2022
Air Quality Progress Report

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

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Mid & East Antrim Borough Council

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Executive Summary

Mid and East Antrim Borough Council (MEABC) has completed this 2022 Air Quality Progress Report in accordance with the provisions of the Environment (Northern Ireland) Order 2002, the Northern Ireland Local Air Quality Management Policy Guidance document LAQM.PGNI (16) and associated tools. In undertaking this report, a review of 2021 ambient air quality monitoring data has been completed across the borough in order to identify locations where new or existing exceedances of Air Quality Strategy (AQS) objectives and European Commission limit values are occurring. It also considers any potential new pollutant emission sources that may have an impact on local air quality.

Mid and East Antrim Borough Council currently have two declared Air Quality Management Areas (AQMAs) enacted due to exceedances of the AQS objectives for Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}):

- Ballymena Ballykeel AQMA - PM_{10}
- Ballymena Linenhall Street AQMA - NO_2

Monitoring of NO_2, PM_{10} and SO_2 is completed across Mid and East Antrim Borough Council using two automatic monitoring sites and a network of passive NO_2 diffusion tubes.

This report confirms that the results from automatic NO_2, PM_{10} and SO_2 monitoring during 2021 showed that all NO_2, PM_{10} and SO_2 AQS objectives were met at the Ballymena Ballykeel monitoring site, located within the Ballykeel AQMA, and all NO_2 AQS objectives were met at the Ballymena Antrim Road monitoring site. At both automatic monitoring sites, the annual mean NO_2 concentrations have increased by 1 µg/m^3 since 2020, most likely a result from the easing of Covid restrictions with people returning to the office and schools returning, increasing the traffic flows within the Ballymena area. NO_2 levels in 2021 remain below pre-Covid levels at both sites. The 2021 monitoring results for PM_{10} within the Ballymena Ballykeel AQMA remain well below the AQS objective for PM_{10}.

NO_2 concentrations at diffusion tube monitoring sites in 2021 did increase slightly at most monitoring locations within the Borough, as traffic flows increased as a result of Covid restrictions easing. The NO_2 diffusion tube located within the declared Ballymena Linenhall Street AQMA (BDT15) remains high, approaching the AQS annual mean objective, as well as two further diffusion tubes located just outside this declared AQMA (BDT07 and BDT17).

The 2021 monitoring data shows compliance with the air quality objectives at monitoring sites within the borough including within the two declared AQMA's and that there is no need to proceed to a detailed assessment based on the 2021 monitoring data.

Government guidance continues to encourage home working in 2021 and traffic flows were still reduced from pre-Covid levels. Although the reduction of NO_2 and PM_{10} levels in Ballymena have continued, the Air Quality Management Areas shall remain until an accurate trend in NO_2 and PM_{10} levels can be established, following the easing of Covid restrictions.

The proposed actions from the Mid and East Antrim Borough Council 2022 Progress Report are as follows:

- Continue to undertake both automatic (NO_2, PM_{10}, $PM_{2.5}$ and SO_2) and passive (NO_2) monitoring to identify future trends in concentration and any exceedances of the AQS objectives,
- The Ballymena Ballykeel and Ballymena Linenhall Street AQMAs will be retained and monitoring will continue within the AQMAs to assess the need for retention of the AQMAs in the future. Review the 2022 automatic monitoring data for PM_{10} within the Ballymena Ballykeel AQMA with a view to revoking the AQMA,
- Continue to gather emissions information for identified new local developments potential sources to determine the impact upon local air quality,
- Continue to examine all planning applications within the Borough to ensure compliance with Air Quality Strategy objectives,
- Proceed to an Annual Progress Report in 2023.

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1 Introduction

1.1 Description of Local Authority Area

Mid and East Antrim Borough Council (MEABC) was established on the 1st of April 2015 through the merging of three separate Boroughs: Ballymena Borough Council, Carrickfergus Borough Council and Larne Borough Council, following Local Government reorganisation in Northern Ireland. Mid and East Antrim is located within County Antrim along the eastern coast from Greenisland in the south, to north of Carnlough and stretching west to bound with Lough Beg. The Borough covers an area just over 400 square miles with the main settlements being Ballymena to the West, Larne to the East, and Carrickfergus to the Southeast. It has a population of over 139,000 people.

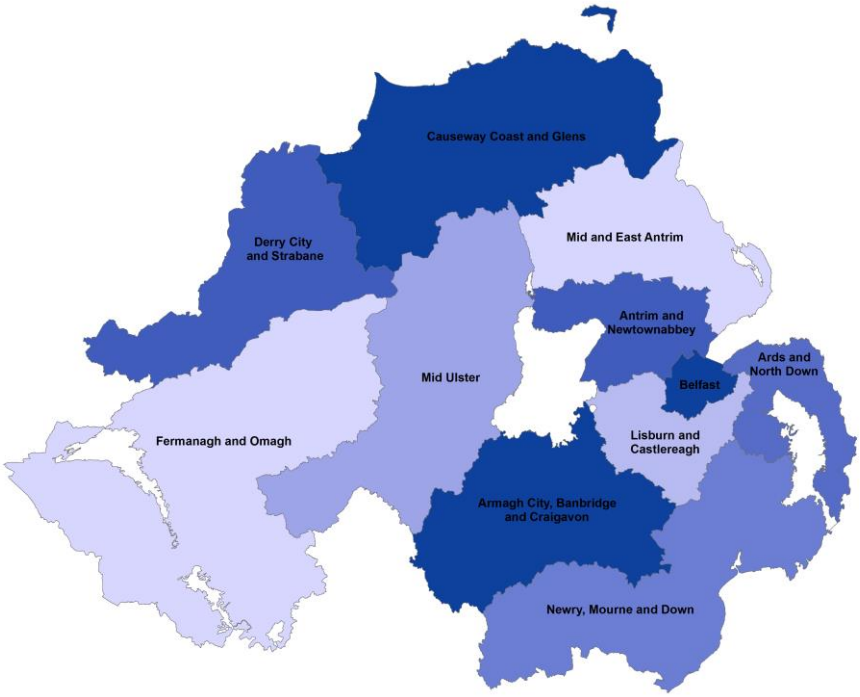


Figure 1.1 - Map showing location of MEABC within Northern Ireland

Figure 1.2 - Map of Mid and East Antrim Borough Boundaries

The main source of air pollution within the Borough is from road traffic, with good road links to Belfast and its two associated airports and also to the seaports of Larne and Belfast. A number of homes within the Borough continue to burn solid fuel although this number has declined over the years due to the arrival of Phoenix piped natural gas and the Northern Ireland Housing Executive home improvement schemes.

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 exceedances 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 exceedance 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 exceedances 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 Assessment Reports

Mid and East Antrim Borough Council was formed on 1st April 2015 comprised of the former Ballymena, Larne and Carrickfergus Borough Councils. The 2015 Updating and Screening Assessment was the first air quality report produced for this new geographical area. Included in Table 1.2 below are summaries of the reviews and assessments completed since that time. Previous reports submitted by Larne Borough Council and Carrickfergus Borough Council showed that air quality objectives had been met, that no detailed assessments were required and no AQMA's had been declared. Previous reports submitted by Ballymena Borough Council highlighted that three AQMA's had been declared in relation to the exceedance of the Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10}) air quality objectives. Ballymena Dunclug AQMA was declared in 2004 for the exceedance of PM_{10} however has since been revoked in 2011. Ballymena Ballykeel AQMA, shown in Figure 1.3, was declared in 2004 in respect of PM_{10} concentrations predicted by domestic fuel modelling exceeding the AQS annual mean objective and Ballymena Linenhall Street AQMA, shown in Figure 1.4, was declared in 2010 due to modelled and monitored concentrations of NO_2 exceeding the AQS annual mean objective, both these AQMAs are currently in force.

Table 1.2 – Summary of Mid and East Antrim Borough Council Previous Review and Assessment Reports.

Previous Assessment	Date completed	Summarised Outcomes
LAQM Updating and Screening Assessment 2015	August 2015	Exceedance of NO_2 annual mean AQS objective within Linenhall Street AQMA. No detailed assessment required for any of the seven pollutants. Ballykeel and Linenhall Street AQMAs to remain. Monitoring of SO_2, NO_2 and PM_{10} to continue.
LAQM Annual Progress Report 2016	November 2016	Exceedance of NO_2 annual mean AQS objective within Linenhall Street AQMA. SO_2 and PM_{10} objectives met. No requirement for detailed assessment.

LAQM Annual Progress Report 2017	August 2017	Exceedance of NO_2 annual mean AQS objective within Linenhall Street AQMA. SO_2 and PM_{10} objectives met. No requirement for detailed assessment.
LAQM Updating and Screening Assessment 2018	November 2018	Renewal of Detailed assessment for NO_2. Exceedance of NO_2 annual mean AQS objective within Linenhall Street AQMA. Monitoring of SO_2, NO_2, PM_{10} to continue. Some relocation of NO_2 tubes required.
LAQM Annual Progress Report 2019	August 2019	Exceedance of NO_2 annual mean AQS objective within Linenhall Street AQMA. SO_2 and PM_{10} objectives met. No requirement for detailed assessment.
LAQM Annual Progress Report 2020	August 2020	Exceedance of NO_2 annual mean AQS objective within Linenhall Street AQMA. SO_2 and PM_{10} objectives met. No requirement for detailed assessment.
LAQM Updating and Screening Assessment 2021	November 2021	No further detailed assessments required for any pollutants. No exceedances of NO_2, SO_2 and PM_{10} AQS objectives. Ballykeel and Linenhall Street AQMAs to remain. Monitoring of NO_2, SO_2 and PM_{10} to continue.

Figure 1.3 - Map of Ballymena Ballykeel AQMA declared for PM_{10}, showing location of Automatic Analyser, which is part of AURN Network

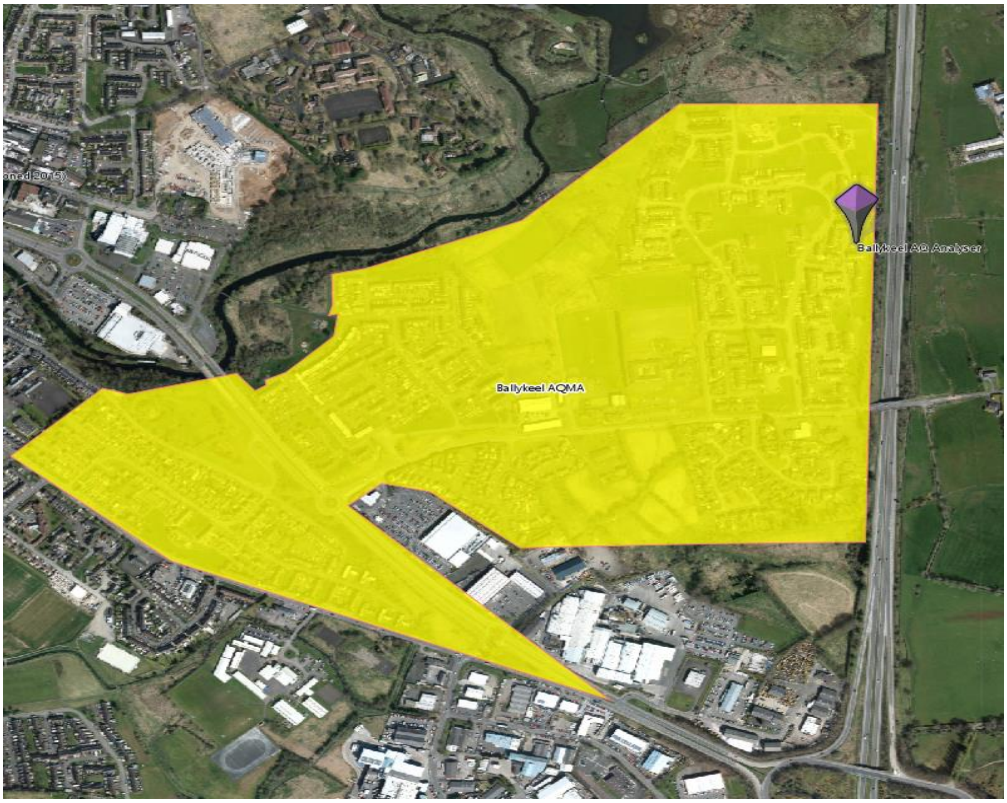


Figure 1.4 - Map of Ballymena Linenhall Street AQMA, declared for NO_2

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Mid and East Antrim Borough Council has two automatic monitoring sites:

- **Ballymena Ballykeel**

This is a long established, part of the DEFRA AURN Network, urban background monitoring site and is located within the Ballymena Ballykeel AQMA declared for PM_{10}.

  - Concentrations of Sulphur Dioxide (SO_2) are continuously monitored using a real time ultraviolet fluorescent SO_2 analyser.
  - From 01/01/2021 to 31/05/2021 concentrations of Particulate Matter (PM_{10}) were continuously monitored using a Tapered Element Oscillating Microbalance (TEOM) with Filter Dynamics Measurement System (FDMS), with VCM correction applied. From 01/06/2021 to 31/12/2021 a new FIDAS analyser was installed to monitor PM_{10} and $PM_{2.5}$ concentrations.
  - A real time NO_x chemiluminescence analyser continuously monitors concentrations of Nitrogen Oxide, Nitrogen Oxides and Nitrogen Dioxide.
  - Also located at this site is a DEFRA PAH and black carbon monitor.

- **Ballymena Antrim Road**

Ballymena Antrim Road site was installed in 2017 as part of an expansion of the DEFRA UK Automatic Urban and Rural Network (AURN) in compliance with the UK's monitoring requirements to comply with The Ambient Air Quality Directive 2008/50/EC.

  - This is an urban roadside real-time NO_x chemiluminescence analyser continuously monitoring concentrations of Nitrogen Oxide (NO), Nitrogen Oxides (NO_x) and Nitrogen Dioxide (NO_2).
  - A co-location study for the NO_2 diffusion tubes is also located at this site, results from this study were submitted to the national data base for 2021.

Table 2.1 provides further details on both automatic monitoring sites within the Borough and their locations are shown in Figures 2.1 and 2.2. Data management/auditing details for the analysers are included in Appendix A.

Figure 2.1 - Location of Ballymena Ballykeel Automatic Monitoring Site

Figure 2.2 - Location of Ballymena Antrim Road Automatic Monitoring Site

Table 2.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS 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?
BALY	Ballymena Ballykeel	Urban Background	312365	402940	3.0	PM_{10} SO_2 NO_2	Y	TEOM (01/01/2021 – 31/05/2021)) FIDAS (01/06/2021 – 31/12/2021) Fluorescent Chemiluminescence	Y (11m)	N/A	N
BAAR	Ballymena Antrim Road	Urban Traffic	310843	401776	1.5	NO_2	N	Chemiluminescence	Y (8.8m)	4.3	Y

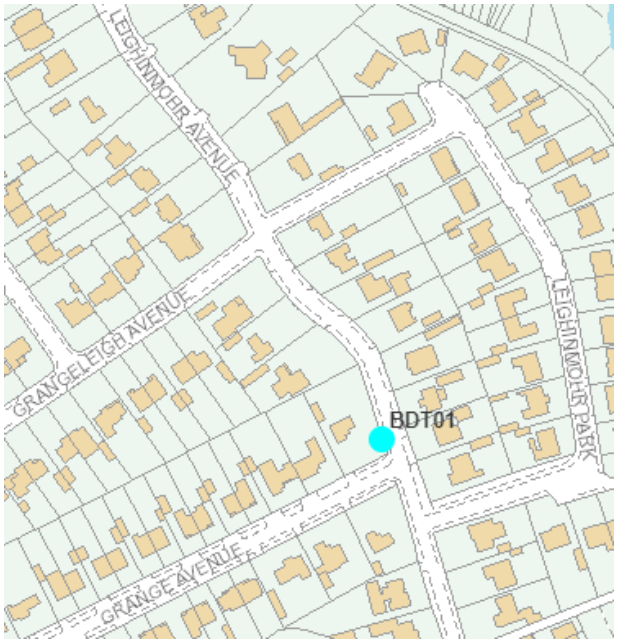
2.1.2 Non-Automatic Monitoring Sites

In 2021, Mid and East Antrim Borough Council had 37 sites monitored with 41 passive NO_2 diffusion tubes. The locations of these sites are shown in Figure 2.3 and details of the monitoring network are provided in Table 2.2.

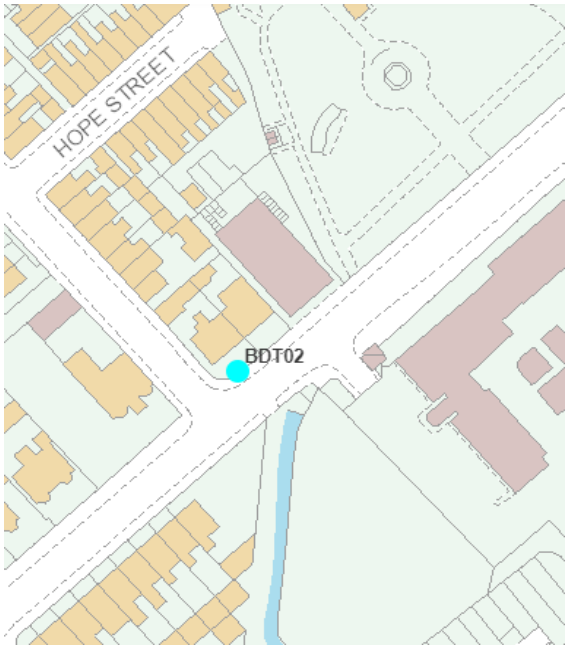
29 of these sites are roadside/kerbside, being located on arterial routes within the three main towns of the borough: Ballymena, Carrickfergus and Larne. There are also 5 urban background monitoring sites.

A triplicate set of NO_2 diffusion tubes are co-located with the automatic NO_x analyser at the Ballymena Antrim Road site. In addition, there are two sets of duplicate diffusion tubes located at 55 Shore Road, Greenisland and Model PS Belfast Road, Carrickfergus.

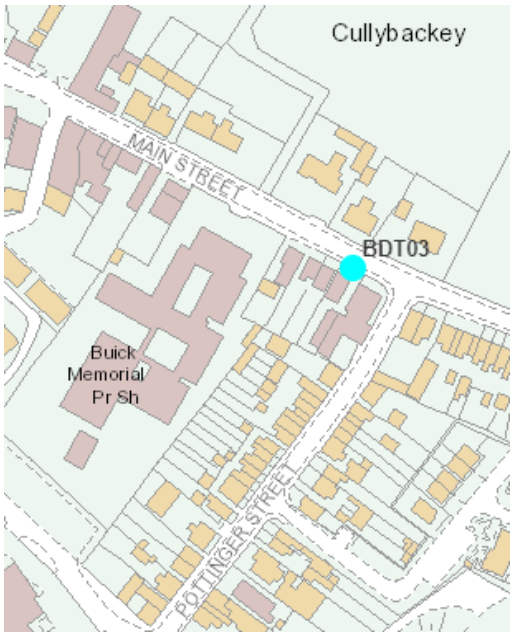
Figure 2.3 – Maps of Non-Automatic Monitoring Sites within Mid and East Antrim Borough Council

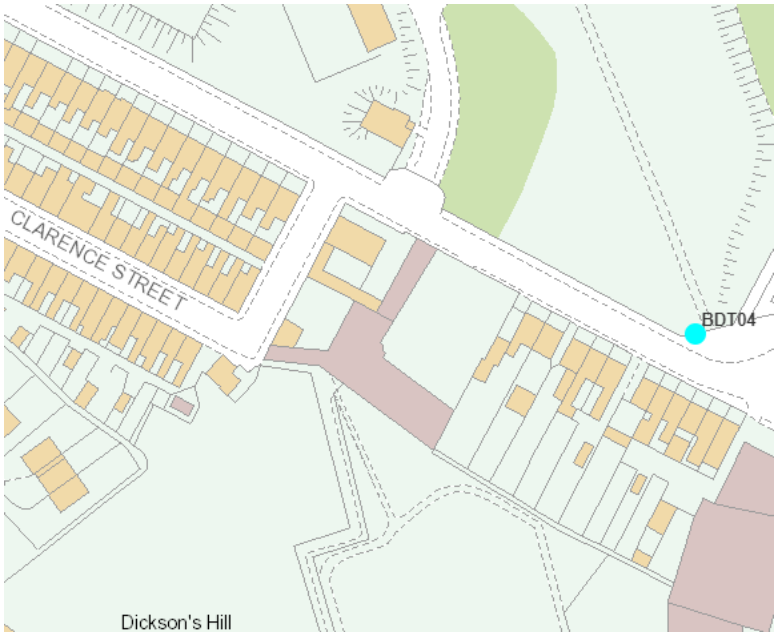


BDT01 – Leighinmohr Avenue, Ballymena

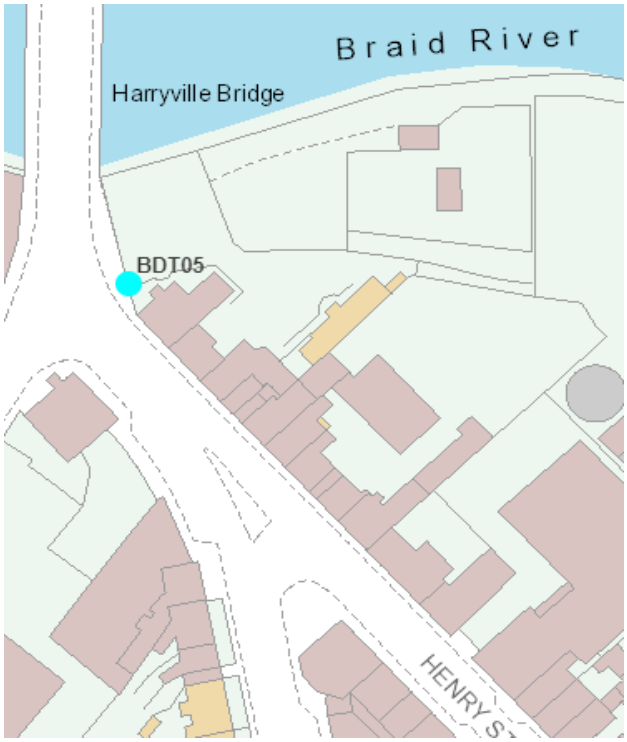


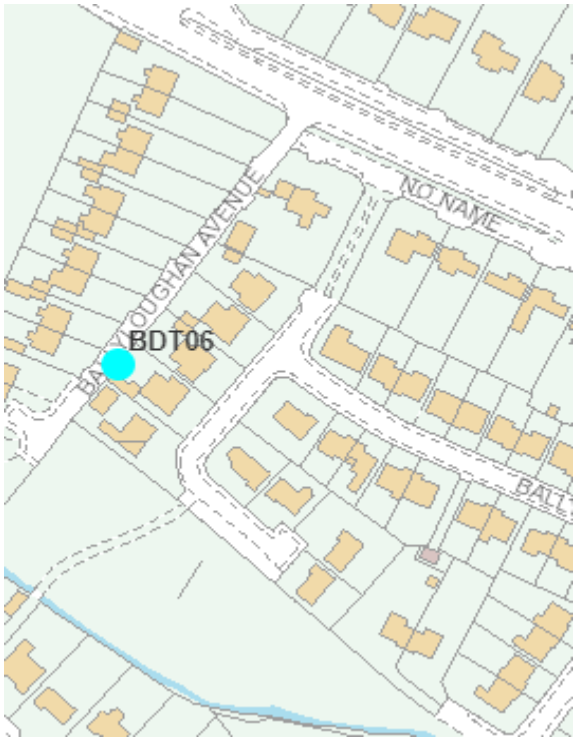
BDT02 – Galgorm Road, Ballymena



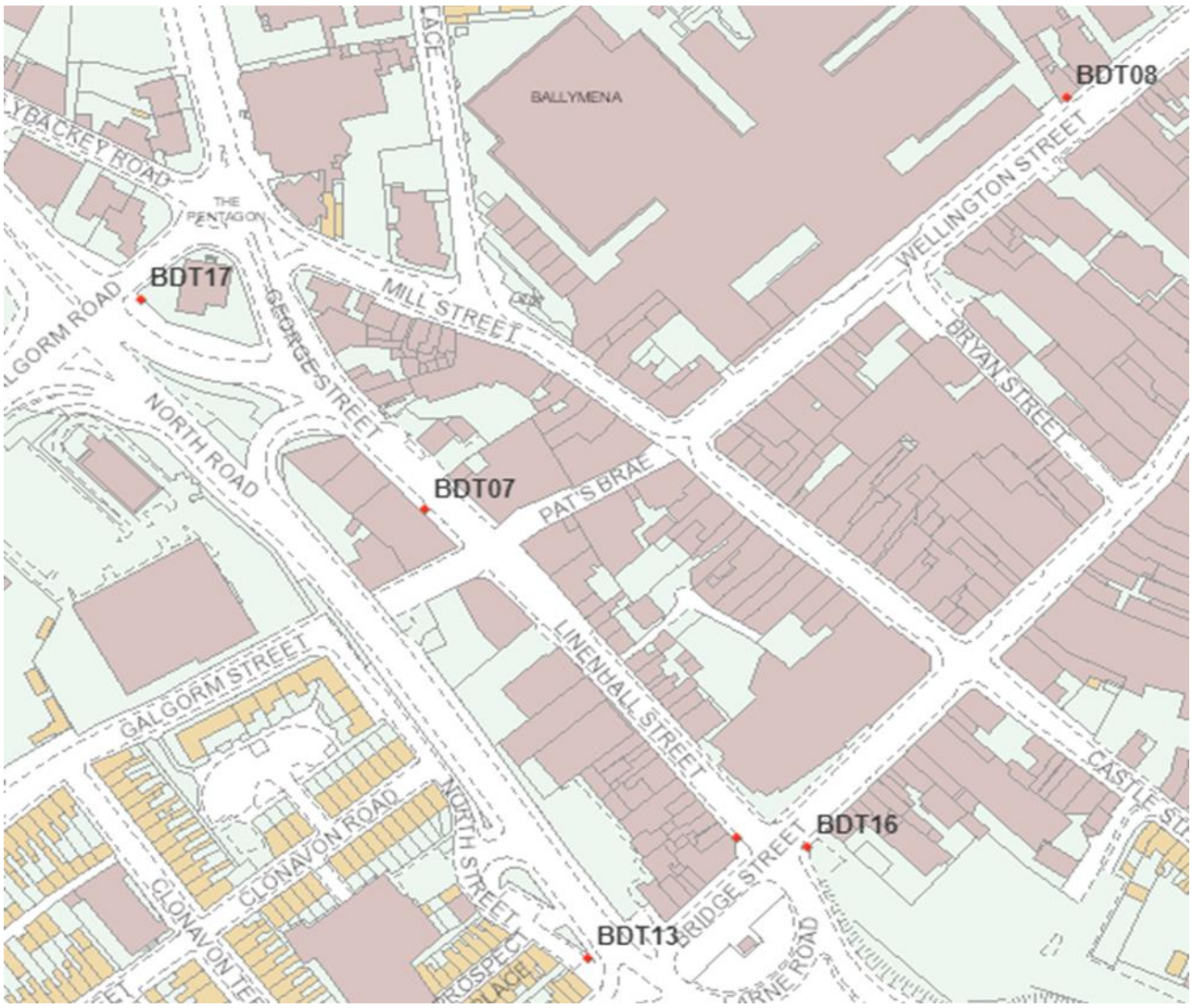


BDT03 – Main Street, Cullybackey **BDT04 – Cullybackey Road, Ballymena**





BDT05 – Larne Street, Ballymena **BDT06 – Ballyloughan Ave, Ballymena**



BDT07 – George Street, Ballymena

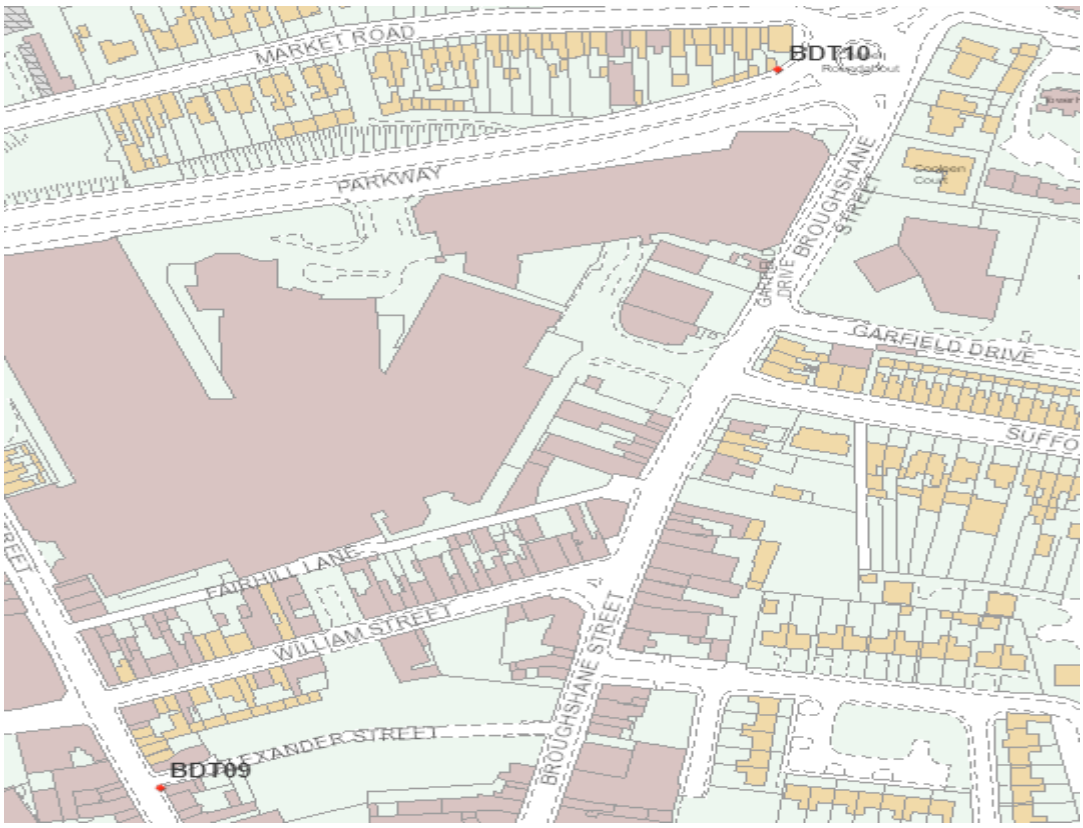
BDT08 – Wellington Street, Ballymena

BDT13 – North Road, Ballymena

BDT15 – Linenhall Street, Ballymena

BDT16 – Bridge Street, Ballymena

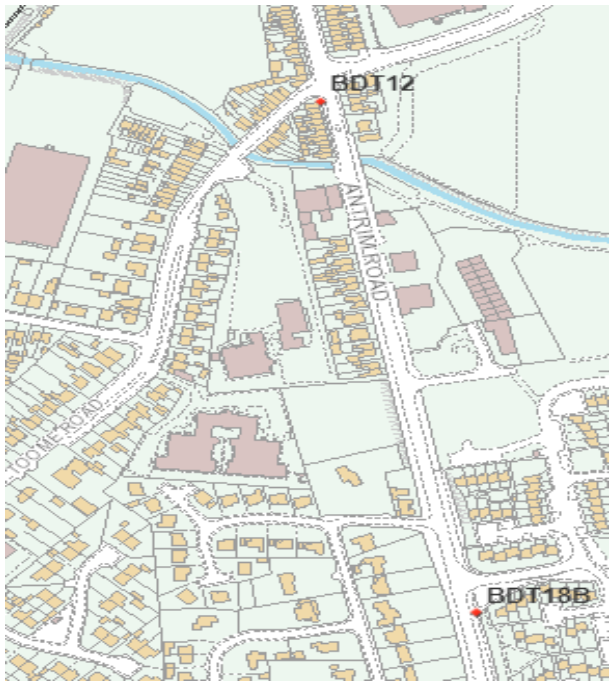
BDT17 – Galgorm Road, Ballymena



BDT09 – Ballymoney Street, Ballymena

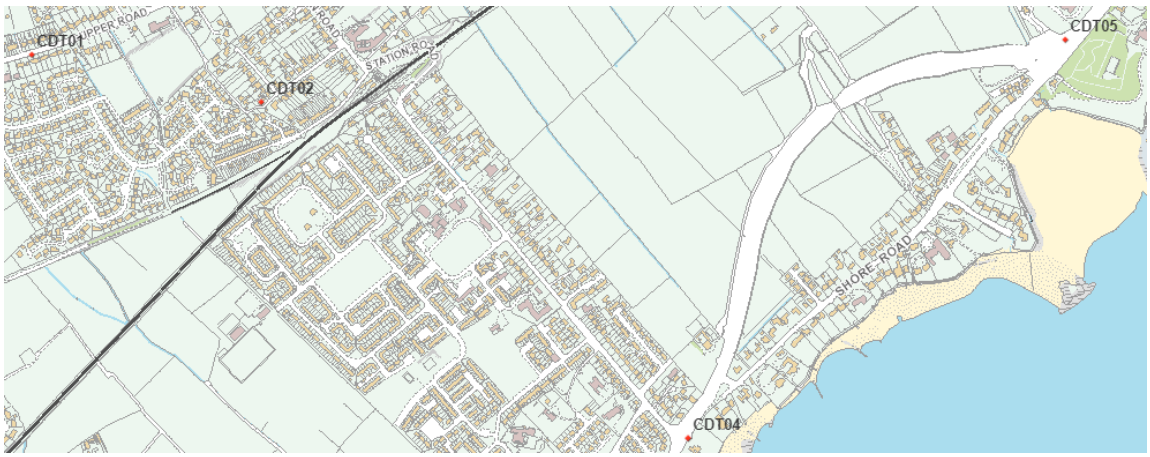
BDT10 – Parkway, Ballymena

BDT11 – Lisnevenagh Road, Ballymena



BDT12 – Queen Street, Ballymena

BDT18, 18A & 18B – Antrim Road, Ballymena

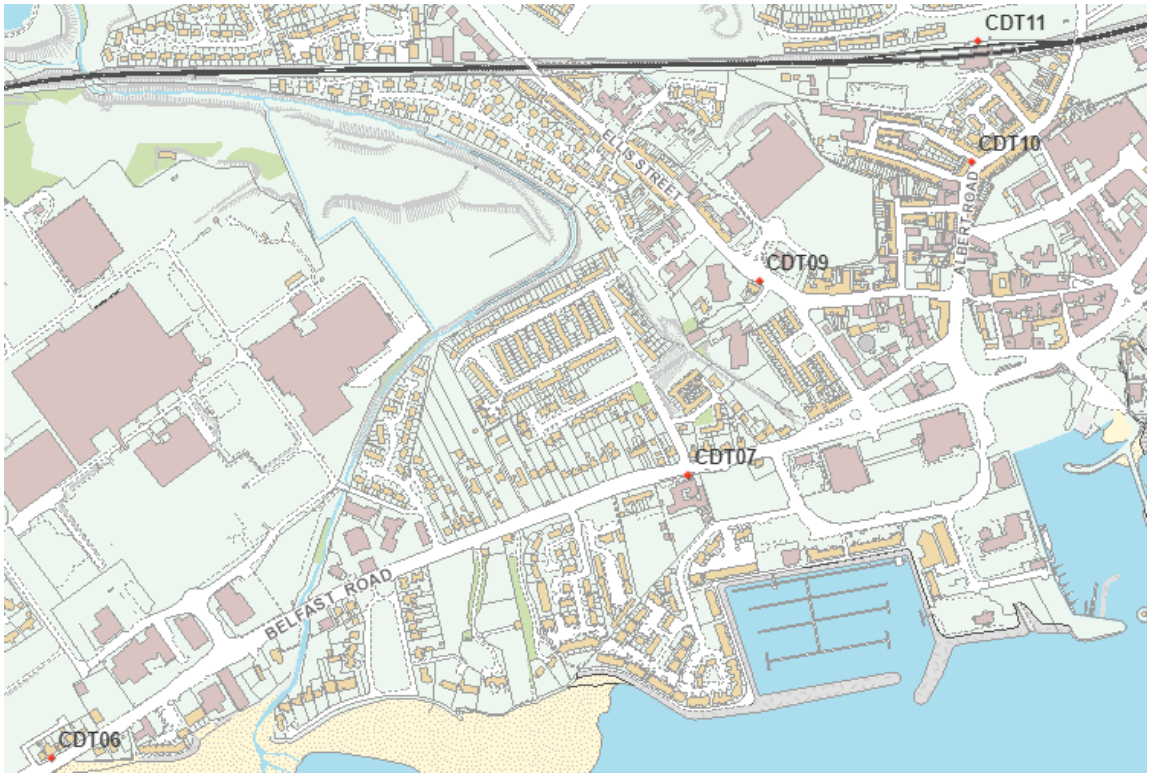


CDT01 - 27 Upper Road, Greenisland

CDT02 – 32 Mullaghmore, Carrickfergus

CDT03 & CDT04 – Shore Road Roundabout, Carrickfergus (Duplicate)

CDT05 – Seapark Roundabout, Carrickfergus



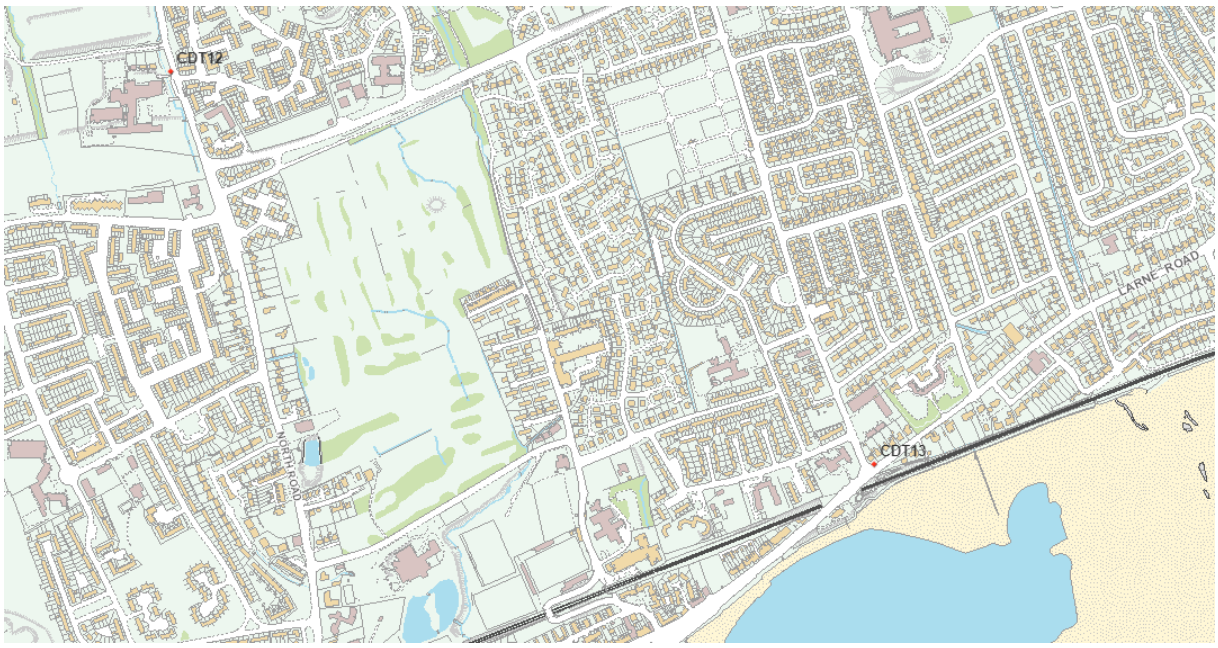
CDT06 – 93 Belfast Road, Carrickfergus

CDT07 & CDT08 – Model Primary School, Belfast Road, Carrickfergus (Duplicate)

CDT09 – Minorca Place/Tesco Junction, Carrickfergus

CDT10 – 42 Albert Road, Carrickfergus

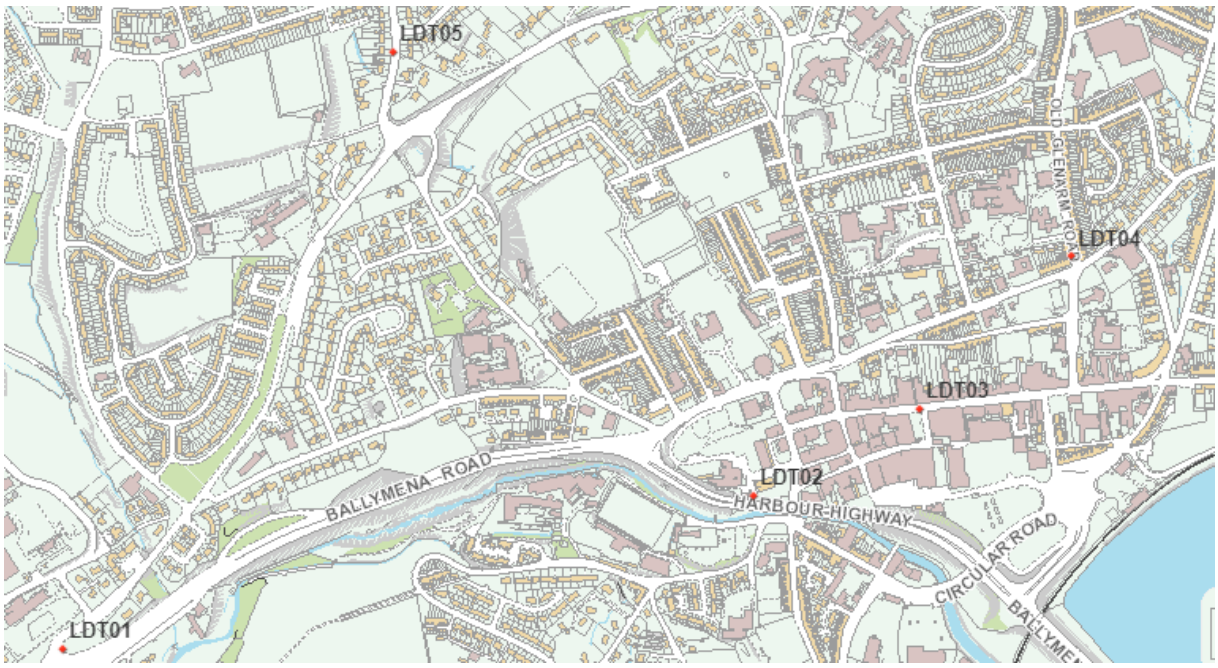
CDT11 – Railway Station, Fergus Avenue, Carrickfergus



CDT12 – North Road, Carrickfergus

CDT13 – Victoria Rd/Larne Road Junction, Carrickfergus

CDT14 – Islandmagee Road, Carrickfergus



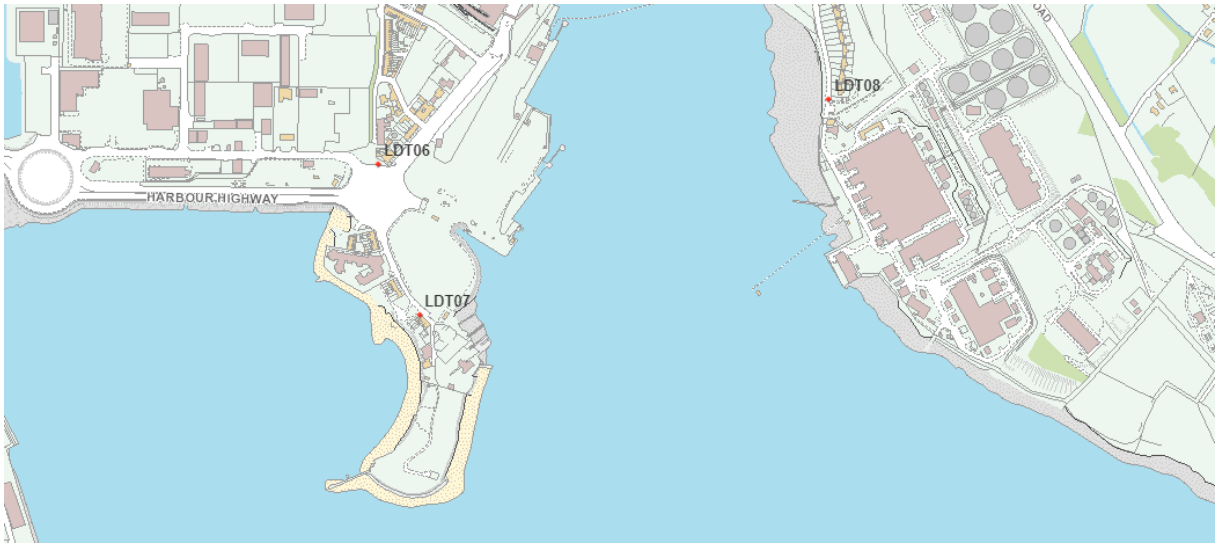
LDT01 – Antiville/A8 Junction, Larne

LDT02 – Latharna House, Larne

LDT03 – Main Street, Larne

LDT04 – Victoria Road/Old Glenarm Road Junction, Larne

LDT05 – Upper Cairncastle Road, Larne



LDT06 – Larne Harbour Roundabout

LDT07 – Coastguard Road/Castle Terrace, Larne

LDT08 – Ballylumford Road, Islandmagee (Ballylumford Power Station)

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?
BDT01	Leighinmohr Ave, Ballymena	Urban Background	310228	402546	4.0	NO_2	N	N	Y (5.5)	N/A	N
BDT02	Galgorm Rd, Ballymena	Kerbside	310336	403196	3.0	NO_2	N	N	Y (1.0)	1.8	Y
BDT03	Main St, Cullybackey	Kerbside	305841	405690	3.0	NO_2	N	N	Y (1.0)	1.0	Y
BDT04	Cullybackey Rd, Ballymena	Kerbside	310350	403443	4.0	NO_2	N	N	Y (11.6)	2.3	Y
BDT05	Larne St, Ballymena	Kerbside	310602	402920	4.0	NO_2	N	N	Y (6.2)	3.2	Y
BDT06	Ballyloughan Ave, Ballymena	Urban Background	309532	404425	3.0	NO_2	N	N	N	N/A	N
BDT07	George St, Ballymena	Kerbside	310584	403239	3.0	NO_2	N	N	Y (0)	1.7	Y
BDT08	Wellington St, Ballymena	Kerbside	310795	403386	3.0	NO_2	N	N	Y (0)	1.7	Y
BDT09	Ballymoney St, Ballymena	Kerbside	310796	403582	3.0	NO_2	N	N	Y (0)	3.7	Y

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?
BDT10	Parkway, Ballymena	Kerbside	311000	403905	4.0	NO_2	N	N	Y (1.0)	1.5	Y
BDT11	Lisnevenagh Rd, Ballymena	Roadside	311884	397037	4.0	NO_2	N	N	Y (38.0)	2.6	Y
BDT12	Queen St, Ballymena	Kerbside	310743	402219	4.0	NO_2	N	N	Y (0)	2.5	Y
BDT13	North Road, Ballymena	Roadside	310638	403079	2.0	NO_2	N	N	Y (7.0)	5.0	Y
BDT15	Linenhall St, Ballymena	Kerbside	310687	403122	3.0	NO_2	Y	N	Y (0)	1.2	Y
BDT16	Bridge St, Ballymena	Kerbside	310710	403119	3.0	NO_2	N	N	Y (14.0)	3.0	Y
BDT17	Galgorm Rd, Ballymena	Kerbside	310491	403314	4.0	NO_2	N	N	Y (13.0)	3.5	Y
BDT18	Antrim Rd, Ballymena	Roadside	310843	401776	1.6	NO_2	N	Co Located Antrim Rd	Y (8.8)	4.3	Y
BDT18A	Antrim Rd, Ballymena	Roadside	310843	401776	1.6	NO_2	N	Co Located Antrim Rd	Y (8.8)	4.3	Y
BDT18B	Antrim Rd, Ballymena	Roadside	310843	401776	1.6	NO_2	N	Co Located Antrim Rd	Y (8.8)	4.3	Y

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?
CDT01	27 Upper Rd, Greenisland	Roadside	336388	385733	3.0	NO_2	N	N	Y (1.0)	2.0	Y
CDT02	32 Mullaghmore Pk,Greenisland	Urban Background	336901	385621	2.0	NO_2	N	N	N	N/A	N
CDT03 (Duplicate)	55 Shore Rd, Greenisland	Roadside	337882	384850	3.0	NO_2	N	N	Y (14.0)	3.0	Y
CDT04 (Duplicate)	55 Shore Rd, Greenisland	Roadside	337882	384850	3.0	NO_2	N	N	Y (14.0)	3.0	Y
CDT05	Seapark R'about, Carrickfergus	Roadside	338747	385764	3.0	NO_2	N	N	Y (58.0)	1.0	Y
CDT06	93 Belfast Rd, Carrickfergus	Roadside	339915	386731	2.0	NO_2	N	N	Y (0)	1.7	Y
CDT07 (Duplicate)	Model PS Belfast Rd, Carrickfergus	Roadside	340798	387122	2.0	NO_2	N	N	Y (0)	3.0	Y

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?
CDT08 (Duplicate)	Model PS Belfast Rd, Carrickfergus	Roadside	340798	387122	2.0	NO_2	N	N	Y (0)	3.0	Y
CDT09	Minorca Pl/ Tesco Jct, Carrickgfergus	Roadside	340898	387391	3.0	NO_2	N	N	Y (3.0)	2.5	Y
CDT10	42 Albert Rd Carrickfergus	Roadside	341192	387556	3.0	NO_2	N	N	Y (0)	1.0	Y
CDT11	Fergus Ave, Carrickfergus	Railway	341200	387723	3.0	NO_2	N	N	Y (39.0)	2.0	Y
CDT12	North Road, Carrickfergus	Roadside	341065	388892	3.0	NO_2	N	N	Y (3.0)	2.0	Y
CDT13	Victoria Rd/Larne Rd Jct, C'fergus	Roadside	342388	388154	3.0	NO_2	N	N	Y (0)	2.0	Y
CDT14	Islandmagee Rd, Whitehead	Roadside	347333	392459	3.0	NO_2	N	N	Y (10.0)	1.9	Y
LDT01	Antiville Rd/A8 Jct, Larne	Roadside	338658	402187	3.0	NO_2	N	N	Y (45.0)	4.0	Y
LDT02	Latharna House, Larne	Urban Background	339815	402444	3.0	NO_2	N	N	Y (9.0)	N/A	N

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?
LDT03	Main St, Larne	Urban Centre	340093	402590	3.0	NO_2	N	N	Y (0)	N/A	N
LDT04	1 Old Glenarm Rd, Larne	Kerbside	340346	402845	4.0	NO_2	N	N	Y (1.0)	2.4	Y
LDT05	Upper Caincastle Rd, Larne	Kerbside	339212	403188	3.0	NO_2	N	N	Y (1.0)	1.5	Y
LDT06	Larne Harbour R'about, Larne	Roadside	341246	401970	3.0	NO_2	N	N	Y (11.0)	5.6	Y
LDT07	Coastguard Rd/Castle Ter, Larne	Urban Background	341321	401696	3.0	NO_2	N	N	Y (1.0)	N/A	N
LDT08	Ballylumford Rd, Islandmagee	Industrial	342069	402090	3.0	NO_2	N	N	Y (9.0)	N/A	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO_2)

There are two AQS objectives for NO_2, namely:

- The annual mean of 40 µg/m^3 and
- The 1-hour mean of 200 µg/m^3 not to be exceeded more than 18 times per year.

Results of the NO_2 monitoring within the borough at the automatic and diffusion tube sites for 2021 have been compared with the objectives.

2.2.1.1 Automatic Monitoring Data

Within the monitoring period of 2021, there was an urban background automatic NO_2 analyser at Ballymena Ballykeel and a roadside automatic NO_2 analyser at Ballymena Antrim Road. Both of these analysers are part of DEFRA operated AURN network. Table 2.3 and Figure 2.4 present the annual mean concentrations of NO_2 determined at the automatic sites from 2017 to 2021. Results from both automatic monitoring sites are also compared with the 1-hour mean objective in Table 2.4. Full details of the QA/QC procedures for the automatic monitors are provided in Appendix A. Data capture was above 75% at the automatic monitoring sites during 2021, therefore annualisation was not required at any site.

The results for 2021 indicate that both the AQS annual mean and hourly mean objectives were met at Ballymena Ballykeel and Ballymena Antrim Road sites, with no exceedances of the AQS annual mean objective in the past five years of monitoring. At both sites the annual mean NO_2 concentrations have increased by 1 µg/m^3 since the previous year, this is most likely a result from the easing of Covid restrictions with people returning to the office and schools returning, increasing the traffic flows within the Ballymena area. Government guidance continues to encourage home working in 2021 and traffic flows were still reduced from pre-Covid levels, therefore a continued reduction trend in NO_2 emissions within the Ballymena area cannot be ascertained at present. 2021 NO_2 levels remain below pre-Covid levels at both sites.

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 2021 %	Annual Mean Concentration (µg/m³)				
					2017	2018	2019	2020	2021
BALY (Ballymena Ballykeel)	Urban Background	Y	98.14	98.14	14	16	14	10	11
BAAR (Ballymena Antrim Rd)	Roadside	N	96.86	96.86	25.08[c]	22	21	16	17

In bold, exceedance of the NO_2 annual mean AQS objective of 40µg/m³

[c] Means should be "annualised" as in Boxes 7.9 and 7.10 of LAQM.TG16, if valid data capture is less than 75%

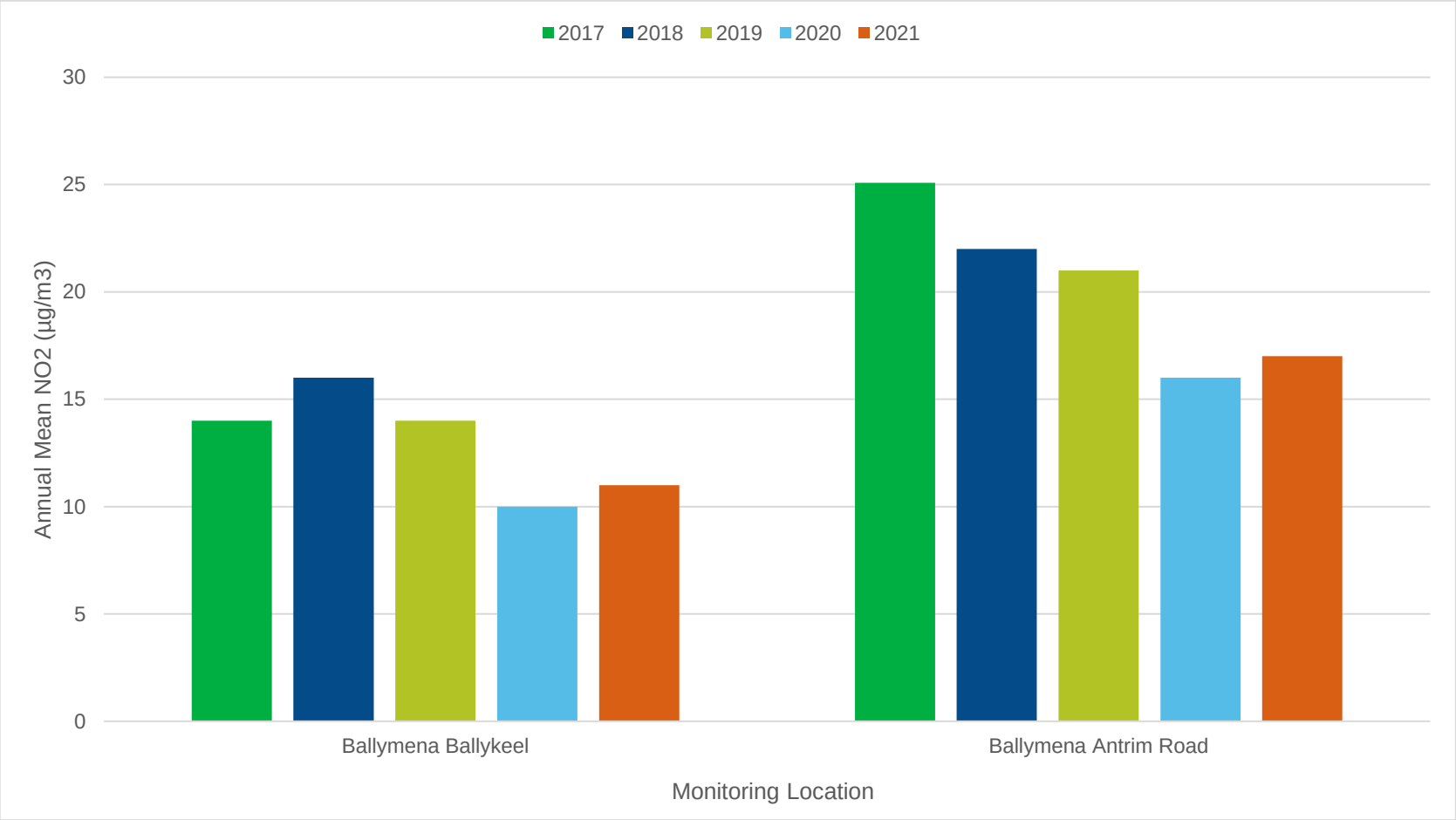
Table 2.4 – Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2021 %	Number of Hourly Means > 200µg/m³				
					2017	2018	2019	2020	2021
BALY (Ballymena Ballykeel)	Urban Background	Y	98.14	98.14	0	0	0	0	0
BAAR (Ballymena Antrim Rd)	Roadside	N	96.86	96.86	0 (116) [c]	0	0	0	0

In bold, exceedance of the NO_2 hourly mean AQS objective (200µg/m³ – not to be exceeded more than 18 times per year)

[c] If the data capture for full calendar year is less than 85%, include the 99.8th percentile of hourly means in brackets

Figure 2.4 – Trends in Annual Mean NO_2 Concentrations Measured at Automatic Monitoring Sites



Diffusion Tube Monitoring Data

Diffusion tube data obtained for the year 2021 was supplied by Socotec, Diffusion Tube Laboratory, Didcot, the tubes were prepared using the 20% triethanolamine (TEA) in water preparation method. There were no monitoring locations where data capture was below 75% therefore no sites have been annualised. QA/QC details for diffusion tubes are provided within Appendix A.

A triplicate co-location study was introduced at the Ballymena Antrim Road Analyser Site from April 2017 onwards (BT18, BT18A, BT18B). The results of this study have been submitted into the national database for 2021.

It is necessary to apply a bias adjustment factor to NO_2 diffusion tube results. This is an estimate of the difference between diffusion tube concentration and continuous monitoring. Co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data from continuous NO_x analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

The national bias adjustment factor is calculated at 0.77 from the national database of diffusion tube co-location surveys, for Socotec 20% TEA diffusion tubes, based on 15 studies. Utilising the measurement data from the triplicate co-location study at Ballymena Antrim Road, the local bias adjustment factor is calculated at 0.75 for 2021.

There is good correlation between the local and national adjustment. It has been decided that all diffusion tube results have been adjusted utilising the national bias factor of 0.77 as it was deemed a more reliable figure, based on 15 studies. Further details of the national bias adjustment factor are provided in Appendix A.

The results of annual mean NO_2 concentrations measured using diffusion tubes in 2021 following bias adjustment are reported in Table 2.5. Monthly results of NO_2 concentrations in 2021 without bias adjustment are also provided in Appendix B.

The annual mean concentration results of NO_2 diffusion tube data (2017 - 2021) are presented in Table 2.6 and Figures 2.5 to 2.7 shows the changing trends of annual mean NO_2 concentrations over the same time period.

The results of the diffusion tube data for 2021 show that there were no exceedances of the AQS NO_2 objectives. However, it is observed that concentrations at three diffusion tube sites (BDT07, BDT15 and BDT17) remain high, approaching the AQS annual mean objective. BDT15 is located within the existing Ballymena Linenhall Street AQMA and BDT07 (George Street) and BDT17 (Galgorm Road) are both located on streets that are of close proximity to this AQMA and the North Road/Galgorm Road interchange. The 2021 results have increased slightly since the previous year, most likely due to the increased traffic flow within the Borough following the easing of the strict travel Covid restrictions introduced in 2020. Due to the Covid restrictions affecting traffic flows over the past two years, a continued reduction trend in NO_2 emissions cannot be ascertained at present as traffic flows are still not reflective of the pre-Covid levels and it is recommended that this AQMA remains as declared and passive monitoring of NO_2 levels continue.

There were no exceedances of the annual mean AQS objective which required NO_2 fall-off with distance calculations.

Table 2.5 – Results of NO_2 Diffusion Tubes 2021

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2021 (Number of Months or %)	2021 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.77
BDT01	Leighinmohr Ave, Ballymena	Urban Background	N	N	12	8.2
BDT02	Galgorm Rd, Ballymena	Kerbside	N	N	12	25.7
BDT03	Main St, Cullybackey	Kerbside	N	N	12	17.1
BDT04	Cullybackey Rd, Ballymena	Kerbside	N	N	12	20.5
BDT05	Larne St, Ballymena	Kerbside	N	N	11	18.1
BDT06	Ballyloughan Ave, Ballymena	Urban Background	N	N	10	7.8
BDT07	George St, Ballymena	Kerbside	N	N	12	35.6
BDT08	Wellington St, Ballymena	Kerbside	N	N	12	13.2
BDT09	Ballymoney St, Ballymena	Kerbside	N	N	12	15.0
BDT10	Parkway, Ballymena	Kerbside	N	N	12	19.9
BDT11	Lisnevenagh Rd, Ballymena	Roadside	N	N	12	20.7
BDT12	Queen St, Ballymena	Kerbside	N	N	12	21.4
BDT13	North Rd, Ballymena	Roadside	N	N	12	21.7

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2021 (Number of Months or %)	2021 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.77
BDT15	Linenhall St, Ballymena	Kerbside	Y	N	12	33.4
BDT16	Bridge St, Ballymena	Kerbside	N	N	12	23.4
BDT17	Galgorm Rd, Ballymena	Kerbside	N	N	12	30.6
BDT18	Antrim Rd, Ballymena	Roadside	N	Triplicate and Co-located	12	17.2
BDT18A	Antrim Rd, Ballymena	Roadside	N	Triplicate and Co-located	12	17.2
BDT18B	Antrim Rd, Ballymena	Roadside	N	Triplicate and Co-located	12	17.2
CDT01	27 Upper Rd, Greenisland	Roadside	N	N	12	15.1
CDT02	32 Mullaghmore Pk, Carrickfergus	Urban Background	N	N	12	7.4
CDT03 (Duplicate)	Shore Rd, Carrickfergus	Roadside	N	N	12	20.8
CDT04 (Duplicate)	Shore Rd, Carrickfergus	Roadside	N	N	12	20.8
CDT05	Seapark Roundabout, Carrickfergus	Roadside	N	N	12	8.8

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2021 (Number of Months or %)	2021 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.77
CDT06	93 Belfast Rd, Carrickfergus	Roadside	N	N	11	21.7
CDT07 (Duplicate)	Model PS Belfast Rd, Carrickfergus	Roadside	N	N	12	23.1
CDT08 (Duplicate)	Model PS Belfast Rd, Carrickfergus	Roadside	N	N	12	23.1
CDT09	Minorca Pl/Tesco Jct, Carrickfergus	Roadside	N	N	12	16.4
CDT10	42 Albert Rd Carrickfergus	Roadside	N	N	12	15.2
CDT11	Fergus Ave, Carrickfergus	Railway	N	N	12	10.9
CDT12	North Rd, Carrickfergus	Roadside	N	N	12	14.2
CDT13	Victoria Rd/Larne Rd Jct, Carrickfergus	Roadside	N	N	12	17.5
CDT14	Islandmagee Rd, Whitehead	Roadside	N	N	10	9.9
LDT01	Antiville Rd/A8 Jct, Larne	Roadside	N	N	12	17.3
LDT02	Latharna House, Larne	Urban Background	N	N	11	9.9
LDT03	Main St, Larne	Urban Centre	N	N	12	13.2

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2021 (Number of Months or %)	2021 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.77
LDT04	1 Old Glenarm Rd, Larne	Kerbside	N	N	9	18.5
LDT05	Upper Caincastle Rd, Larne	Kerbside	N	N	12	14.0
LDT06	Larne Harbour Roundabout, Larne	Roadside	N	N	12	11.7
LDT07	Coastguard Rd/Castle Ter, Larne	Urban Background	N	N	11	8.1
LDT08	Ballylumford Rd, Islandmagee	Industrial	N	N	10	8.4

In bold, exceedance of the NO_2 annual mean AQS objective of 40µg/m^3

Table 2.6 – Results of NO_2 Diffusion Tubes (2017 to 2021)

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]				
			2017 (Bias Adjustment Factor = 0.87)	2018 (Bias Adjustment Factor = 0.93)	2019 (Bias Adjustment Factor = 0.92)	2020 (Bias Adjustment Factor = 0.76)	2021 (Bias Adjustment Factor = 0.77)
BDT01	Urban background	N	10.2	11.4	11.0	7.47	8.2
BDT02	Kerbside	N	29.7	32.0	29.5	22.15	25.7
BDT03	Kerbside	N	21.9	22.0	21.5	14.93	17.1
BDT04	Kerbside	N	26.3	26.9	26.7	17.45	20.5
BDT05	Kerbside	N	25.6	26.3	23.6	16.18	18.1
BDT06	Urban background	N	9.6	10.8	9.2	6.41	7.8
BDT07	Kerbside	N	**41.2**	**48.7**	**43.9**	32.21	35.6
BDT08	Kerbside	N	25.2	23.2	21.9	13.33	13.2
BDT09	Kerbside	N	21.7	21.7	22.1	14.57	15.0
BDT10	Kerbside	N	27.9	27.6	26.7	18.07	19.9
BDT11	Roadside	N	25.1	29.3	27.1	17.19	20.7
BDT12	Kerbside	N	26.1	27.8	26.9	18.27	21.4
BDT13	Roadside	N	24.2	27.9	27.3	17.43	21.7
BDT15	Kerbside	Y	**44.4**	**46.1**	**44.1**	32.79	33.4
BDT16	Kerbside	N	28.0	29.3	30.2	19.13	23.4

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]				
			2017 (Bias Adjustment Factor = 0.87)	2018 (Bias Adjustment Factor = 0.93)	2019 (Bias Adjustment Factor = 0.92)	2020 (Bias Adjustment Factor = 0.76)	2021 (Bias Adjustment Factor = 0.77)
BDT17	Kerbside	N	35.1	37.3	34.5	23.88	30.6
BDT18	Roadside	N	21.1	22.5	22.2	15.34	17.2
BDT18A	Roadside	N	20.9	23.7	22.0	14.80	17.2
BDT18B	Roadside	N	20.2	22.2	22.1	14.87	17.2
CDT01	Roadside	N	20.7	20.0	17.6	13.76	15.1
CDT02	Urban background	N	8.6	14.9	12.9	7.22	7.4
CDT03	Roadside	N	32.0	28.3	26.8	21.22	20.8
CDT04	Roadside	N	29.5	23.8	24.7	19.71	20.8
CDT05	Roadside	N	28.5	28.6	26.7	10.22	8.8
CDT06	Roadside	N	26.6	26.6	26.1	17.90	21.7
CDT07	Roadside	N	26.6	28.2	30.1	18.95	23.1
CDT08	Roadside	N	25.2	30.5	27.6	20.49	23.1
CDT09	Roadside	N	22.7	27.1	24.4	16.99	16.4
CDT10	Roadside	N	20.5	24.4	21.8	14.60	15.2
CDT11	Roadside	N	13.8	14.3	11.8	11.59	10.9
CDT12	Roadside	N	16.0	20.6	17.9	10.79	14.2

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]				
			2017 (Bias Adjustment Factor = 0.87)	2018 (Bias Adjustment Factor = 0.93)	2019 (Bias Adjustment Factor = 0.92)	2020 (Bias Adjustment Factor = 0.76)	2021 (Bias Adjustment Factor = 0.77)
CDT13	Roadside	N	24.7	24.5	23.1	15.09	17.5
CDT14	Roadside	N	12.1	17.4	15.6	8.20	9.9
LDT01	Roadside	N	19.9	22.9	22.8	14.36	17.3
LDT02	Urban background	N	11.4	14.1	13.8	9.33	9.9
LDT03	Kerbside	N	19.1	21.1	18.1	12.68	13.2
LDT04	Kerbside	N	24.1	18.2	19.8	15.05	18.5
LDT05	Kerbside	N	16.0	16.3	17.4	11.59	14.0
LDT06	Roadside	N	12.4	13.5	13.1	10.80	11.7
LDT07	Urban background	N	9.6	12.7	9.1	7.78	8.1
LDT08	Industrial	N	10.3	10.9	9.2	9.21	8.4

In bold, exceedance of the NO_2 annual mean AQS objective of 40µg/m^3

[a] Means should be “annualised” as in Boxes 7.9 and 7.10 of LAQM.TG16, if full calendar year data capture is less than 75%

Figure 2.5 – Trends in Annual Mean NO_2 Concentrations Measured at Ballymena Diffusion Tube Monitoring Sites

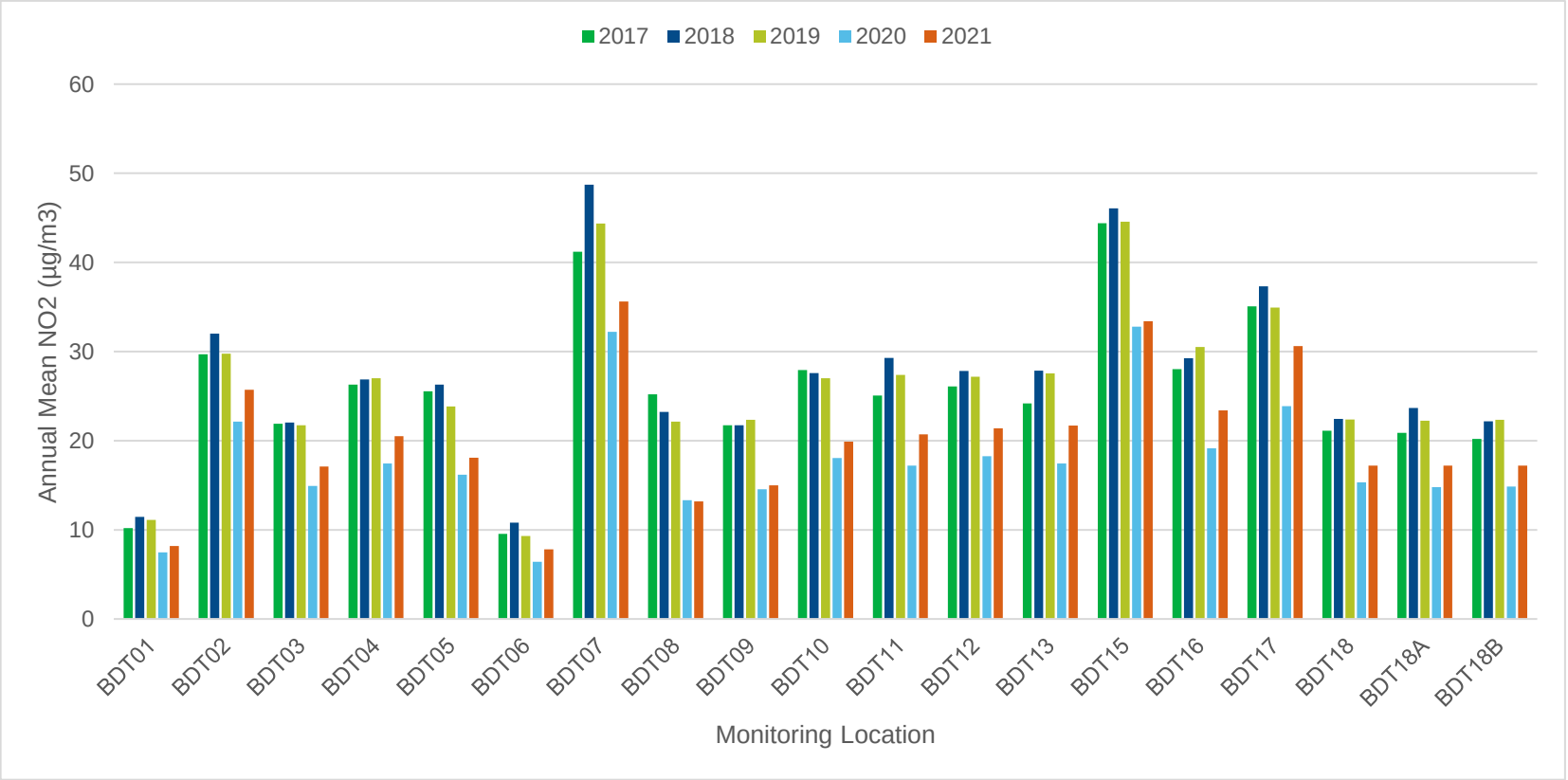


Figure 2.6 – Trends in Annual Mean NO_2 Concentrations Measured at Carrickfergus Diffusion Tube Monitoring Sites

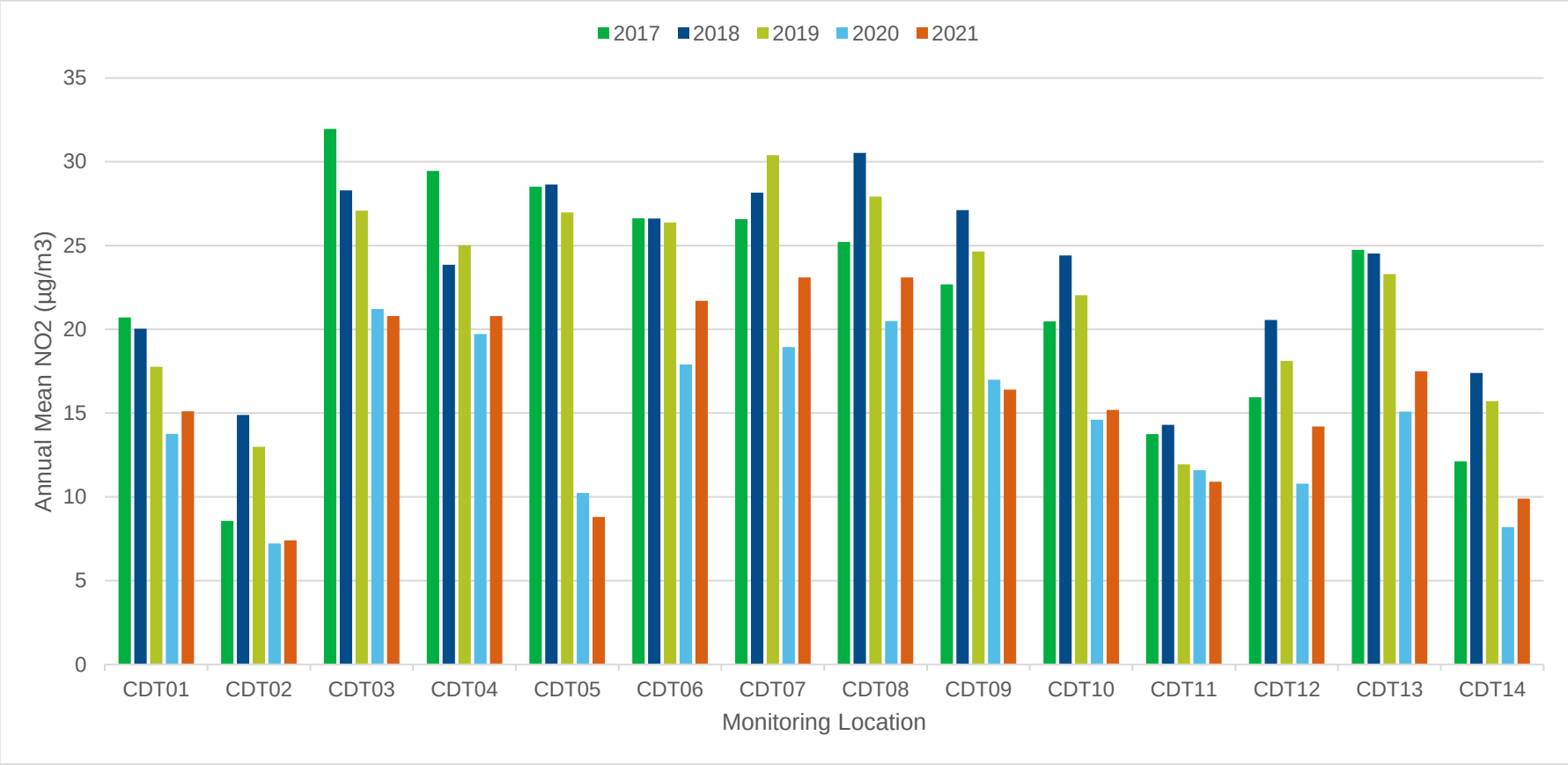


Figure 2.7 – Trends in Annual Mean NO_2 Concentrations Measured at Larne Diffusion Tube Monitoring Sites

2.2.2 Particulate Matter (PM_{10})

There are two AQS objectives for PM_{10} namely:

- The annual mean of 40 µg/m^3; and
- The 24-hour mean of 50 µg/m^3 not to be exceeded more than 35 times a year.

Mid and East Antrim Borough Council continue to undertake real time monitoring of PM_{10} at the urban background Ballymena Ballykeel automatic monitoring site, which is located within the existing Ballymena Ballykeel AQMA (declared for exceedances of PM_{10}). During 2021, monitoring was conducted using the TEOM real-time analyser with FDMS up until 1st June 2021 when the analyser was upgraded to a FIDAS 200 real-time analyser, now facilitating measuring of $PM_{2.5}$ also. The results have been adjusted to gravimetric equivalent by applying the VCM correction and have also been ratified by the data management company. Full details of the QA/QC procedures are provided in Appendix A.

Comparison between the annual mean objective and the PM_{10} Annual Mean concentration monitoring data for 2017 to 2021 is presented in Table 2.7. Annual mean PM_{10} levels for 2021 have continued to decrease with no exceedance of the annual mean PM_{10} AQS objective. Table 2.8 shows that there have been no exceedances of the 24-hour Mean AQS objective.

The trend graph presented as Figure 2.8 shows a gradual reduction in annual mean PM_{10} levels over the last five years of monitoring, remaining well below the annual mean objective. It is recommended to consider revoking this AQMA following a further review of the 2022 PM_{10} monitoring results.

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 %	Valid Data Capture 2021 %	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration (µg/m^3)				
						2017 [c]	2018	2019	2020	2021
BALY (Ballymena Ballykeel)	Urban Background	Y	94.84	94.84	Y	15.84	14.0	14.0	11.0	10.0

In bold, exceedance of the PM_{10} annual mean AQS objective of 40µg/m^3

[c] Means should be "annualised" as in Boxes 7.9 and 7.10 of LAQM.TG16, if valid data capture is less than 75%

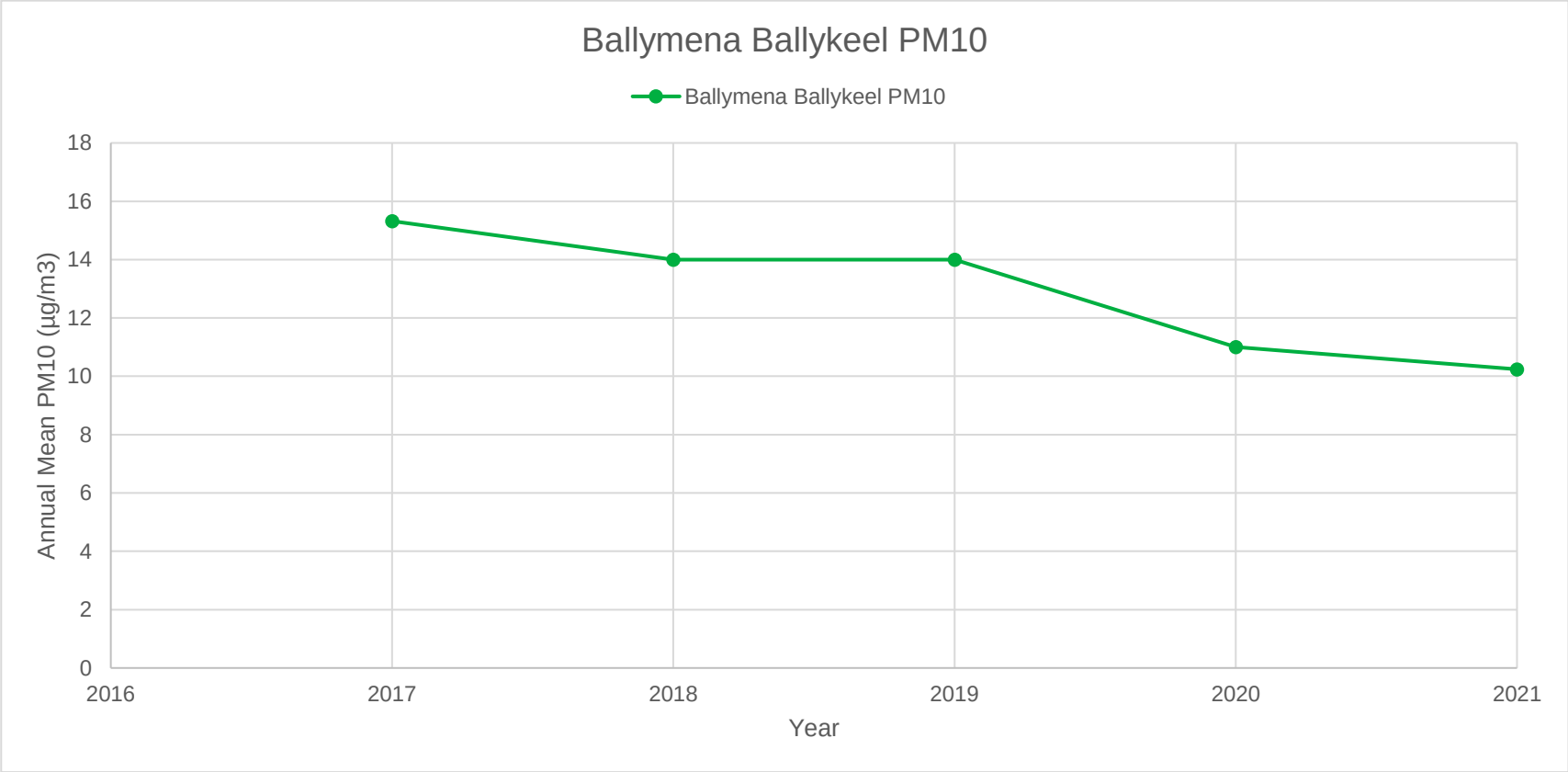
Table 2.8 – Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2021 %	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m^3				
						2017 [c]	2018	2019	2020	2021
BALY (Ballymena Ballykeel)	Urban Background	Y	94.84	94.84	Y	2 (28)	0	0	0	0

In bold, exceedance of the PM10 daily mean AQS objective (50µg/m^3 – not to be exceeded more than 35 times per year)

[c] if data capture for full calendar year is less than 85%, include the 90.4th percentile of 24-hour means in brackets

Figure 2.8 – Trends in Annual Mean PM_{10} Concentrations



2.2.3 Sulphur Dioxide (SO_2)

There are three air quality objectives for Sulphur Dioxide, namely:

- the 1-hour mean of 350µg/m^3, not to be exceeded more than 24 times a year,
- the 24-hour mean of 125µg/m^3 not to be exceeded more than 3 times a year, and
- the 15-minute mean of 266µg/m^3 not to be exceeded more than 35 times a year.

The 2021 SO_2 automatic monitoring data for Ballymena Ballykeel is presented in Table 2.9 and when compared with the relevant AQS objectives, all AQS objectives for SO_2 were met for 2021.

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 %	Valid Data Capture 2021 %	Number of:		
					15-minute Means > 266µg/m^3	1-hour Means > 350µg/m^3	24-hour Means > 125µg/m^3
BALY	Urban Background	Y	89.94	89.94	0	0	0

In Bold, exceedances of the relevant AQS objective (15-min mean = 35 allowed/year, 1-hour mean = 24 allowed/year, 24-hour mean = 3 allowed/year).

2.2.4 Benzene

No monitoring of Benzene has been carried out within Mid and East Antrim Borough Council. All submitted planning applications are reviewed and no significant changes have been identified requiring further assessment of Benzene.

2.2.5 Other Pollutants Monitored

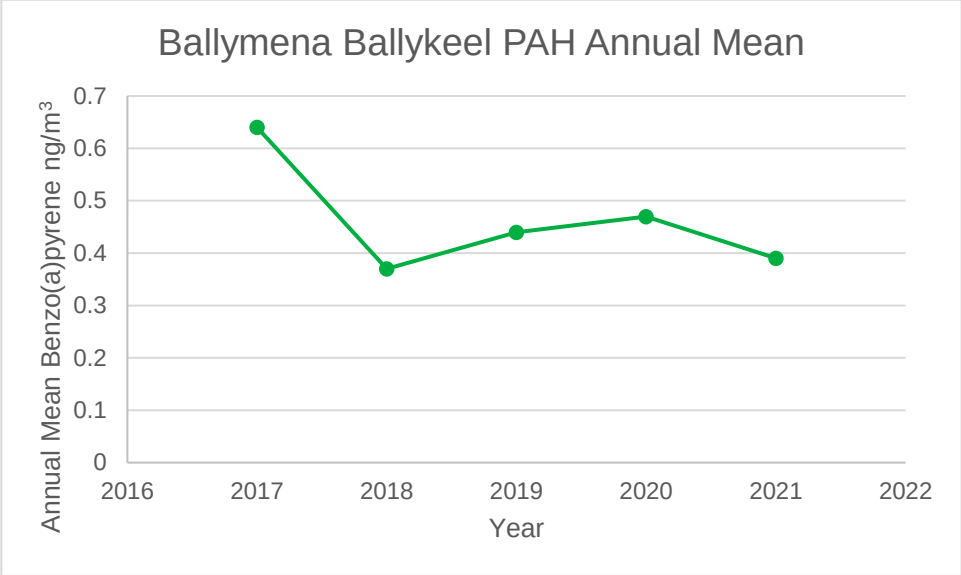
Polycyclic aromatic hydrocarbons (PAH)

The national network monitoring for PAH includes three monitoring sites in Northern Ireland, operated by Ricardo Energy & Environment, Ballymena Ballykeel site in MEABC being one of these. The UK National Air Quality objective for PAH (Benzo(a)pyrene) is an annual average of 0.25ng/m^3 and the EU target annual mean value is 1ng/m^3. Table 2.10 shows that results for PAH Benzo(a)pyrene concentrations at the Ballymena Ballykeel monitoring site in 2021 is 0.39ng/m^3 which is below the EU objective but slightly above the UK non-mandatory objective. The trend graph in Figure 2.9 shows that 2021 PAH levels have declined slightly since the previous year.

Table 2.10 - Results for PAH (Benzo(a)pyrene) 2017 - 2021.

Site	Data Capture for 2021 (%)	2017 Annual mean ng/m^3	2018 Annual mean ng/m^3	2019 Annual mean ng/m^3	2020 Annual mean ng/m^3	2021 Annual mean ng/m^3
Ballymena Ballykeel (BALY)	95	0.64	0.37	0.44	0.47	0.39

Figure 2.9 - Trends in PAH (Benzo(a)pyrene) concentrations 2017 - 2021



Particulate Matter ($PM_{2.5}$)

Under the current LAQM regime there is no requirement for Local Authorities to review and assess $PM_{2.5}$ against objectives set out in the UK Air Quality Regulations.

A new FIDAS 200 analyser was installed at Ballymena Ballykeel automatic monitoring site in June 2021, capable of monitoring PM_{10} and $PM_{2.5}$. The 2021 annual data capture for $PM_{2.5}$ was 53.76% however the data capture for the monitoring period was 91.12%. Therefore, the data has been annualised using the methodology demonstrated in Box 7.9 of LAQM.TG16 before it has been compared to the annual mean target value of 25 µg/m^3 (calculations are provided within Appendix A). The annual mean result for $PM_{2.5}$ in 2021 was 6.56 µg/m^3, well below the annual mean target value.

2.2.6 Summary of Compliance with AQS Objectives

Mid and East Antrim Borough Council has examined the results from monitoring in the borough. Concentrations are all below the objectives therefore, there is no need to proceed to a Detailed Assessment.

3 New Local Developments

3.1 Road Traffic Sources

Mid and East Antrim Borough Council has not identified any of the following new road traffic sources since the last Updating and Screening Assessment:

- Narrow congested streets with residential properties close to the kerb,
- Busy streets where people may spend on 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.

3.2 Other Transport Sources

MEABC has not identified any of the following new transport sources since the last Updating and Screening Assessment:

- Airports
- Locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m,
- Ports for shipping.

Since the last Updating and Screening Assessment the following planning permission has been granted approval, which involves residential receptors being located within 30m from a railway line which may affect air quality for the receptors:

- Planning Reference: LA02/2021/0649/F – Erection of 3 no. complex needs social housing bungalows with associated site works at Lands to the rear of 1,5,10,11 and 15 McKeens Avenue, Carrickfergus.

3.3 Industrial Sources

MEABC has not identified any of the following new industrial sources since the last Updating and Screening Assessment:

- 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

Since the last Updating and Screening Assessment the following planning permissions have been granted approval for poultry farms within the Borough, which may affect air quality:

- Planning reference LA02/2021/0562/F – Proposed additional free range poultry shed with 2no. feed bins, a storage shed and associated site works at land approx. 250m North East of 30 Bally Road, Ballymena.
- Planning reference LA02/2021/0364/F – Proposed new poultry unit for up to 24,000 laying hens, new litter store, new concrete apron, meal silos at land approximately 197m South of 37B Tullygrawley Road, Ballymena.

3.4 Commercial and Domestic Sources

MEABC has not identified any of the following new commercial or domestic sources since the last Updating and Screening Assessment:

- 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.

Since the last Updating and Screening Assessment the following planning permission has been granted approval for Combined Heat and Power (CHP) plant within the Borough which may affect air quality:

- Planning reference LA02/2021/0216/F – 2 no. 68m (10.8m above roof level) flue gas stacks and balance of plant. Balance of plant comprises: Bank of gas turbine fin fan coolers: Acoustic barrier: Air intakes (2 no.): Auxiliary engine bank of fin fan coolers (2no.): Auxiliary engine flue gas stacks (2 no.): Underground services (Gas and Heat Export Pipework and Electrical Cabling): Pipe bridge: Transformer cooling banks (2 no.): CO2 bottle storage rack compound: Ignition gas propane tank compound and Distillate Oil unloading area – Kilroot Power Station, Station Road, Carrickfergus.

3.5 New Developments with Fugitive or Uncontrolled Sources

MEABC has not identified any of the following new potential sources of fugitive or uncontrolled particulate matter since the last Updating and Screening Assessment:

- Landfill sites
- Quarries
- Unmade haulage roads on industrial sites
- Waste transfer stations,
- Other potential sources of fugitive particulate matter emissions.

Mid and East Antrim Borough Council confirms 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.**

A number of new local developments which may impact on air quality in the Local Authority area have been identified within Section 3 above. These will be taken into consideration in the next Updating and Screening Assessment.

4 Planning Applications

Planning applications have been received for the following proposed developments since the last Updating and Screening Assessment, which may affect air quality within the Borough however, no decisions have been made by the Planning system. These will be reviewed during the next Updating and Screening Assessment:

- Planning Reference: LA02/2021/0541/F – A private residential assisted living and retirement housing scheme comprising a mix of house types (234 houses and 81 apartments) and nursing home, spa/community facility, tennis courts and bowling green with associated parkland and green link. A drive thru restaurant, park and ride facility and relocation of long stay hotel car park at lands at 75 Belfast Road, Carrickfergus.
- Planning reference LA02/2021/1156/RM – Proposed development of 189 dwellings (comprising 47 detached, 120 semi-detached, 4 maisonettes and 18 apartments); Neighbourhood Centre comprising 1 retail unit, 1 hot food/café unit, 1 petrol filling station and an ATM; and a Childcare crèche facility at Lands NE of Ballyboley Road north and west of Ballyboley Distributor Road and adjacent and SW of Lindara Close Lindara Crescent and Blackthorn Rise Larne.
- Planning reference LA02/2021/0131/F – Proposed development of 214 dwellings (comprising of 30 detached and 184 semi-detached) with associated car parking and landscaping at Lands northwest of Brackenridge, Brackenridge Green and Brackenridge Close Carrickfergus.
- Planning reference LA02/2021/1127/F – Erection of Industrial Unit (Light and General) with associated yard areas, car parking and site works – Site adjacent to 8 Sloefield Park Trooperslane Industrial Unit, Carrickfergus.
- Planning reference LA02/2021/1108/F – Housing development of 146no. dwellings (houses and bungalows) with roads, footways, public open space landscaping and children’s playground area (Amendment to house types previously approved under LA02/2018/0154/F) - Land adjacent to Minorca Drive Carrickfergus – (Site bounded by Woodburn River to NE and SE).
- Planning reference LA02/2021/1065/F – Retrospective application for the extension to previously approved haulage yard for the storage of commercial trailers at 49A Rankinstown Road Ballymena.

- Planning reference LA02/2021/0941/O – Site for fuel filling station – Adjacent to 20 Old Belfast Road, Millbrook, Larne.
- Planning reference LA02/2021/0853/F – Proposed 2no.poultry units for 32,000 birds and 4no. feed bins at 175m NE of 247 Gortgole Road, Portglenone.
- Planning reference LA02/2021/0764/F – Park and Ride facility (392 car parking spaces and cycle parking) with associated lighting, CCTV, landscaping and boundary treatment with access from and junction improvements at Galgorm Road and provision of photovoltaic panels on roof of existing maintenance building, at Land at Translink Bus Depot to the west of Translink Bus Depot and north of Beechfield Close, Galgorm Road, Ballymena.
- Planning reference LA02/2021/0722/F – Proposed Petrol Filling Station with associated canopy, car parking and retail unit including hot food and seating area – Site to the south of 13 Old Belfast Road, Larne.
- Planning reference LA02/2021/0615/F – A northerly extension to existing quarry, with internal haul road providing connectivity between the proposed extraction site and the existing quarry and processing units. Proposed phased winning and working of the material with contemporary overburden placement and planning restoration of the existing quarry void, restoration of the proposed extension area to nature conservation habitat and with accessible nature trails and walkways. – Lands 150m North of the existing quarry at 9 Starbog Road Kilwaughter, Larne.
- Planning reference LA02/2021/0209/F – Demolition of the existing school buildings to allow for the construction of a new 800 Pupil, 9737 sqm, post primary school. Landscaping works will include additional car parking, as well as the refurbishment of the pitches to allow for a MUGA and a 3G GAA pitch at 25 Tower Road, Carnlough.

5 Air Quality Planning Policies

Mid and East Antrim Local Development Plan (LDP) 2030

Mid and East Antrim Borough Council's Local Development Plan 2030 is currently at the Draft Plan Strategy stage, which was published in September 2019. The Plan Strategy sets out the Local Development Plan vision and strategic planning objectives for the Borough. The Plan Strategy includes a range of strategic subject policies to properly manage development across the Borough. The Local Development Plan will:

- Be prepared in the context of wider government policy including the Regional Development Strategy and Strategy Planning Policy Statement.
- Identify how and where settlements will grow and the anticipated amount of growth over the Plan period,
- Bring forward growth strategies for various types of development including housing, economic, retail, leisure, minerals and renewable energy,
- Provide for balanced development in the countryside, meeting the needs of rural communities, while safeguarding rural amenity and character,
- Protect, and wherever possible enhance areas and assets that are enjoyed by the citizens and visitors of Mid and East Antrim Borough Council.

Until the Plan Strategy is adopted, planning decisions must be taken in accordance with the provisions of the developments plans and planning policy publications that were prepared by the Department of the Environment (DOE), unless material considerations indicate otherwise. Once the Plan Strategy is adopted, its strategic planning policies will replace those regional operational policies currently retained within the various topic based Planning Policy Statements.

6 Local Transport Plans and Strategies

MEABC has no statutory responsibility in relation to local transport plans or strategies as this lies wholly with Central Government's Department of Infrastructure.

Regional Development Strategy 2035

The Regional Development Strategy (RDS) is a strategy, which incorporates local transport plans and strategies, guiding the future development of Northern Ireland to 2035 by way of a framework which provides the strategic context for where development should occur and recognises that development policies will have a significant impact on the environment and the health of individuals. It addresses economic, social and environmental issues aimed at achieving sustainable development and social cohesion. It aims to:

- Support strong, sustainable growth for the benefit of all parts of the Region.
- Support our towns, villages and rural communities to maximise their potential.
- Promote development which improves the health and well-being of communities.
- Improve connectivity to enhance the movement of people, goods, energy and information between places.
- Protect and enhance the environment for its own sake.
- Take actions to reduce our carbon footprint and facilitate adaptation to climate change.

The Spatial Framework

The Spatial Framework, a component of the Regional Development Strategy, allows strategic choices to be made in relation to development and infrastructural investment and sets new directions and priorities to better achieve sustainable development in the interests of future generations. It is designed to deal with the major issues of climate change, population growth and movement, transportation. A key issue which influenced the Spatial Framework includes a new emphasis on how to reduce dependence on the car and change travel behaviour and importance of forward planning to address the consequences of climate change.

The components of the Framework up to 2035 are:

- The Metropolitan Area centred on Belfast
  The Belfast Metropolitan Urban Area (BMUA) including Carrickfergus, is at the centre of the regional transport network and the major gateway for national and international trade. Guidance is provided on managing the movement of people and goods within the BMUA. Emphases is placed on encouraging a modal shift in travel from cars to public transport.
- A North West Region centred on Londonderry as a key international gateway providing access by road, rail and sea to the North West. Spatial Framework guidance is provided on managing the movement of people and goods within the North West and the protection and enhancing the environmental assets.
- Hubs and Clusters of Hubs
  Main and Local Hubs which have the greatest potential for growth and which provide a range of services to the surrounding areas are identified and include Ballymena and Larne.
- Clusters of cities and towns
  To encourage co-operation clustering of towns is promoted in the framework, one of the proposed clusters being Ballymena, Larne and Antrim.
- The need to sustain rural communities by new development and employment opportunities which respect environmental circumstances.
- Gateway and corridors
  Gateways are important transport interchanges which are important for economic development, freight distribution activities and additional employment generation. The Gateways identified include Larne.

Within the Strategic Guidance is provided to meet a number of key regional challenges emerging from the significant local, national and international forces including delivering a balanced approach to transport infrastructure and a sustainable and secure energy supply.

Environment

It highlights that improving the quality of the environment by reducing air pollution and greenhouse gas emissions that it can make an important contribution towards achieving a better quality of life and aims to:

- Reduce our carbon footprint and facilitate mitigation and adaptation to climate change whilst improving air quality.
- Manage waste sustainably.
- Conserve, protect and enhance the built heritage and natural environment.
- Promote a more sustainable approach to the provision of water and sewerage services and flood risk management.

Transport

The focus is on managing the use of the road and railways and how we can use the network in a better, smarter way. The new approach to regional transport includes:

- Improve connectivity.
- Maximise the potential of the Regional Strategic Transport Network.
- Use road space and railways more efficiently.
- Improve social inclusion.
- Manage the movement of freight.
- Improve access to our cities and towns.
- Improve safety by adopting a ‘safe systems’ approach to road safety.

The RDS is a key document within the planning system, it sets out strategic guidance which is used in the preparation of local authority development plans.

7 Climate Change Strategies

The UK Government has set a legal target for the UK to reach net zero carbon emissions by 2050. A Notice of Motion on Climate Change was accepted by Mid and East Antrim Borough Council in September 2019, outlining Council's commitment to mitigation and adaption. This motion aims to set up an All-Party Climate Change Working Group to provide strategic direction and leadership in relation to Council's response to the Climate Change Agenda.

8 Implementation of Action Plans

Ballykeel Air Quality Action Plan (AQAP)

Ballymena Ballykeel AQMA was declared in 2004 for particulate matter (PM_{10}). Ballymena Borough Council submitted its AQAP in April 2008 which outlined measures to be taken in pursuit of achieving the national air quality strategy objectives for PM_{10} within the AQMA.

The following works have been implemented with regard to the action plan measures:

- Conversion of solid fuel heating systems to LPG within NIHE housing stock
- Promotion of Warm Homes and Energy Efficiency Schemes
- Bonfire guidance and controls for community bonfires
- Environmental Protection Department investigate and enforce legislation to unlicensed or nuisance burning of wastes complaints within the AQMA.

As a result, the PM_{10} levels within this AQMA have declined and remain well below the AQS objectives for PM_{10}.

Linenhall Street Air Quality Action Plan (AQAP)

Ballymena Linenhall Street AQMA was declared in 2010 for nitrogen dioxide (NO_2) as dispersion modelling confirmed that NO_2 concentrations along Linenhall Street were likely to exceed the annual mean objective of 40µg/m^3, mainly due to traffic sources. This was also reflected in NO_2 diffusion tube monitoring results.

Linenhall Street is a one-way street forming the southbound section of the A26 in Ballymena. The A26 is a link corridor connecting the north of Northern Ireland. Traffic is held by traffic lights at the junction with Bridge Street resulting in consistent queuing on Linenhall Street throughout the day. There is also a traffic light controlled pedestrian crossing further up the street which restricts traffic speeds. Source apportionment indicated that emissions from local moving traffic are the main contributor to overall NO_2 levels, although idling emissions due to queuing vehicles are also particularly important.

An Air Quality Action Plan was finalised in October 2012 outlining the measures to be taken aiming to achieve the national air quality strategy objectives for NO_2 within the AQMA. Progress to date is summarised within Table 8.1. Monitoring shows a decline from pre-covid levels however it is recommended to continue monitoring levels within this AQMA.

Table 8.1 – Action Plan Progress

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
1	Reduction of queuing traffic on Linenhall Street	Reductions in queuing time and therefore reduction of emission from idling cars is therefore likely to reduce pollution levels.	DFI Roads	Completed	Completed	Changes to traffic light sequence at Linenhall Street/Bridge Street Junction	0.5-1 µg/m^3	Traffic passing down Linenhall Street can pass through green light for a maximum of 56 seconds compared to a maximum of 24 seconds for traffic entering the junction from other roads.	Completed	Completed	Priority is weighted in favour of traffic from Linenhall Street to reduce queue length, although stationary traffic will always occur.
2	Improvements in Bus Fleet Emissions	Translink to replace Ulsterbus buses with latest Euro class buses. To continue to improve the bus fleet by providing Eco-Driving Training and installing Driver Monitoring Devices	Translink	Completed	Completed	Improvement of bus fleet Number of drivers trained, and devices fitted	2-5 µg/m^3	Ongoing	Ongoing	Ongoing	Replacing poorer performance buses would decrease concentrations of NO_2

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
3	Encouraging Modal Shift	Public Realm Strategy - to reduce car usage within Ballymena: Walking – footpath connections to the centre resurfaced, signage and new lighting. Cycling – cycle lanes created and cycle stands provided. Public Transport – Pedestrian routes between station and town centre made easily accessible.	MEABC	Completed	Completed	Implementation of Ballymena Public Realm Strategy	0.5 – 1 µg/m^3	Project prepared for Planning Application and approval granted. Project delivered	Completed	Completed	Modal shift from private cars to public transport, cycling and walking in the Town Centre will reduce NO_2 levels.
4	Ballymena South West Distributor Road	Plans for a South-West Distributor Road linking Ballee Road West, south of the town centre, and the A42 Parkway to the north.	DFI Roads	Completed	Completed	Detailed design of SWD	>5 µg/m^3	The South-West Distributor Road link operational	Completed	Completed	Road intended to distribute traffic from the Belfast direction into the suburbs reducing congestion in the town centre.

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
5	Bus Park and Ride	Introduce a Park and Ride Scheme at Galgorm Road	DFI	Completed	The Sub-Regional Transport Plan (SRTP) 2015 - Park and Ride Scheme implemented. Further planning application proposed for a 392 car park and ride facility at Galgorm Road	Park and Ride facility operational	0.5 – 1 µg/m^3	Completed Ongoing	Completed Planning system processing application	Operational facility Progressing	Increasing P&R capacity will have a beneficial impact on air quality by reducing road traffic to and from the town centre, including through the AQMA in Linenhall Street.
6	Investigate options for use of cleaner fuels and purchase vehicles that comply with the prevailing EURO standard	Fitting pollution abatement equipment to older heavy goods vehicles depending on EURO classification	MEABC	Completed	Completed	Number of vehicles purchased in compliance and cleaner fuels being used		Ongoing	The Council continues to actively review vehicle specifications and acquisitions with regard to emission levels.	Ongoing	Reduced impact of Council Fleet vehicles through purchasing lower/zero emission vehicles

No.	Measure	Focus	Lead Authority	Planning Phase	Implemen-tation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
7	Carry out vehicle emission testing	Compliance with MOT/PSV emissions criteria	MEABC	Completed	Completed	Number of vehicle emission testing events/reduce numbers of highly polluting vehicles		Implemented	Implemented	Ongoing	All vehicles undergo annual PSV and emission testing
8	Comment on planning applications to ensure that all relevant air quality issues are highlighted and mitigation measures are considered.	Use Planning Process to ensure potential air quality issues are assessed.	MEABC	Implemented	Implemented	Visibility of and comment on all relevant planning applications		All planning applications assessed for air quality impact in line with planning guidance.	Ongoing	Ongoing	No specific applications for development received within AQMAs during 2021
9	Contribute to influence forthcoming development policies for MEABC to ensure that air quality considerations are included.	Ensure that sustainable development and air quality considerations are included in future development policies.	MEA	Implemented	Ongoing	Air quality added to MEABC planning policy		Ongoing	Ongoing	Ongoing	Potential air quality issues addressed at Planning stage

No.	Measure	Focus	Lead Authority	Planning Phase	Implemen-tation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
10	Authorise and regularly inspect industrial premises under the Industrial Pollution Control (NI) Order 1997 and The Pollution Prevention and Control (Industrial Emissions) Regulations (NI) 2013	Permitting and inspection of industrial processes and installations under Part C of the Industrial Pollution Control (NI) Order 1997 and the Pollution Prevention and Control (Industrial Emissions) Regulations (NI) 2013	MEABC	Completed	Completed	Continued permitting and inspection. Compliance with conditions and air pollutant emission limits within permit.		Ongoing inspection programme based on risk assessment.	Inspections completed as per inspection programme.	Ongoing	Enforcing of the Industrial Pollution Control (NI) Order 1997 and the Pollution Prevention and Control (Industrial Emissions) Regulations (NI) 2013 to reduce emissions within the Borough.
11	Enforce relevant legislation to reduce the burning of commercial and domestic waste.	Take enforcement action under The Clean Neighbourhoods and Environment Act (NI) 2011, The Clean Air Order (NI) 1981 and Pollution Control and Local Government (NI) Order 1978 in accordance with Council enforcement policy.	MEABC	Completed	Completed	Continued enforcement action		Ongoing	Ongoing	Ongoing	Enforcement of relevant legislation to reduce emissions within the Borough

No.	Measure	Focus	Lead Authority	Planning Phase	Implementation Phase	Indicator	Target Annual Emission Reduction in the AQMA	Progress to Date	Progress in Last 12 Months	Estimated Completion Date	Comments Relating to Emission Reductions
12	Reduction of emissions by Council Waste Collections	Review of bin collection procedures with emphasis on energy and emissions minimisation	MEABC	Completed	Completed	Effective and efficient bin collection service in place with minimal energy usage and emissions		Completed	Completed	Completed	Route optimisation of bin collection for Council vehicles operating across the borough will reduce energy usage and emissions.
13	Promotion of cycling across the Borough	Promotion of cycling as a means of transport within the Borough by promoting cycle to work schemes, promoting safe cycling routes to schools and promoting Bike week	MEABC in partnership with Travelwise	Implemented	Ongoing – running promotional events	Promotional cycling events within the Borough		Ongoing	Ongoing	Ongoing	Cycling reduces emissions within the Borough
15	Education initiatives – Develop awareness within primary schools	Education programme delivered through ECO School award	MEABC	Completed	Completed	School achieving the ECO status and creating sustainable practices with pupils.		Implemented	Implemented	Ongoing	Delivering educational programmes will change environmental practices and reduce carbon emissions.

9 Conclusions and Proposed Actions

9.1 Conclusions from New Monitoring Data

During 2021 monitoring of NO_2, PM_{10} and SO_2 was completed within Mid and East Antrim Borough Council using continuous automatic analysers at two sites and passive NO_2 diffusion tubes at 37 locations: seventeen within Ballymena, twelve in Carrickfergus and eight in Larne.

The 2021 monitoring data has been analysed and the results shows compliance with the air quality objectives for NO_2, PM_{10} and SO_2 at the Ballymena Ballykeel automatic monitoring location, for NO_2 at the Ballymena Antrim Road automatic monitoring location and for NO_2 at the diffusion tubes sites.

At both automatic monitoring sites, the annual mean NO_2 concentrations have increased by 1 µg/m^3 since the previous year, this is most likely a result from the easing of Covid restrictions with people returning to the office and schools returning, increasing the traffic flows within the Ballymena area. Government guidance continues to encourage home working in 2021 and traffic flows were still reduced from pre-Covid levels, therefore a continued reduction trend in NO_2 emissions within the Ballymena area cannot be ascertained at present. 2021 NO_2 levels remain below pre-Covid levels at both sites.

NO_2 concentrations at diffusion tube monitoring sites in 2021 did increase slightly at most monitoring locations within the Borough, as traffic flows increased as a result of Covid restrictions easing but still remain at reduced levels compared with pre-Covid traffic levels. The NO_2 diffusion tube located within the declared Ballymena Linenhall Street AQMA (BDT15) remains high, approaching the AQS annual mean objective, as well as two further diffusion tubes located just outside this declared AQMA (BDT07 and BDT17). MEABC will continue monitoring at the Ballymena Linenhall Street AQMA location in 2022 to establish a further trend in NO_2 levels before a review of this AQMA is carried out.

The monitoring results for PM_{10} within the Ballymena Ballykeel AQMA remain well below the Air Quality Strategy objective for Particulate Matter however, MEABC will continue to monitor PM_{10} levels within this AQMA and a review of the 2022 data will be carried out before recommending revoking this AQMA.

The 2021 monitoring data shows compliance with the air quality objectives at monitoring sites within the borough including within the two declared AQMA's and that there is no need to proceed to a detailed assessment based on the 2021 monitoring data.

9.2 Conclusions relating to New Local Developments

Relevant planning applications in the Borough, as highlighted within Section 3 and 4, will require more detailed consideration in the next Updating and Screening Assessment.

There is no need to proceed to a detailed assessment at this stage based on new local developments that have been considered.

9.3 Other Conclusions

No significant changes in emission sources within the Borough have been identified which would significantly impact on air quality.

9.4 Proposed Actions

This 2022 Progress Report has identified that there is no need to proceed to a detailed assessment for any of the pollutants.

Although the reduction of NO_2 and PM_{10} levels in Ballymena have continued, the Air Quality Management Areas shall remain until an accurate trend in NO_2 and PM_{10} levels can be established, following the easing of Covid restrictions.

The proposed actions from the Mid and East Antrim 2022 Progress report are as follows:

- Continue to undertake both automatic (NO_2, PM_{10}, $PM_{2.5}$ and SO_2) and passive (NO_2) monitoring to identify future trends in concentration and any exceedances of the AQS objectives,
- The Ballymena Ballykeel and Ballymena Linenhall Street AQMAs will be retained and monitoring will continue within the AQMAs to assess the need for retention of the AQMAs in the future. Review the 2022 automatic monitoring data for PM_{10} within the Ballymena Ballykeel AQMA with a view to revoking the AQMA,
- Continue to gather emissions information for identified new local developments potential sources to determine the impact upon local air quality,
- Continue to examine all planning applications within the Borough to ensure compliance with Air Quality Strategy objectives,
- Proceed to an Annual Progress Report in 2023.

10 References

I. Local Air Quality Management Technical Guidance LAQM.TG(16), prepared by the Department for Environment, Food and Rural Affairs, April 2021

II. The Environmental (Northern Ireland) Order 2002

III. Air Quality Regulations (Northern Ireland) 2003

IV. The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA (2007)

V. Northern Ireland Air – Air Quality in Northern Ireland website http://www.airqualityni.co.uk/

VI. Mid and East Antrim Borough Council Local Development Plan 2030

VII. Defra (2009) Part IV of the Environment Act 2995, Local Air Quality Management, Technical Guidance LAQM.TG(09)

VIII. National Diffusion Tube Bias Adjustment Spreadsheet v09/22

IX. The Regional Development Strategy 2035, DRD

X. Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance for Laboratories and Users, Issue 1a Feb 2008

11 Appendices

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

Appendix B: Diffusion Tube Monitoring Data

Appendix C: 2021 Air Quality Report for Ballymena Ballykeel

Appendix D: 2021 Air Quality Report for Ballymena Antrim Road

Appendix E: Impact of COVID-19 upon LAQM

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

QA/QC of Diffusion Tube Monitoring

Defra and the Devolved Administrations provide a set of centralised QA/QC services, to assist local authorities using diffusive samplers for monitoring NO_2. In 2021, Mid and East Antrim Borough Council utilised SOCOTEC, Didcot, England to supply, analyse and report data for its diffusion tubes. The analysis methodology used was 20% triethanolamine solution for monitoring ambient nitrogen dioxide which adheres to the requirements of the government's 'Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance for Laboratories and Users' publication. SOCOTEC, Didcot is a UKAS accredited laboratory and participates in laboratory performance and proficiency testing scheme, namely the independent AIR-PT scheme. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations reported are of a high quality. SOCOTEC has performed to the following proficiency levels during AIR-PT testing scheme in 2021:

AIR PT Round	AIR PT AR037	AIR PT AR039	AIR PT AR040	AIR PT AR042	AIR PT AR043	AIR PT AR045	AIR PT AR046
Round conducted in the period	May – June 2020	July – August 2020	September – October 2020	January – February 2021	May – June 2021	July – August 2021	September – October 2021
SOCOTEC	NR [4]	NR [4]	100 % [1]	100 % [1]	100 % [1]	87.5 % [1]	100 % [1]

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Mid and East Antrim Borough Council recorded data capture of 75% therefore it was not required to annualise any monitoring data.

Diffusion Tube Bias Adjustment Factors

Mid and East Antrim Borough Council have applied a national bias adjustment factor of 0.77 to the 2021 monitoring data, calculated from the national spreadsheet 09/22 for Socotec 20% TEA diffusion tubes, based on 15 studies.

Figure A.1 - National bias adjustment factor calculation

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 09/22

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 March 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

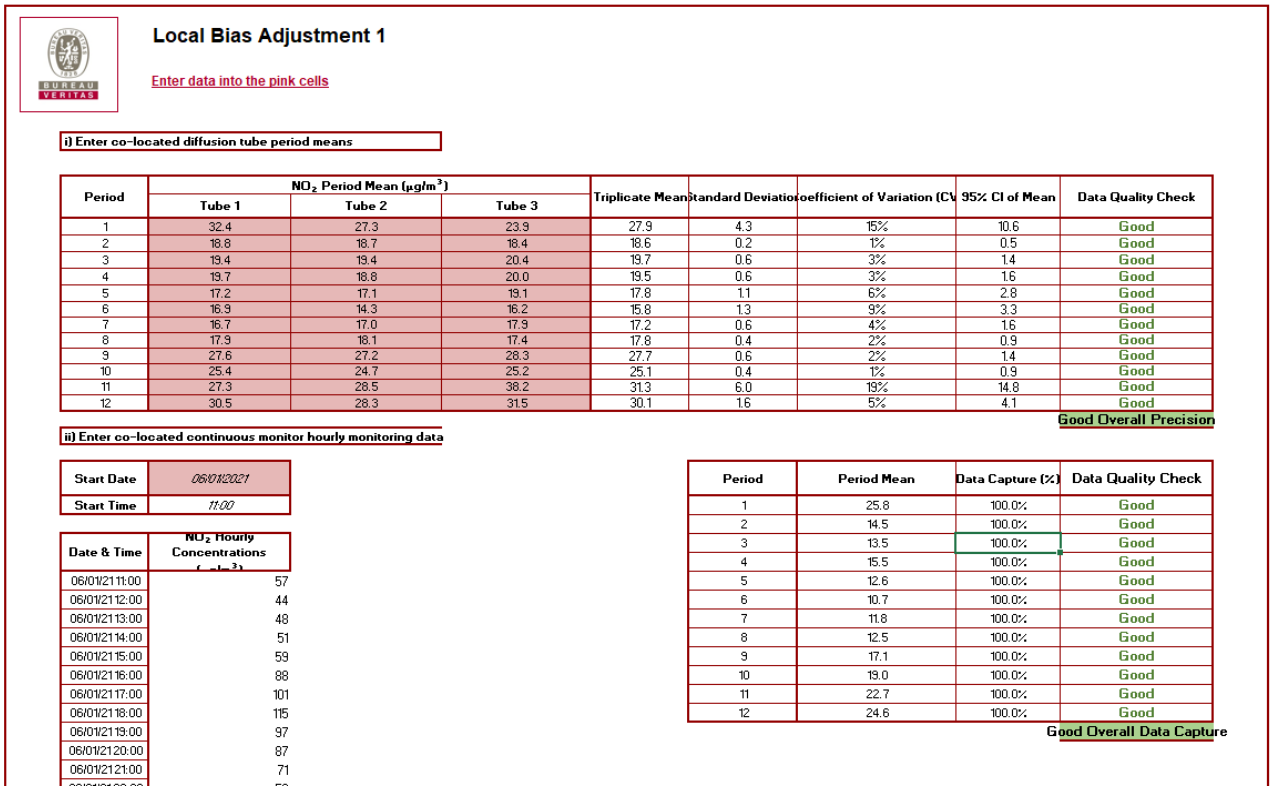
Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[2] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[5]	Bias Adjustment Factor (A) (Cm/Dm)
Socotec Didcot	20% TEA in water	2021	KS	New Forest District Council	12	37	25	50.0%	G	0.67
Socotec Didcot	20% TEA in water	2021	R	New Forest District Council	12	29	23	27.2%	G	0.79
Socotec Didcot	20% TEA in water	2021	R	South Oxfordshire District Council	11	25	18	38.5%	G	0.72
Socotec Didcot	20% TEA in water	2021	R	South Oxfordshire District Council	11	37	33	12.9%	G	0.89
Socotec Didcot	20% TEA in water	2021	KS	Fife Council	11	24	19	25.5%	G	0.80
Socotec Didcot	20% TEA in water	2021	R	Fife Council	11	21	16	36.0%	G	0.74
Socotec Didcot	20% TEA in water	2021	R	Fife Council	12	21	14	51.9%	G	0.66
Socotec Didcot	20% TEA in water	2021	R	Fife Council	12	23	19	20.4%	G	0.83
Socotec Didcot	20% TEA in water	2021	R	London Borough of Ealing	12	63	50	27.1%	G	0.79
Socotec Didcot	20% TEA in water	2021	R	London Borough of Ealing	12	41	32	28.6%	G	0.78
Socotec Didcot	20% TEA in water	2021	R	London Borough of Ealing	11	47	35	33.9%	G	0.75
Socotec Didcot	20% TEA in water	2021	R	Vale of White Horse DC	11	22	17	29.7%	G	0.77
Socotec Didcot	20% TEA in water	2021	R	Rhondda Cynon Taf CBC	12	24	22	11.8%	G	0.89
Socotec Didcot	20% TEA in water	2021	R	Mid and East Antrim Borough Council	12	22	17	34.4%	G	0.74
SOCOTEC Didcot	20% TEA in water	2021		Overall Factor[3] (15 studies)				Use		0.77

A local bias adjustment factor was calculated as 0.75 using the diffusion tube data processing tool, based on a triplicate diffusion tube monitoring site located at the Ballymena Antrim Road automatic monitoring site. Table A.1 shows the local bias adjustment calculation and Figure A.2 shows the prevision and accuracy of the data for clarity.

Table A.1 – Local Bias Adjustment Calculations.

	Local Bias Adjustment Input 1	Local Bias Adjustment Input 2	Local Bias Adjustment Input 3	Local Bias Adjustment Input 4	Local Bias Adjustment Input 5
Periods used to calculate bias	12	-	-	-	-
Bias Factor A	0.75 (0.7 – 0.8)	-	-	-	-
Bias Factor B	34% (25% - 43%)	-	-	-	-
Diffusion Tube Mean (µg/m³)	22.4	-	-	-	-
Mean CV (Precision)	5.9%	-	-	-	-
Automatic Mean (µg/m³)	16.7	-	-	-	-
Data Capture	100%	-	-	-	-
Adjusted Tube Mean (µg/m³)	17 (16 – 18)	-	-	-	-

Figure A.2 – Local bias adjustment prevision and accuracy of data.



Local Bias Adjustment 1

Enter data into the pink cells

i) Enter co-located diffusion tube period means

Period	NO_2 Period Mean ($\mu g/m^3$)			Triplicate Mean	Standard Deviation	Coefficient of Variation (CV	95% CI of Mean	Data Quality Check
	Tube 1	Tube 2	Tube 3					
1	32.4	27.3	23.9	27.9	4.3	15%	10.6	Good
2	18.8	18.7	18.4	18.6	0.2	1%	0.5	Good
3	19.4	19.4	20.4	19.7	0.6	3%	1.4	Good
4	19.7	18.8	20.0	19.5	0.6	3%	1.6	Good
5	17.2	17.1	19.1	17.8	1.1	6%	2.8	Good
6	16.9	14.3	16.2	15.8	1.3	9%	3.3	Good
7	16.7	17.0	17.9	17.2	0.6	4%	1.6	Good
8	17.9	18.1	17.4	17.8	0.4	2%	0.9	Good
9	27.6	27.2	28.3	27.7	0.6	2%	1.4	Good
10	25.4	24.7	25.2	25.1	0.4	1%	0.9	Good
11	27.3	28.5	38.2	31.3	6.0	19%	14.8	Good
12	30.5	28.3	31.5	30.1	1.6	5%	4.1	Good

Good Overall Precision

ii) Enter co-located continuous monitor hourly monitoring data

Start Date	06/01/2021
Start Time	11:00

Date & Time	NO_2 Hourly Concentrations ($\mu g m^{-3}$)
06/01/21 11:00	57
06/01/21 12:00	44
06/01/21 13:00	48
06/01/21 14:00	51
06/01/21 15:00	59
06/01/21 16:00	88
06/01/21 17:00	101
06/01/21 18:00	115
06/01/21 19:00	97
06/01/21 20:00	87
06/01/21 21:00	71

Period	Period Mean	Data Capture (%)	Data Quality Check
1	25.8	100.0%	Good
2	14.5	100.0%	Good
3	13.5	100.0%	Good
4	15.5	100.0%	Good
5	12.6	100.0%	Good
6	10.7	100.0%	Good
7	11.8	100.0%	Good
8	12.5	100.0%	Good
9	17.1	100.0%	Good
10	19.0	100.0%	Good
11	22.7	100.0%	Good
12	24.6	100.0%	Good

Good Overall Data Capture

A summary of bias adjustment factors used by Mid and East Antrim Borough Council over the past five years is presented in Table A.2.

Table A.2 - Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	National	09/22	0.77
2020	Local	-	0.76
2019	National	06/20	0.92
2018	National	03/19	0.93
2017	National	03/19	0.87

NO_2 Fall-off with Distance from the Road

No diffusion tube NO_2 monitoring locations within Mid and East Antrim Borough Council required distance correction during 2021.

QA/QC of Automatic Monitoring

The role of Central Management and Co-ordination Unit (CMCU) for the Ballymena Ballykeel and Ballymena Antrim Road AURN analysers is contracted to Bureau Veritas, whilst formal Quality Assurance/Quality Control (QA/QC) data management duties are contracted to Ricardo Energy & Environment, to ensure reliability and accuracy of the concentrations recorded. Audits of all the automatic analysers at the monitoring sites are completed on a six-monthly basis by Ricardo Energy & Environment.

The maintenance and any urgent call outs of both monitoring sites are completed by Environmental Monitoring Systems Ltd.

Calibrations and minor maintenance of the automatic monitors is completed by an air quality management officer from Mid and East Antrim Borough Council acting as the Local Site Operator (LSO) under a contract from Bureau Veritas. Calibration duties are completed on a fortnightly basis at Ballymena Antrim Road site and monthly at Ballymena Ballykeel site. Manual Calibrations are carried out for each analyser in accordance with AURN requirements. Calibration gases for the network are supplied by BOC Limited and are provided with a UKAS certificate of calibration by Ricardo Energy & Environment.

Data verification and ratification process

DAERA have put in place a comprehensive system of both automatic and manual reviews and updates for the UK Automatic Urban and Rural Monitoring Network (AURN) data.

Hourly mean monitoring results from the AURN are uploaded as **provisional data** every hour. These figures undergo basic screening criteria to exclude clearly faulty data. The objective is to provide data for human health concerns on a near real-time basis, so the checks have to be essentially automatic and rapid. This means that full Quality Assurance and Quality Control (QA/QC) procedures cannot be applied and the data are therefore likely to be of lower accuracy and reliability than that required for final reporting. Provisional data and statistics are clearly marked with a flag in the database to indicate their status.

Following the publication of initial provisional data, there are at least a further two stages which all automatic monitoring data are required to go through to meet the standards required for National Air Quality Monitoring networks.

Data Verification is carried out on an ongoing basis and is nominally a process to "clean-up" the initial provisional data. Any corrections to the data made during the verification process are automatically uploaded (still as PROVISIONAL at this stage) to the UK-AIR for end-users to access. The process includes:

- Further manual review of the data to exclude any data from instrument malfunctions or faulty calibrations.
- Incorporation of any data which were initially missing due to communications failure with a monitoring station.
- Updates to data scaling following application of the most recent calibration factors.

Data Ratification is a detailed manual check of the data set carried out on a quarterly basis for the AURN. It requires a longer-term view of the dataset incorporating the results from **independent QA/QC audits** of the monitoring stations.

Data ratification reviews all calibration data, information from analyser services and repairs and any other information available for the particular site or analyser over the whole ratification period. In addition, the results from the independent QA/QC audits are incorporated to take account of any problems detected during the QA/QC audits such as:

- Long-term drift in an ozone instrument calibration.
- Faulty NOx converters.
- Drifts in calibration cylinder concentrations.
- Instrument leaks or flow faults.
- Faulty instrument configuration.

Incorporation of the QA/QC audits ensures that ratified data are traceable to UK national and international gas calibration standards.

Once all the ratification checks and corrections have been made then the data are re-loaded to the UK-AIR with a new status flag of "Ratified".

All data presented within the 2022 Progress Report is ratified. Live and historical data for air quality monitoring within Mid and East Antrim Borough Council is available at https://uk-air.defra.gov.uk/ and https://www.airqualityni.co.uk/data.

PM_{10} and $PM_{2.5}$ Monitoring Adjustment

Mid and East Antrim Borough Council operated a Tapered Element Oscillating Microbalances (TEOM) PM_{10} analyser at Ballymena Ballykeel from 1st January to 1st June 2021, with the data adjusted to gravimetric equivalent using the VCM methodology. From the 1st June 2021 PM_{10} and $PM_{2.5}$ concentrations were monitored using a FIDAS 200 real-time analyser, with data managed and corrected by Ricardo AEA in compliance with DEFRA UK Standards.

Automatic Monitoring Annualisation

All automatic monitoring locations within Mid and East Antrim Borough Council recorded data capture of greater than 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

NO_2 Fall-off with Distance from the Road

No automatic NO_2 monitoring locations within Mid and East Antrim Borough Council required distance correction during 2021.

Appendix B - Diffusion Tube Monitoring Data

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	NO_2 Mean Concentrations (µg/m³)												Simple Annual Mean (µg/m3)
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
BDT1	310228	402546	17.4	12.0	10.5	10.1	7.2	6.1	7.1	8.3	12.1	11.0	11.5	15.2	10.7
BDT2	310336	403196	38.4	29.5	30.9	35.1	27.2	23.0	25.6	23.7	36.5	40.5	47.4	42.1	33.3
BDT3	305841	405690	30.5	16.9	19.9	21.7	21.5	15.3	16.7	18.9	23.4	22.7	26.0	33.0	22.2
BDT4	310350	403443	33.8	25.0	22.6	25.4	25.1	18.8	21.3	23.8	30.7	22.6	33.8	37.1	26.7
BDT5	310602	402920	29.0		21.1	20.9	19.5	16.8	17.6	18.0	25.0	29.3	27.1	34.9	23.6
BDT6	309532	404425	16.1	11.6	7.9	8.6	7.7	4.0	5.8			7.9	17.2	14.7	10.2
BDT7	310584	403239	58.2	32.2	37.6	36.9	40.9	32.6	45.9	25.4	56.8	62.5	61.7	64.8	46.3
BDT8	310795	403386	24.5	18.3	16.0	16.0	15.3	9.8	12.7	7.4	20.1	21.6	21.7	22.9	17.2
BDT9	310796	403582	22.9	17.7	17.2	15.4	15.6	14.8	15.8	8.5	22.4	24.8	34.3	24.5	19.5
BDT10	311000	403905	21.4	24.9	22.5	26.6	26.9	18.2	20.2	21.7	30.2	28.4	34.9	34.8	25.9
BDT11	311884	397037	31.8	28.2	20.7	24.0	25.9	18.5	24.2	25.6	33.9	30.7	26.6	32.4	26.9
BDT12	310743	402219	31.1	20.6	25.4	29.1	25.6	25.9	22.6	27.1	30.3	31.1	33.3	30.7	27.7
BDT13	310638	403079	33.4	27.7	25.6	28.4	25.8	19.2	24.2	21.3	32.9	31.0	31.5	37.1	28.2
BDT15	310687	403122	53.4	35.7	38.8	36.0	37.8	30.5	37.7	40.3	51.0	50.8	49.0	58.9	43.3
BDT16	310710	403119	30.8	20.6	28.8	31.9	26.9	26.2	28.2	27.8	30.6	35.7	40.1	36.5	30.3
BDT17	310491	403314	48.9	35.9	33.0	31.2	30.6	23.3	37.4	31.3	49.1	45.8	51.0	59.5	39.8
BDT18	310843	401776	32.4	18.8	19.4	19.7	17.2	16.9	16.7	17.9	27.6	25.4	27.3	30.5	-
BDT18A	310843	401776	27.3	18.7	19.4	18.8	17.1	14.3	17.0	18.1	27.2	24.7	28.5	28.3	-
BDT18B	310843	401776	23.9	18.4	20.4	20.0	19.1	16.2	17.9	17.4	28.3	25.2	38.2	31.5	22.4
CDT1	336388	385733	22.9	23.6	13.8	18.6	15.5	13.0	15.6	16.7	22.8	22.8	26.4	24.0	19.6
CDT2	336901	385621	12.1	11.8	5.7	8.2	7.2	6.7	8.7	8.9	10.7	10.7	11.8	12.7	9.6
CDT3	337882	384850	31.5	26.3	23.7	25.4	21.1	22.1	19.6	23.1	32.1	32.1	39.0	32.5	-
CDT4	337882	384850	19.4	30.8	29.9	25.3	18.8	29.1	9.8	23.3	34.1	34.1	40.9	23.3	27.0
CDT5	338747	385764	14.0	13.0	7.3	10.7	8.1	7.4	11.3	10.3	13.1	13.1	13.3	16.2	11.5
CDT6	339915	386731	36.2	34.6	33.5	22.2	22.0	21.6	28.4	26.8	30.5	30.5		23.0	28.1
CDT7	340798	387122	35.1	29.4	22.7	31.7	30.2	18.4	31.1	29.7	29.7	29.7	29.8	33.6	-
CDT8	340798	387122			23.8	36.5	35.2	24.0	36.0	29.4	29.7	29.7	28.9	30.9	30.0
CDT9	340898	387391	24.0	21.3	17.4	22.6	19.6	9.3	18.8	18.6	23.6	23.6	29.0	27.5	21.3

CDT10	341192	387556	24.8	21.0	17.3	17.7	15.5	15.0	16.0	16.3	22.2	22.2	23.0	25.9	19.7
CDT11	341200	387723	15.7	16.2	10.7	10.5	10.1	10.7	11.9	11.9	16.4	16.4	21.6	18.3	14.2
CDT12	341065	388892	21.3	20.2	14.0	22.0	19.3	14.7	18.0	14.4	17.8	17.8	18.8	22.5	18.4
CDT13	342388	388154	23.4	25.9	22.8	21.0	17.8	17.4	18.2	19.2	27.0	27.0	26.2	26.4	22.7
CDT14	347333	392459	12.6			14.6	9.8	8.4	20.3	8.7	12.0	12.0	13.0	17.5	12.9
LDT1	338658	402187	27.5	23.9	20.2	21.0	19.9	16.1	18.8	20.5	26.6	26.6	23.5	25.6	22.5
LDT2	339815	402444	19.8	12.4	10.2	12.9	11.5	8.3	11.5	12.0	13.5	13.5		16.5	12.9
LDT3	340093	402590	21.9	16.2	11.7	18.0	15.9	10.5	16.5	16.4	18.5	18.5	20.4	21.8	17.2
LDT4	340346	402845			20.2	20.1	19.4		23.3	20.7	27.4	27.4	30.0	27.8	24.0
LDT5	339212	403188	20.7	20.8	16.6	19.2	16.0	13.7	15.6	16.8	19.7	19.7	16.5	22.4	18.1
LDT6	341236	401970	21.6	22.5	12.1	13.1	14.7	9.9	11.6	10.5	16.4	16.4	15.5	18.7	15.3
LDT7	341321	401696	11.5	11.6	7.4	12.7	9.6		12.2	13.7	9.0	9.0	8.6	10.8	10.6
LDT8	342069	402090	13.1	10.6	8.7	9.6	8.2	8.4	8.7	8.2			19.1	14.6	10.9

Appendix C – 2021 Air Quality Report for Ballymena Ballykeel

Air Pollution Report

1st January to 31st December 2021

Ricardo Energy & Environment

Ballymena Ballykeel (Site ID: BALY)

These data have been fully ratified

Only relevant statistics for LAQM are presented in the table. Cells with - indicate no data available or calculated.

Pollutant	NO µg/m³	NO_2 µg/m³	NO_x as NO_2 µg/m³	SO_2 µg/m³	PM_{10} µg/m³	PM_{25} µg/m³
Number Days Low	-	365	-	343	345	194
Number Days Moderate	-	0	-	0	0	0
Number Days High	-	0	-	0	0	0
Number Days Very High	-	0	-	0	0	0
Max 15 min SO2	-	-	-	9	-	-
Max Daily Mean	67	48	144	2	25	18
Annual Max	195	95	395	7	97	65
Annual Mean	4	11	17	1	10	6
98th Percentile of daily mean	-	-	-	-	22	-
90th Percentile of daily mean	-	-	-	-	17	-
99.9th Percentile of 15 minute mean	-	-	-	4	-	-
99.8th Percentile of hourly mean	-	69	-	-	-	-
99.7th Percentile of hourly mean	-	-	-	3	-	-
98th Percentile of hourly mean	31	41	85	2	28	18
95th Percentile of hourly mean	13	31	50	2	23	14
50th Percentile of hourly mean	2	8	11	1	9	5
% Annual data capture	**98.14%**	**98.14%**	**98.14%**	**89.94%**	**94.84%**	**53.76%**

Instruments:

PM_{10}: Conventional TEOM Gravimetric Equivalent (VCM correction applied) (01/01/2021 to 31/05/2021), Conventional TEOM Gravimetric Equivalent (VCM correction applied) (03/05/2021 to 03/05/2021), FIDAS (01/06/2021 to 31/12/2021)

PM_{25}: FIDAS

Pollutant	Air Quality Standards Regulations (NI) 2010	Exceedances	Days
PM10 particulate matter (Hourly measured)	daily mean > 50 microgrammes per metre cubed	0	0
PM10 particulate matter (Hourly measured)	Annual mean > 40 microgrammes per metre cubed	0	-
PM2.5 particulate matter (Hourly measured)	Annual mean > 25 microgrammes per metre cubed	0	-
Nitrogen dioxide	Hourly Mean > 200 microgrammes per metre cubed	0	0
Nitrogen dioxide	Annual Mean > 40 microgrammes per metre cubed	0	-
Sulphur dioxide	15 Minute mean > 266 microgrammes per metre cubed	0	0
Sulphur dioxide	Hourly mean > 350 microgrammes per metre cubed	0	0
Sulphur dioxide	Daily Mean > 125 microgrammes per metre cubed	0	0
Sulphur dioxide	Annual mean > 20 microgrammes per metre cubed	0	-
Sulphur dioxide	Winter Mean > 20 microgrammes per metre cubed	0	-

Appendix D – 2021 Air Quality Report for Ballymena Antrim Road

Air Pollution Report

1st January to 31st December 2021

Ricardo Energy & Environment

Ballymena Antrim Road (Site ID: BAAR)

These data have been fully ratified

Only relevant statistics for LAQM are presented in the table. Cells with - indicate no data available or calculated.

Pollutant	NO µg/m³	NO_2 µg/m³	NO_x as NO_2 µg/m³
Number Days Low	-	363	-
Number Days Moderate	-	0	-
Number Days High	-	0	-
Number Days Very High	-	0	-
Max Daily Mean	144	55	276
Annual Max	393	115	718
Annual Mean	14	17	39
99.8th Percentile of hourly mean	-	87	-
98th Percentile of hourly mean	82	59	183
95th Percentile of hourly mean	49	46	120
50th Percentile of hourly mean	8	13	25
% Annual data capture	**96.86%**	**96.86%**	**96.86%**

All gaseous pollutant mass units are at 20°C and 1013mb. Particulate matter concentrations are reported at ambient temperature and pressure. NO_X mass units are NO_X as NO_2 µg m-3

Pollutant	Air Quality Standards Regulations (NI) 2010	Exceedances	Days
Nitrogen dioxide	Hourly Mean > 200 microgrammes per metre cubed	0	0
Nitrogen dioxide	Annual Mean > 40 microgrammes per metre cubed	0	-

Appendix E - Impact of COVID-19 upon LAQM

1. Did your local authority maintain diffusion tube monitoring networks as normal (exposure and analysis in line with diffusion tube calendar) during 2021, including over the lockdown period?

   Mid and East Antrim Borough Council maintained diffusion tube monitoring as normal during 2021 ensuring exposure and analysis in line with the diffusion tube calendar.

2. Did your local authority maintain automatic air quality monitoring sites as normal (LSO visits, etc.) during 2021, including over the lockdown period?

   Mid and East Antrim Borough Council LSO's maintained automatic air quality monitoring sites as normal during 2021, including over the lockdown period.

3. Did your local authority carry out any additional monitoring during 2021, in response to the COVID-19 pandemic?

   Mid and East Antrim Borough Council did not conduct any additional monitoring during 2021 in response to the COVID-19 pandemic.

4. Are there any ongoing issues with your local air quality monitoring network related to the COVID-19 response?

   There are no ongoing issues with Mid and East Antrim Borough Council's local air quality monitoring network related to the COVID-19 response.

5. Has the local authority undertaken any analysis of the impact of the COVID-19 pandemic in air quality within its district?

   Mid and East Antrim Borough Council have not undertaken any additional analysis of the impact of the COVID-19 pandemic in air quality within the district.

6. Did COVID-19 provide any opportunities for LAQM within the local authority area in respect of improving local air quality, such as through promotion of walking and cycling, additional cycle infrastructure etc

   Travel restrictions introduced by Government during the COVID-19 pandemic dramatically reduced the traffic flows through the Borough including the declared AQMA's, resulting in improved local air quality.