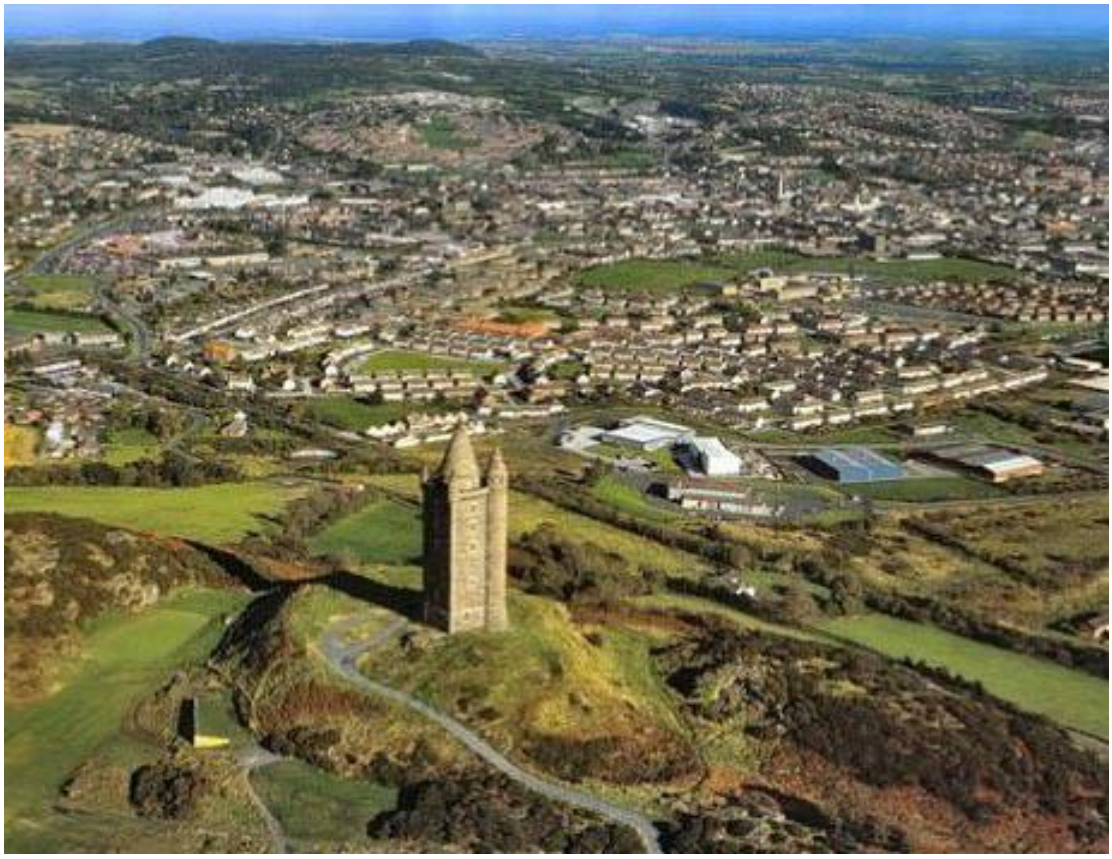
Ards and North Down Borough Council

2023 Air Quality Progress Report

In fulfillment of Environment (Northern Ireland) Order 2002
Local Air Quality Management
May 2023



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Executive Summary

The Air Quality Strategy has established the framework for air quality management in the UK. Local Authorities have a duty under the Environment Act 1995 and subsequent regulations to review and assess air quality in their areas on a periodic basis to identify all areas where the air quality objectives are being or are likely to be exceeded. A phased approach has been adopted for the review and assessment process so that the level of assessment undertaken is commensurate with the risk of an exceedance of an air quality objective.

An updating and screening assessment (USA) is required to be prepared every three years by all local authorities in the UK. The last updating and screening assessment of air quality was undertaken in 2021, Ards and North Down Borough Council have presently no Air Quality Management Area (AQMA) declared.

This report is the 2023 progress report for Ards and North Down Borough Council (ANDBC) and has been completed using the recommended template. The assessment is fully compliant with the applicable policy and technical guidance. This report identified no exceedances of the Air Quality Strategy objectives for 2022 for any of the pollutants assessed with relevant exposure. Planning applications have been examined by ANDBC Environmental Health, Protection and Development Department to assess if an air quality impact assessment is required.

NO_2 levels due to vehicle emissions remain the main source of concern within ANDBC, it is a popular residential area due to the easy commute to Belfast city centre. The automatic monitoring site in Holywood is positioned on the A2 Bangor to Belfast main route to the city centre where the highest traffic flow is recorded within the Borough. The NO_2 results have shown a reduction in the past three years, the reductions in emissions in 2020 and 2021 are likely to have been a result of the lower traffic flows due to the COVID pandemic. Levels have increased in 2022 when the COVID restrictions were eased but still remain lower than the pre-pandemic levels, possibly due to changes in working patterns, therefore it is not possible to determine a true trend in the levels of NO_2 in the past five years.

Monitoring will continue in 2023 on the A2 main arterial route into Belfast City and hot spots around the Borough where traffic congestion is common at rush hour. The large housing development in the Movilla area of Newtownards is now established and a new link road has commenced to improve traffic flows when building work is

completed. The housing development on the Rathgael Road in Bangor, and the new road layout are now completed helping to prevent congestion of the traffic in this area. During the planning process, these and other smaller housing developments were examined by the Environmental Department and were found to have no significant impact on air quality. Ards & North Down Borough Council are actively working towards improving Air Quality within the Borough. There are plans to extend existing coastal Green Ways and construct new cycle and pedestrian routes that connect with the Belfast cycle route and the City Centre, also giving easy access to the new Belfast Rapid Transport System from Dundonald. Translink are also planning to develop a new 450 space Park & Ride in Newtownards on the lands of the former council leisure centre.

ANDBC launched the new “Engine off Prevent the Cough” initiative in 2019 in local primary schools, educating pupils and parents about the harmful emissions from vehicles with the emphasis on idling engines outside schools. Unfortunately it was not carried out in 2020 due to COVID 19, but was re-launched in 2021. ANDBC will continue to encourage participation in the initiative in 2023 by utilising social media, existing contacts and the local press.

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1 Introduction

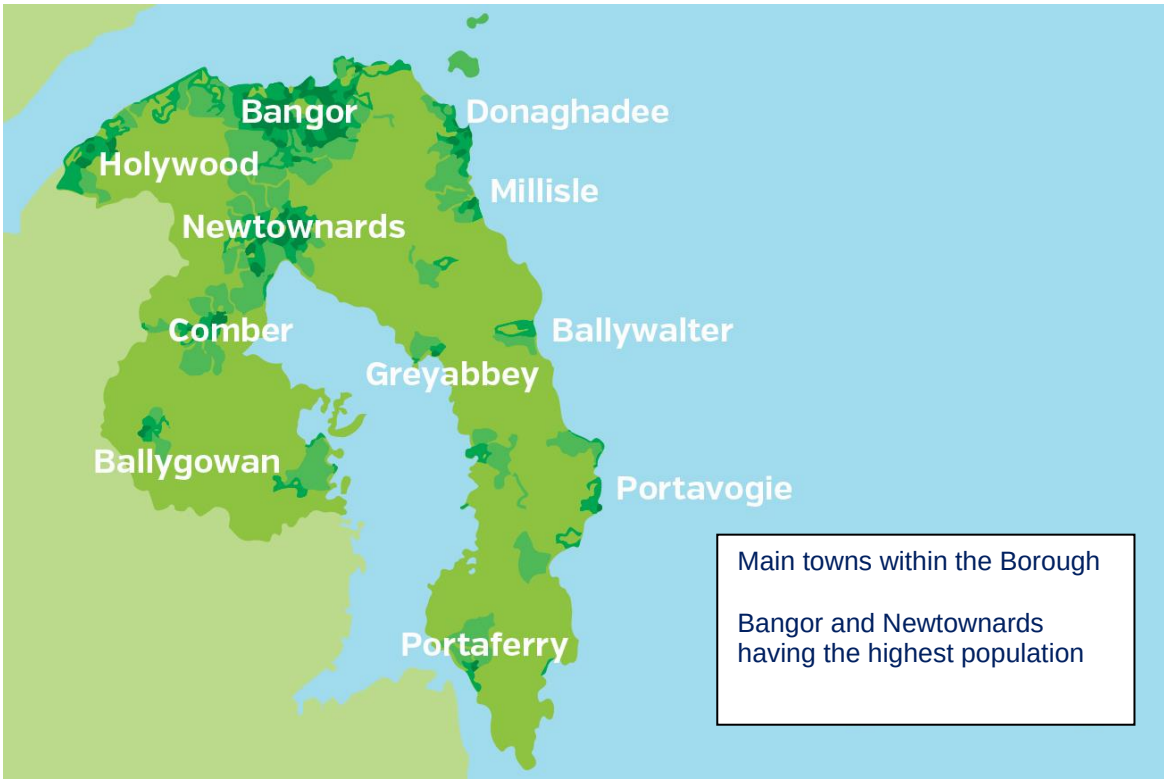
1.1 Description of Local Authority Area

Ards and North Down Borough Council is one of 11 councils in Northern Ireland, with a population of 162,714. The Borough is of mixed urban and rural character situated east of Belfast City and the two largest towns Bangor and Newtownards are popular residential areas due to the ease of commute to Belfast City. It is an area of outstanding natural beauty and special scientific interest bounded by over 100 miles of coastline and the prevailing wind direction is south-westerly.

Air Quality in ANDBC is generally good as there is good ventilation from sea breezes. There are few industrial processes in the area that are significantly detrimental to air quality and heavy fuel oil is not widely used for heat generation. Solid fuel is still very popular as a secondary fuel. However, there are a number of very busy trunk roads in the area and four main arterial routes into Belfast, the busiest being the A2 commuter route from Bangor to Belfast with approximate average daily traffic flows of over 44,000 vehicle movements per day at Holywood. This remains the main area of concern with relation to Air Quality for Nitrogen Dioxide and PM_{10}. Several monitoring sites are located at relevant exposure along this main arterial route to Belfast. Other sites are located at congested points throughout Newtownards, Bangor, and Comber town centers. All present monitoring within the Borough indicates that the objectives in the air quality strategy are not currently being exceeded at relevant exposure.

Figure 1.1 Map of Ards and North Down Borough Council within Northern Ireland

Figure 1.2 Ards and North Down Borough Council area



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 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 (milligrams 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 Assessments

Local authorities in Northern Ireland amalgamated on 1st April 2015 creating 11 new councils, the following reports have been submitted by ANDBC since the amalgamation.

2015 - Update and Screening Assessment
2016 - Progress report
2017 - Progress report
2018 - Update and Screening Assessment
2019 - Progress report
2020 - Progress report
2021 - Update and Screening Assessment
2022 – Progress report

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

ANDBC has one automatic monitoring site on the A2 in Holywood, monitoring NO_2 and PM_{10} and $PM_{2.5}$. Manual calibrations are carried out by the Local Air Quality officer. AQDM (Air Quality Data Management) are employed to ratify and validate the data. A specialist engineer is employed to service and maintain the site as required. Results and correction factors are detailed in Appendix A.

In 2022 a co-location study for the NO_2 diffusion tubes was also carried out at this site. Results from this study were submitted to the March 2023 national data base.

Results and correction factors are detailed in Appendix A.

Figure 2.1 Position of the automatic air monitoring site within ANDBC

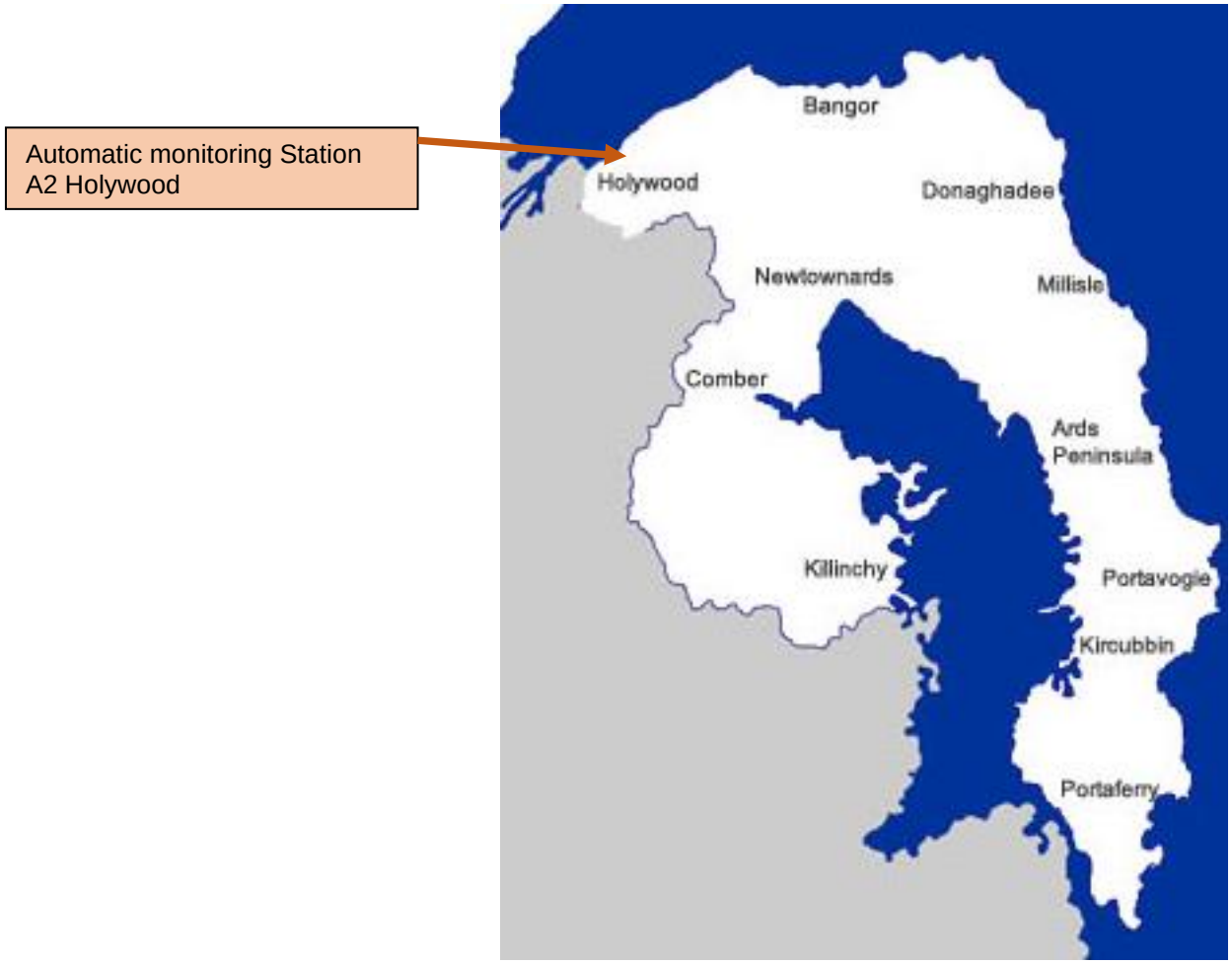


Figure 2.2 Position of Automatic Monitoring Site on the A2 Holywood

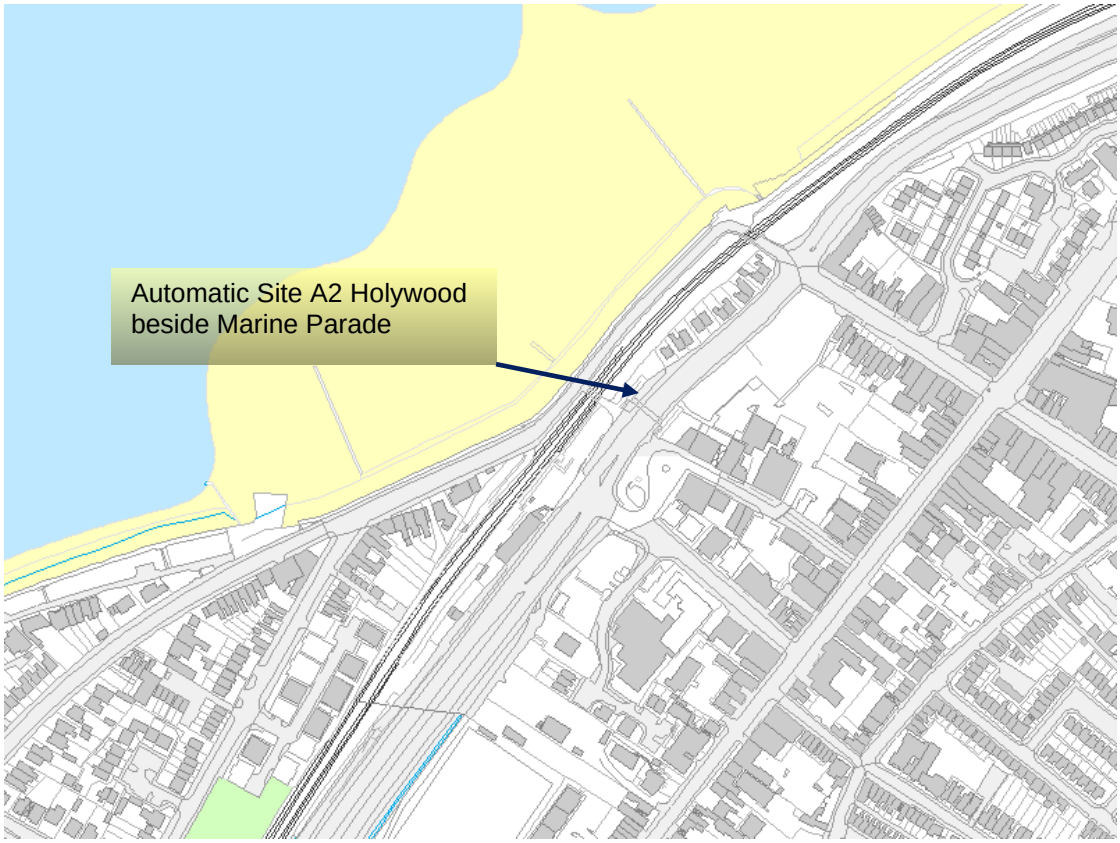


Figure 2.3 Aerial photo of Automatic Monitoring Station A2 Holywood

Table 2.1 – Details of Automatic Monitoring Sites

Site Name	Site Type	Irish Grid Reference	Irish Grid Reference	Inlet Height (m)	Pollutants Monitored	In AQMA?	Monitoring Technique	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
Marine Parade Holywood A2	Roadside	X339481	Y379328	2	PM_{10}, $PM_{2.5}$ NO_2	N	FIDAS 200 Chemiluminescence	YES 30m	4.6M	YES

2.1.2 Non-Automatic Monitoring Sites

ANDBC has 15 NO_2 diffusion tube sites at roadside and background sites. Seven are positioned along the A2 main arterial route into Belfast from Bangor at roadside and on facades of the closest dwellings to the roadside, four of these sites are located at the Holywood junction where traffic flows are at their highest and there are a number of roadside residential properties. The remainder of the tubes are at relevant exposure at various hotspots where there is traffic congestion at rush hour in Newtownards, Bangor, Comber and Holywood, and where further development has been planned. In 2020 monitoring also commenced on the façade of a property in Cleland Park South Bangor due to the health concerns related to air pollution from traffic congestion at rush hour, this was removed in 2022 due to access issues and will be re-located to the outer ring behind the property in 2023. A co-location study was carried out at the automatic site in Holywood and these results were submitted into the national data base and included in the March 2023 data sheet. It has not been possible to determine a trend from the diffusion tube studies for the past five years (See Fig. 2.16). In 2020 there was a significant reduction at all the NO_2 sites, however this was during the COVID 19 pandemic, during lockdown the traffic flows on all the main routes in the Borough leading to Belfast City centre were greatly reduced. In 2021 and 2022 levels of NO_2 showed an increase but remain lower than the pre COVID levels, possibly due to changes in working patterns.

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

The bias adjustment factor from the co-location study is **0.67** and was calculated using the R&A support precision and accuracy spread sheet. A decision was made to apply the national figure of **0.83** as 27 studies were included and was deemed to be a more realistic figure.

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

Below are maps of the diffusion tube sites.

Figure 2.4 Map(s) of Non-Automatic Monitoring Sites

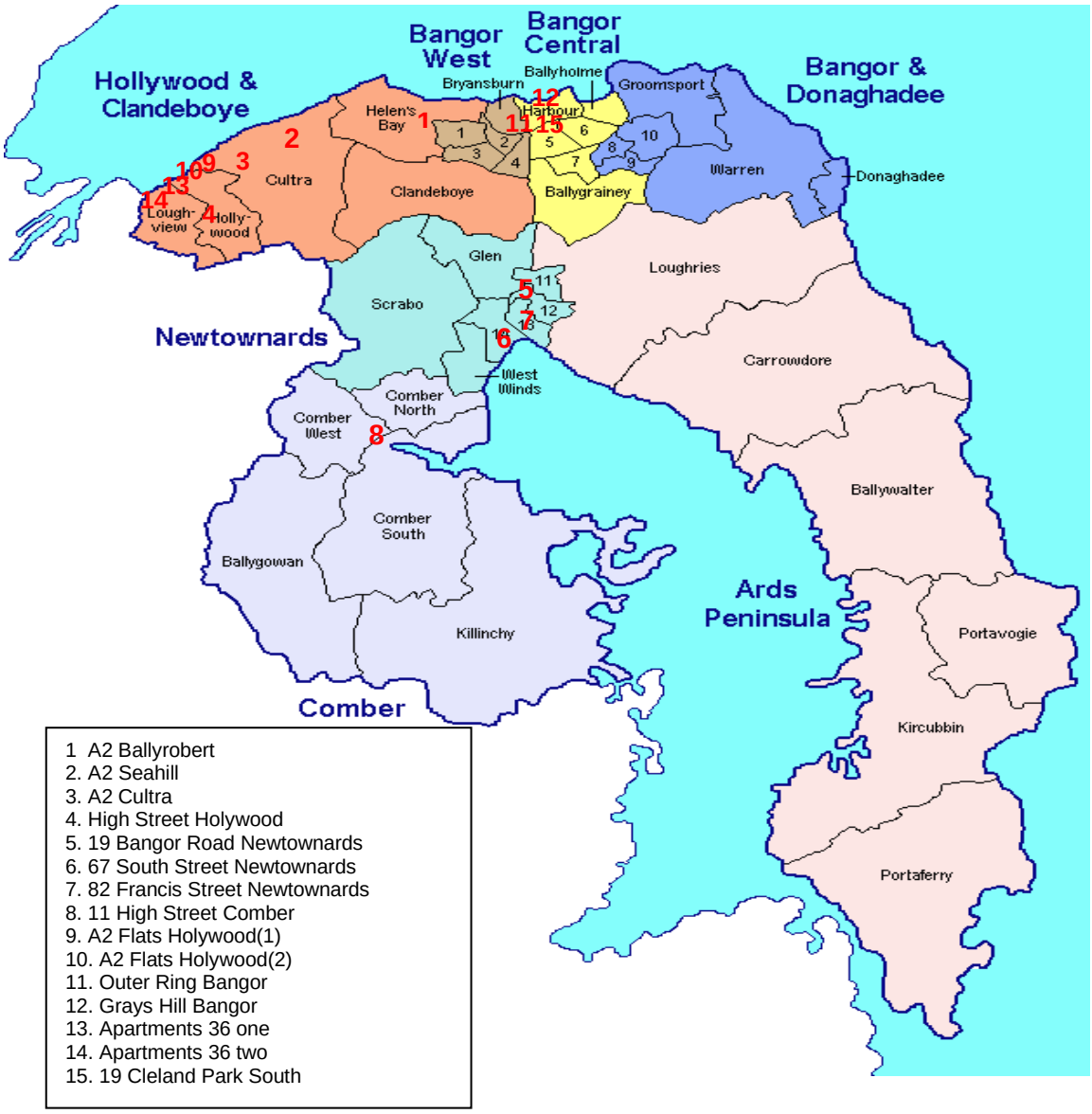


Figure 2.5 Position of Diffusion tube sites 5-7 in Newtownards

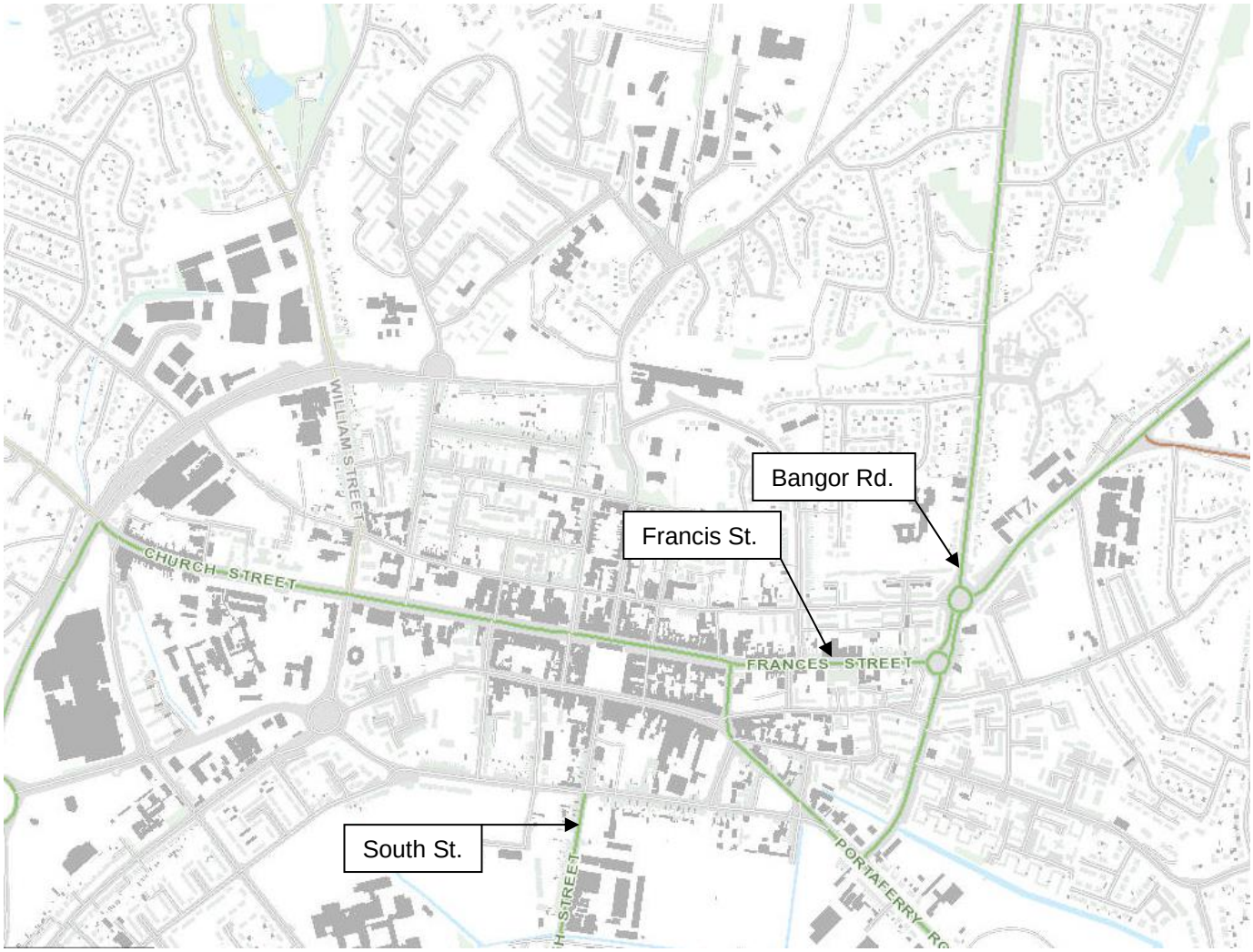
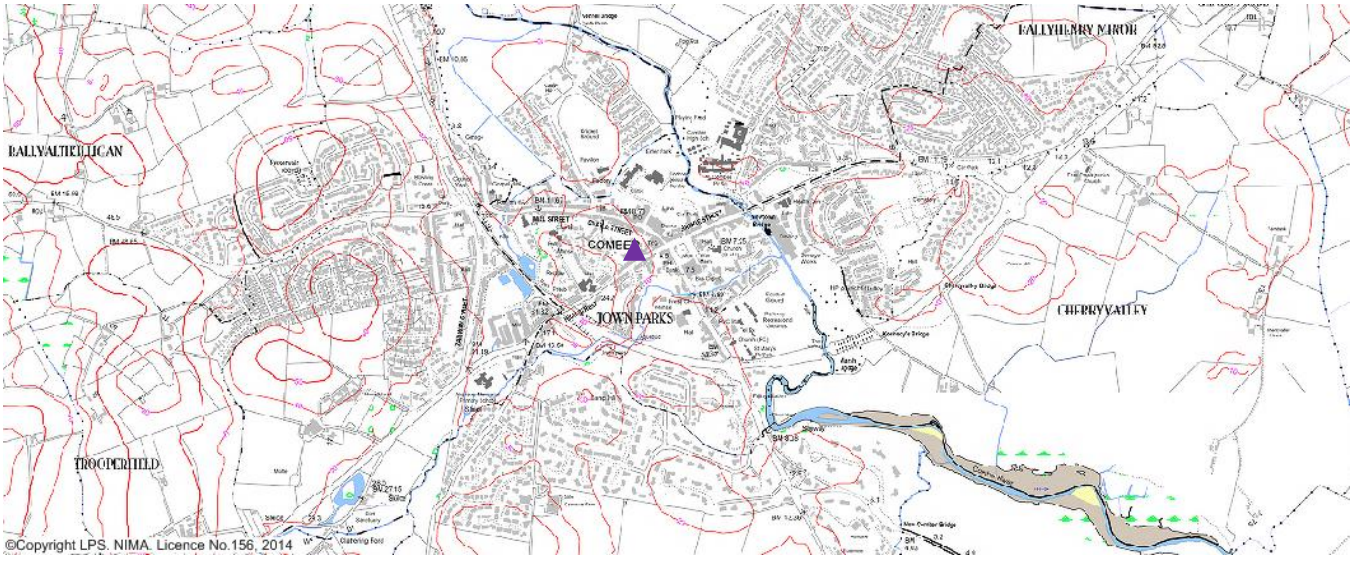
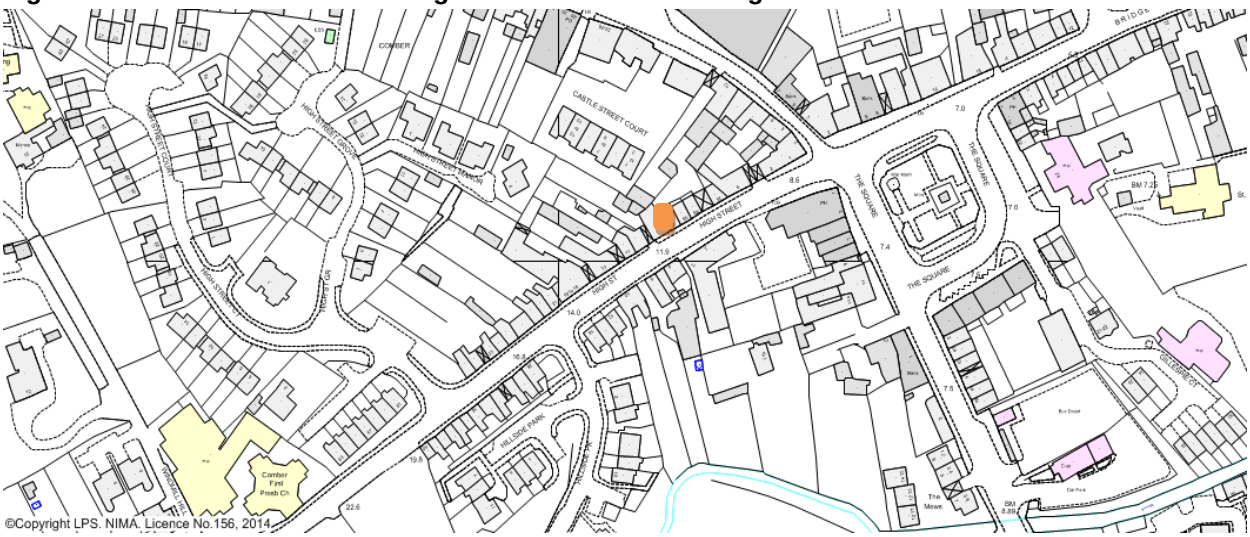


Figure2.6 Position of tube 8 in Comber village



▲ Position of diffusion tube in Comber Village Centre

Figure2.7 Position of tube 8 on High Street in Comber village



Position of diffusion tube 6 - High Street Comber

Figure2.8 Position of tubes 1-4,9,10,13,14 on and near A2

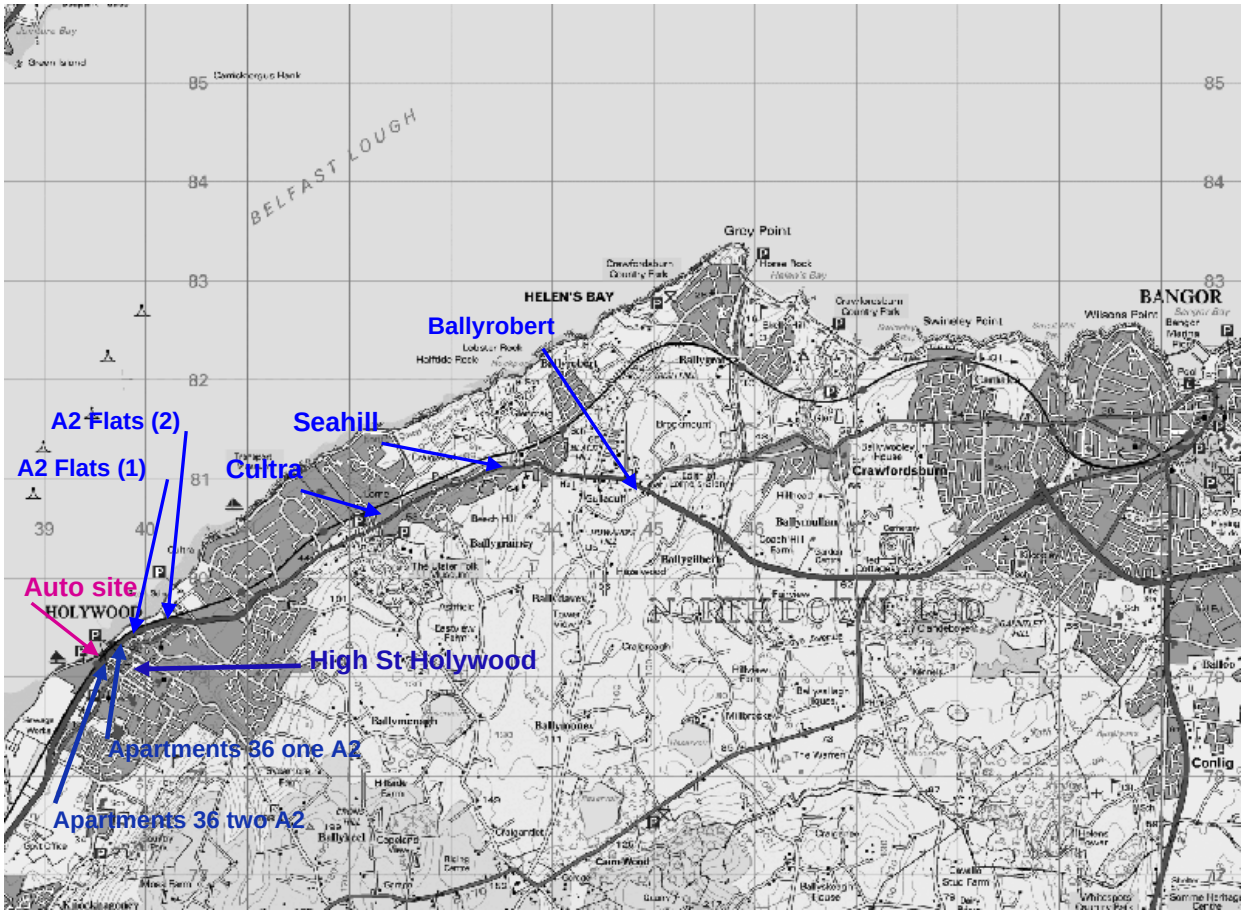
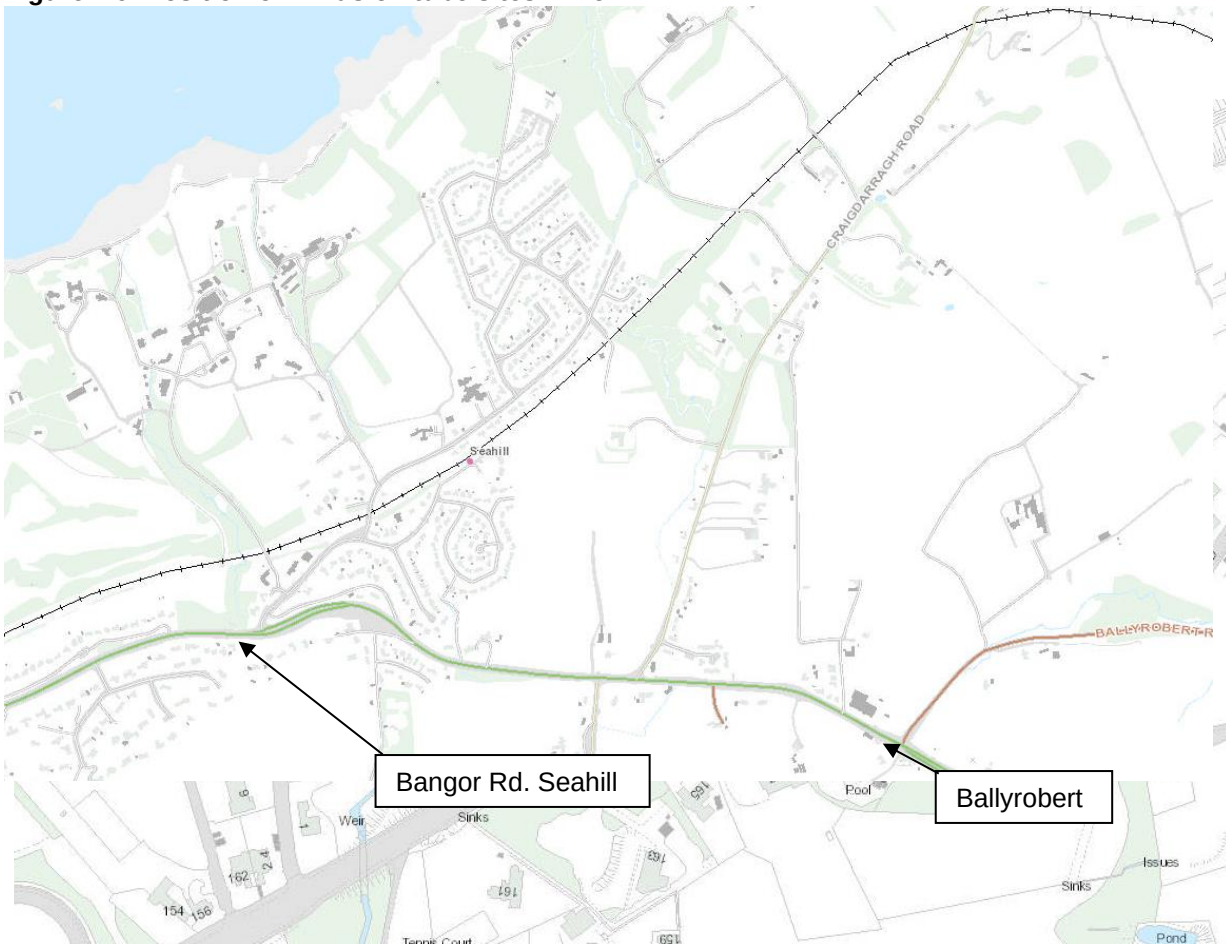


Figure 2.9 Position of Diffusion tube sites 1-2 on A2



Figures 2.10 Position of Diffusion tube sites 4,9,10 on the A2 in Holywood, and the two new sites in 2019 (13,14) at Apartments 36 Shore Road Holywood.

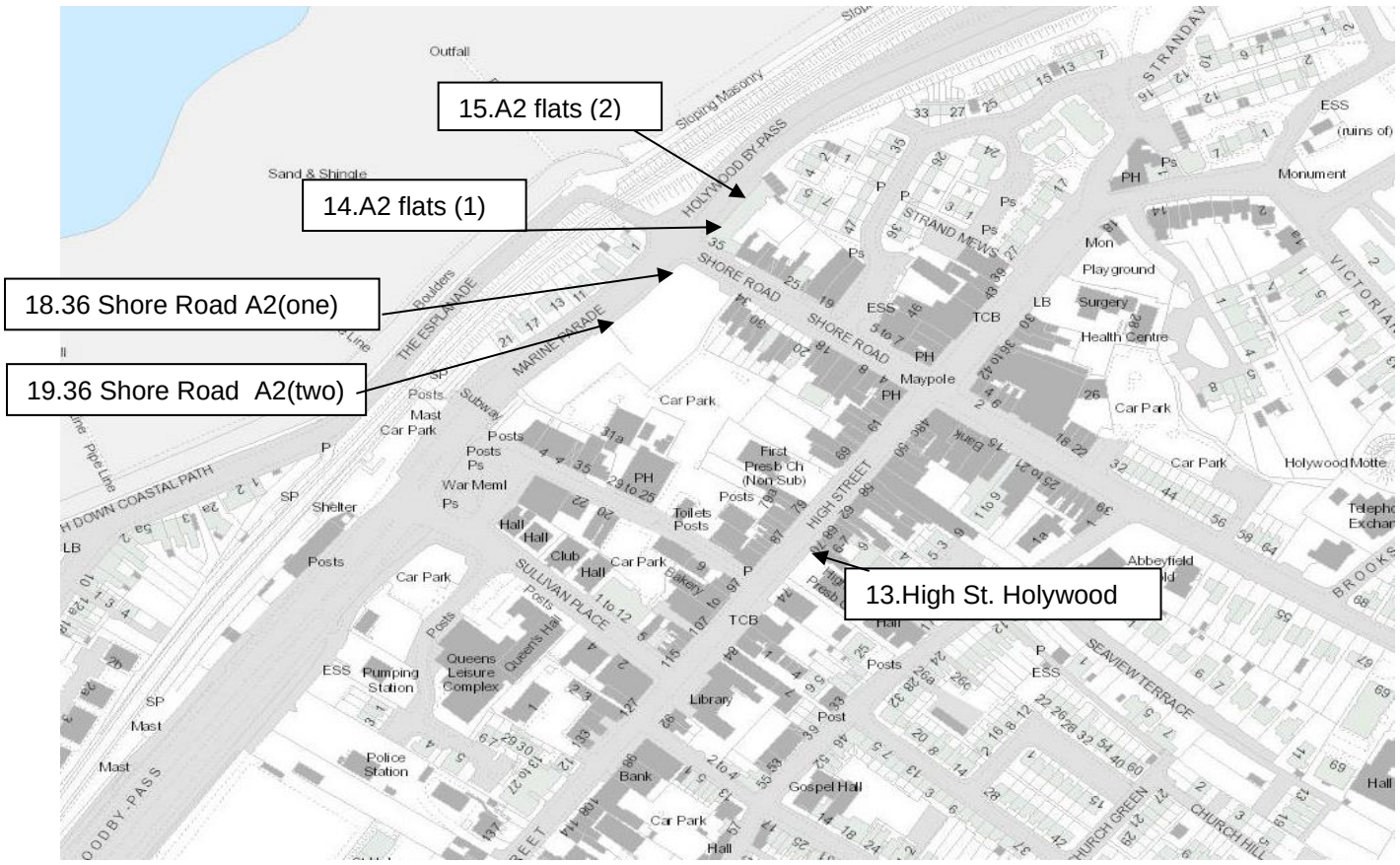


Figure 2.11 Holywood junction A2

Tubes 9, 10 A2 flats Holywood **Tubes 13, 14 at apartments 36 Shore Road A2**

Figure 2.12 Position of Diffusion Tube site 11 Outer Ring Bangor

Position tube

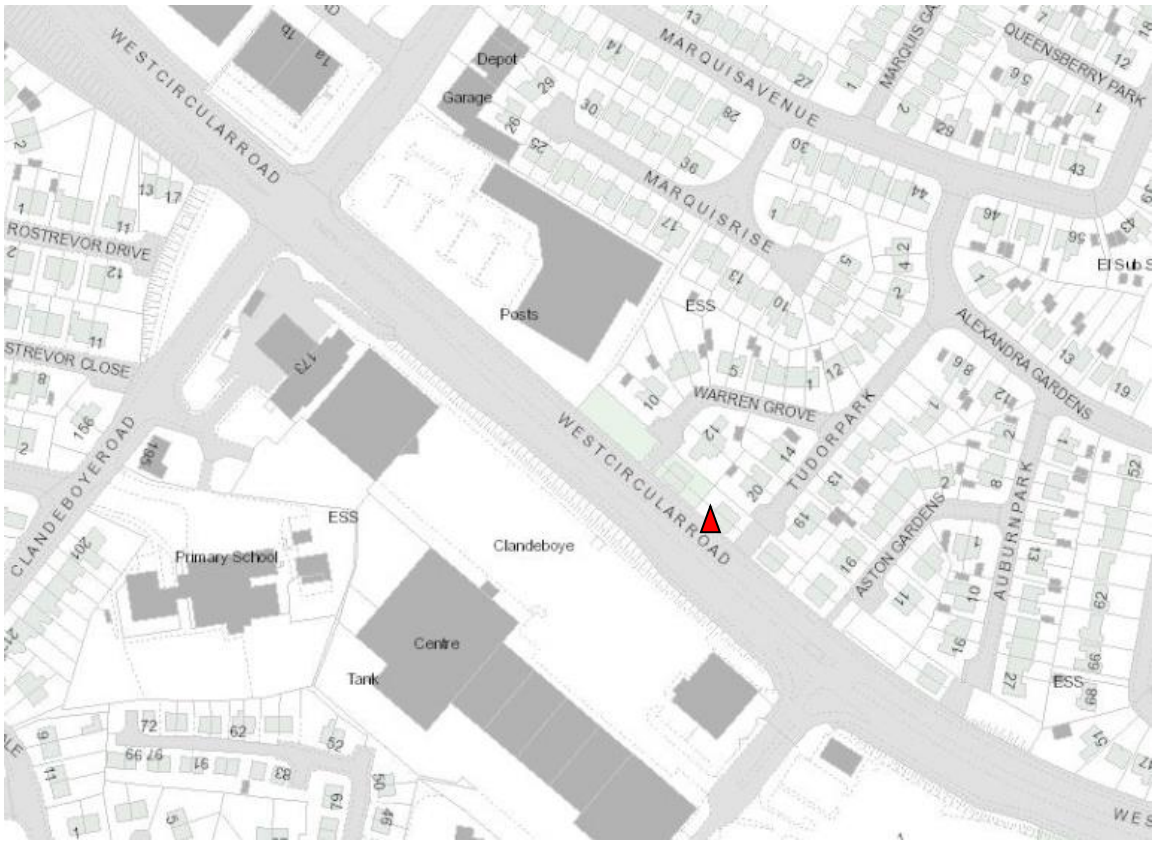


Figure 2.13 Position of Diffusion Tube site 12 at 17 Grays Hill Bangor

Position of tube

Figure 2.14 Position of Diffusion Tube site 15 Cleland Park South Bangor (new tube 2020, 2021 and removed in 2022)

Position new tube

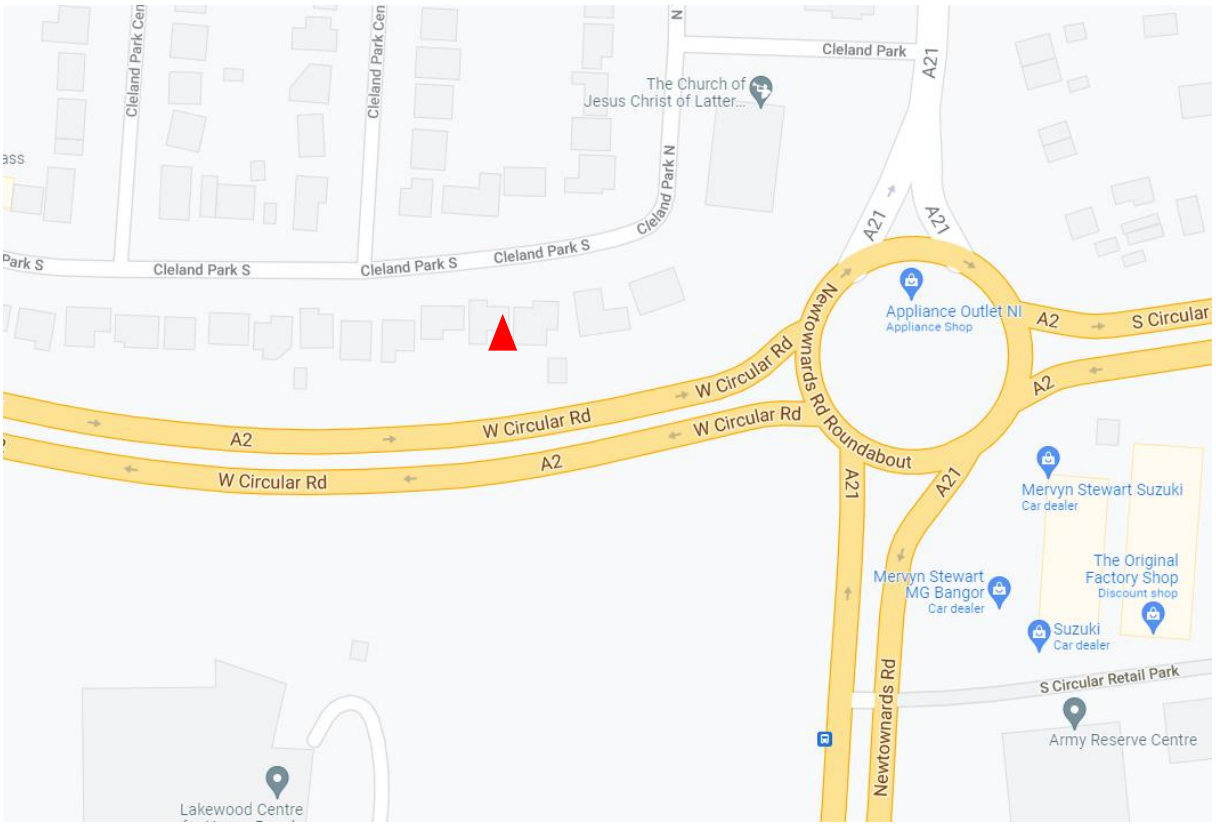


Table 2.2 – Details of Non- Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
1	A2 Ballyrobert	Roadside	345002	380823	2	NO_2	No	No	Y (<1m)	3m	Y
2	A2 Seahill	Roadside	343545	381102	2	NO_2	No	No	Y (<1m)	10m	Y
3	A2 Station Rd Cultra roadside	Roadside	342461	380656	2	NO_2	No	No	Y (5m)	1.3m	Y
4	High Street Holywood	Roadside	339785	379119	2.5	NO_2	No	No	Y (20m)	1.5	Y
5	19 Bangor Rd Newtownards	Roadside	349687	374267	2.5	NO_2	No	No	Y (1.5m)	1.5m	Y
6	67 South St. Newtownards (b)	Roadside	348238	373590	2.5	NO_2	No	No	Y (0.5m)	1.5m	Y
7	82 Frances St. Newtownards	Roadside	349324	369201	2	NO_2	No	No	Y (0.5)	1.5m	Y
8	11 High St Comber	Roadside	345827	369201	2.5	NO_2	No	No	Y (0.5)	1.5m	Y
9	A2 Flats Holywood(1)	Roadside	339756	379330	2	NO_2	No	No	Y (0.5m)	2.9m	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?
10	A2 Flats Holywood(1)	Roadside	339774	379351	2	NO_2	No	No	Y (0.5m)	2.9m	Y
11	Outer Ring Bangor	Roadside	349578	380087	2	NO_2	No	No	Y (2m)	2m	Y
12	Grays Hill Bangor	Roadside	350195	381781	2	NO_2	No	No	Y (11m)	2m	Y
13	Apartment 36 A2 one	Roadside	339729	379277	2	NO_2	No	No	Y (5.1)	2.9m	Y
14	Apartment 36 A2 two	Roadside	339691	379264	2	NO_2	No	No	Y (5.1)	2.9m	Y
15	Cleland Park South	Roadside	349954	379980	2	NO_2	No	No	Y (0)	25m	Y

The sites in green commenced in 2018

The sites in orange commenced in 2019

The site was monitored in 2020 and 2021

2.2 Comparison of Monitoring Results with Air Quality Objectives

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

2.2.1 Nitrogen Dioxide (NO_2)

In the following section results are presented for NO_2 at the automatic and diffusion tube sites and compared with the objective.

All sites meet the objective at relevant exposure.

Automatic Monitoring Data

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

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

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2022 % [b]	Annual Mean Concentration (µg/m^3)				
					2018* [c]	2019* [c]	2020* [c]	2021* [c]	2022 [c]
A2 Holywood	Roadside	NO	N/A	99.7	29	26	20	22	22

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

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

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

* Annual mean concentrations for previous years are optional

Figure 2.15 – Trends in Annual Mean NO_2 Concentrations Measured at Automatic Monitoring Sites

Results have been consistent since installation of the automatic station; any variation was most probably due to climatic conditions pre the COVID pandemic when levels reduced and have remained constant since the COVID restrictions eased and traffic flows increased again although a reduction is still evident. There have been no exceedances of the hourly mean.

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

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period % [a]	Valid Data Capture 2022 % [b]	Number of Hourly Means > 200µg/m^3				
					2018* [c]	2019* [c]	2020* [c]	2021* [c]	2022 [c]
A2 Holywood	Roadside	NO	N/A	99.7	0	0	0	0	0

In bold, exceedance of the NO_2 hourly mean AQS objective (200µg/m^3 – not to be exceeded more than 18 times per year)

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

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

* Number of exceedances for previous years is optional

Diffusion Tube Monitoring Data

Results of the NO_2 diffusion tube sites, situated within the borough are shown below in Table 2.5.

They are sited in accordance with the technical guidance LAQM.TG (16)

A diffusion tube co-location study in 2022 was carried out at the Holywood automatic site, the results of this study were submitted into the national data base, the 2022 local bias was **0.67,** as in previous years a decision has been made to apply the national bias adjustment factor of **0.83,** as this is based on 27 studies and therefore deemed to be a more realistic figure.

The A2 Holywood junction continues to be a source of concern as this is where the highest traffic flows can normally be found on this main arterial route to the City Centre. At this roadside location there are two large residential apartment blocks built directly beside the road and there are four diffusion tubes positioned here. All the A2 roadside sites have been distance calculated to the nearest relevant exposure. The NO_2 results from the automatic real time monitoring unit, which is positioned across from the diffusion tube sites at this Holywood junction, are lower. However its location benefits from sea breezes whereas the diffusion tubes at the apartment blocks are sheltered. A picture of these sites can be found in figures 2.10 and 2.11. Results have been lower since 2020 due to the reduced traffic flows during the COVID pandemic and working patterns changing since restriction have been eased.

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

Trends for the 15 diffusion tube sites within the Council area are shown in figure 2.16.

Table 2.5 – Results of NO_2 Diffusion Tubes 2022

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2022 (Number of Months)	2022 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.83
1	A2 Ballyrobert	Roadside	N	single	12	22
2	A2 Seahill	Roadside	N	single	12	10
3	A2 Station Rd Cultra roadside	Roadside	N	single	11	34
4	High Street Holywood	Roadside	N	single	12	19
5	19 Bangor Rd Newtownards	Roadside	N	single	12	23
6	67 South St. Newtownards (b)	Roadside	N	single	11	22
7	82 Frances St. Newtownards	Roadside	N	single	12	20
8	11 High St Comber	Roadside	N	single	11	25
9	A2 Flats (1) Holywood	Roadside	N	single	12	26
10	A2 Flats (2) Holywood	Roadside	N	single	12	28
11	Outer Ring Bangor	Roadside	N	single	12	18
12	Gray's Hill Bangor	Roadside	N	single	12	17
13	Apartment 36 shore Road A2 one	Roadside	N	single	12	32

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2022 (Number of Months)	2022 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.83
14	Apartment 36 Shore Road A2 two	Roadside	N	single	12	32

These sites were new in 2018

These sites were new in 2019

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

Underlined, annual mean > 60µg/m^3, indicating a potential exceedance of the NO_2 hourly mean AQS objective

[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%

[b] If an exceedance is measured at a monitoring site not representative of public exposure, NO_2 concentration at the nearest relevant exposure should be estimated based on the "NO_2 fall-off with distance" calculator (http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html), and results should be discussed in a specific section. The procedure is also explained in paragraphs 7.77 to 7.79 of LAQM.TG16.

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

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]				
			2018 (Bias Adjustment Factor = 0.93)	2019 (Bias Adjustment Factor = 0.92)	2020 (Bias Adjustment Factor = 0.81)	2021 (Bias Adjustment Factor = 0.84)	2022 (Bias Adjustment Factor = 0.83)
1	A2 Ballyrobert	N	29	28	19	23	22
2	A2 Seahill	N	13	11	9	15	10
3	A2 Station Rd Cultra roadside			39	26	29	34
4	High Street Holywood	N	21	26	17	21	19
5	19 Bangor Rd Newtownards	N	29	28	22	23	23
6	67 South St. Newtownards (b)	N	25	26	19	22	22
7	82 Frances St. Newtownards	N	24	25	18	21	20
8	11 High St Comber	N	31	31	24	22	25
9	A2 Flats (1) Holywood	N	38	35	24	28	26
10	A2 Flats (2) Holywood	N	37	32	24	25	28
11	Outer Ring Bangor	N	23	22	16	17	18
12	Gray's Hill Bangor	N	19	19	15	17	17
13	Apartment 36 shore Road A2 one	N		34[b]	29	30	32

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]				
			2018 (Bias Adjustment Factor = 0.93)	2019 (Bias Adjustment Factor = 0.92)	2020 (Bias Adjustment Factor = 0.81)	2021 (Bias Adjustment Factor = 0.84)	2022 (Bias Adjustment Factor = 0.83)
14	Apartment 36 Shore Road A2 two	N		33	25	30	32
15	19 Cleland Park South Bangor	N			11	14	

These sites were new in 2018

These sites were new in 2019

This site was a short-term monitoring site 2020 and 2021

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

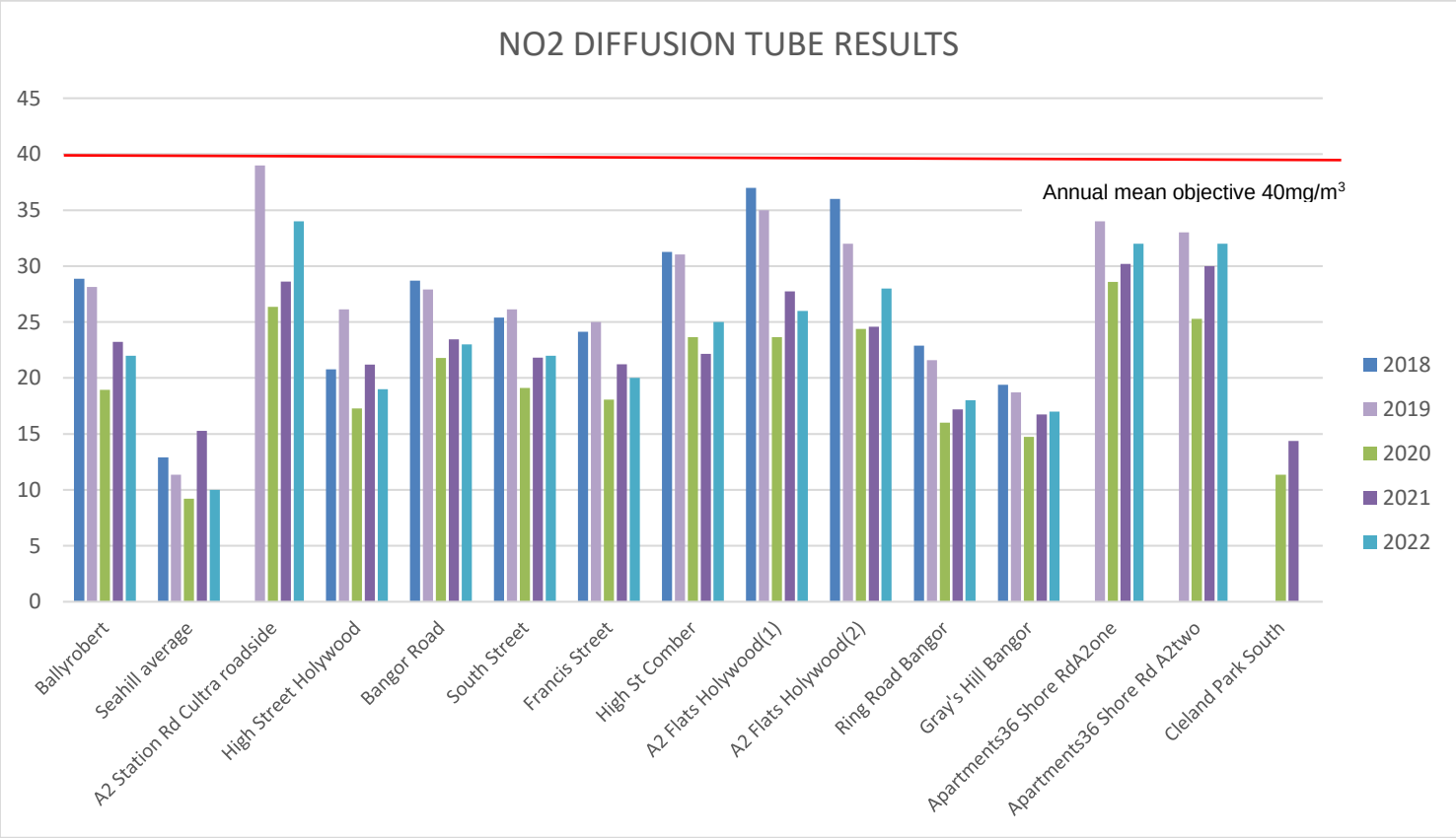
Underlined, annual mean > 60µg/m^3, indicating a potential exceedance of the NO_2 hourly mean AQS objective

[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%

[b] If an exceedance is measured at a monitoring site not representative of public exposure, NO_2 concentration at the nearest relevant exposure should be estimated based on the "NO_2 fall-off with distance" calculator (http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html), and results should be discussed in a specific section. The procedure is also explained in paragraphs 7.77 to 7.79 of LAQM.TG16.

Figure 2.16 – Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites

NO_2 diffusion tube results have remained consistent any annual variation is more likely to be as a result of climatic conditions rather than changes in emissions, the lower results in 2020, 2021 and 2022 are most likely due to the reduced traffic flows during the COVID pandemic and a continued change in working patterns.



2.2.2 Particulate Matter (PM_{10})

Automatic monitoring of PM_{10} were recorded at the Holywood site using a TEOM instrument until 2021 when the instrument was upgraded to a FIDAS 200 also measuring $PM_{2.5}$. The results are ratified and adjusted accordingly by AQDM, the data management company.

Summaries of this data, with regards to annual and hourly mean objectives, are presented below.

Results continued in 2022 to be below the air quality objective. AQDM were contracted to carry out the QA/QC for the site and ratify the data. ESU1 were employed to service and maintain the site. Summaries of this data, regarding annual and hourly mean objectives, are presented below. The TEOM data has been corrected using Volatile Correction Model.

The data was downloaded onto the NI Air Quality web site, providing real-time data for the Daily Air Quality Index (DAQI) which has been developed to provide advice on expected levels of air pollution. www.airqualityni.co.uk

Reports from the ratified data and the QA/QC applied can be found in appendix A.

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

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Valid Data Capture 2022 %[b]	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration μg/m³				
						2018	2019	2020	2021	2022
A2 Holywood	Roadside	N	N/A	99.9%	Y	18	17	14	12	13

In bold, exceedance of the PM_{10} annual mean AQS objective of 40μg/m³

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

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

* Annual mean concentrations for previous years are optional

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

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %[a]	Valid Data Capture 2022 %[b]	Confirm Gravimetric Equivalent	Number of Daily Means > 50µg/m^3				
						2018	2019	2020	2021	2022
A2 Holywood	Roadside	N	N/A	99.9%	Y	0	4	0	0	3

In bold, exceedance of the PM_{10} daily mean AQS objective (50µg/m^3 – not to be exceeded more than 35 times per year)

[a] i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year

[b] i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%)

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

* Number of exceedances for previous years is optional

Figure 2.17 – Trends in Annual Mean PM_{10} Concentrations

PM_{10} has remained consistently low in Holywood

2.2.3 Sulphur Dioxide (SO_2)

Ards and North Down Borough Council did not carry out any monitoring of SO_2 in 2022. No new sites were identified through the planning process and Air Quality Assessments submitted.

2.2.4 Benzene

Ards and North Down Borough Council did not carry out any monitoring of Benzene in 2022. All planning applications and all air quality assessments received are reviewed and no major changes have been identified requiring a further assessment of Benzene. ANDBC borders Belfast City Council with the largest population and traffic flows within Northern Ireland. Benzene has been monitored in Belfast since 2002 and remains well below the objective of 3.25 ug/m^3

Table 2.10 Results of monitoring for benzene: Annual mean concentrations for the Belfast Centre site

Site ID	Site type	Within AQMA? Which AQMA?	Valid Data Capture 2020%	Running annual mean concentrations (µg/m^3)				
				2016	2017	2018	2019	2020
Belfast Centre	Urban Background	N	100	0.49	0.46	0.45	0.44	0.37

2.2.5 Other Pollutants Monitored

Particulate Matter ($PM_{2.5}$)

At the beginning of 2021, a new FIDAS 200 unit for monitoring PM_{10} and $PM_{2.5}$ was installed at the Holywood automatic site. The annual mean results for $PM_{2.5}$ in 2022 were 8 ug/m^3, below the UK limit value of 20 ug/m^3 .

2021	2022
7 ug/m^3	8 ug/m^3

2.2.6 Summary of Compliance with AQS Objectives

Ards and North Down 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

Ards and North Down Borough Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area resulting in exceedances of the Air Quality Objectives.

Ards and North Down 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.**

3.1 Road Traffic Sources

ANDBC can confirm that we have considered:

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

The Environmental Health Department has commented on planning applications where an air quality impact assessment may be necessary and no new road traffic sources were identified.

3.2 Other Transport Sources

ANDBC can confirm that we have considered:

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

3.3 Industrial Sources

ANDBC can confirm that we have considered:

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

The Environmental Health Department comments on planning applications where an Air Quality Impact Assessment (AQIA) may be necessary. No applications were received which required AQIA to be submitted.

3.4 Commercial and Domestic Sources

ANDBC can confirm that we have considered:

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

The Environmental Health Department comments on planning applications where an Air Quality Impact Assessment (AQIA) may be necessary. No applications received required AQIA to be submitted.

3.5 New Developments with Fugitive or Uncontrolled Sources

ANDBC can confirm that we have considered:

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

The Environmental Health Department comments on planning applications where an Air Quality Impact Assessment (AQIA) may be necessary. The following applications were requested to submit an AQIA, and no issues were identified in the reports.

- Craigantlet Quarry, 73 Holywood Road - Erection of Roadstone Plant LA06/2022/0689/F
- Ballystockart Quarry LA06/2022/0310/F

4 Planning Applications

The Environmental Health Department comments on planning applications where an Air Quality Impact Assessment (AQIA) may be necessary. The following applications were requested to submit an AQIA and no issues were identified in the reports.

- Craigantlet Quarry, 73 Holywood Road - Erection of Roadstone Plant LA06/2022/0689/F
- Ballystockart Quarry LA06/2022/0310/F

5 Conclusions and Proposed Actions

5.1 Conclusions from New Monitoring Data

There have been no exceedances of the air quality objectives at monitoring sites at relevant exposure within the Council Area. The NO_2 diffusion tube sites in Holywood established in 2015 and 2019 where apartment blocks have been constructed on the A2 remain an area of concern. There has been a reduction in the levels since the COVID restrictions in 2020 however until a new working pattern is further established, a confirmed trend in reduction cannot be confirmed. The results from the automatic real time NO_2 monitor positioned across from the Holywood junction residential properties, are much lower, however its location benefits from sea breezes whereas the diffusion tubes at the apartment blocks are sheltered. A picture of these sites can be found in figures 2.10 and 2.11.

No new sites were identified in 2022 through the planning process.

5.2 Conclusions relating to New Local Developments

There are no new local developments that will require more detailed consideration in the next Updating and Screening Assessment.

5.3 Proposed Actions

This 2023 Progress Report for Ards and North Down Borough Council has identified that there is no need to proceed to a detailed assessment for any of the pollutants. Ards and North Down Borough Council is focused upon improving air quality therefore all existing monitoring sites shall continue in 2023 until a more normal living and working trend post pandemic is established.

Ards and North Down Borough Council launched a “no idling of vehicles engines outside schools” campaign in 2019 and although it was suspended in 2020 due to COVID restrictions, it was re-launched in 2021 and continued in 2022. ANDBC are presently working on expanding the initiative.

6 References

Local Air Quality Management: Technical Guidance LAQM.TG (03) 2003
Part IV of the Environment Act 1995.
Guidance prepared by the Department for Environment, Food and Rural Affairs and the Devolved Administrations, January 2003.

Local Air Quality Management Technical Guidance (TG16) 2016
Part IV of the Environment Act 1995
Environment (Northern Ireland) Order 2002 Part III

Appendices

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

QA/QC Data of automatic sites

Ards and North Down Borough Council commissioned AQDM Technology to provide the QA/QC of the automatic measurements of NO_2, PM_{10} and $PM_{2.5}$ for the A2 Holywood site. Local authority staff act as the local site operator and visit the site on a weekly basis carrying out any manual calibration or filter changes required.

ESU1 were employed to service and maintain the analyser.

Automatic station reports produced by data management company

Air Quality Report

Produced by AQDM on behalf of North Down

NORTH DOWN HOLYWOOD A2 2022

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

Site Environment and Description

ROADSIDE: Marine Highway

Map Photo Dashboard

Statistical Summary Report

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

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

Gravimetric $PM_{2.5}$

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

Daily Air Quality Index (DAQI)

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

DAQI Pollutant	Moderate	High	Very High
Nitrogen Dioxide	0 hours	0	0
PM_{10} Particulate Matter	3 days	0	0
$PM_{2.5}$ Particulate Matter	3 days	0	0

Gravimetric PM_{10} was Moderate on 22nd 23rd 26th Mar with a daily mean reaching 56 µg m^{-3}.
Gravimetric $PM_{2.5}$ was Moderate on 22nd 23rd 26th Mar with a daily mean reaching 42 µg m^{-3}.

Air Quality Exceedances of the AQS Objectives

NO_2 - annual data capture was 99.7 %
The annual mean was 22 µg m^{-3} which did not exceed the 40 µg m^{-3} Objective.

The maximum hourly mean was 111 µg m^{-3} so there were no exceedances of the NO_2 hourly limit of 200 µg m^{-3}. There is an annual allowance of 18 hours so the Objective was not exceeded.

Gravimetric PM_{10} - annual data capture was 99.9 %
The annual mean was 13 µg m^{-3} which did not exceed the 40 µg m^{-3} Objective.

The maximum daily mean was 56 µg m^{-3} so there were 3 exceedances of the PM_{10} daily limit of 50 µg m^{-3}. There is an annual allowance of 35 days so the Objective was not exceeded.

Gravimetric $PM_{2.5}$ - annual data capture was 99.6 %
The annual mean was 8 µg m^{-3} which did not exceed the 25 µg m^{-3} Objective. Note that the $PM_{2.5}$ standard is not set in the regulations.

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

AQDM Air Quality Data Management

Air Quality Report
NORTH DOWN HOLYWOOD A2 2022

Air Quality Statistics

Pollutant	NO_2	NO	NO_X	Grav PM_{10}*	Grav $PM_{2.5}$~	$PM_1$$	Wind Speed
Number Very High #	0	-	-	0	0	-	-
Number High #	0	-	-	0	0	-	-
Number Moderate #	0	-	-	3	3	-	-
Number Low #	8732	-	-	362	361	-	-
Maximum 15-min mean	143 µg m^{-3}	364 µg m^{-3}	656 µg m^{-3}	-	-	96 µg m^{-3}	-
Maximum hourly mean	111 µg m^{-3}	282 µg m^{-3}	497 µg m^{-3}	116 µg m^{-3}	77 µg m^{-3}	71 µg m^{-3}	-
Maximum running 8-hr mean	85 µg m^{-3}	196 µg m^{-3}	369 µg m^{-3}	75 µg m^{-3}	50 µg m^{-3}	45 µg m^{-3}	-
Maximum running 24-hr mean	68 µg m^{-3}	108 µg m^{-3}	220 µg m^{-3}	58 µg m^{-3}	45 µg m^{-3}	43 µg m^{-3}	-
Maximum daily mean	61 µg m^{-3}	99 µg m^{-3}	209 µg m^{-3}	56 µg m^{-3}	42 µg m^{-3}	39 µg m^{-3}	-
Average	22 µg m^{-3}	16 µg m^{-3}	46 µg m^{-3}	13 µg m^{-3}	8 µg m^{-3}	6 µg m^{-3}	-
Data capture	99.7 %	99.7 %	99.7 %	99.9 %	99.6 %	99.6 %	0.0 %

Daily Air Quality Index (DAQI) as defined by COMEAP January 2012 and revised April 2013
* Gravimetric PM_{10} as measured by a FIDAS instrument using 1 gravimetric factor
~ Gravimetric $PM_{2.5}$ as measured by a FIDAS instrument using 0.94 gravimetric factor
$ PM_1 as measured by a FIDAS instrument
Mass units for the gases are at 20°C and 1013mb
NO_X mass units are NO_X as NO_2 µg m^{-3}

Air Quality Exceedances

Pollutant	Air Quality Regulations (Northern Ireland) 2003	Max Conc	Number	Days	Allowed	Exceeded
Nitrogen Dioxide	Annual mean > 40 µg m^{-3}	22 µg m^{-3}	0	-	-	No
Nitrogen Dioxide	Hourly mean > 200 µg m^{-3}	111 µg m^{-3}	0	0	18 hours	No
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 40 µg m^{-3}	13 µg m^{-3}	0	-	-	No
PM_{10} Particulate Matter (Gravimetric)	Daily mean > 50 µg m^{-3}	56 µg m^{-3}	3	3	35 days	No
$PM_{2.5}$ Particulate Matter (Gravimetric) *	Annual mean > 25 µg m^{-3}	8 µg m^{-3}	0	-	-	No

* Not set in regulations

AQDM
Air Quality Data Management

Air Quality Report

NORTH DOWN HOLYWOOD A2 2022

Monthly Data Captures %

Pollutant	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Nitrogen Dioxide	99.7	100.0	99.9	99.3	99.9	100.0	99.5	99.9	99.9	98.5	99.7	100.0
Grav PM_{10}	99.7	100.0	100.0	100.0	99.9	100.0	99.5	100.0	100.0	99.3	99.9	100.0
Grav $PM_{2.5}$	99.7	100.0	100.0	100.0	99.9	97.8	99.3	100.0	100.0	99.1	99.9	99.9
PM_1	99.7	100.0	100.0	100.0	99.9	97.8	99.3	100.0	100.0	99.1	99.9	99.9

Monthly Means

Pollutant	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Nitrogen Dioxide µg m^{-3}	28	20	28	20	17	18	17	21	17	21	25	30
Grav PM_{10} µg m^{-3}	18	13	25	14	11	11	8	10	10	12	14	14
Grav $PM_{2.5}$ µg m^{-3}	11	7	16	8	6	6	5	6	5	7	8	9
PM_1 µg m^{-3}	8	4	14	7	4	4	3	4	3	4	6	7

QA/QC of Diffusion Tube Monitoring

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

Diffusion Tube Bias Adjustment Factors

Factor from Local Co-location Studies

A co-location study was carried out at the Holywood site and the data submitted to the national data base https://laqm.defra.gov.uk/air-quality/air-quality-assessment/national-bias/
The local bias adjustment figure was **0.67.**

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

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

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

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

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

Step 1:	Step 2:	Step 3:	Step 4:								
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.								
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method is not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data[2]	If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953								
Analysed By[1]	Method To undo your selection, choose (All) from the pop-up list	Year[5] To undo your selection, choose (All)	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[6]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2022	R	Blackburn With Darwen Bc	12	26	19	35.0%	G	0.74
Gradko	20% TEA in water	2022	R	Gedling Borough Council	12	31	26	19.9%	G	0.83
Gradko	20% TEA in water	2022	R	Ards And North Down Borough Council	12	33	22	49.4%	G	0.67
Gradko	20% TEA in water	2022	R	Bath & North East Somerset	12	30	25	19.0%	G	0.84

Decision to use the bias adjustment factor of 0.83

The results of the local co-location study at the Holywood site were submitted to the national data base. The Holywood local bias adjustment factor was calculated at **0.67.** **T**his co-location study is on one of the main arterial routes into Belfast City centre. Ards and North Down Borough Council has confidence in the data from the automatic site, with 99.7% data capture.
The March 2023 national bias adjustment figure for Gradko in 2022 is **0.83.**
A decision was made to apply the national figure of **0.83** as 27 studies were included in this and therefore deemed to be a more realistic figure.

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

National Diffusion Tube Bias Adjustment Factor Spreadsheet

Spreadsheet Version Number: 03/23

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

This spreadsheet will be updated at the end of June 2023

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[4]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2022	R	Belfast City Council	12	36	28	29.0%	G	0.78
Gradko	20% TEA in water	2022	R	Brighton & Hove City Council	10	37	23	62.8%	G	0.61
Gradko	20% TEA in water	2022	UB	Hertsmere Borough Council	12	16	15	7.1%	G	0.93
Gradko	20% TEA in water	2022	R	Southampton City Council	12	36	28	30.6%	G	0.77
Gradko	20% TEA in water	2022	UC	Southampton City Council	12	28	24	15.4%	G	0.87
Gradko	20% TEA in water	2022	R	Southampton City Council	12	34	31	8.4%	G	0.92
Gradko	20% TEA in water	2022	R	Worcestershire	11	13	12	4.2%	G	0.96
Gradko	20% TEA in water	2022	R	Lancaster City Council	13	34	27	25.8%	G	0.79
Gradko	20% TEA in water	2022	R	Lancaster City Council	12	28	24	15.2%	G	0.87
Gradko	20% TEA in water	2022		Overall Factor[3] (27 studies)				Use		0.83