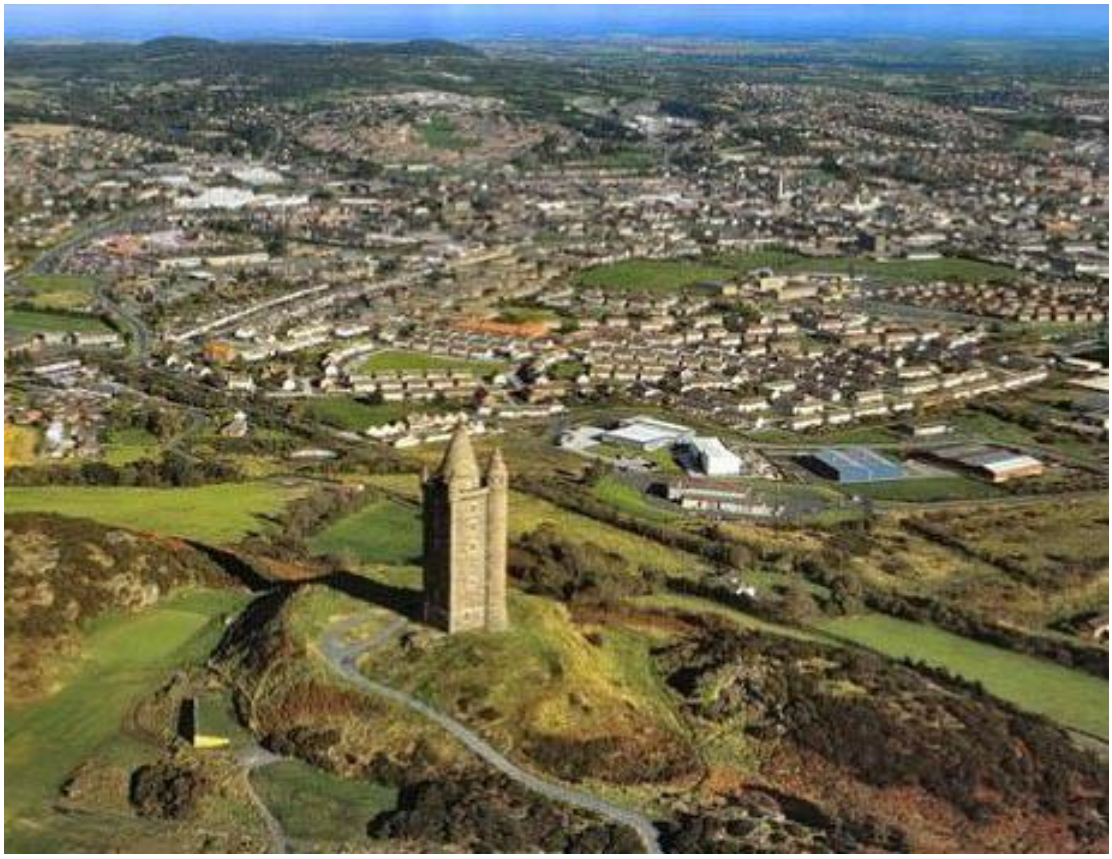
Ards and North Down Borough Council

2022 Air Quality Progress Report

In fulfillment of Environment (Northern Ireland) Order 2002
Local Air Quality Management
June 2022



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Report Reference number	ANDBC PR2022
Date	June 2022

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.

This report is the 2022 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 2021 for any of the pollutants assessed with relevant exposure, planning applications have been examined by ANDBC Environmental Health, Protection and Development Department to access 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 position on the A2 Bangor to Belfast main route to the city centre where there are also roadside apartment blocks. The NO_2 results in the Borough have not shown a trend in reduction, the large reduction in emissions in 2020 was more likely to have been a result of the low traffic flows during the COVID pandemic, levels increased slightly during 2021 as the COVID restrictions eased and traffic flows increased.

Monitoring will continue in 2022 on the A2 main arterial route into Belfast City and hot spots around the Borough where traffic congestion is common at rush hour. The two large housing developments in the Movilla area of Newtownards and the Rathgael area of Bangor are nearing completion, both included a new road layout which has prevented congestion of the traffic in these areas, 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, plans to extend the Comber Green Way to Newtownards and to extend the existing coastal Green Way to Donaghadee continue to move forward, these are popular 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, the Department of Infrastructure have plans to develop a Park & Ride in Newtownards.

ANDBC launched a new initiative in 2019 in primary schools “Engine off Prevent the Cough”, educating pupils and parents to the harmful emissions from vehicles with the emphasis on idling engines outside schools, unfortunately it was not run in 2020 due to COVID 19, it was re-launched in 2021, ANDBC will continue to encourage participation in the initiative in 2022 and in the social media.

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1 Introduction

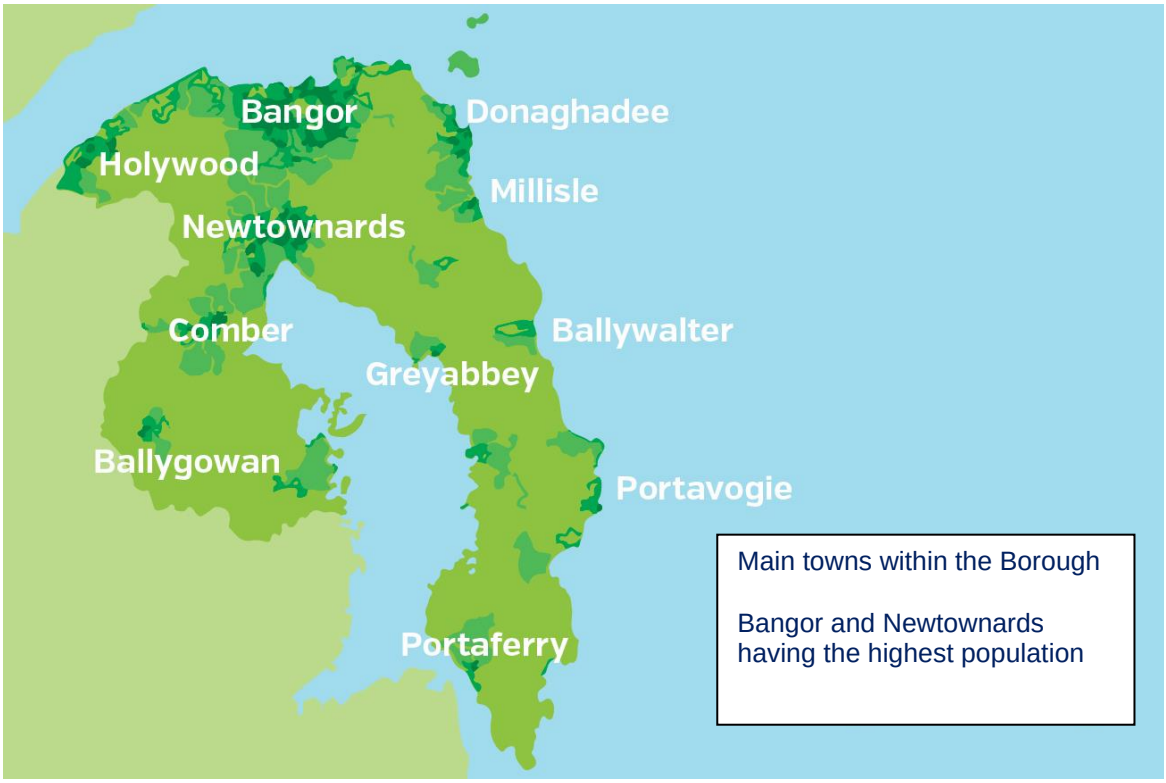
1.1 Description of Local Authority Area

Ards and North Down Borough Council is one of the new 11 councils in Northern Ireland, with a population of 162,056. 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 with a combined traffic flow of approximately 66500, the busiest being the A2 commuter route from Bangor to Belfast with average daily traffic flows of approximately 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 and two new ones added in 2019. 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

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 every two weeks by the Local Air Quality officer. AQDM (Air Quality Data Management) are employed to ratify and validate the data. A specialist engineer is employed to service and maintain the site as required. Results and correction factors are detailed in Appendix A.

In 2021 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 2022 national data base.

Results and correction factors are detailed in Appendix A.

Figure 2.1 Position of the automatic air monitoring site within ANDBC

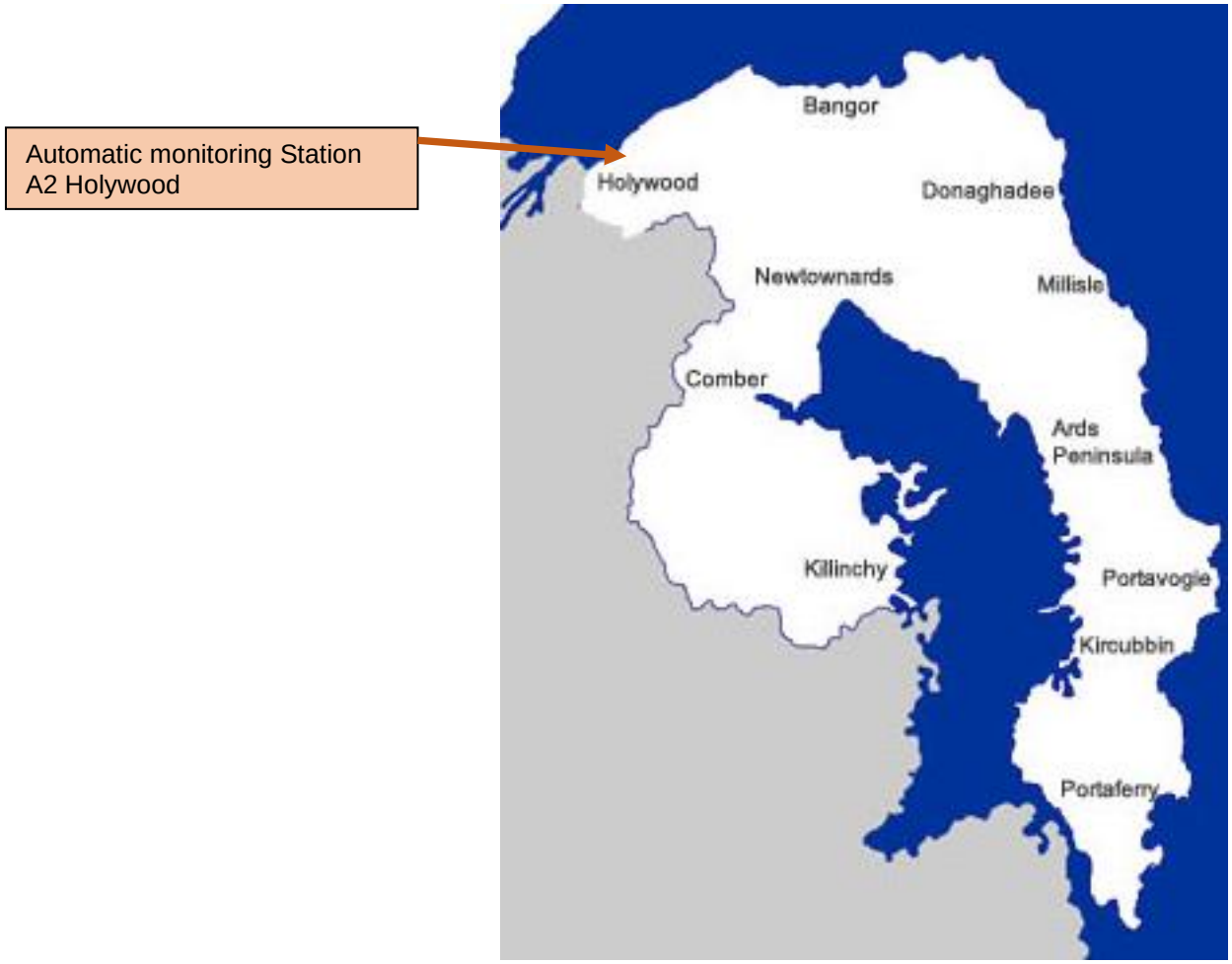


Figure 2.2 Position of Automatic Monitoring Site on the A2 Holywood

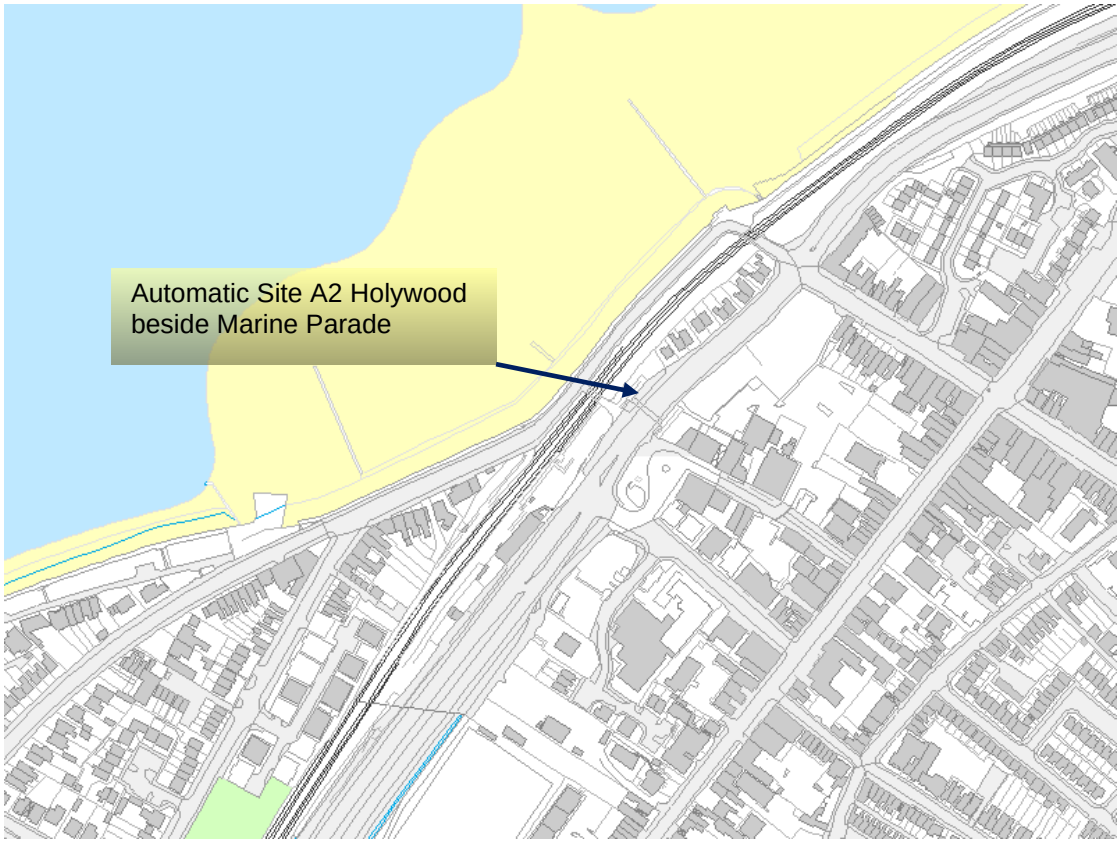


Figure 2.3 Aerial photo of Automatic Monitoring Station A2 Holywood

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, monitoring at the Holywood junction was extended in 2019 on the completion of a new apartment block, further commercial development is also planned at this location. 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, in 2018 monitoring also commenced in Grays Hill Bangor where a large seafront development is planned and 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. A co-location study is carried out at the automatic site in Holywood, the results of the co-located study were submitted into the national data base, to be included in the 2022 data sheet. The diffusion tube studies for the past five years do not show any trends (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 and this continued when lockdown was lifted as home working and schooling continued during the remainder of 2020, results from the NO_2 diffusion tube sites have shown an increase in 2021 as the COVID restrictions eased however schools did not return fully until the September and COVID guidance still encouraged home working where possible therefore any trend in NO_2 is inconclusive.

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

The bias adjustment factor from the co-location study is **0.72.** This was calculated using the R&A support precision and accuracy spread sheet. A decision was made to apply the national figure of **0.84** as 32 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 previous and current

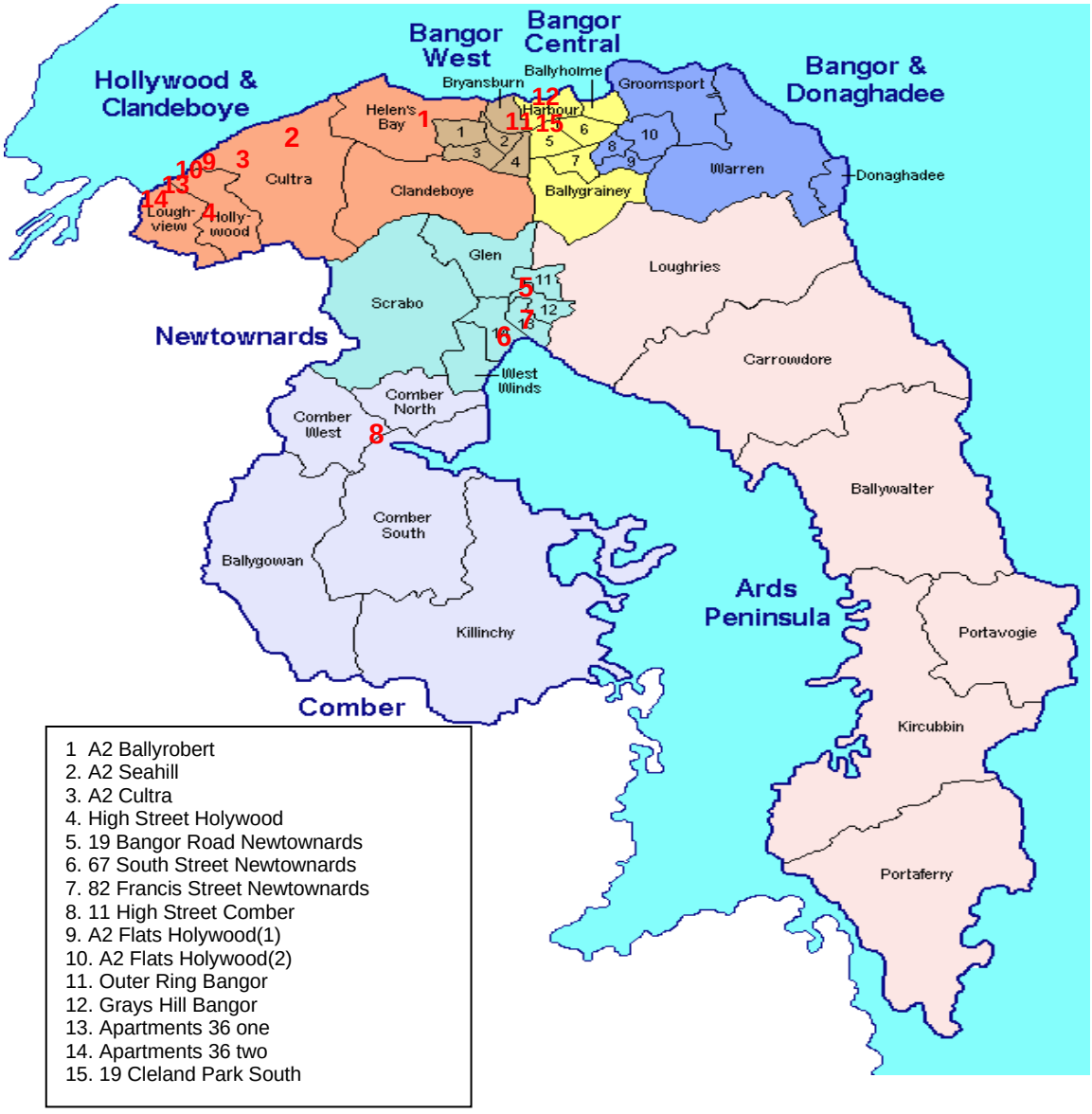


Figure 2.5 Position of Diffusion tube sites 5-7 in Newtownards

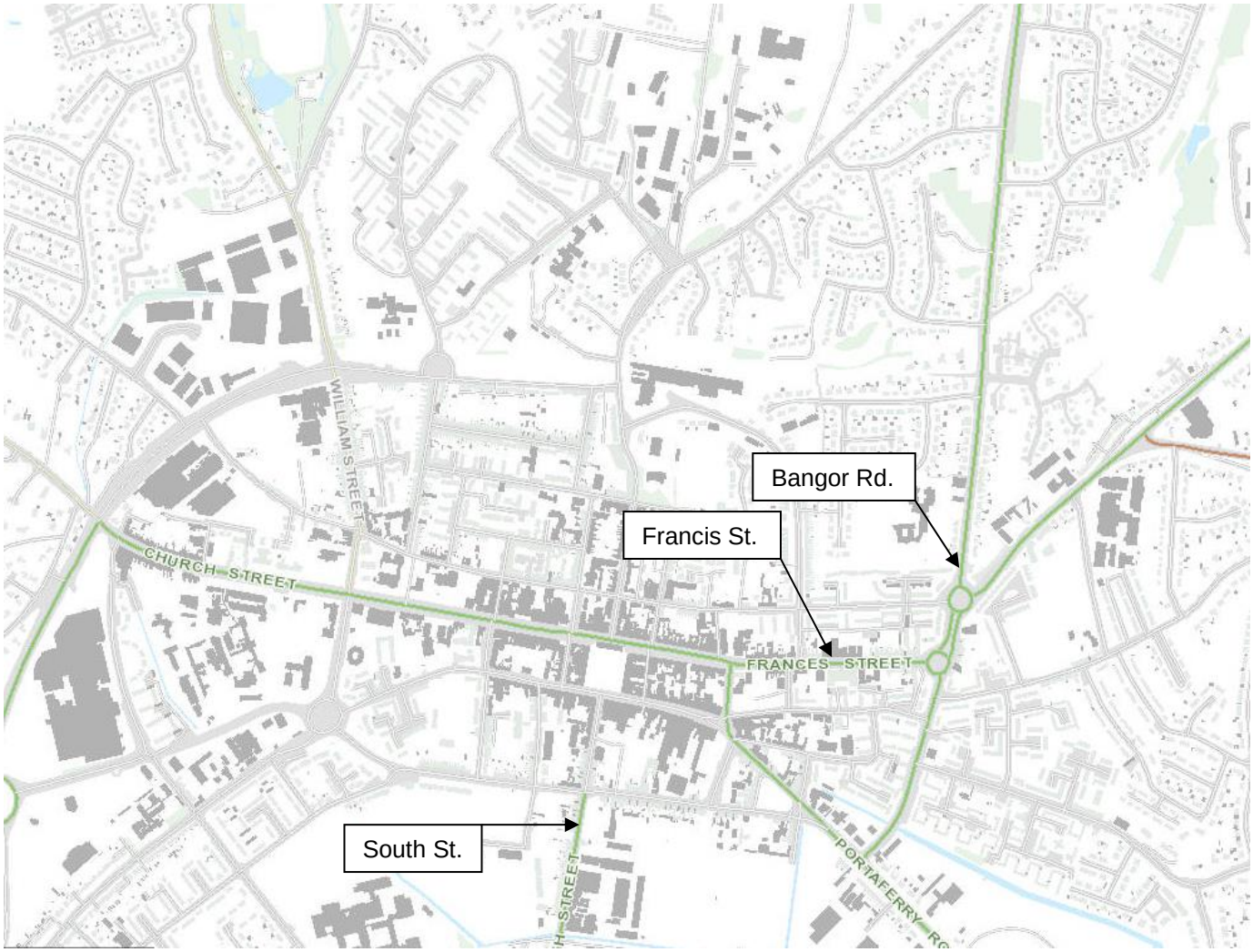
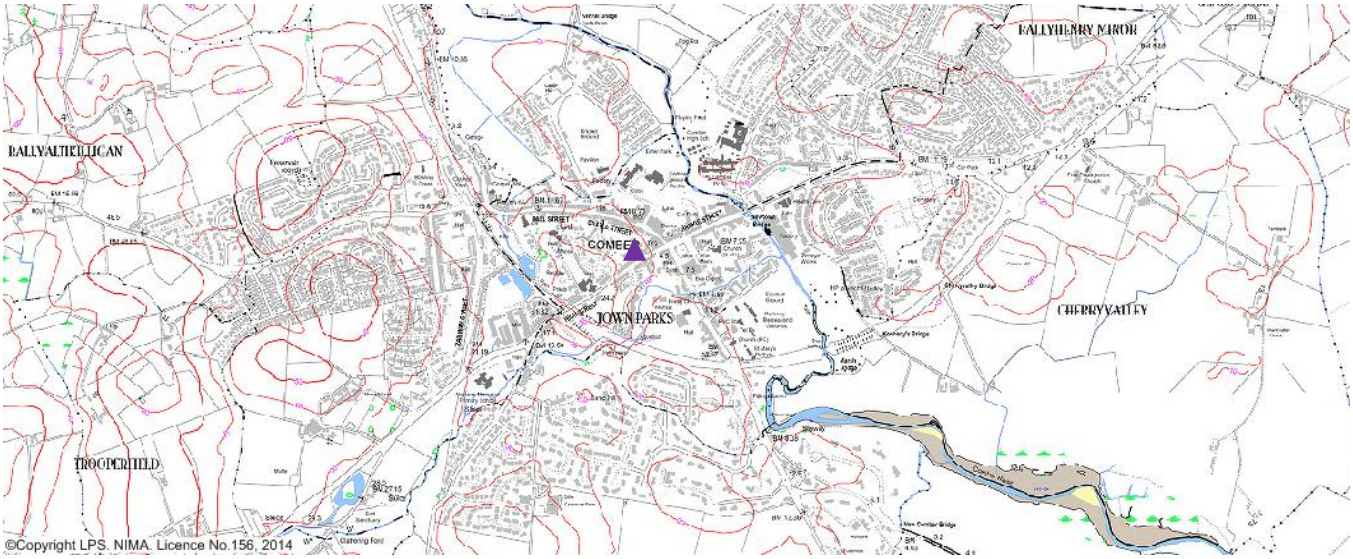
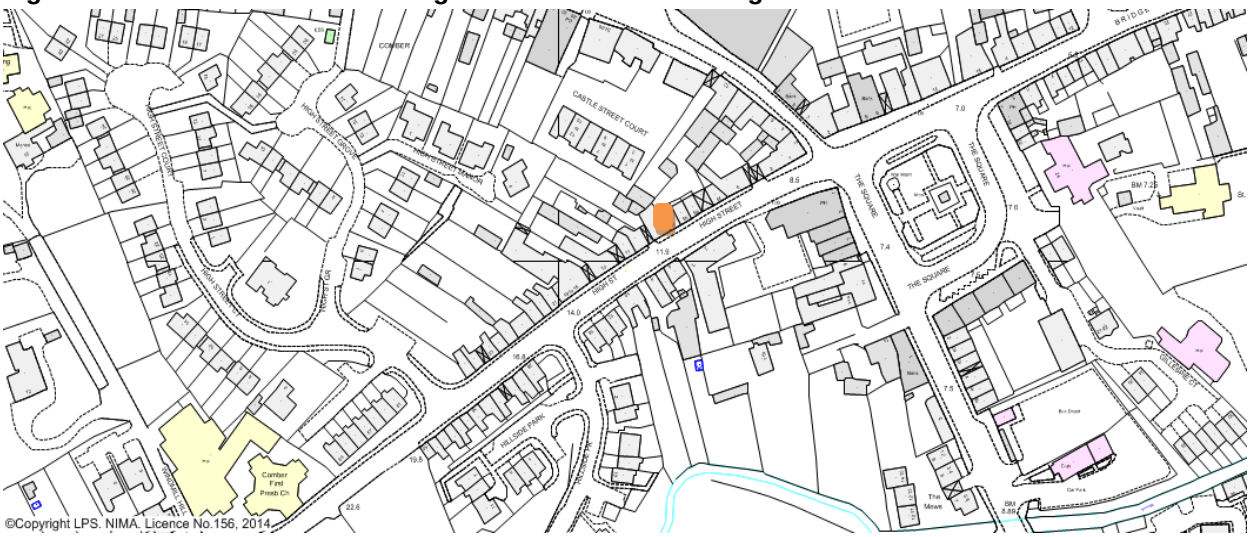


Figure2.6 Position of tube 8 in Comber village



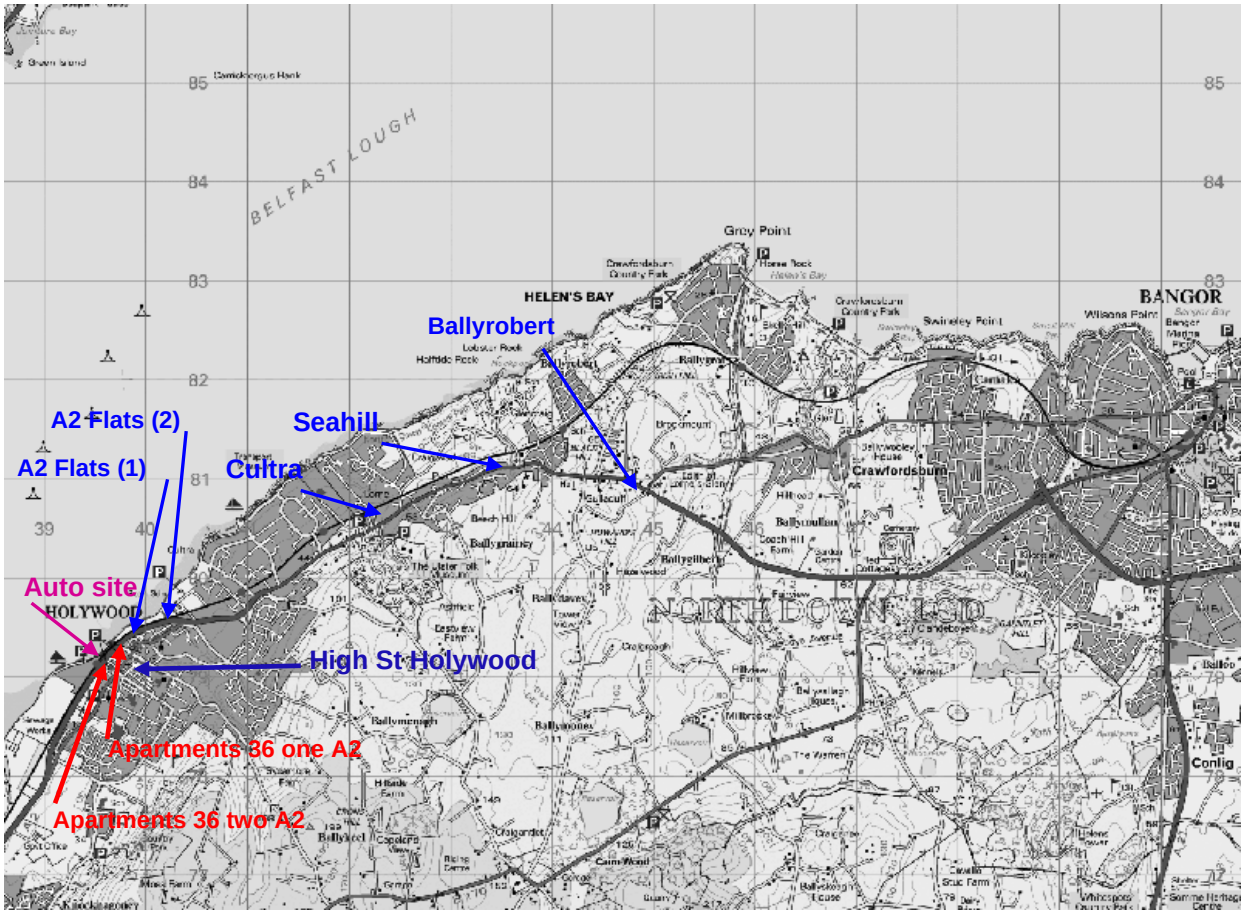
▲ Position of diffusion tube in Comber Village Centre

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



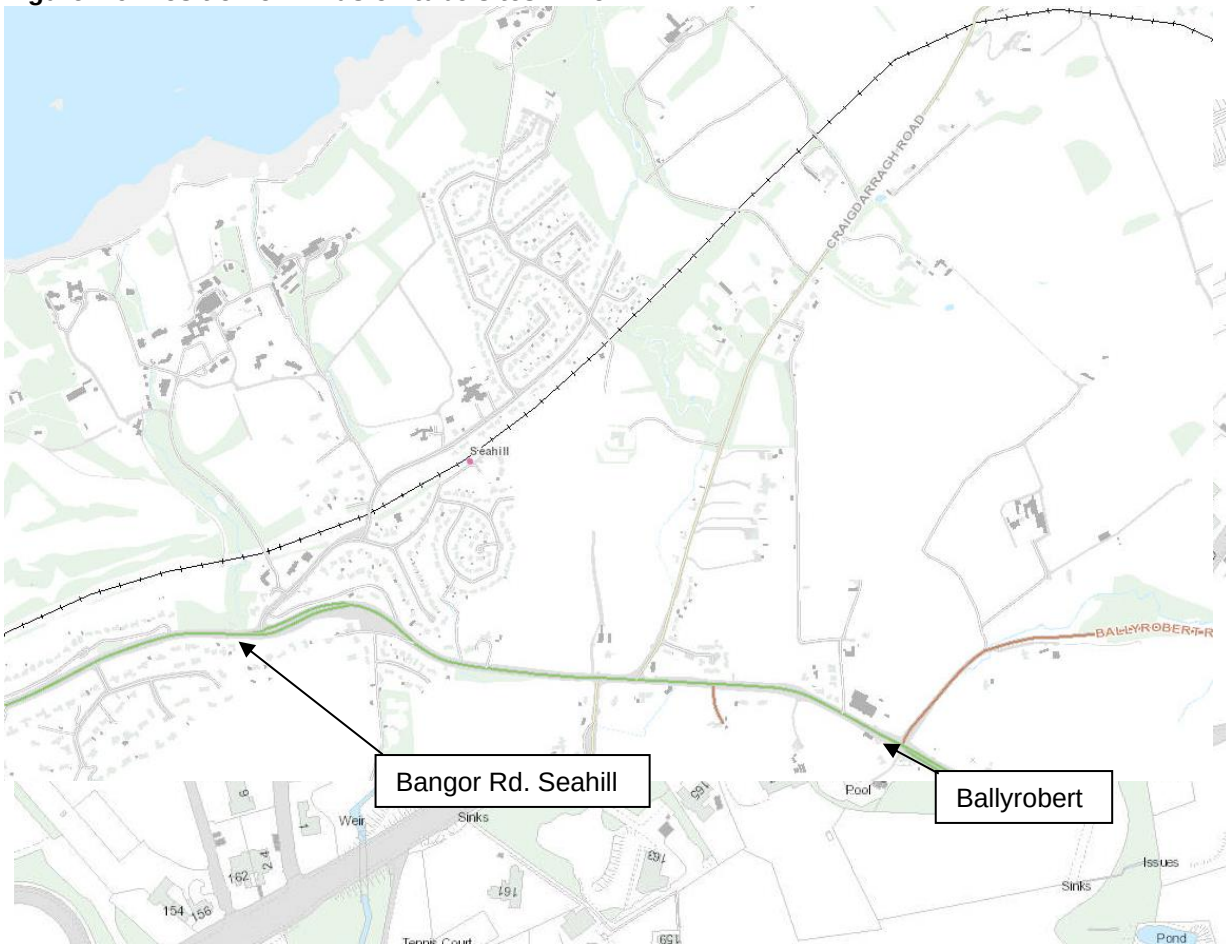
Position of diffusion tube 6 - High Street Comber

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



New sites in 2019

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.

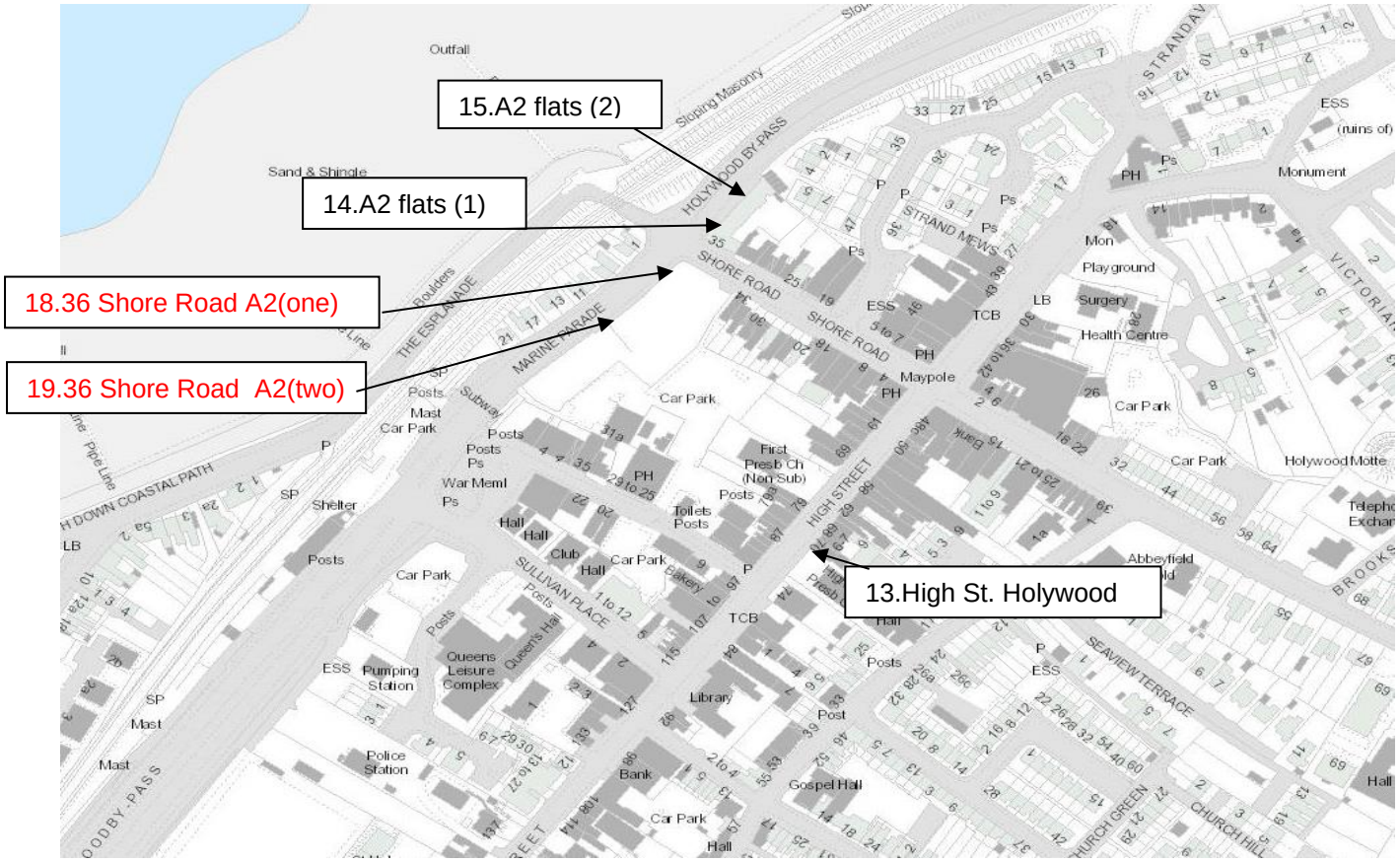


Figure 2.11 36 Shore Road Holywood new apartment block pictured from A2

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 (new tube 2018)

▲ Position of new tube

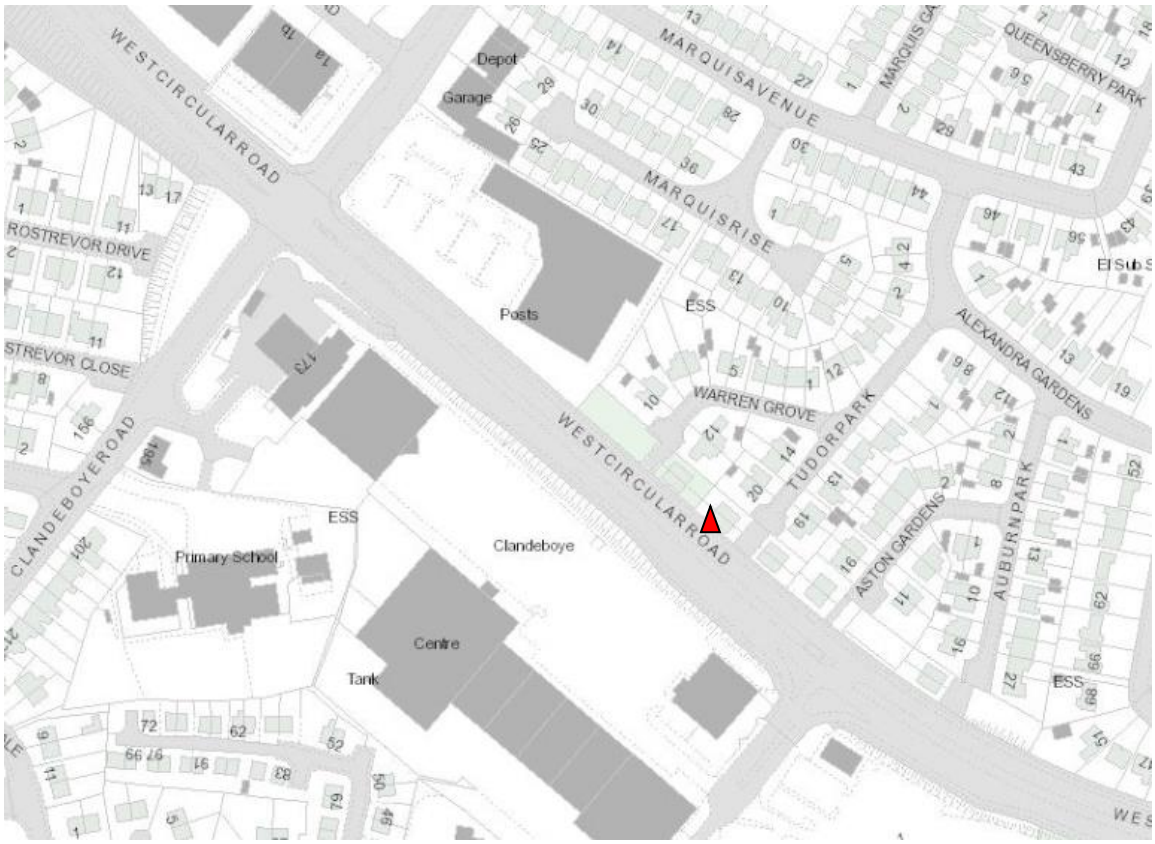


Figure 2.13 Position of Diffusion Tube site 12 at 17 Grays Hill Bangor (new tube 2018)

▲ Position of new tube

Figure 2.14 Position of Diffusion Tube site 15 Cleland Park South Bangor (new tube 2020)

Position of new tube

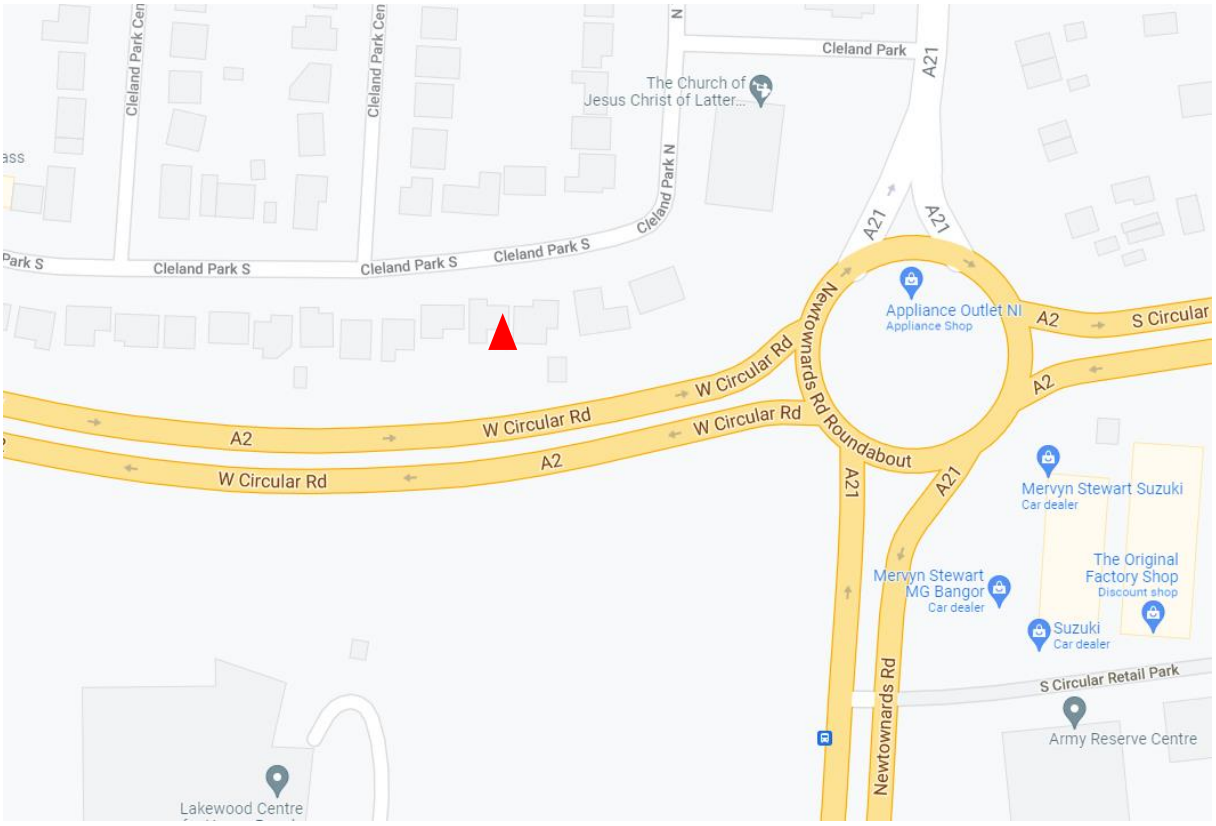


Table 2.2 – Details of Non- Automatic Monitoring Sites

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 were new in 2018

The sites in orange were new in 2019

The site was new in 2020

2.2 Comparison of Monitoring Results with Air Quality Objectives

No exceedances of the AQS objectives have been identified from the monitoring data collected since the 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 2021 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 2021 % [b]	Annual Mean Concentration (µg/m^3)				
					2017* [c]	2018* [c]	2019* [c]	2020* [c]	2021 [c]
A2 Holywood	Roadside	NO	N/A	92.9	25	29	26	20	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, and in 2020 and 2021 the COVID pandemic and reduced traffic at this location. 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 2021 % [b]	Number of Hourly Means > 200µg/m^3				
					2017* [c]	2018* [c]	2019* [c]	2020* [c]	2021 [c]
A2 Holywood	Roadside	NO	N/A	92.9	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 2021 was carried out at the Holywood automatic site, the results of this study were submitted into the national data base, the 2021 local bias was **0.72,** as in previous years a decision has been made to apply the national bias adjustment factor of **0.84,** as this is based on 32 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 also at this roadside location a second large residential apartment block was completed in 2018 (Apartments 36 Shore Road Holywood), monitoring was extended in 2019 and there are now four diffusion tubes positioned here, all the A2 roadside sites have been distance calculated to the nearest relevant exposure. The automatic real time NO_2 monitor positioned across from the Holywood junction results are lower, however its location benefits from sea breezes as 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 in 2020 and 2021 have been reduced due to the COVID pandemic and greatly reduced traffic flows.

Details of the QA/QC for the diffusion tubes and the reason for the use of the bias adjustment factor **0.84** 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 2021

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2021 (Number of Months)	2021 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.84
1	A2 Ballyrobert	Roadside	N	single	11	23
2	A2 Seahill	Roadside	N	single	11	15
3	A2 Station Rd Cultra roadside	Roadside	N	single	11	21[b]
4	High Street Holywood	Roadside	N	single	9	21
5	19 Bangor Rd Newtownards	Roadside	N	single	10	23
6	67 South St. Newtownards (b)	Roadside	N	single	11	22
7	82 Frances St. Newtownards	Roadside	N	single	10	21
8	11 High St Comber	Roadside	N	single	11	22
9	A2 Flats (1) Holywood	Roadside	N	single	11	28[b]
10	A2 Flats (2) Holywood	Roadside	N	single	11	25[b]
11	Outer Ring Bangor	Roadside	N	single	10	17
12	Grays Hill Bangor	Roadside	N	single	10	17
13	Apartment 36 shore Road A2 one	Roadside	N	single	11	28[b]

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2021 (Number of Months)	2021 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.84
14	Apartment 36 Shore Road A2 two	Roadside	N	single	11	18[b]
15	19 Cleland Park South Bangor	Roadside	N	single	9	14

These sites were new in 2018

These sites were new in 2019

This site was new in 2020

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 (2017 to 2021)

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m³) - Adjusted for Bias [a]				
			2017 (Bias Adjustment Factor = 0.89)	2018 (Bias Adjustment Factor = 0.93)	2019 (Bias Adjustment Factor = 0.92)	2020 (Bias Adjustment Factor = 0.81)	2021 (Bias Adjustment Factor = 0.84)
1	A2 Ballyrobert	N	28	29	28	19	23
2	A2 Seahill	N	13	13	11	9	15
3	A2 Station Rd Cultra roadside				29[b]	17.7[b]	21[b]
4	High Street Holywood	N	21	21	26	17	21
5	19 Bangor Rd Newtownards	N	28	29	28	22	23
6	67 South St. Newtownards (b)	N	26	25	26	19	22
7	82 Frances St. Newtownards	N	25	24	25	18	21
8	11 High St Comber	N	32	31	31	24	22
9	A2 Flats (1) Holywood	N	35[b]	37[b]	34[b]	23.5[b]	28[b]
10	A2 Flats (2) Holywood	N	36[b]	36[b]	31[b]	23.6[b]	25[b]
11	Outer Ring Bangor	N		23	22	16	17
12	Grays Hill Bangor	N		19	19	15	17
13	Apartment 36 shore Road A2 one	N			34[b]	26.8[b]	28[b]

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]				
			2017 (Bias Adjustment Factor = 0.89)	2018 (Bias Adjustment Factor = 0.93)	2019 (Bias Adjustment Factor = 0.92)	2020 (Bias Adjustment Factor = 0.81)	2021 (Bias Adjustment Factor = 0.84)
14	Apartment 36 Shore Road A2 two	N			27[b]	16.8[b]	18[b]
15	19 Cleland Park South Bangor	N				11	14

These sites were new in 2018

These sites were new in 2019

This site was new in 2020

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

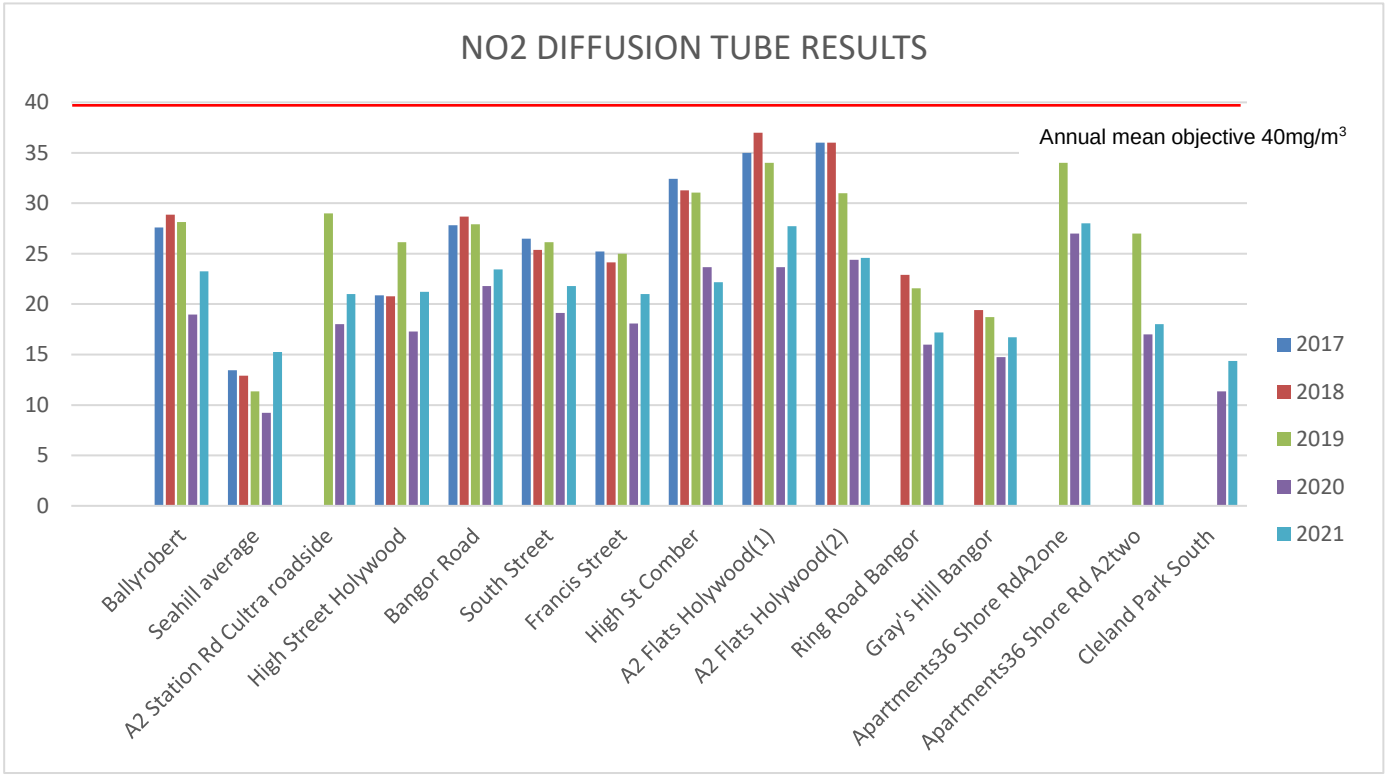
Underlined, annual mean > 60µg/m^3, indicating a potential exceedance of the NO_2 hourly mean AQS objective

[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 low results in 2020 and 2021 are due to the reduced traffic flows during the COVID pandemic.



2.2.2 Particulate Matter (PM_{10})

Before 2021 Automatic monitoring of PM_{10} were recorded using a TEOM instrument, in 2021 this 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 regard to annual and hourly mean objectives, are presented below.

At the Holywood site, results continued in 2021 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 2021 %[b]	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration μg/m³				
						2017	2018	2019	2020	2021
A2 Holywood	Roadside	N	N/A	99.5%	Y	14	18	17	14	12

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 2021 %[b]	Confirm Gravimetric Equivalent	Number of Daily Means > 50µg/m^3				
						2017	2018	2019	2020	2021
A2 Holywood	Roadside	N	N/A	99.5%	Y	1	0	4	0	0

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 2021, no new sites were identified through the planning process and Air Quality Assessments submitted.

2.2.4 Benzene

No monitoring of Benzene was carried out in 2021, ANDBC review all planning application and all air quality assessments received, 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 monitoring PM_{10} and $PM_{2.5}$ was installed at the Holywood automatic site, the annual mean results for $PM_{2.5}$ in 2021 were 7 ug/m3, below the UK limit value of 20 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 they have considered

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

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

3.2 Other Transport Sources

ANDBC can confirm they have considered

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

Ports for shipping.

3.3 Industrial Sources

ANDBC can confirm they have considered the following

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

Poultry farms.

The Environmental Health Department comments on planning applications where an Air Quality Impact Assessment (AQIA) may be necessary, no applications where received requiring an AQIA.

3.4 Commercial and Domestic Sources

LCCC can confirm they have considered the following

- Biomass combustion plant – individual installations.
- Areas where the combined impact of several biomass combustion sources may be relevant.
- Areas where domestic solid fuel burning may be relevant.

Combined Heat and Power (CHP) plant.

The Environmental Health Department comments on planning applications where an Air Quality Impact Assessment (AQIA) may be necessary

LA06/2019/0452/LBC at Ballywalter house (Biomass)
No AQIA necessary

LA06/2018/0638/F – (CHP) Noise and Air quality assessments received
No issues where identified in the report

4 Planning Applications

A number of planning applications were examined by the Environmental Department requiring an air quality impact assessment, no issues where identified in the reports.

LA06/2020/0097/F Queens Parade mixed use
LA06/2021/1012/F South Circular Road/ Gransha Road residential
LA06/2021/0061/F Movilla Road residential
LA06/2019 /1046/F : Lands on Ballyreagh Road, to the North of Bowtown Road, Residential.
LA06/2022/0310/F Ballystockart Quarry

5 Conclusions and Proposed Actions

5.1 Conclusions from New Monitoring Data

No monitoring sites at relevant exposure within the Council Area have shown exceedances of the air quality objectives. The NO_2 diffusion tube sites in Holywood established in 2015 at an apartment block on the A2 (tubes 9,10) and monitoring extended in 2019 as a further apartment block was completed remain an area of concern, there was a reduction in the results in 2019 but a trend could not be established in 2020 or 2021, due to the COVID restriction all NO_2 levels were greatly reduced as shown in Appendix B. The automatic real time NO_2 monitor positioned across from the Holywood junction results are much lower, however its location benefits from sea breezes as 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 2021 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 2022 Progress Report for Ards and North Down Borough Council has identified there is no need to proceed to a detailed assessment for any of the pollutants. Ards and North Down Borough is focused upon improving air quality as a whole, due to the impact of COVID19 restrictions during 2020 and 2021 a trend in NO_2 and PM_{10} has been inconclusive, therefore all existing monitoring sites shall continue in 2022 until a more normal living trend is established.
Ards and North Down Borough Council initiated a no idling outside schools campaign launched in 2019 although paused in 2020 due to COVID restrictions it was re-launched in 2021 and ANDBC hope to expand it in the future.

6 References

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

TG (2016) Part IV of the Environment Act 1995. Local Air Quality Management: Technical

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 and 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 2021

Fully ratified by AQDM to the LAQM (TG16) standards using the AURN methodology

Site Environment and Description

ROADSIDE: Marine Highway

Map Photo Dashboard

Statistical Summary Report

This 2021 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	0 days	0	0
$PM_{2.5}$ Particulate Matter	0 days	0	0

Air Quality Exceedences of the AQS Objectives

NO_2 - annual data capture was 92.9 %
The annual mean was 22 µg m^{-3} which did not exceed the 40 µg m^{-3} Objective.

The maximum hourly mean was 107 µg m^{-3} so there were no exceedences 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 99.5 %
The annual mean was 12 µg m^{-3} which did not exceed the 40 µg m^{-3} Objective.

The maximum daily mean was 40 µg m^{-3} so there were no exceedences 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 99.5 %
The annual mean was 7 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 2021

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	-	-	0	0	-	-
Number Low #	8135	-	-	363	363	-	-
Maximum 15-min mean	119 µg m^{-3}	247 µg m^{-3}	469 µg m^{-3}	-	-	272 µg m^{-3}	-
Maximum hourly mean	107 µg m^{-3}	208 µg m^{-3}	407 µg m^{-3}	267 µg m^{-3}	182 µg m^{-3}	95 µg m^{-3}	-
Maximum running 8-hr mean	93 µg m^{-3}	159 µg m^{-3}	337 µg m^{-3}	52 µg m^{-3}	43 µg m^{-3}	43 µg m^{-3}	-
Maximum running 24-hr mean	68 µg m^{-3}	85 µg m^{-3}	198 µg m^{-3}	41 µg m^{-3}	30 µg m^{-3}	29 µg m^{-3}	-
Maximum daily mean	58 µg m^{-3}	80 µg m^{-3}	181 µg m^{-3}	40 µg m^{-3}	29 µg m^{-3}	28 µg m^{-3}	-
Average	22 µg m^{-3}	15 µg m^{-3}	45 µg m^{-3}	12 µg m^{-3}	7 µg m^{-3}	5 µg m^{-3}	-
Data capture	92.9 %	92.9 %	92.9 %	99.5 %	99.5 %	99.5 %	0.0 %

Daily Air Quality Index (DAQI) as defined by COMEAP January 2012 and revised April 2013
* Grav PM_{10} as measured by a FIDAS using 1 gravimetric factor
~ Grav $PM_{2.5}$ as measured by a FIDAS using 0.94 gravimetric factor
§ PM_1 as measured by a FIDAS
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 Exceedences

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}	107 µg m^{-3}	0	0	18 hours	No
PM_{10} Particulate Matter (Gravimetric)	Annual mean > 40 µg m^{-3}	12 µg m^{-3}	0	-	-	No
PM_{10} Particulate Matter (Gravimetric)	Daily mean > 50 µg m^{-3}	40 µg m^{-3}	0	0	35 days	No
$PM_{2.5}$ Particulate Matter (Gravimetric) *	Annual mean > 25 µg m^{-3}	7 µg m^{-3}	0	-	-	No

QA/QC of Diffusion Tube Monitoring

In 2021 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 **0.72.**

Data from the Automatic Analyser (Matching Individual Diffusion Tube Periods)						
Period	Start Date (dd/mm/yy)	End Date (dd/mm/yy)	% Data Capture	Ratified / Provisional	NOx (if available) (ug/m^3)	Nitrogen Dioxide (ug/m^3)
1	06/01/2021	02/02/2021	99.8	Ratified	54	25.7
2						
3	02/03/2021	30/03/2021	99.6	Ratified	33.3	17.1
4	30/03/2021	06/05/2021	96.4	Ratified	41.3	21
5	06/05/2021	01/06/2021	99.8	Ratified	35.5	18.8
6	01/06/2021	30/06/2021	99.9	Ratified	39.4	18.7
7	30/06/2021	02/08/2021	84.1	Ratified	43.2	21.9
8	02/08/2021	31/08/2021	33.8	Ratified	47.5	22.9
9	31/08/2021	01/10/2021	99.5	Ratified	53.3	24.9
10	01/10/2021	01/11/2021	99.5	Ratified	47.4	22
11	01/11/2021	29/11/2021	99.9	Ratified	49.6	22.7
12	29/11/2021	04/01/2022	99.7	Ratified	56.7	24.9
13						
Please express NOx as NO_2 (e.g. ppb x 1.913) or alternatively note the approach / units here:						
When you are identifying the automatic monitoring periods that match your diffusion tube exposure periods, please be as precise as possible. It is not, however, necessary to match start times to the exact hour that you put out your tubes.						

Individual Period (monthly) Mean Nitrogen Dioxide Data from the Diffusion Tubes (ug/m^3)					
Period		Tube 1	Tube 2 (if available)	Tube 3 (if available)	Tube 4 (if available)
1		38	37	37	
2					
3		28	26	28	
4		26	27	26	
5		23	26	26	
6		27	25	21	
7		25	24	24	
8		32	33	34	
9		36	36	38	
10		35	39	33	
11		28	16	45	
12		37	32	35	
13					

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/22

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 June 2022
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/m^3)	Automatic Monitor Mean Conc. (Cm) (µg/m^3)	Bias (B)	Tube Precision[5]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2021	R	Gedling Borough Council	12	32	26	23.1%	G	0.81
Gradko	20% TEA in water	2021	UB	West Northamptonshire Council	11	14	10	32.1%	G	0.76
Gradko	20% TEA in water	2021	R	Ards and North Down Borough Council	10	30	22	38.4%	G	0.72
Gradko	20% TEA in water	2021	R	Birmingham City Council	10	33	25	35.2%	G	0.74
Gradko	20% TEA in water	2021	R	Cheshire West and Chester	12	34	29	14.1%	G	0.88

Decision to use the bias adjustment factor 0.84

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 **0.72,** this 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 92.9% data capture.
The June 2022 national bias adjustment figure for Gradko in 2021 is **0.84.**
A decision was made to apply the national figure of **0.84** as 32 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: 03/22

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 June 2022
LAQM Helpdesk Website

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

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

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

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

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

Step 4: Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.

If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[2] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[5]	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in water	2021	R	Gedling Borough Council	12	32	26	23.1%	G	0.81
Gradko	20% TEA in water	2021	UB	West Northamptonshire Council	11	14	10	32.1%	G	0.76
Gradko	20% TEA in water	2021	R	Ards and North Down Borough Council	10	30	22	36.4%	G	0.72
Gradko	20% TEA in water	2021	R	Birmingham City Council	10	33	25	35.2%	G	0.74
Gradko	20% TEA in water	2021	R	Cheshire West and Chester	12	34	29	14.1%	G	0.88
Gradko	20% TEA in water	2021	R	Cheshire West and Chester	12	33	29	12.6%	G	0.89
Gradko	20% TEA in water	2021	R	Lisburn & Castlereagh City Council	12	25	19	31.9%	G	0.76
Gradko	20% TEA in water	2021	R	Nottingham City Council	12	32	35	-8.1%	G	1.09
Gradko	20% TEA in water	2021	R	SOUTHAMPTON CITY COUNCIL	12	34	32	5.2%	G	0.95
Gradko	20% TEA in water	2021	R	SOUTHAMPTON CITY COUNCIL	12	34	27	28.6%	G	0.78
Gradko	20% TEA in water	2021	R	Bath & North East Somerset	12	31	27	15.1%	G	0.87
Gradko	20% TEA in water	2021	R	Bedford Borough Council	11	34	31	7.6%	G	0.93
Gradko	20% TEA in water	2021	R	Bedford Borough Council	11	19	17	11.7%	G	0.90
Gradko	20% TEA in water	2021	R	Blackburn with Darwen Borough Council	12	27	20	32.3%	G	0.76
Gradko	20% TEA in water	2021	R	Brent Council	12	51	46	9.9%	G	0.91
Gradko	20% TEA in water	2021	R	Gateshead Council	10	23	19	23.8%	G	0.81
Gradko	20% TEA in water	2021	R	Gateshead Council	12	25	22	13.7%	G	0.88
Gradko	20% TEA in water	2021	R	Gateshead Council	11	27	25	9.8%	G	0.91
Gradko	20% TEA in water	2021	R	Gateshead Council	12	31	25	26.6%	G	0.79
Gradko	20% TEA in water	2021	R	Gateshead Council	12	32	34	-4.1%	G	1.04
Gradko	20% TEA in water	2021	KS	Marylebone Road Intercomparison	11	53	42	25.0%	G	0.80
Gradko	20% TEA in Water	2021	R	Monmouthshire County Concil	11	35	29	21.8%	G	0.82
Gradko	20% TEA in water	2021	R	Belfast City Council	12	25	20	24.3%	G	0.80
Gradko	20% TEA in water	2021	UC	Belfast City Council	12	25	20	28.5%	G	0.78
Gradko	20% TEA in water	2021	R	Belfast City Council	12	42	35	19.8%	G	0.84
Gradko	20% TEA in water	2021	R	Belfast City Council	12	38	27	39.4%	G	0.72
Gradko	20% TEA in water	2021	UB	Dudley MBC	12	20	15	36.0%	G	0.74
Gradko	20% TEA in water	2021	R	Dudley MBC	12	30	29	4.2%	G	0.96
Gradko	20% TEA in water	2021	R	Dudley MBC	12	42	40	5.5%	G	0.95
Gradko	20% TEA in Water	2021	R	Lambeth	10	91	62	46.6%	G	0.68
Gradko	20% TEA in water	2021	R	Lancaster City Council	13	38	32	18.4%	G	0.84
Gradko	20% TEA in water	2021	R	Lancaster City Council	13	28	27	4.9%	G	0.95
Gradko	20% TEA in water	2021		Overall Factor[3] (32 studies)					Use	0.84

The following tool was used to distance calculate NO_2 levels on the A2 where they were not on the façade of the nearest relevant exposure.

http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html

A2 Flats 1 Holywood

Enter data into the pink cells

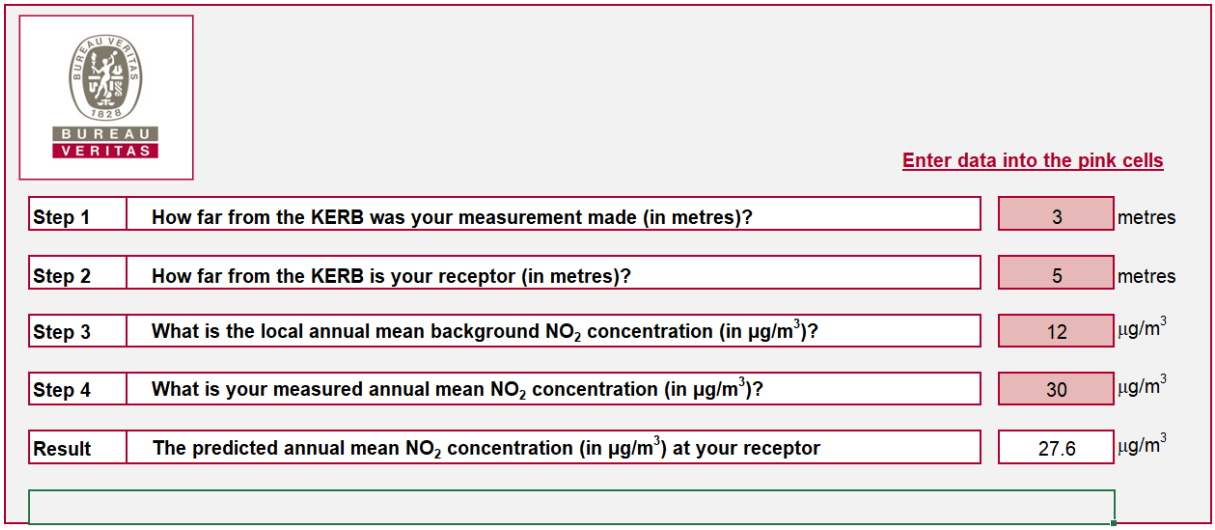
Step 1	How far from the KERB was your measurement made (in metres)?	2.37	metres
Step 2	How far from the KERB is your receptor (in metres)?	2.8	metres
Step 3	What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?	12	$\mu g/m^3$
Step 4	What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	28	$\mu g/m^3$
Result	The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	27.3	$\mu g/m^3$

A2 Flats 2 Holywood

Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	3.5	metres
Step 2	How far from the KERB is your receptor (in metres)?	4	metres
Step 3	What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?	12	$\mu g/m^3$
Step 4	What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	25	$\mu g/m^3$
Result	The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	24.5	$\mu g/m^3$

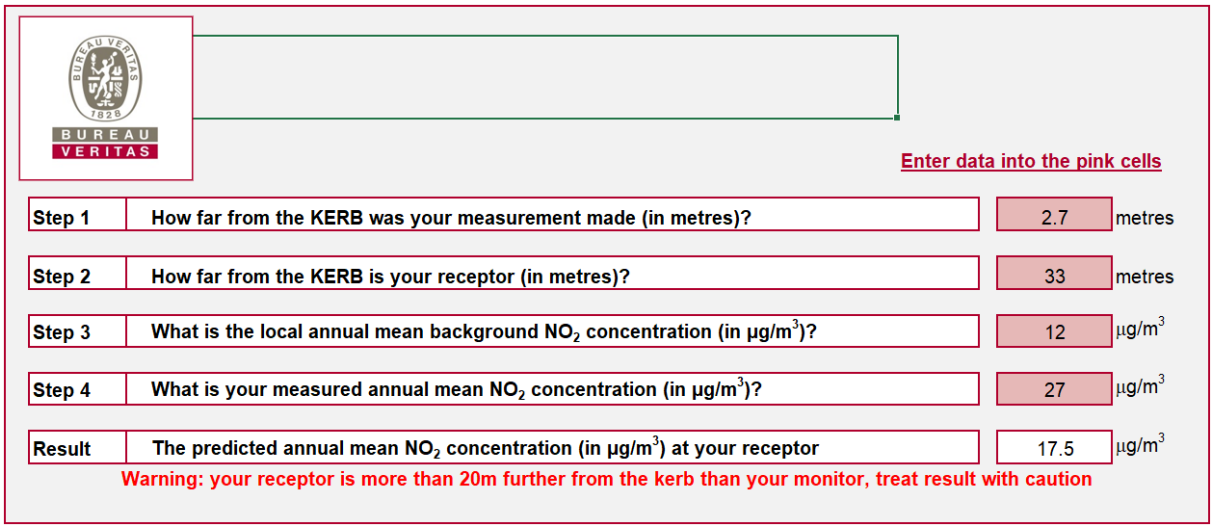
Apartment36 Shore Road A2 one



Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	3	metres
Step 2	How far from the KERB is your receptor (in metres)?	5	metres
Step 3	What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?	12	$\mu g/m^3$
Step 4	What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	30	$\mu g/m^3$
Result	The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	27.6	$\mu g/m^3$

Apartment36 Shore Road A2 two

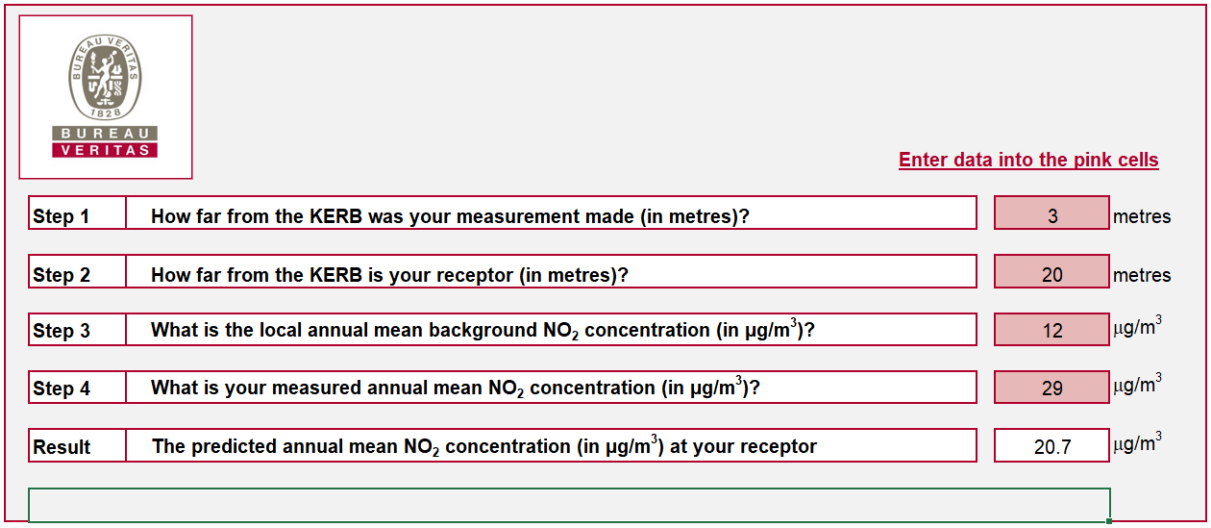


Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	2.7	metres
Step 2	How far from the KERB is your receptor (in metres)?	33	metres
Step 3	What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?	12	$\mu g/m^3$
Step 4	What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	27	$\mu g/m^3$
Result	The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	17.5	$\mu g/m^3$

Warning: your receptor is more than 20m further from the kerb than your monitor, treat result with caution

Cultra Roadside



Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	3	metres
Step 2	How far from the KERB is your receptor (in metres)?	20	metres
Step 3	What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?	12	$\mu g/m^3$
Step 4	What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	29	$\mu g/m^3$
Result	The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	20.7	$\mu g/m^3$

Appendix B: Impact of COVID-19 upon LAQM

COVID-19 has had a significant impact on society. Inevitably, COVID-19 has also had an impact on the environment, with implications to air quality at local, regional, and national scales. COVID-19 has presented various challenges for Local Authorities with respect to undertaking their statutory LAQM duties in the 2021 reporting year.

Despite the challenges that the pandemic has given rise to, the events of 2020 have also provided Local Authorities and other organisations with an opportunity to quantify the air quality impacts associated with wide-scale and extreme intervention and changes in behaviour such as reduced road traffic and working from home.

DAERA deemed air quality to be an essential service during lockdown. The ANDBC air quality monitoring sites do not require access to any premises and therefore it was possible to continue monitoring both the automatic sites and all the NO_2 diffusion tubes sites, with the loss of only one month's data in 2020 due to a postal issue during the lockdown period. ANDBC employs a dedicated air quality officer which made restrictions easier to comply with as this was the only officer requiring permission to visit the sites, maintaining good QA/QC.
In 2020 there was a noticeable reduction in NO_2 due to the reduction in traffic flows this can been seen here https://www.infrastructure-ni.gov.uk/publications/traffic-flow-figures , in 2021 restrictions eased although schools did not return fully until the September and the guidance still encouraged home working where possible, the results of this in table 2.3 and table 2.6, there was a possibility PM_{10} may have risen due to lockdown and home working but there was no evidence of this, which most likely was due to the unusual mild climate during this period as shown in DEARAs report https://www.daera-ni.gov.uk/publications/effects-covid-19-restrictions-air-quality-northern-ireland

There was a greatly reduced use of public transport and the Park & Rides were seldom used, home working and schooling through most of 2020 kept the traffic greatly reduced, in 2021 as restrictions eased and schools returned an increase in traffic flows was evident near the later part of the year, although guidance

encouraged home working and normal traffic flows where still not evident. Cycling had become very popular as a recreational activity during lockdown, the Greenways became very popular with cyclists and walkers, ANDBC remained active with the plans to extend the Comber Green Way to Newtownards and to extend the existing coastal Green Way to Donaghadee enabling easier access around the Borough and linking to the City Centre.

ANDBC launched a new initiative in 2019 in primary schools “Engine off Prevent the Cough”, educating pupils and parents to the harmful emissions from vehicles with the emphasis on idling engines outside schools, unfortunately it was not run in 2020 due to COVID 19 restrictions and school closures, it was re-launched in 2021 although with the uncertainty of COVID 19 uptake was slow.