	2019	2020	2021
Belfast Centre	Urban Background	N	100	0.46	0.45	0.44	0.37	0.39

2.2.5 Other Pollutants Monitored

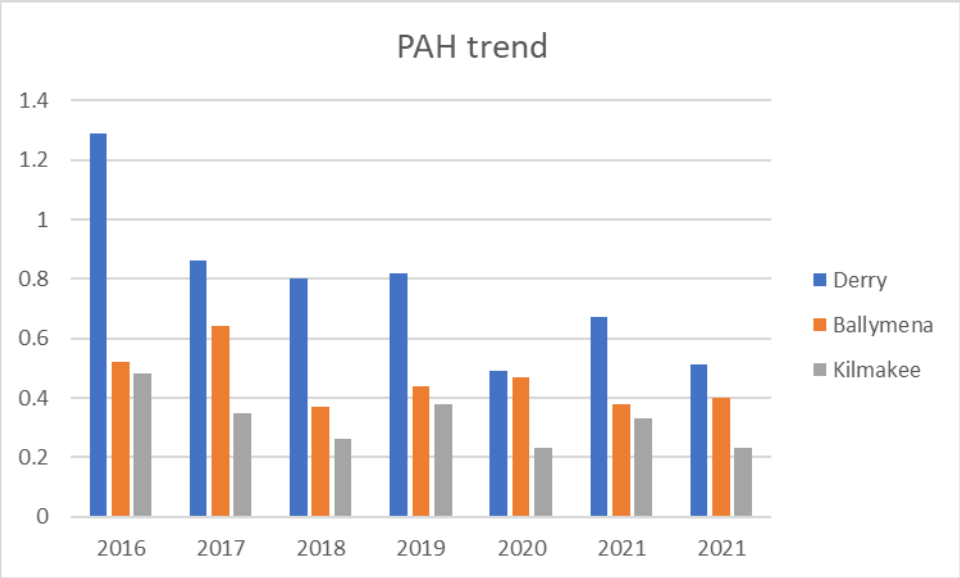
Polycyclic Aromatic Hydrocarbons (PAH)

The national network monitoring for PAH includes three monitoring sites in Northern Ireland and Kilmakee Activity Centre, Seymour Hill in LCCC is one of these. The UK National Air Quality Objective for PAH is an annual average of 0.25ng/m3, the EU limit value for PAH is an annual average of 1ng BaP/m3. The Kilmakee site in LCCC is below the EU objective and in 2022 was also below the UK non-mandatory objective.

The following table shows the results from 2016 to 2021.

Site	2016 ng/m^3 annual mean	2017 ng/m^3 annual mean	2018 ng/m^3 annual mean	2019 ng/m^3 annual mean	2020 ng/m^3 annual mean	2021 ng/m^3 annual mean	2021 ng/m^3 annual mean
Derry	1.29	0.86	0.80	0.82	0.49	0.67	0.51
Ballymena	0.52	0.64	0.37	0.44	0.47	0.38	0.40
Kilmakee	0.48	0.35	0.26	0.38	0.23	0.33	0.23

Figure 2.19 Trends in PAH Northern Ireland



Particulate Matter ($PM_{2.5}$)

At the beginning of 2021 a new FIDAS 200 monitoring PM_{10} and $PM_{2.5}$ was installed at the Kilmakee site in Lisburn, the annual mean results for $PM_{2.5}$ in 2022 were 8ug/m3 with 92.7% data capture which was below the UK limit value of 20 ug/m3

2.2.6 Summary of Compliance with AQS Objectives

Lisburn and Castlereagh City Council has examined the results from monitoring in the area.

Concentrations within the AQMA (Normandy Court, Dundonald) are not exceeding the objective for NO_2 in 2022. Since the COVID19 pandemic and the continued popularity of the Rapid Transport System, results have continued to show a downward trend. LCCC will continue to monitor levels within the AQMA in 2023. Concentrations outside of the AQMA are also below the objectives at relevant exposure, therefore there is no need to proceed to a Detailed Assessment.

3 New Local Developments

Lisburn & Castlereagh City Council confirm that there are no new or newly identified local developments in 2022 that may have an impact on air quality within the Local Authority area.

Lisburn & Castlereagh City Council confirm that all the following have been considered:

- **Road traffic sources**
- **Other transport sources**
- **Industrial sources**
- **Commercial and domestic sources**
- **New developments with fugitive or uncontrolled sources.**

3.1 Road Traffic Sources

LCCC can confirm they have considered

- Narrow congested streets with residential properties close to the kerb.
- Busy streets where people may spend one hour or more close to traffic.
- Roads with a high flow of buses and/or HGVs.
- Junctions.
- New roads constructed or proposed since the last Updating and Screening Assessment.
- Roads with significantly changed traffic flows.
- Bus or coach stations

The Environmental Health Service Unit have commented on the following planning applications where an air quality impact assessment may be necessary–

LA05/2018/1155/F - Construction of a new link road (1.6km) connecting the existing M1 junction 8/A101 roundabout to existing Moira/Knockmore Road Junction AQIA requested

3.2 Other Transport Sources

LCCC can confirm they have considered

- Airports.
- Locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.
- Locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.
- Ports for shipping.

The Environmental Health Service Unit did not comment on any relevant applications.

3.3 Industrial Sources

LCCC can confirm they have considered the following

- Industrial installations: new or proposed installations for which an air quality assessment has been carried out.
- Industrial installations: existing installations where emissions have increased substantially or new relevant exposure has been introduced.
- Industrial installations: new or significantly changed installations with no previous air quality assessment.
- Major fuel storage depots storing petrol.
- Petrol stations.
- Poultry farms.

The Environmental Health Service Unit have commented on the following planning applications where an air quality impact assessment may be necessary –

LA05/2021/0999/F - Extension of curtilage to existing waste management facility for erection of maturation hall with associated hardstanding and landscaping

AQIA submitted

LA05/2022/0686/F - Proposed asphalt batching plant, perimeter fence, security gates, access and ancillary site works.

AQIA requested subsequently submitted

LA05/2020/0998/F - Planning application for the retention of an existing on-farm (500KW) Anaerobic Digestion Facility (to include provision for 1 no Digestate Storage Tank, 1 no covered Digestate Tank, 2 no Agricultural Feedstock Storage Clamps, Biogas Feeder System, Associated CHP, pump room and office building, Emergency Backup Generator Container, Containerised Pressure Relief Container, Underground Pre-Reception Tank, 5 no Erected Lighting Columns, Associated retaining walls and existing hard standing area and access laneway), together with the proposed erection of a portal roof covering over the existing feedstock storage clamps, proposed new solid separator clamp and feedstock building, weighbridge, ancillary works and associated landscaping (amended description).

AQIA requested subsequently submitted

3.4 Commercial and Domestic Sources

LCCC can confirm they have considered the following

- Biomass combustion plant – individual installations.
- Areas where the combined impact of several biomass combustion sources may be relevant.
- Areas where domestic solid fuel burning may be relevant.
- Combined Heat and Power (CHP) plant.

The Environmental Health Service Unit have commented on the following planning applications where an air quality impact assessment may be necessary -

LA05/2021/0811/F - Retention of farm building including underground slurry tanks for agricultural purposes and the construction of a proposed cattle house (Amended description/additional info provided).

AQIA requested subsequently submitted

3.5 New Developments with Fugitive or Uncontrolled Sources

LCCC can confirm they have considered the following

- Landfill sites.
- Quarries.
- Unmade haulage roads on industrial sites.
- Waste transfer stations, etc.

LA05/2022/0635/F - Extension of existing waste transfer station to provide ancillary refuse derived fuel storage yard with associated site works, drainage, fencing and landscaping

AQIA provided

LA06/2022/0310/F - North-westerly lateral extension of Ballystockart Quarry, with associated deepening of the existing Northern operational area, to include a phased operational plan and holistic restoration.

4 Planning Applications

LCCC Environmental Health Service Unit considered all relevant planning applications and the following applications submitted an Air Quality Impact Assessment.

Air quality assessments completed or requested

LA05/2018/0303/F - Erection of admin/staff office building for continued use of site for car sales (Retrospective application for temporary planning permission for 3 years).

AQIA submitted

LA05/2022/0686/F - Proposed asphalt batching plant, perimeter fence, security gates, access and ancillary site works.

AQIA requested subsequently submitted

LA05/2022/0908/PAD - Erection of circa 58,000sqm storage and distribution centre with associated access, parking, loading and unloading areas and landscaping. Access proposed from the A1 to the west

AQIA requested

LA05/2022/0913/PAD - Erection of a 58,000sqm storage and distribution centre with associated access, parking, loading and unloading areas and landscaping. Access proposed from Ferguson Drive to the east

AQIA requested

Significant applications involving AQ considerations

LA05/2022/0830/F - Demolition of existing buildings/structures and erection of mixed use development comprising mixed tenure residential development (36 no. dwelling houses, 55no. apartments and 2 maisonettes- 93 no. units in total), 6 no. Class B2 industrial/employment units (total 1,098 sq. metres) with service yard; 3 no. flexible work spaces/ Wi-Fi hubs (total 300 sq. metres); 2 no. take away coffee pod units; private, communal and public space, landscaping, cycle and car parking,

AQIA requested subsequently submitted

The above report did not identify any air quality issues.

5 Local Transport Plans and Strategies

Lisburn & Castlereagh City Council falls within the Belfast Metropolitan Area Plan and therefore the Belfast Metropolitan Transport plan, https://www.infrastructure-ni.gov.uk/publications/regional-strategic-transport-network-transport-plan-2015, and in 2020 a transport study was carried out by The Department of Infrastructure,. https://www.infrastructure-ni.gov.uk/publications/belfast-metropolitan-transport-study

6 Implementation of Action Plans

LCCC Updating and Screening Assessment 2015 explained the amalgamation of local authorities in Northern Ireland, and how LCCC was made up from the previous council areas of Lisburn City and Castlereagh Borough with a substantial portion moving into Belfast City Council.

Castlereagh Borough Council declared the AQMA (now within LCCC area) in Dundonald village (apartments Normandy Court), in January 2011 and an Air Quality Action plan was submitted to the Department in 2013.

A survey at that time carried out by TransportNI indicated the Park & Ride situated east of the AQMA in Dundonald and the introduction of the new rapid Transport system (Glider Bus) could reduce road traffic vehicles by 20%.

The new Rapid Transport System which came into operation in September 2018, and there was a noticeable reduction in NO_2. The opening times of the Park & Ride were extended to midnight at this time and in 2019 it continued to grow in popularity and is at capacity during working hours. The 2019 recorded NO_2 annual mean was 31ug/m^3 within the AQMA Normandy Court showing a further 10% reduction. Levels of NO_2 were greatly reduced in 2020 due to reduced traffic volumes during the COVID pandemic, in 2022 they still are reduced from the pre-pandemic levels and a trend in the reduction of NO_2 within the AQMA is being established. If this trend continues the AQMA will be reviewed in 2024.

LCCC have updated the 2013 Action Plan and it will be submitted when all processes have been completed.

Pictures the Park & Ride Dundonald

Table 6.1 – Progress on the present 2013 Action plan

Actions in 2012	Lead Authority	Impact	Time Scale	Status	Impact	Cost	Cost Effective Score	2012 Update on actions	2023 Update on actions
1. Investigate the efficiency of the traffic lights at the junctions of Upper Newtownards Road and Church Road	2012 DRD Roads Service (NI) 2022 DFI	Less congestion and faster speeds at junctions leading to a reduction in NO2 levels	S	I	3	7	21	Roads service responded to this action. Response indicated a change in times may well have a detrimental affect elsewhere and that the timings were already at its most optimum.	This has not changed and timings remain at their optimum
2. Investigate the efficiency of having both lanes of traffic operational at all times and not just peak times.	2012 DRD Roads (NI) 2022 DFI	Reduction of traffic building up around Normandy Court and therefore reducing NO2 levels	S	I	2	7	14	Roads Service investigated this option and indicated that traffic during off peak times does not present an issue.	This action is no longer relevant as parking on the road is not permitted at any time. The inside lanes are now designated as bus lane and traffic is mostly restricted to the outside lane.
3. Alternative planning routes/bypass of Dundonald village	2012 DRD Roads (NI) 2022 DFI	Reduction in traffic and therefore reduction in NO2 levels	L	O	3	5	15	Roads Service indicated that no immediate or long term plans to develop a bypass or improve traffic lanes.	There are still no immediate or long term plans to develop a bypass, with the introduction of the Rapid transport System the most efficent road layout has been constructed
4. Council vehicle fleet- Improving Euro Emissions	2012 Castlereagh Borough Council 2022 LCCC	Improving air quality with Euro 5 Vehicles and consideration of alternative environmentally friendly fuels	M	O	2	6	12	Castlereagh Borough Council will continue to try and improve vehicle emissions when purchasing new vehicles	In 2015 Councils amalgamated and the Castlereagh Borough Councils AQMA now falls within Lisburn & Castlereagh City Council who continue to try and improve vehicle emissions when purchasing new vehicles

5. Continue to improve the bus fleet by providing Eco- driver training an installation of driver monitoring devices	Translink	Reduced	M	O	1	7	7	Translink will continue to replacement/renewal. CBC will continue with air quality monitoring	Translink continue to provide Eco-driver training and roll out a mentor programme. LCCC continue to monitor air quality
6.Improve the bus fleet by providing Eco-driver training an installation of driver monitoring devices Continue current practice of purchasing Euro 5 vehicles on fleet renewal	Translink	Emissions from buses in AQMA	M	O	1	7	7	Purchase Euro 5 vehicles on replacement/renewal. CBC will continue with air quality monitoring	Purchase Euro 5 vehicles on replacement/renewal. LCCC will continue with air quality monitoring
7. Council to implement a sustainable transport method scheme for employees	2012 Castlereagh Borough Council 2022 LCCC	Reduced Vehicle emissions	S	O	1	7	7	Castlereagh Borough Council will assess employee's needs and suggest other sustainable means of transport.	Lisburn & Castlereagh City Council will continue to promote sustainable means of transport
8. Park & Ride Scheme at Quarry Corner Dundonald	2012 DRD Roads Service (NI 2022 DFI	Reduced Vehicle emissions as better use of Public transport	S	O	4	4	16	DRD Roads to purchase land and operate P&R scheme. This is hoped to be in operation within the next 2 years	DRD Roads completed the Park & Ride at Quarry corner on 1st December 2014 which now falls under The Department for Infrastructure.

7 Conclusions and Proposed Actions

7.1 Conclusions from New Monitoring Data

All monitoring at relevant exposure within the Council Area have not shown an increase at key locations in 2022 and are below the AQS objectives.

The NO_2 levels within the AQMA in Dundonald in 2022 have continued to show a reduction and with the success of the new rapid transport system and a change in working patterns they have not returned to pre COVID levels. LCCC shall continue monitoring at the AQMA location in 2023 to establish a further trend in NO_2 levels with a review of the AQMA to be carried out in 2024.

7.2 Conclusions relating to New Local Developments

Lisburn & Castlereagh City Council assessed the NO_2 diffusion tube sites, and found no new sites requiring further monitoring in 2022.

7.3 Proposed Actions

This 2023 Progress Report has identified there is no need to proceed to a detailed assessment for any of the pollutants. LCCC is focused on improving air quality as a whole, therefore all existing monitoring sites shall continue in 2023.

LCCC jointly with Ards and North Down Borough Council initiated a no idling outside schools campaign in 2019, this initiative did not run in 2020 and 2021 due to COVID and re-run in 2022 and was widely promoted on our social media on Clean Air Day 2022.

Although the reduction of NO_2 levels in Dundonald have remained post COVID, the Air Quality Management Area shall remain in place until the possible changes in working pattern are further established and a more accurate review can be carried out in 2024.

The Action Plan published in 2013 has been updated and will be submitted in 2023 when all processes have been completed.

8 References

TG (2009) Part IV of the Environment Act 1995. Local Air Quality Management: Technical

Guidance LAQM.TG(16). Guidance prepared by the Department for Environment, Food and Rural Affairs and the Devolved Administrations, February 2009

Appendices

Appendix A: Quality Assurance / Quality Control (QA/QC) Data

QA/QC Data of automatic sites

Lisburn City & Castlereagh City Council commissioned AQDM Technology to provide the QA/QC of the automatic measurements of NO_2, SO_2, PM_{10},$PM_{2.5}$ for the Kilmakee, Seymour Hill and Dundonald A20 sites. Local authority staff act as the local site operator and visit the sites on a weekly basis carrying out any manual calibration or filter changes required. The sites were repaired as necessary and ESU1 were contracted to service the sites.

Automatic station reports produced by the data Management Company

Air Quality Report

Produced by AQDM on behalf of Castlereagh

CASTLEREAGH DUNDONALD 2022

Fully ratified by AQDM to the LAQM TG22 standards using the AURN methodology

Site Environment and Description

ROADSIDE: Upper Newtownards Road

Map Photo Dashboard

Statistical Summary Report

This 2022 report contains all the statistics required for the LAQM reporting.

The full results and statistics are available from the Northern Ireland website https://www.airqualityni.co.uk.

Daily Air Quality Index (DAQI)

The table below shows the duration within the bands of the Daily Air Quality Index (DAQI).
The DAQI was introduced by Defra in January 2012 and revised April 2013.

DAQI Pollutant	Moderate	High	Very High
Nitrogen Dioxide	0 hours	0	0

Air Quality Exceedances of the AQS Objectives

NO_2 - annual data capture was 98.1 %

The annual mean was 19 µg m^{-3} which did not exceed the 40 µg m^{-3} Objective.

The maximum hourly mean was 98 µg m^{-3} so there were no exceedances of the NO_2 hourly limit of 200 µg m^{-3}. There is an annual allowance of 18 hours so the Objective was not exceeded.

Air Quality Report
CASTLEREAGH DUNDONALD 2022

Air Quality Statistics

Pollutant	NO_2	NO	NO_x
Number Very High #	0	-	-
Number High #	0	-	-
Number Moderate #	0	-	-
Number Low #	8593	-	-
Maximum 15-min mean	107 µg m^{-3}	471 µg m^{-3}	819 µg m^{-3}
Maximum hourly mean	98 µg m^{-3}	398 µg m^{-3}	689 µg m^{-3}
Maximum running 8-hr mean	68 µg m^{-3}	220 µg m^{-3}	400 µg m^{-3}
Maximum running 24-hr mean	58 µg m^{-3}	143 µg m^{-3}	272 µg m^{-3}
Maximum daily mean	53 µg m^{-3}	133 µg m^{-3}	257 µg m^{-3}
Average	19 µg m^{-3}	14 µg m^{-3}	41 µg m^{-3}
Data capture	98.1 %	98.1 %	98.1 %

Daily Air Quality Index (DAQI) as defined by COMEAP January 2012 and revised April 2013
Mass units for the gases are at 20'C and 1013mb
NO_x mass units are NO_x as NO_2 µg m^{-3}

Air Quality Exceedances

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Max Conc	Number	Days	Allowed	Exceeded
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	19 µg m^{-3}	0	-	-	No
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	98 µg m^{-3}	0	0	18 hours	No

Air Quality Report
CASTLEREAGH DUNDONALD 2022

Monthly Data Captures %

Pollutant	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Nitrogen Dioxide	100.0	100.0	100.0	99.9	100.0	100.0	100.0	100.0	100.0	77.8	99.9	100.0

Monthly Means

Pollutant	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Nitrogen Dioxide µg m^{-3}	27	19	25	22	14	14	12	15	14	16	22	29

Air Quality Report

Produced by AQDM on behalf of Lisburn

LISBURN DUNMURRY SEYMOUR HILL 2022

Fully ratified by AQDM to the LAQM TG22 standards using the AURN methodology

Site Environment and Description

URBAN BACKGROUND: Kilmakee Activity Centre

Map Photo Dashboard

Statistical Summary Report

This 2022 report contains all the statistics required for the LAQM reporting.

The full results and statistics are available from the Northern Ireland website
https://www.airqualityni.co.uk

Gravimetric $PM_{2.5}$

The Gravimetric $PM_{2.5}$ is the FIDAS $PM_{2.5}$ / 1.06

Daily Air Quality Index (DAQI)

The table below shows the duration within the bands of the Daily Air Quality Index (DAQI).
The DAQI was introduced by Defra in January 2012 and revised April 2013.

DAQI Pollutant	Moderate	High	Very High
PM_{10} Particulate Matter	1 day	0	0
$PM_{2.5}$ Particulate Matter	2 days	0	0
Sulphur Dioxide	0 15-minutes	0	0

Gravimetric PM_{10} was Moderate on 22nd Mar with a daily mean reaching 51 µg m^{-3}.
Gravimetric $PM_{2.5}$ was Moderate on 22nd 26th Mar with a daily mean reaching 39 µg m^{-3}.

Air Quality Report

Air Quality Exceedances of the AQS Objectives

Gravimetric PM_{10} - annual data capture was 92.7 %
The annual mean was 12 µg m^{-3} which did not exceed the 40 µg m^{-3} Objective.

The maximum daily mean was 51 µg m^{-3} so there was 1 exceedance of the PM_{10} daily limit of 50 µg m^{-3}. There is an annual allowance of 35 days so the Objective was not exceeded.

Gravimetric $PM_{2.5}$ - annual data capture was 92.7 %
The annual mean was 8 µg m^{-3} which did not exceed the 25 µg m^{-3} Objective. Note that the $PM_{2.5}$ standard is not set in the regulations.

There should be a 15% cut in urban background exposure (annual mean) for all Local Authorities from 2010 to 2020.

SO_2 - annual data capture was 79.6 %
The maximum 15-minute mean was 40 µg m^{-3} so there were no exceedances of the SO_2 15-minute limit of 266 µg m^{-3}. There is an annual allowance of 35 15-minute means so the Objective was not exceeded.

The maximum hourly mean was 35 µg m^{-3} so there were no exceedances of the SO_2 1-hour limit of 350 µg m^{-3}. There is an annual allowance of 24 hours so the Objective was not exceeded.

The maximum daily mean was 22 µg m^{-3} so there were no exceedances of the SO_2 daily limit of 125 µg m^{-3}. There is an annual allowance of 3 days so the Objective was not exceeded.

The annual mean was 3 µg m^{-3} which did not exceed the 20 µg m^{-3} Objective.

Air Quality Report

LISBURN DUNMURRY SEYMOUR HILL 2022

Air Quality Statistics

Pollutant	Grav PM_{10}+	Grav $PM_{2.5}$~	$PM_1$$	SO_2	Wind Dir	Wind Speed
Number Very High #	0	0	-	0	-	-
Number High #	0	0	-	0	-	-
Number Moderate #	1	2	-	0	-	-
Number Low #	336	335	-	27981	-	-
Maximum 15-min mean	-	-	166 µg m^{-3}	40 µg m^{-3}	-	-
Maximum hourly mean	127 µg m^{-3}	110 µg m^{-3}	114 µg m^{-3}	35 µg m^{-3}	-	-
Maximum running 8-hr mean	81 µg m^{-3}	73 µg m^{-3}	76 µg m^{-3}	31 µg m^{-3}	-	-
Maximum running 24-hr mean	53 µg m^{-3}	40 µg m^{-3}	38 µg m^{-3}	22 µg m^{-3}	-	-
Maximum daily mean	51 µg m^{-3}	39 µg m^{-3}	37 µg m^{-3}	22 µg m^{-3}	-	-
99.9th percentile of 15-min means†	-	-	-	29 µg m^{-3}	-	-
99.7th percentile of hourly means†	-	-	-	24 µg m^{-3}	-	-
99.2nd percentile of daily means†	-	-	-	12 µg m^{-3}	-	-
Average	12 µg m^{-3}	8 µg m^{-3}	6 µg m^{-3}	3 µg m^{-3}	-	-
Data capture	92.7 %	92.7 %	92.7 %	79.6 %	0.0 %	0.0 %

Daily Air Quality Index (DAQI) as defined by COMEAP January 2012 and revised April 2013
† Percentile required for annual data capture < 85%
+ Gravimetric PM_{10} as measured by a FIDAS instrument using 1 gravimetric factor
~ Gravimetric $PM_{2.5}$ as measured by a FIDAS instrument using 0.94 gravimetric factor
$ PM_1 as measured by a FIDAS instrument
Mass units for the gases are at 20'C and 1013mb

Air Quality Exceedances

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Max Conc	Number	Days	Allowed	Exceeded
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 40 µg m^{-3}	12 µg m^{-3}	0	-	-	No
PM_{10} Particulate Matter (Gravimetric)	Daily mean > 50 µg m^{-3}	51 µg m^{-3}	1	1	35 days	No
$PM_{2.5}$ Particulate Matter (Gravimetric) *	Annual mean > 25 µg m^{-3}	8 µg m^{-3}	0	-	-	No
Sulphur Dioxide	15-minute mean > 266 µg m^{-3}	40 µg m^{-3}	0	0	35 15 mins	No
Sulphur Dioxide	Hourly mean > 350 µg m^{-3}	35 µg m^{-3}	0	0	24 hours	No
Sulphur Dioxide	Daily mean > 125 µg m^{-3}	22 µg m^{-3}	0	0	3 days	No
Sulphur Dioxide	Annual mean > 20 µg m^{-3}	3 µg m^{-3}	0	-	-	No

Air Quality Report

LISBURN DUNMURRY SEYMOUR HILL 2022

Monthly Data Captures %

Pollutant	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Grav PM_{10}	100.0	100.0	100.0	100.0	100.0	69.3	82.1	97.0	74.4	89.2	100.0	100.0
Grav $PM_{2.5}$	100.0	100.0	100.0	100.0	100.0	69.3	82.1	97.0	74.4	89.2	100.0	100.0
PM_1	100.0	100.0	100.0	100.0	100.0	69.3	82.1	97.0	74.4	89.2	100.0	100.0
Sulphur Dioxide	97.7	98.8	95.6	90.1	91.8	6.3	0.0	90.3	100.0	97.4	93.1	95.4

Monthly Means

Pollutant	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Grav PM_{10} µg m^{-3}	17	10	22	13	10	10	8	9	9	11	12	15
Grav $PM_{2.5}$ µg m^{-3}	11	6	15	8	6	6	5	5	5	6	8	12
PM_1 µg m^{-3}	9	4	13	7	4	4	4	3	3	4	6	11
Sulphur Dioxide µg m^{-3}	2	3	4	5	6	6	-	1	1	1	5	7

QA/QC of Diffusion Tube Monitoring

In 2022 the NO_2 tubes were supplied, prepared and analysed by Gradko International Limited, using the preparation method 20%TEA/Water.

Diffusion Tube Bias Adjustment Factors

Factor from Local Co-location Studies

A co-location study was carried out at the Dundonald site and the data submitted to the national data base.
https://laqm.defra.gov.uk/air-quality/air-quality-assessment/national-bias/

The local bias adjustment figure has been calculated as **0.81.**

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/23

Follow the steps below in the correct order to show the results of relevant co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2023
LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List
If a laboratory is not shown, we have no data for this laboratory.

Step 2: Select a Preparation Method from the Drop-Down List
If a preparation method is not shown, we have no data for this method at this laboratory.

Step 3: Select a Year from the Drop-Down List
If a year is not shown, we have no data[2]

Step 4: Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.
If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[2] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[5]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2022	R	Gateshead Council	11	30	23	29.0%	G	0.77
Gradko	20% TEA in water	2022	R	Gateshead Council	9	31	36	-14.0%	G	1.16
Gradko	20% TEA in Water	2022	R	Lisburn & Castlereagh City Council	12	24	19	23.7%	G	0.81
Gradko	20% TEA in Water	2022	R	Monmouthshire County Council	12	35	28	23.8%	G	0.81

Decision to use the bias adjustment factor 0.83

The results of the local co-location study at the Dundonald site were submitted to the national data base, the Dundonald local bias adjustment factor was calculated at **0.81,** this co-location study is 30M from the AQMA in Dundonald and is on one of the main arterial routes into Belfast City centre.

The March 2023 national bias adjustment figure for Gradko in 2022 is **0.83.**

As in recent years a decision was made to apply the national figure of **0.83** as 27 studies were included in this and therefore deemed to be a more realistic figure and therefore will show a more accurate trend. .

A copy of the National bias adjustment spread sheet can be found below:

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/23

Follow the steps below **in the correct order** to show the results of **relevant** co-location studies
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet
This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2023

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Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1:	Step 2:	Step 3:	Step 4:
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory	If a year is not shown, we have no data[2]	If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[5] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2022	R	Southampton City Council	12	34	31	8.4%	G	0.92
Gradko	20% TEA in water	2022	R	Worcestershire	11	13	12	4.2%	G	0.96
Gradko	20% TEA in water	2022	R	Lancaster City Council	13	34	27	25.8%	G	0.79
Gradko	20% TEA in water	2022	R	Lancaster City Council	12	28	24	15.2%	G	0.87
Gradko	20% TEA in water	2022		**Overall Factor[3] (27 studies)**				**Use**		**0.83**