Armagh City, Banbridge and Craigavon Borough Council

2022 Air Quality Progress Report

In fulfilment of Environment (Northern Ireland) Order 2002

Local Air Quality Management

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Executive Summary

Armagh Banbridge Craigavon Borough Council has completed this 2022 Air Quality Progress Report in accordance with the provisions of the Environment (Northern Ireland) Order 2002 and the Northern Ireland Local Air Quality Management Policy Guidance document LAQM.PGNI (09).

In undertaking this report, we have completed a review of air quality monitoring data across the borough using a network of passive diffusion tubes and one monitoring station (Lonsdale Road, Armagh) which forms part of a UK National AURN network.

Data and trends have been assessed against Air Quality Strategy Objectives and European Commission Limit Values.

This Progress Report shows that nitrogen dioxide emissions have reduced from 2020. Delineation work undertaken to determine the extent of objective exceedances in Tandragee and Greenpark Terrace, Armagh (as well as the area of concern in Gilford) has indicated that the highest concentrations are extremely localized in the vicinity of traffic management infrastructure, narrow streets or topography and are not indicative of wide-spread pollution (as defined by an exceedance of the objective) in the area.

The Council are publishing this updated suite of data and welcome any comments or feedback from residents or interested stakeholders. The Council do not intend to revoke the AQMA at this stage. The Council's Action Plan focusses on the reduction of unnecessary nitrogen dioxide emissions across the Borough as a whole and across NI as a region. We believe this aligns closely with the Council's declaration of a Climate Emergency made in July 2019 and the strategy and policies being developed to meet 'net zero' targets by 2050.

Revoking the AQMA would be premature in the absence of a NI Clean Air Strategy and NI Energy Strategy (which it is hoped will provide a clear and supported route-map to reducing emission potential across Northern Ireland).

At the end of this document an updated review of the Council's Air Quality Action Plan is provided.

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1 Introduction

1.1 Description of Local Authority Area

The Borough is a beautiful rural, historic area served by the main motorway network in Northern Ireland, with major road links to the business capitals of Belfast and Dublin. Armagh City. Banbridge and Craigavon Borough has a mixture of heavy industry, services such as local government, the local education authority, health and social services, retail, and agriculture. The greatest contribution to air quality pollution in the Borough is from road traffic, particularly in the city/town centres of Armagh, Portadown and Lurgan where the road network is frequently congested. Given the size of the rural hinterland, public transport options are limited and there is a greater tendency to rely on the private car as the primary means of transport. The road network within the Borough is regarded as a route hub to the border with the Republic of Ireland and is a main through-route between mid-Ulster and the south-east of Northern Ireland and hence has a traffic flow higher than that which could be created by local traffic alone. Particulate Matter (PM_{10}) and NO_2 would be considered as the pollutants most at risk of breaching the objective limits in the Borough as a result of road traffic.

Domestic fuel usage throughout the Borough has historically been based on solid fuel/oil with limited use of gas. As within the province generally, the use of coal is declining although a trend of secondary or primary heating using wood or multi-fuel burning stoves is apparent giving rise to additional air quality concerns.

1.2 Purpose of Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in the Environment (Northern Ireland) Order 2002, the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine

whether or not the air quality objectives are likely to be achieved. Where exceedances are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

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

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

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in **Northern Ireland** are set out in the Air Quality Regulations (Northern Ireland) 2003, Statutory Rules of Northern Ireland 2003, no. 342, and are shown in Table 1.1. This table shows the objectives in units of micrograms per cubic metre µg/m^3 (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

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	**Measured as**	
	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

Report Type	Date	Exceedences	Detailed Assessment Required	AQMA's Declared
Initial Review and Assessment	Jan 2001	None	No	None
Progress Report	April 2005	None	No	None
Updating & Screening Assessment	April 2006	None	No	None
Progress Report	April 2007	None	No	None
Detailed Assessment for NO_2	Nov 2007	None	No	None
Progress Report	April 2008	NO_2	No	Yes
Updating & Screening Assessment	April 2009	NO_2	No	In the previous year
Progress Report	May 2010	NO_2	Yes	None
Progress Report	May 2011	NO2	No	Yes
Updating and Screening Assessment	April 2012	NO2	No	Yes
Progress Report	April 2013	NO2	No	No

Report Type	Date	Exceedences	Detailed Assessment Required	AQMA's Declared
Progress Report	April 2014	NO2	No	No new AQMAs
Updating and Screening Assessment	April 2015	NO2	Yes	No new AQMAs
Progress Report & DA (hereby presented)	April 2016 (May 2017)	NO2	Yes	To be declared
Progress Report	August 2017	NO2	Yes	Declaration prepared
Update and Screening Assessment	October 2018	NO2	No	Borough-wide declaration made
Progress Report	2019	NO2	No	Borough-wide AQMA remains unchanged
Progress Report	2020	NO2	No	Borough-wide AQMA remains unchanged
Updating and Screening Assessment	2021	NO2	No	Borough-wide AQMA remains unchanged

Report Type	Date	Exceedences	Detailed Assessment Required	AQMA's Declared
Progress Report	2022	NO2	No	Borough-wide AQMA remains unchanged

Figure 1-1.1– Map of AQMA Boundaries

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Armagh Banbridge Craigavon Borough Council operates one automatic monitoring station located at Lonsdale Road, Armagh

This station forms part of DEFRA's Automatic Urban and Rural Network (AURN) network and provides information for the draft Programme for Government Air Quality Indicator.

As an AURN Network site, to ensure that the data is both accurate and representative, a four-weekly calibration is carried out by Council staff in accordance with the procedures detailed in the DEFRA Automatic Urban and Rural Network local site operators' manual.

Data management, quality assurance and quality control and service and maintenance support are all provided by DEFRA's appointed contractors. The data from our sites is made available to the Department of Agriculture, Environment and Rural Affairs and is reported on the 'Northern Ireland Air' website in near real time.

All data is validated and corrected in accordance with Government technical guidance, such as Bata Attenuation Monitoring (BAM) for PM_{10}.

For consistency, all automatic monitoring data reported in this progress report has been obtained from the 'Northern Ireland Air Quality' website.

Automatic data reported in this report relates to the calendar year (i.e. January – December) and data capture levels exceed substantially the Department's 75% data capture threshold for the calculation of annual statistics.

Further information regarding our QA/QC procedures and processes can be obtained in Appendix A to this report.

Figure 2-1 Map of Automatic Monitoring Site

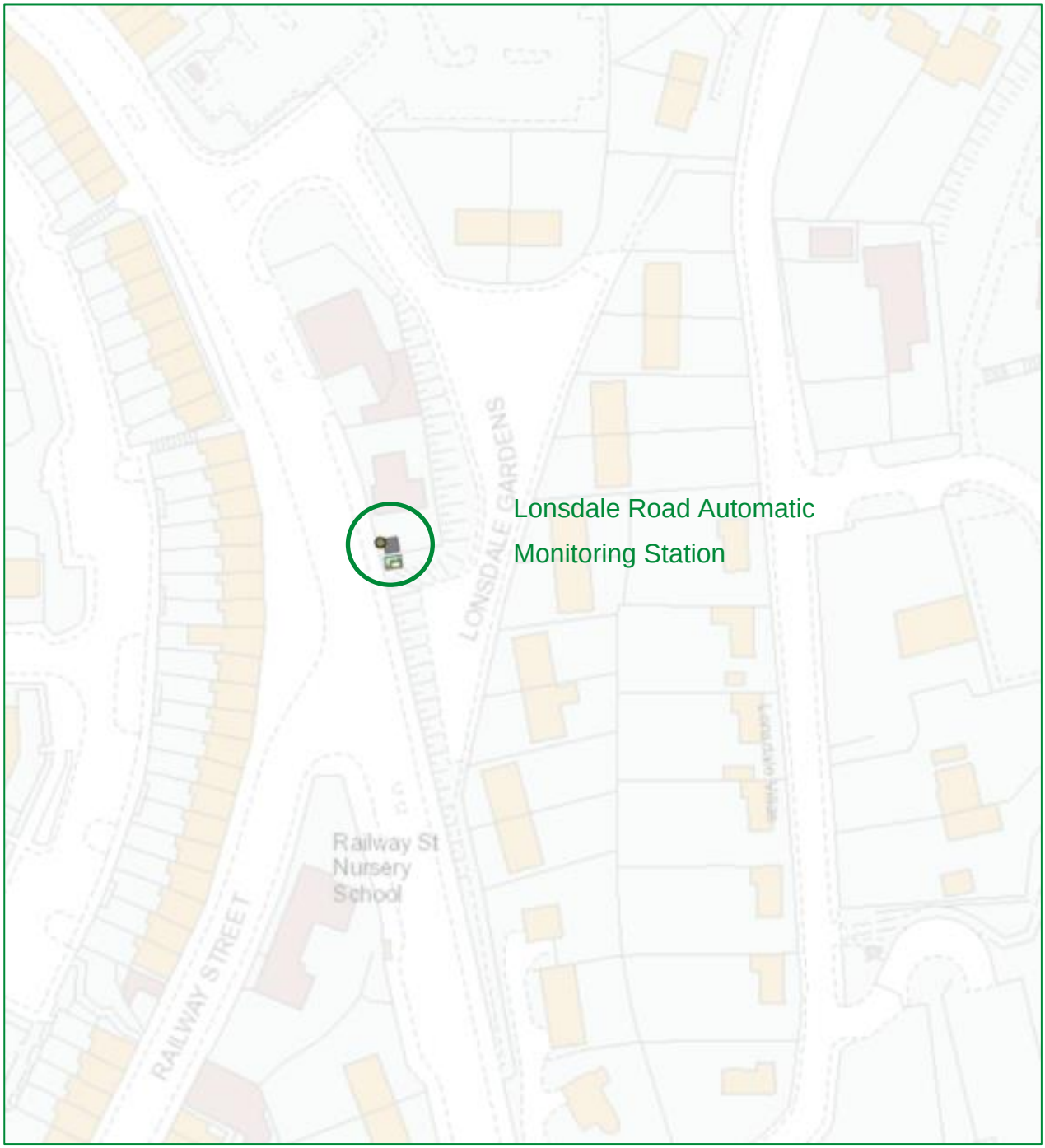


Table 2-1 Details of Automatic Monitoring Sites

Site ID	**Site Name**	**Site Type**	**X OS Grid Reference**	**Y OS Grid Reference**	**Inlet Height (m)**	**Pollutants Monitored**	**In AQMA?**	**Monitoring Technique**	**Relevant Exposure?** (Y/N with distance (m) from monitoring site to relevant exposure)	**Distance to Kerb of Nearest Road (m)** (N/A if not applicable)	**Does this Location Represent Worst-Case Exposure?**
AURN1	Lonsdale Road	Roadside	287520	345840	2.5	NOx PM_{10} PAH	Y	API BAM DIGITEL	Y(20m)	3m	Y

2.1.2 Non-Automatic Monitoring Sites

During monitoring period 2021 Armagh Banbridge Craigavon Borough Council carried out monitoring of nitrogen dioxide by diffusion tube exposure at 28 points (at 24 geographical locations) within the Borough.

This is a risk based exposure assessment monitoring nitrogen dioxide levels and how they vary at main road locations and background locations across the borough.

Diffusion tubes are placed in accordance with Government Technical guidance for Ambient NO_2 monitoring.

Armagh Banbridge Craigavon Borough Council's diffusion tubes are exposed for successive four or five week periods, in approximate accordance with the Defra Diffusion Tube Monitoring Calendar and, as a result, they provide a good general indication of average nitrogen dioxide concentrations, thereby allowing a comparison with the annual mean objective.

In 2021 Council utilised Gradko to supply and analyse diffusion tubes. Gradko follows the requirements Government Technical guidance for Ambient NO_2 monitoring. Tubes are prepared with a 20% triethanolamine solution (TEA) for monitoring ambient nitrogen dioxide. Analysis is by UV spectrophotometry.

Laboratory performance regarding NO_2 Proficiency Testing Scheme is assessed under AIR. AIR is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Executive (HSE). AIR PT is a new scheme, started in April 2014, which combined two long running PT schemes: LGC Standards STACKS PT scheme and HSE WASP PT scheme.

Performance documentation for Gradko can be found : https://laqm.defra.gov.uk/wp-content/uploads/2022/07/LAQM-NO2-Performance-data_Up-to-June-2022_V2.1.pdf

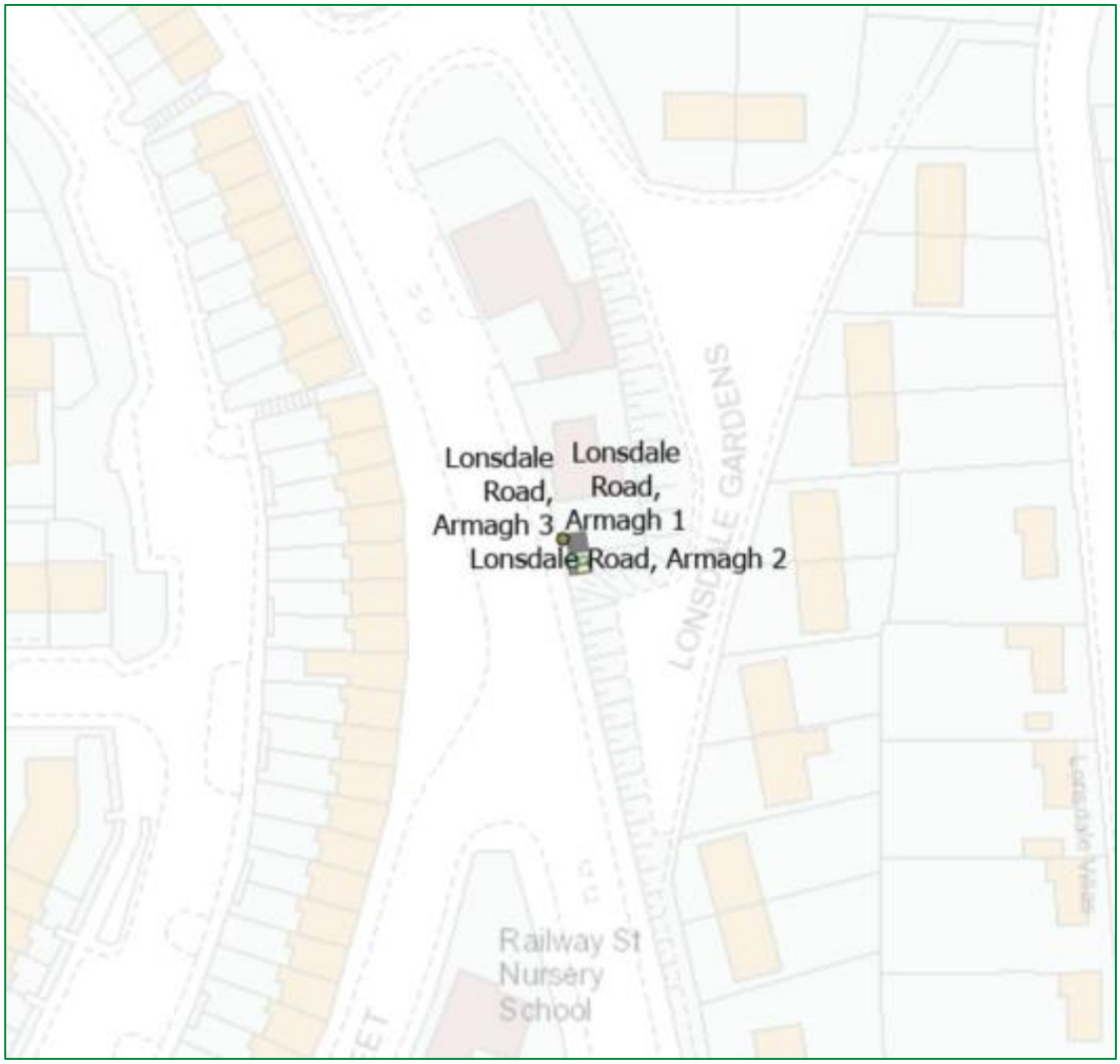
In the AIR PT intercomparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, Gradko currently holds the highest rank of a Satisfactory laboratory.

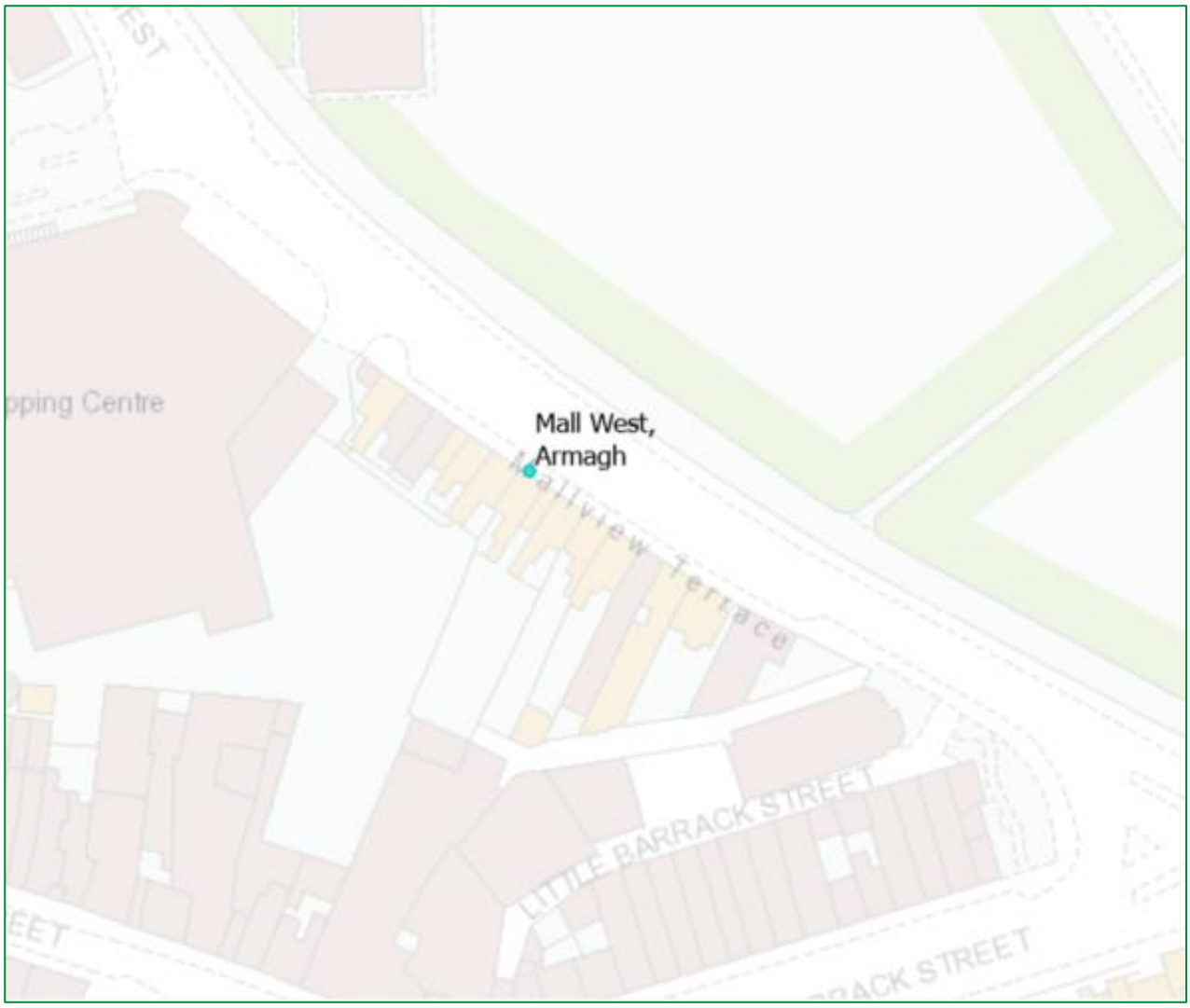
To further ensure that diffusion tube monitoring data is as accurate as possible tubes are co-located at the Armagh Lonsdale Road continuous monitoring station (chemiluminescent).

This allows a bias adjustment factor (with a 95% confidence interval as an estimate of the uncertainty on the bias adjustment factor) to be calculated that can be used to correct the diffusion tube monitoring data.

For the purposes of reporting, and in accordance with Government technical guidance all diffusion tube data is presented with a national bias adjustment factor.

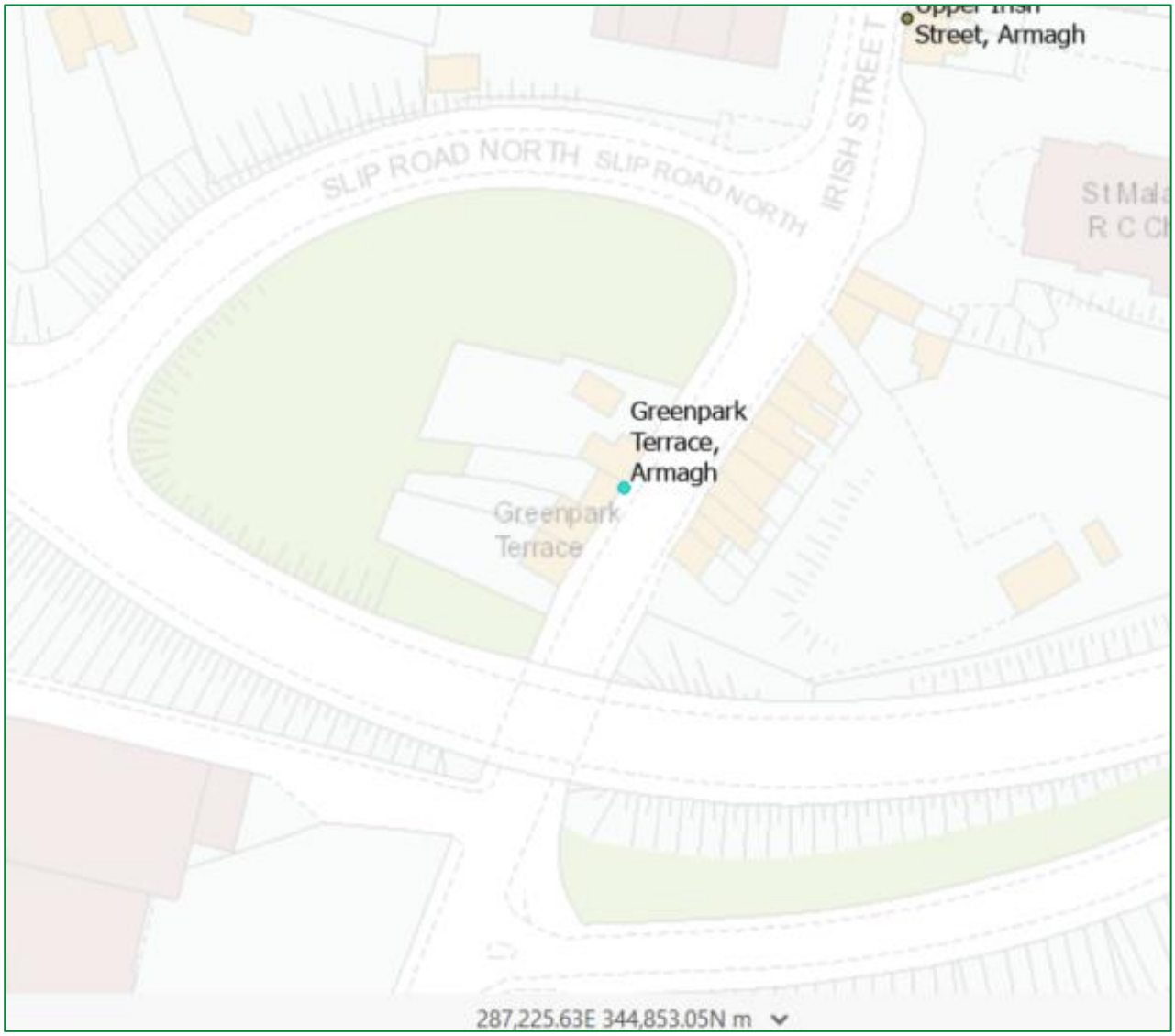
Figure 2-2 Maps of Non-Automatic Monitoring Sites

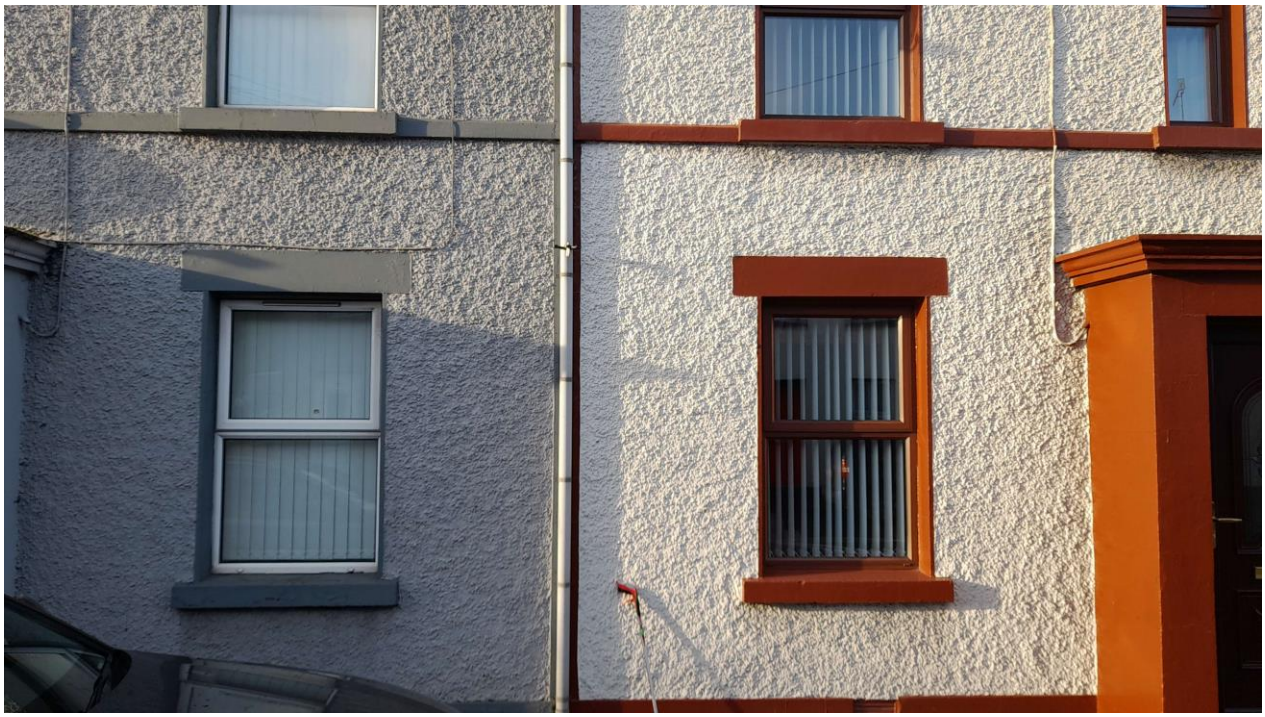



Mall West,
Armagh
LITTLE BARRACK STREET

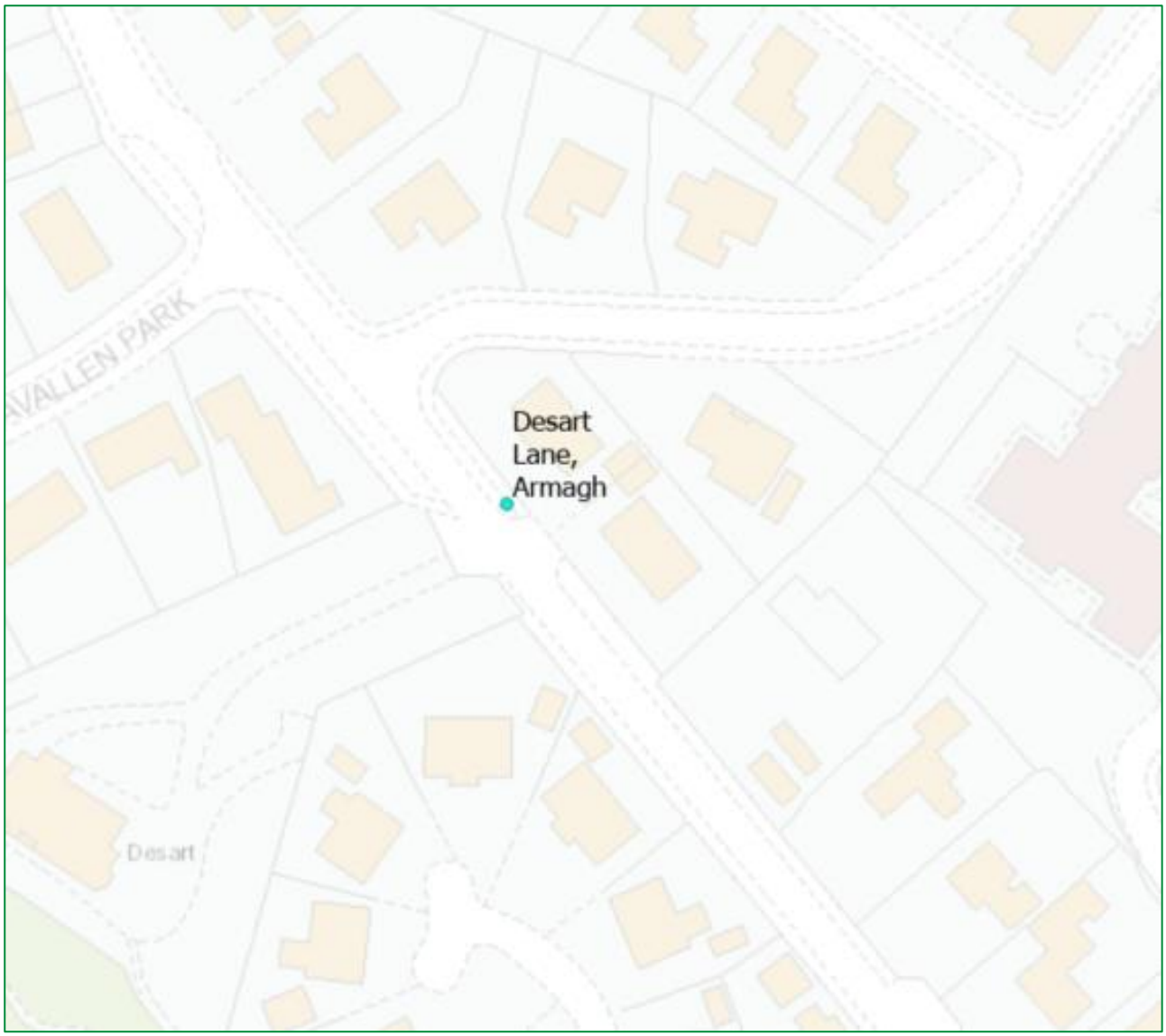

P
Mon-Sat
8.30 am-5.15 pm
60 mins
No return
within 60 mins


Railway
Street,
Armagh


Street, Armagh
SLIP ROAD NORTH
SLIP ROAD NORTH
IRISH STREET
Greenpark Terrace, Armagh
Greenpark Terrace
287,225.63E 344,853.05N m

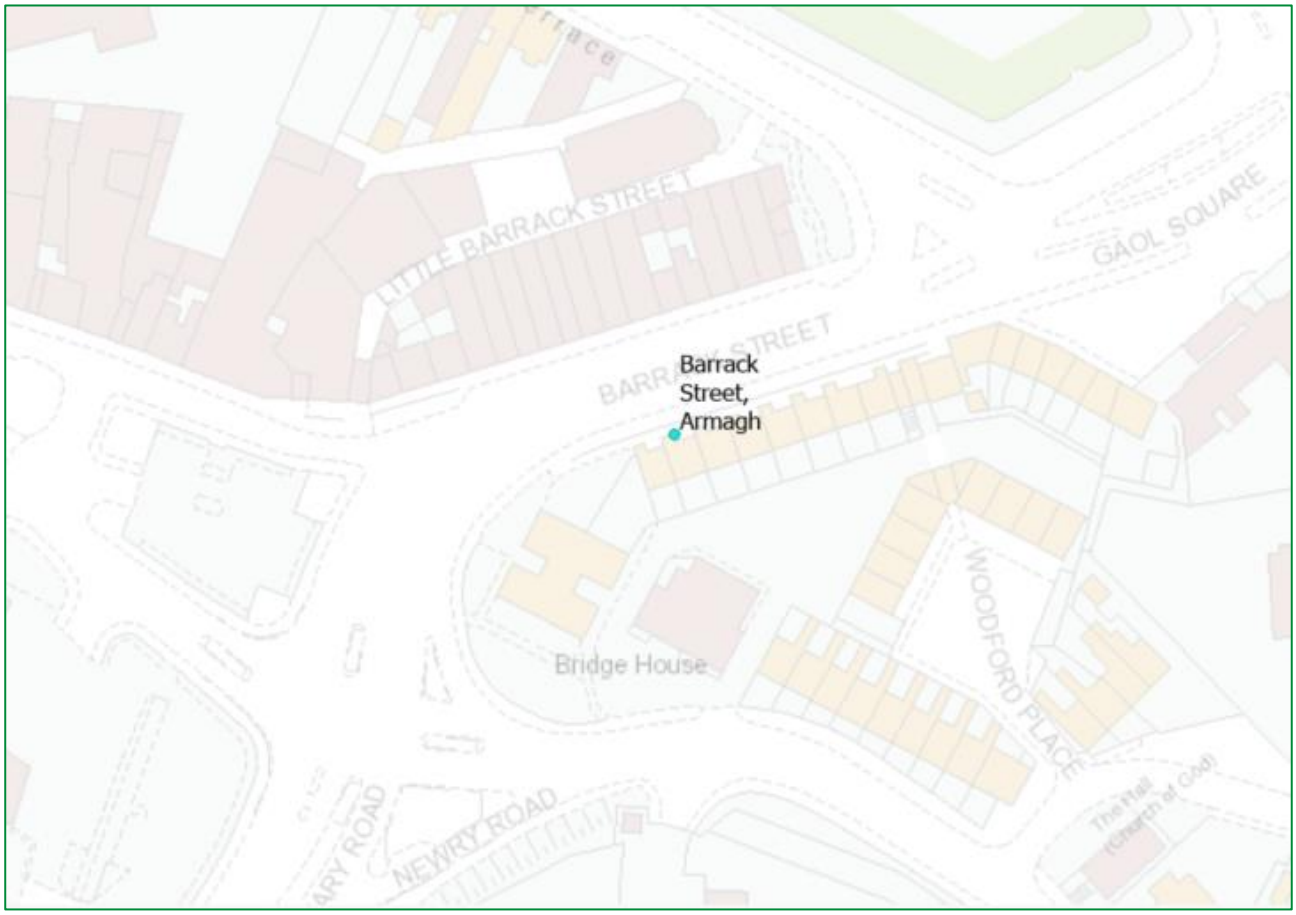


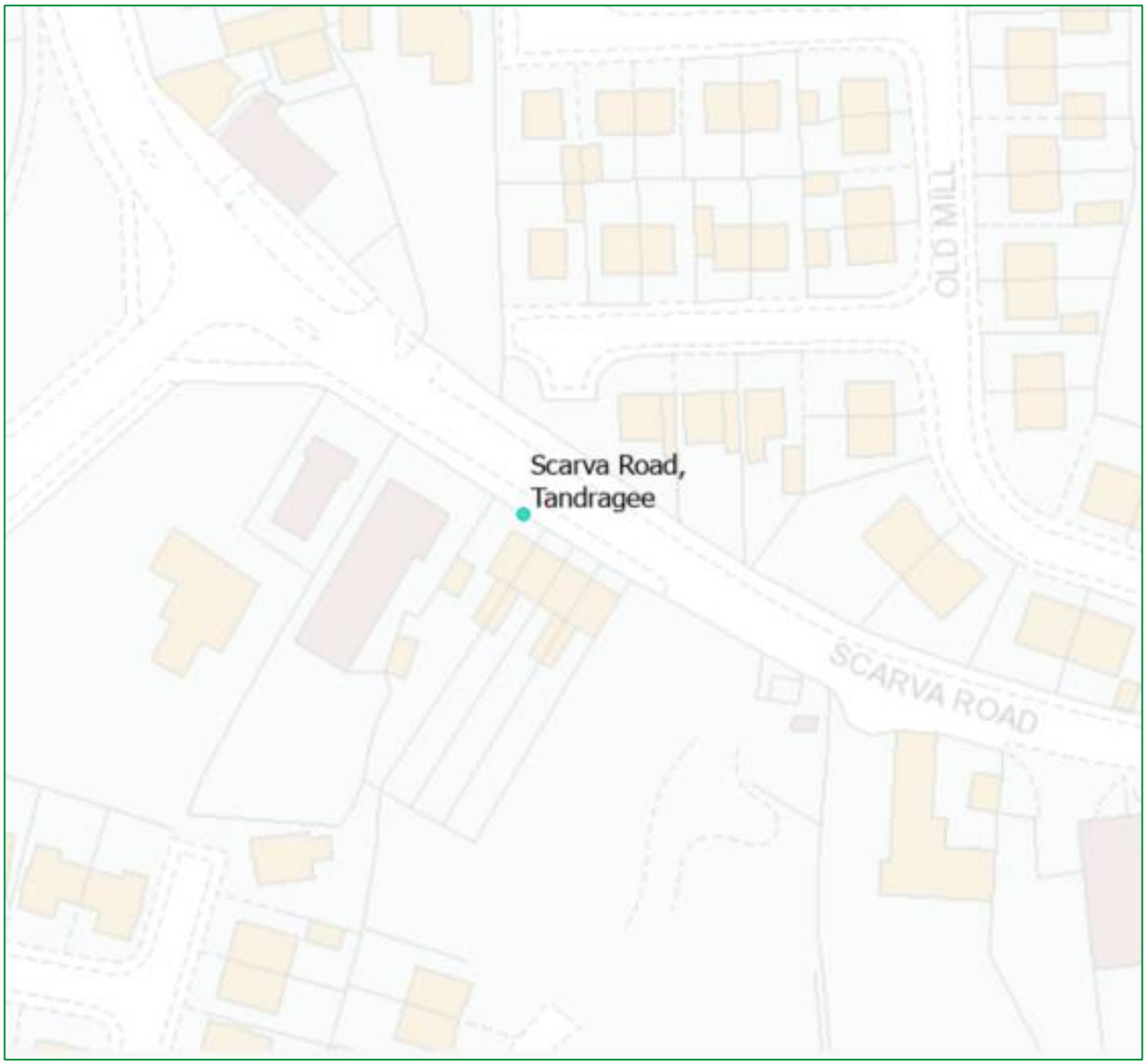

Ballynahone River
Dobbins Valley
Greenfield
Way, Armagh
GREENFIELD WAY


Desart
Lane,
Armagh
Desart


Mill Street
Tandragee 2
Mill Street Tandragee 1
Mill Street
Tandragee 3
OLD MILL COURT

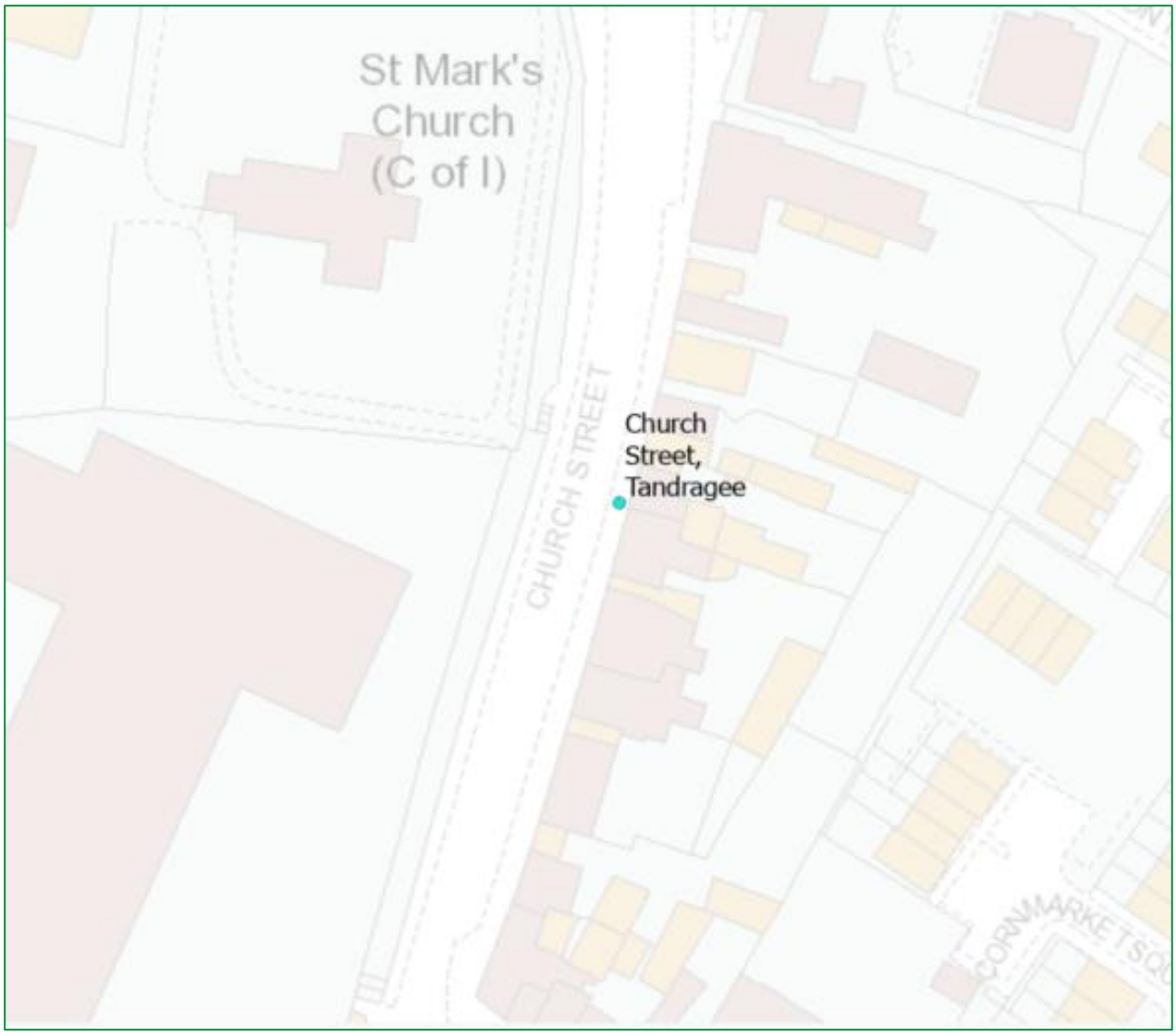

19


LITTLE BARRACK STREET
GAOL SQUARE
Barrack
Street,
Armagh
Bridge House
WOODFORD PLACE
NEWRY ROAD


Scarva Road,
Tandragee
OLD MILL
SCARVA ROAD

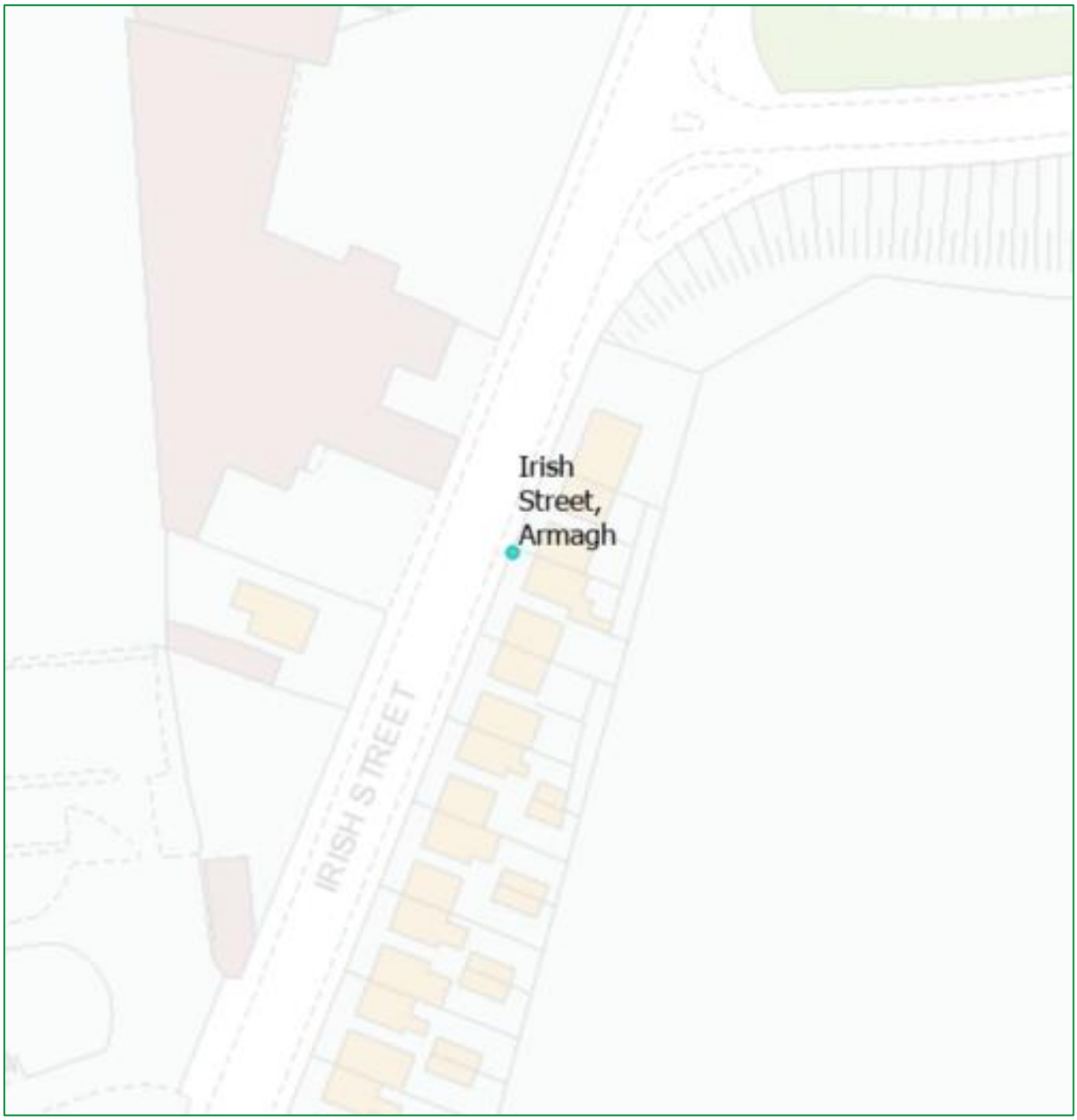

Market
Street,
Tandragee
MARKET STREET COURT
Meth
Ch


PRIVATE
PARKING
Residents Only
67

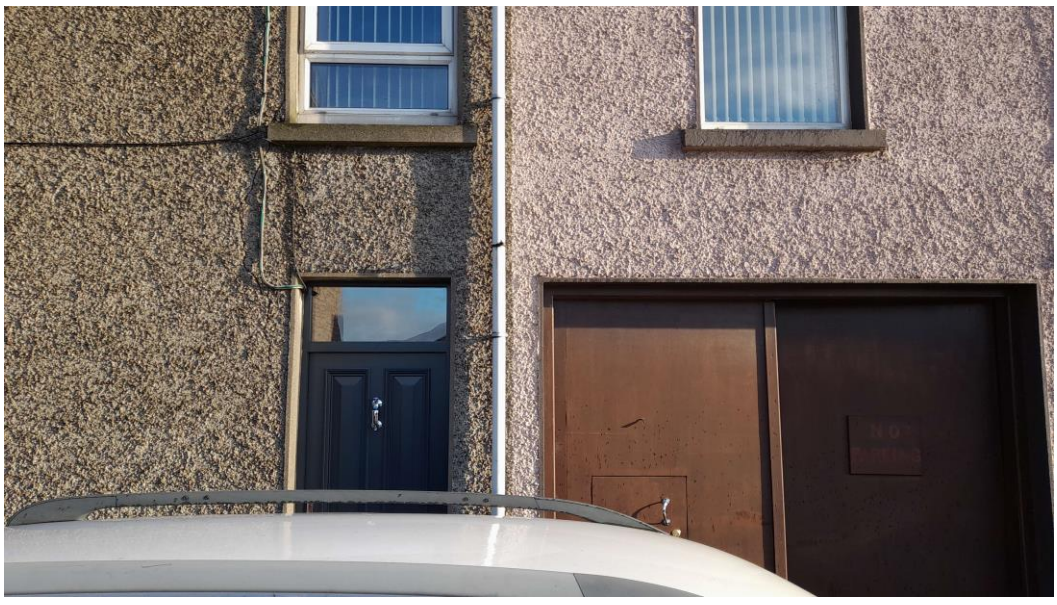

St Mark's
Church
(C of I)
CHURCH STREET
Church
Street,
Tandragee


Portadown
Road,
Tandragee
ROAD
St Mark's
Church


PORTADOWN ROAD


Irish
Street,
Armagh
IRISH STREET

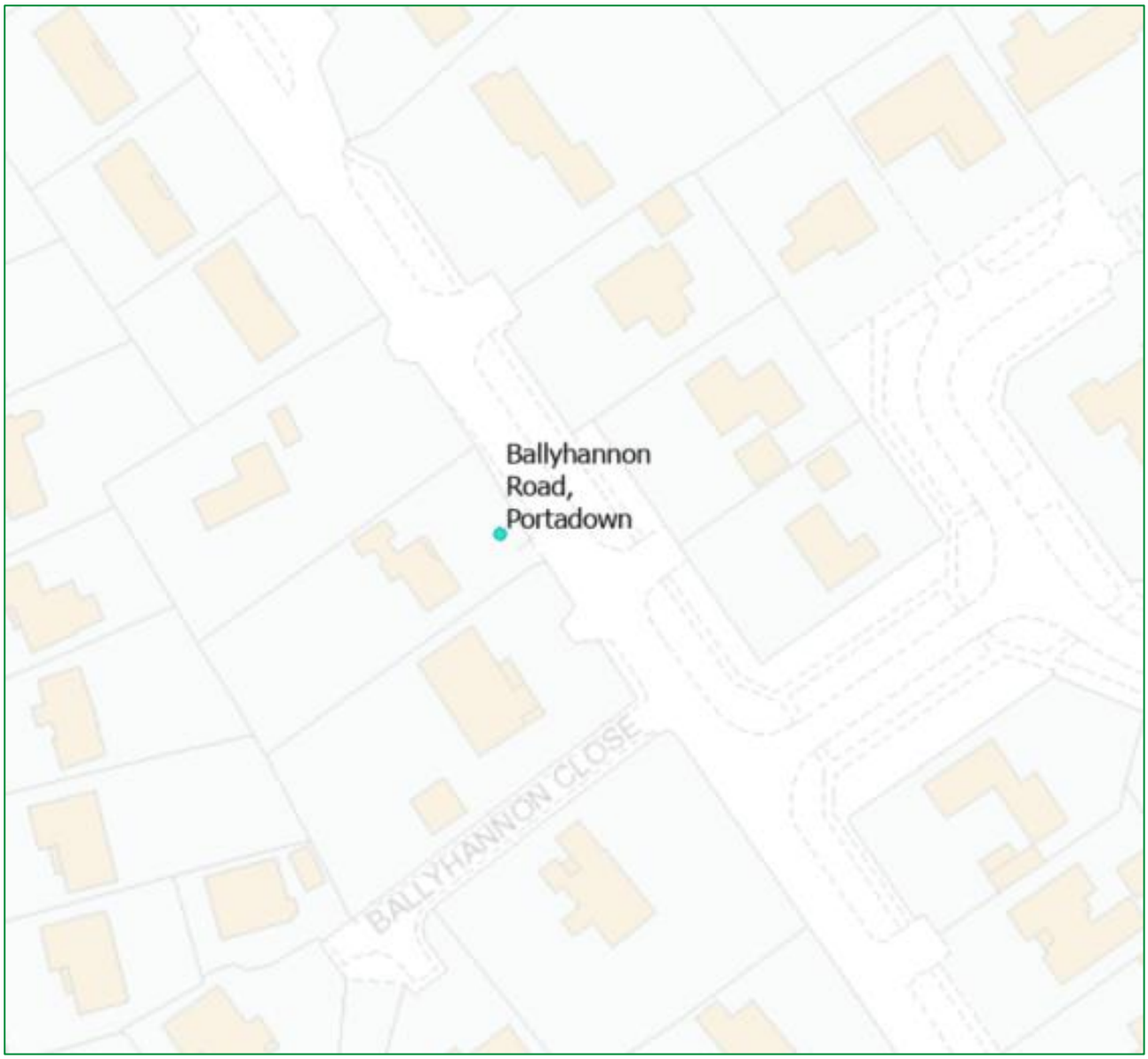

NAVAN STREET
Upper Irish Street, Armagh
IRISH STREET
OAD NORTH SLIP ROAD NORTH
St Malachy's R C Church
Greenpark Terrace, Armagh
Greenpark

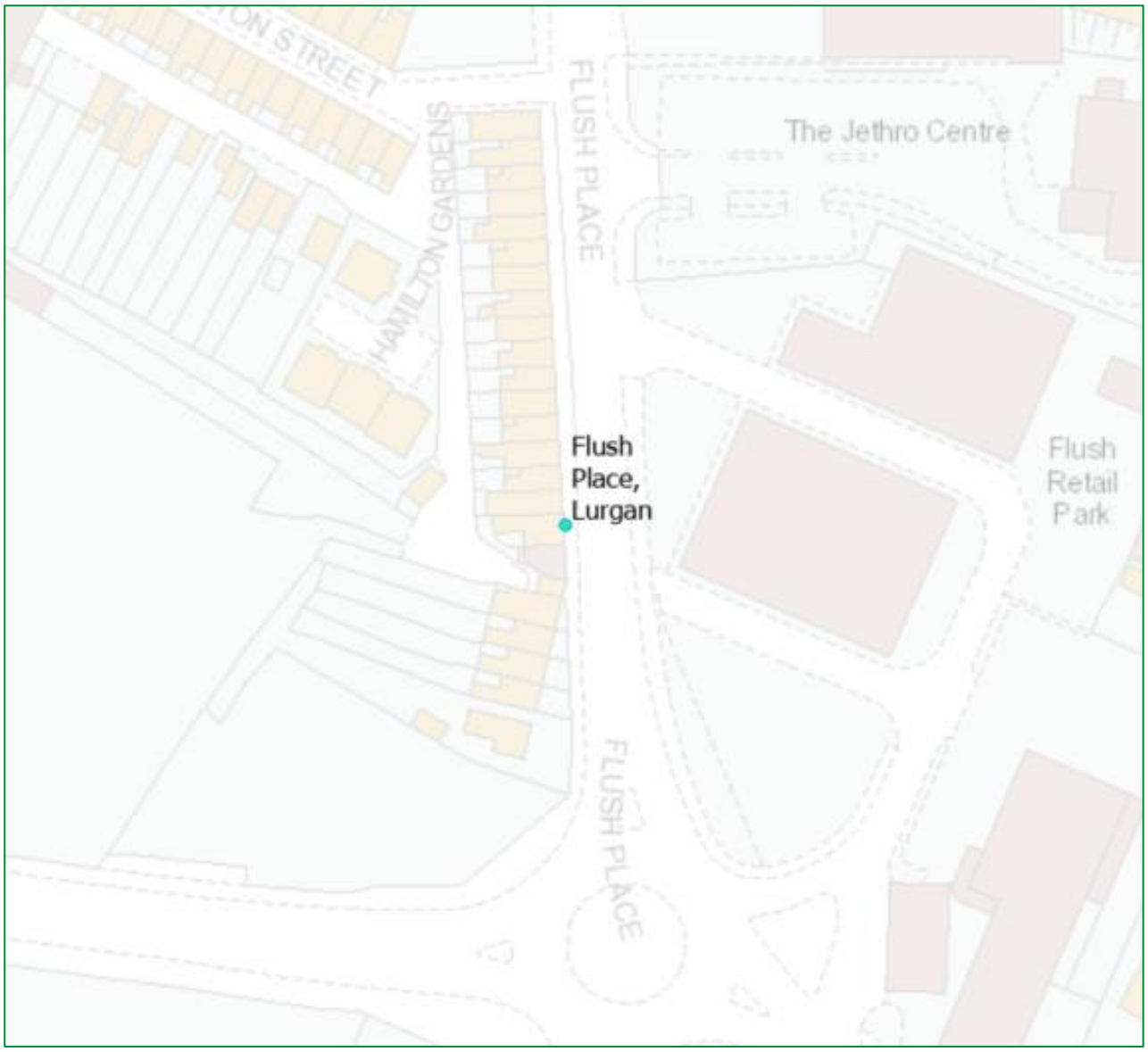



WATSONS LANE
Bridge
Street,
Portadown
CARRICKBLACK
EDEN AVENUE

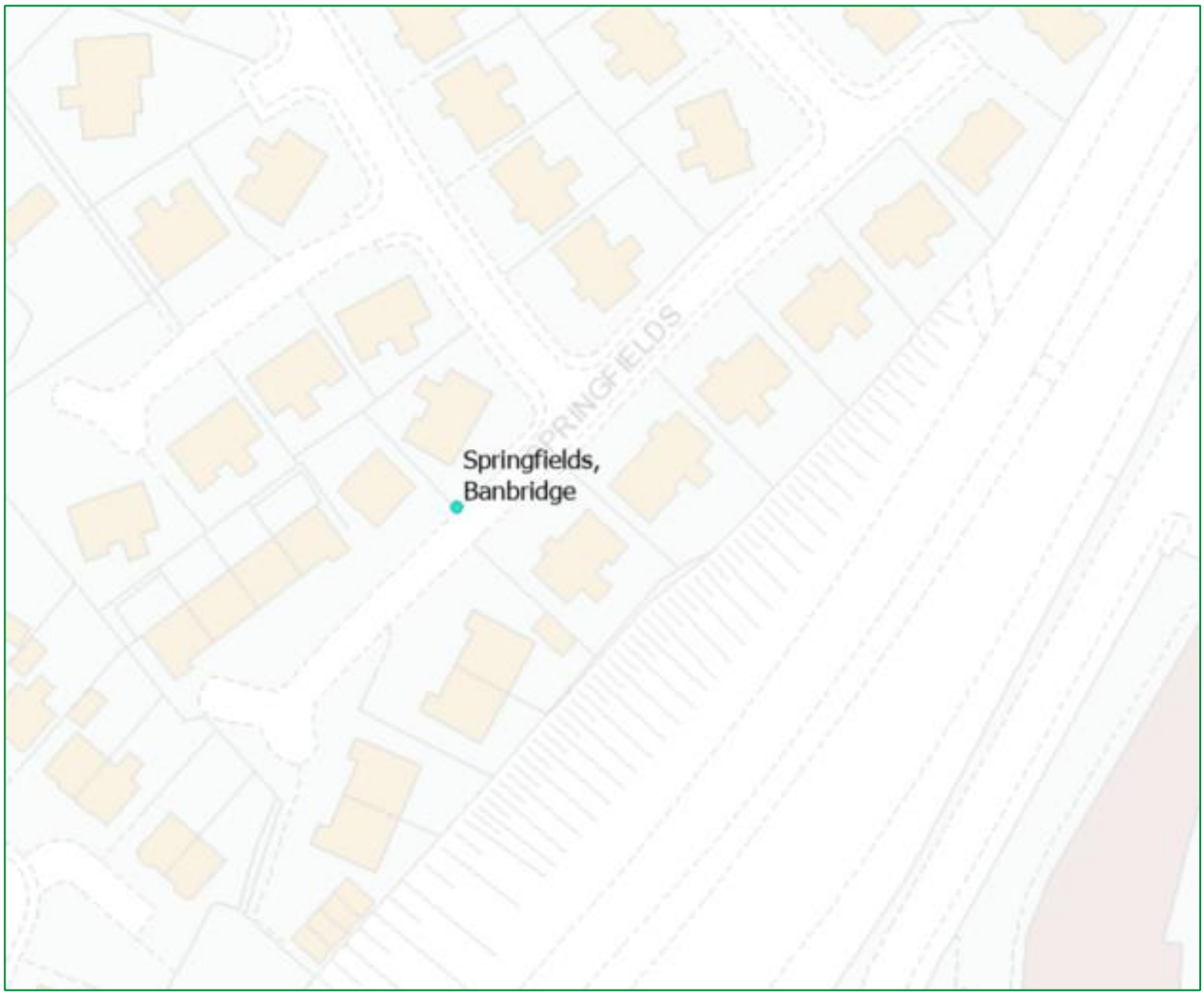

SALVAGE

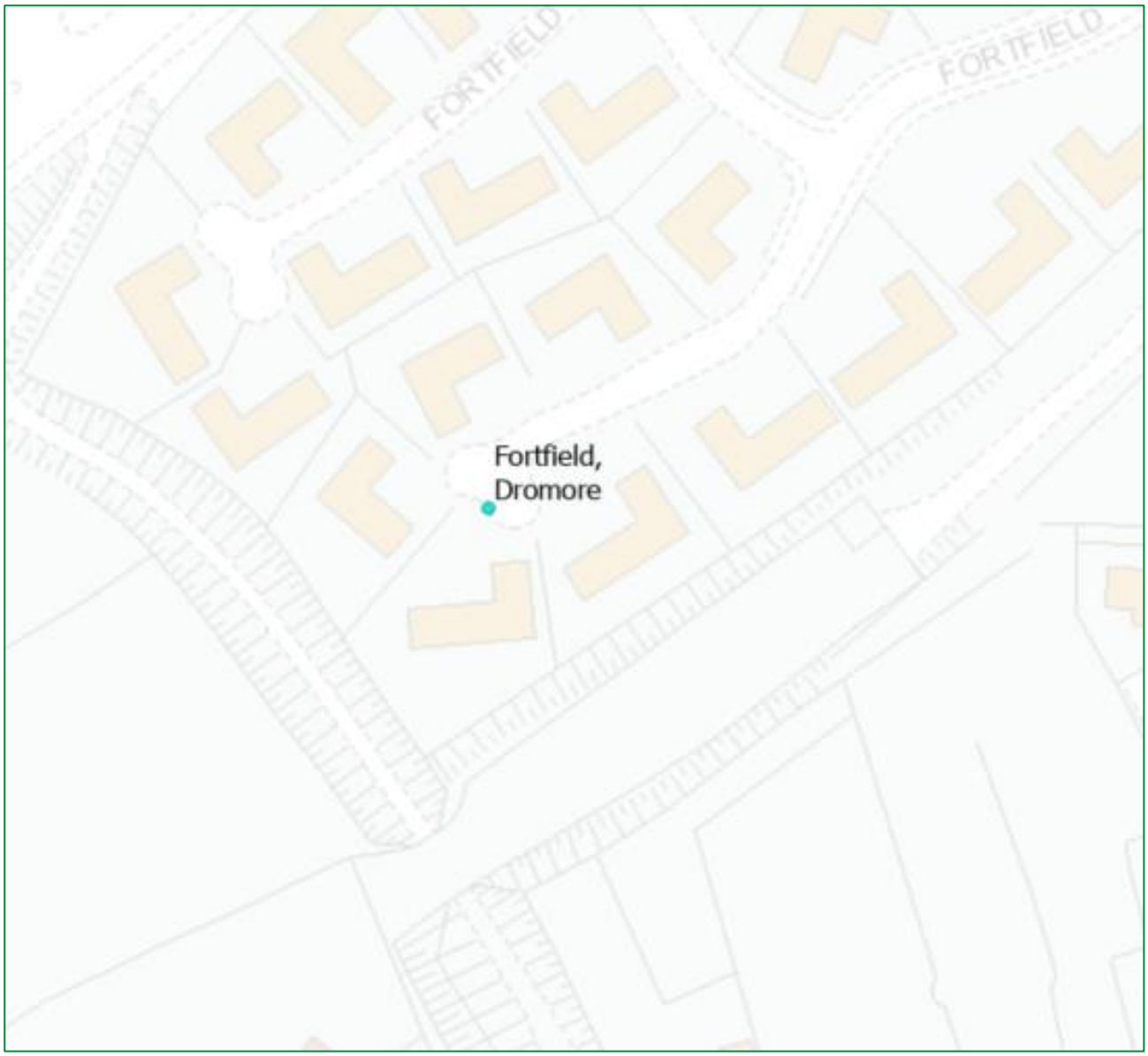

Ardboe
Drive,
Lurgan
COLBAN CRESC
PORTLEC PLACE

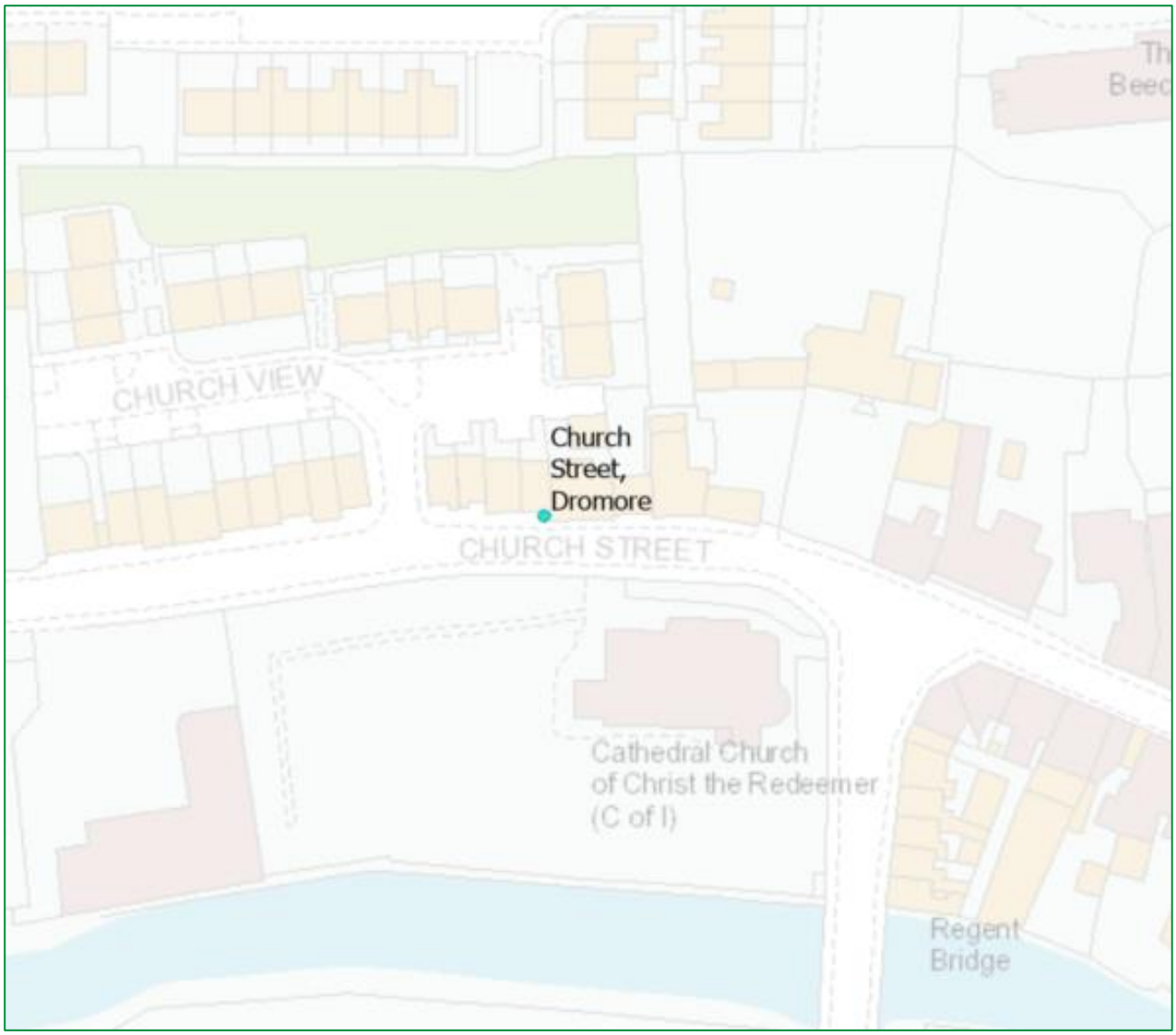

Ballyhannon
Road,
Portadown
BALLYHANNON CLOSE

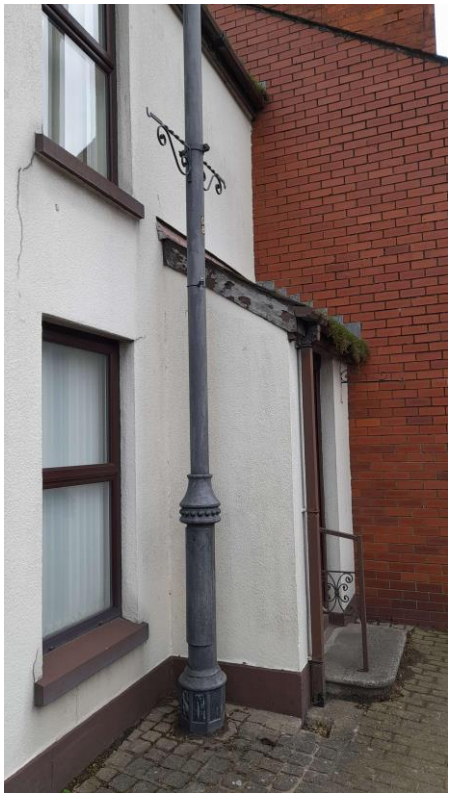

HAMILTON GARDENS
FLUSH PLACE
The Jethro Centre
Flush
Place,
Lurgan
Flush
Retail
Park
FLUSH PLACE


Bus Stop


Springfields,
Banbridge


FORTFIELD
FORTFIELD
Fortfield,
Dromore


CHURCH VIEW
Church
Street,
Dromore
CHURCH STREET
Cathedral Church
of Christ the Redeemer
(C of I)
Regent
Bridge




Mill Street,
Gilford
Castle
Street,
Gilford
GE STREET
Gilford Bridge

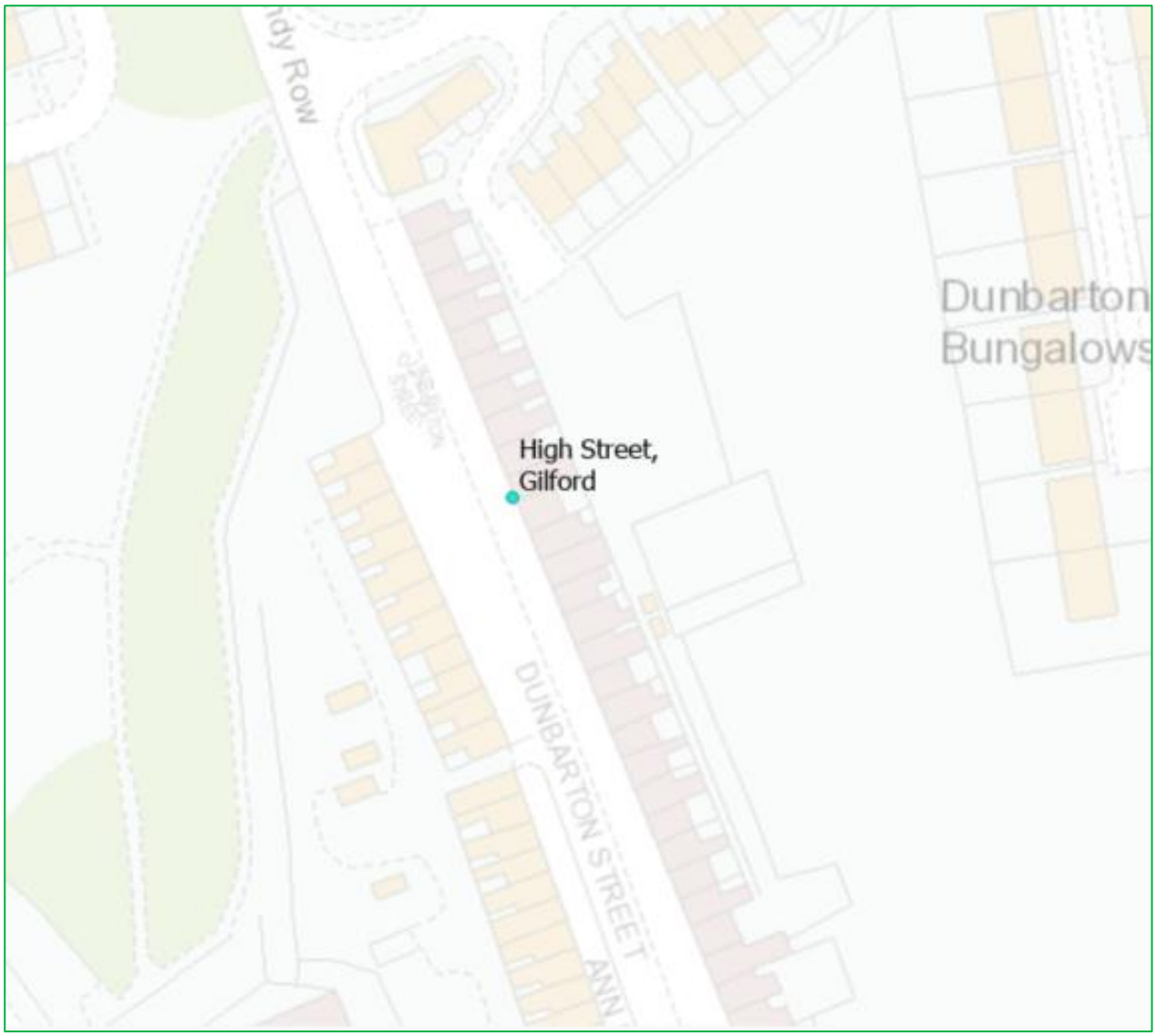

Dunbarton
Bungalows
High Street,
Gilford
DUNBARTON STREET

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?
ABCNO2DIF001	Lonsdale Road, Armagh 1	Roadside	287527	345839	2.3	NO2	Y	Y	Y(15m)	4.6	Y
ABCNO2DIF002	Lonsdale Road, Armagh 2	Roadside	287527	345839	2.3	NO3	Y	Y	Y(15m)	4.6	Y
ABCNO2DIF003	Lonsdale Road, Armagh 3	Roadside	287527	345839	2.3	NO4	Y	Y	Y(15m)	4.6	Y
ABCNO2DIF004	Mall West, Armagh	Roadside	287834	345152	2.7	NO5	Y	N	Y(1m)	5.5	Y
ABCNO2DIF005	Railway Street, Armagh	Roadside	287456	345963	2.6	NO6	Y	N	Y(1m)	2	Y
ABCNO2DIF006	Greenpark Terrace, Armagh	Roadside	287336	344775	2.6	NO7	Y	N	Y(1m)	2.4	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?
ABCNO2DIF007	Greenfield Way, Armagh	Urban Background	288792	344257	2.8	NO8	Y	N	Y(5m)	N/A	Y
ABCNO2DIF008	Desart Lane, Armagh	Urban Background	286786	345752	2.7	NO9	Y	N	Y(5m)	N/A	Y
ABCNO2DIF009	Mill Street Tandragee 1	Roadside	303319	345870	2.7	NO10	Y	N	Y(1m)	1.5	Y
ABCNO2DIF010	Mill Street Tandragee 2	Roadside	303319	345870	2.7	NO11	Y	N	Y(1m)	1.5	Y
ABCNO2DIF011	Mill Street Tandragee 3	Roadside	303319	345870	2.7	NO12	Y	N	Y(1m)	1.5	Y
ABCNO2DIF012	Barrack Street, Armagh	Roadside	287888	345054	3	NO13	Y	N	Y(1m)	3	Y

Site ID	Site Name	Site Type	X OS Grid Reference	Y OS Grid Reference	Site Height (m)	Pollutants Monitored	In AQMA?	Is Monitoring Co-located with a Continuous Analyser (Y/N)	Relevant Exposure? (Y/N with distance (m) from monitoring site to relevant exposure)	Distance to Kerb of Nearest Road (m) (N/A if not applicable)	Does this Location Represent Worst-Case Exposure?
ABCNO2DIF013	Scarva Road, Tandragee	Roadside	303414	345722	2.7	NO14	Y	N	Y(3m)	1.5	Y
ABCNO2DIF014	Market Street, Tandragee	Roadside	303235	346085	2.7	NO15	Y	N	Y(1m)	6	Y
ABCNO2DIF015	Church Street, Tandragee	Roadside	303118	346311	2.7	NO16	Y	N	Y(2m)	3.6	Y
ABCNO2DIF016	Portadown Road, Tandragee	Roadside	303093	346461	2.7	NO17	Y	N	Y(1m)	1.6	Y
ABCNO2DIF017	Irish Street, Armagh	Roadside	287288	344628	2.7	NO18	Y	N	Y(2m)	4.1	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?
ABCNO2DIF018	Upper Irish Street, Armagh	Roadside	287385	344856	2.7	NO19	Y	N	Y(1m)	1.3	Y
ABCNO2DIF019	Bridge Street, Portadown	Roadside	301548	354231	2.6	NO20	Y	N	Y(1m)	1.9	Y
ABCNO2DIF020	Ardboe Drive, Lurgan	Urban_Background	308128	357820	2.5	NO21	Y	N	Y(1m)	N/A	Y
ABCNO2DIF021	Ballyhannon Road, Portadown	Urban_Background	303172	354283	1.8	NO22	Y	N	Y(5m)	N/A	Y
ABCNO2DIF022	Flush Place, Lurgan	Roadside	308824	357773	2.7	NO23	Y	N	Y(1m)	2	Y
ABCNO2DIF023	Springfields, Banbridge	Urban_Background	311938	344065	2.7	NO24	Y	N	Y(5m)	N/A	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?
ABCNO2DIF024	Fortfield, Dromore	Urban_Background	319804	353510	2.7	NO25	Y	N	Y(5m)	N/A	Y
ABCNO2DIF025	Church Street, Dromore	Roadside	320014	353392	2.6	NO26	Y	N	Y(1m)	2.8	Y
ABCNO2DIF026	Mill Street, Gilford	Roadside	306679	348352	2.9	NO27	Y	N	Y(1m)	2.2	Y
ABCNO2DIF027	High Street, Gilford	Roadside	306261	348905	2.9	NO28	Y	N	Y(1m)	2.6	Y
ABCNO2DIF028	Castle Street, Gilford	Roadside	306724	348303	2.9	NO29	Y	N	Y(1m)	4	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide (NO_2)

Automatic Monitoring Data.

Tables 2.3 and 2.4 summarise recent monitoring data from the Armagh Lonsdale Road Continuous analyser for nitrogen dioxide for 2022 and preceding years from 2018.

During this time there have been no exceedences of the Air Quality Strategy Objectives for nitrogen dioxide.

Trends in annual mean monitoring data for nitrogen dioxide are summarised

in Figure 2.3.

Annual mean concentrations at the Armagh Lonsdale Automatic Monitoring Station remain below the 40µ/gm-3 annual mean objective for nitrogen dioxide as denoted by the solid blue line on the graph.

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	2018	2019	2020	2021
Armagh Lonsdale Road	Roadside	Y		99	24	25	24	20	21

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

Figure 2-3 Trends in Annual Mean NO_2 Concentrations Measured at Automatic Monitoring Sites

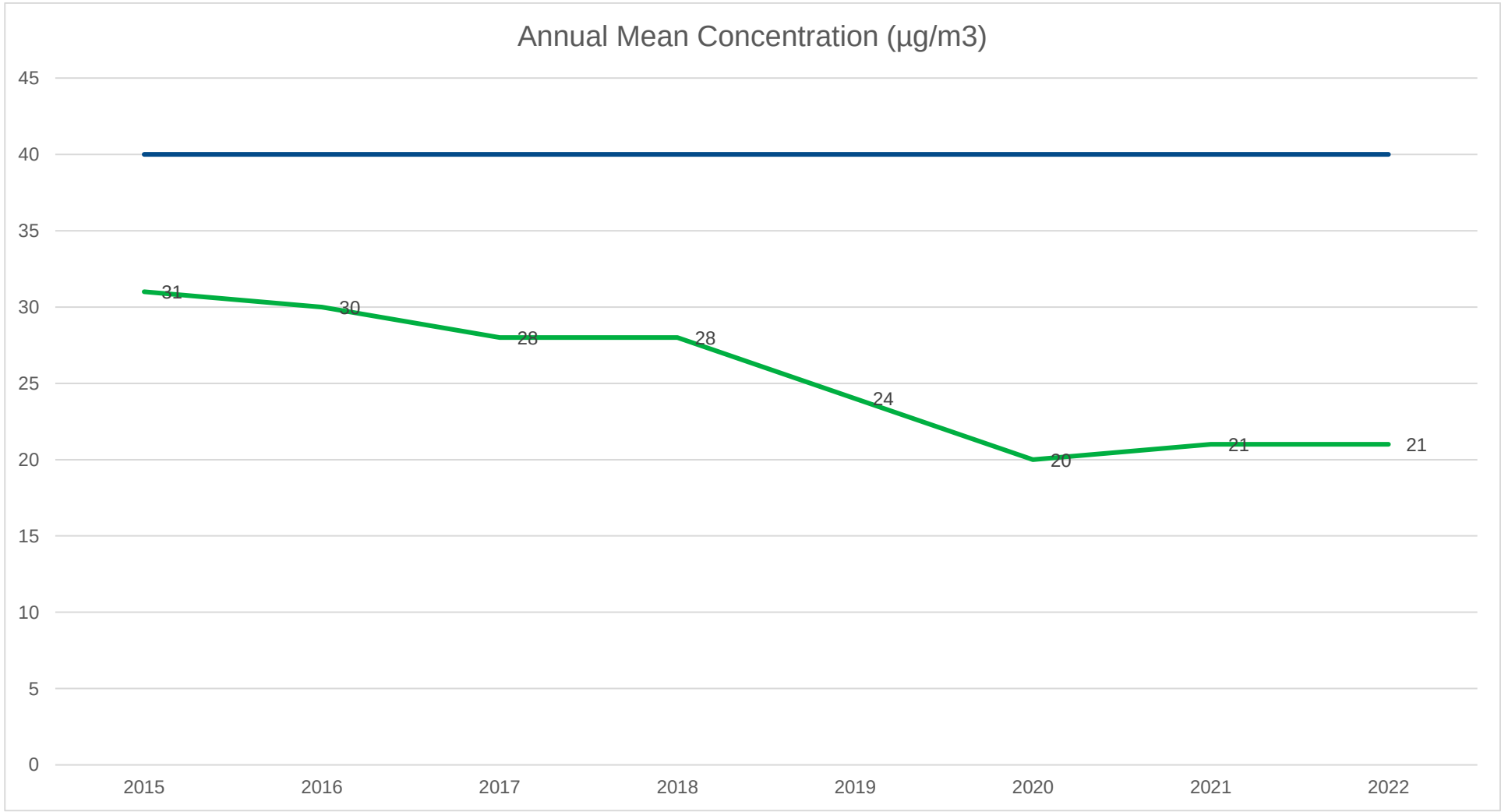


Table 2-4 Results of Automatic Monitoring for NO_2: Comparison with 1-hour Mean Objective

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]
Armagh Lonsdale Road	Roadside	Y		99	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

Armagh Banbridge Craigavon Borough Council has 24 diffusion tube monitoring locations across the borough, situated on arterial borough, diffusion tubes are located at 24 locations.

The general trend in nitrogen dioxide concentrations is downward without any large scale, local public sector investment.

During 2021 there have been no exceedences of the Air Quality Strategy Objectives for nitrogen dioxide.

Trends in annual mean diffusion tube monitoring data for nitrogen dioxide are summarised in Figure 2.4.

Annual average mean concentrations at all diffusion tube monitoring locations are below the 40µ/gm-3 annual mean objective for nitrogen dioxide as denoted by the solid blue line on the graph.

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 2021 (Number of Months or %) [a]	2021 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.84 [b]
ABCNO2DIF001,2,3	Lonsdale Road, Armagh 1, Lonsdale Road, Armagh 2, Lonsdale Road, Armagh 3	Roadside	Y	Triplicate	100.0	26.20
ABCNO2DIF004	Mall West, Armagh	Roadside	Y	No	92	28.55
ABCNO2DIF005	Railway Street, Armagh	Roadside	Y	No	100.0	34.17
ABCNO2DIF006	Greenpark Terrace, Armagh	Roadside	Y	No	92.3	33.91

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2021 (Number of Months or %) [a]	2021 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.84 [b]
ABCNO2DIF007	Greenfield Way, Armagh	Urban Background	Y	No	100.0	6.77
ABCNO2DIF008	Desart Lane, Armagh	Urban Background	Y	No	100.0	12.43
ABCNO2DIF09,10,11	Mill Street Tandragee 1, Mill Street Tandragee 2, Mill Street Tandragee 3	Roadside	Y	Triplicate	92	32.93
ABCNO2DIF012	Barrack Street, Armagh	Roadside	Y	No	100.0	27.60
ABCNO2DIF013	Scarva Road, Tandragee	Roadside	Y	No	100.0	14.65

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2021 (Number of Months or %) [a]	2021 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.84 [b]
ABCNO2DIF014	Market Street, Tandragee	Roadside	Y	No	100.0	14.60
ABCNO2DIF015	Church Street, Tandragee	Roadside	Y	No	92	26.74
ABCNO2DIF016	Portadown Road, Tandragee	Roadside	Y	No	92	24.95
ABCNO2DIF017	Irish Street, Armagh	Roadside	Y	No	100	29.01
ABCNO2DIF018	Upper Irish Street, Armagh	Roadside	Y	No	100.0	28.05
ABCNO2DIF019	Bridge Street, Portadown	Roadside	Y	No	100	24.97

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2021 (Number of Months or %) [a]	2021 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.84 [b]
ABCNO2DIF020	Ardboe Drive, Lurgan	Urban Background	Y	No	100.0	7.75
ABCNO2DIF021	Ballyhannon Road, Portadown	Urban Background	Y	No	100.0	9.56
ABCNO2DIF022	Flush Place, Lurgan	Roadside	Y	No	100	22.22
ABCNO2DIF023	Springfields, Banbridge	Urban Background	Y	No	100	10.70
ABCNO2DIF024	Fortfield, Dromore	Urban Background	Y	No	92	9.40
ABCNO2DIF025	Church Street, Dromore	Roadside	Y	No	100.0	19.18

Site ID	Location	Site Type	Within AQMA?	Triplicate or Co-located Tube	Full Calendar Year Data Capture 2021 (Number of Months or %) [a]	2021 Annual Mean Concentration (µg/m^3) - Bias Adjustment factor = 0.84 [b]
ABCNO2DIF026	Mill Street, Gilford	Roadside	Y	No	100.0	25.03
ABCNO2DIF027	High Street, Gilford	Roadside	Y	No	100.0	18.94
ABCNO2DIF028	Castle Street, Gilford	Roadside	Y	No	100.0	24.08

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.TG22, 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, and results should be discussed in a specific section. The procedure is also explained in paragraphs 7.82 to 7.85 of LAQM.TG22.

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]				
			2017 (Bias Adjustment Factor = 0.87	2018 (Bias Adjustment Factor = 0.92	2019 (Bias Adjustment Factor = 0.91	2020 (Bias Adjustment Factor = 0.81	2021 (Bias Adjustment Factor = 0.84
Lonsdale Rd 1,2,3	Roadside	Yes	30.7	30.52	30.95	25.06	26.20
Mall West	Roadside	Yes	35.8	36.34	36.51	29.03	28.55
Railway St	Roadside	Yes	**42.7**	**40.12**	**40.53**	32.59	34.17
Green Park Terrace	Roadside	Yes	**43.2**	**41.50**	**40.59**	32.58	33.91
Greenfield Way	Urban_Background	Yes	8.2	7.86	8.14	6.34	6.77
Desart Lane	Urban_Background	Yes	12.6	13.05	12.71	9.94	12.43

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]				
			2017 (Bias Adjustment Factor = 0.87	2018 (Bias Adjustment Factor = 0.92	2019 (Bias Adjustment Factor = 0.91	2020 (Bias Adjustment Factor = 0.81	2021 (Bias Adjustment Factor = 0.84
Mill St Tandragee 1,2,3	Roadside	Yes	**42.9**	**41.54**	**41.52**	32.25	32.93
Barrack St	Roadside	Yes	29.7	31.26	33.03	24.36	27.60
Scarva St, Tandragee	Roadside	Yes	-	15.68	17.05	13.37	14.65
Market St, Tandragee	Roadside	Yes	-	19.84	18.86	14.93	14.60
Church St, Tandragee	Roadside	Yes	-	31.96	30.33	25.64	26.74
Portadown Rd, Tandragee	Roadside	Yes	-	30.58	28.17	24.09	24.95
Irish St, Armagh	Roadside	Yes	-	36.82	32.58	25.97	29.01

Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]				
			2017 (Bias Adjustment Factor = 0.87	2018 (Bias Adjustment Factor = 0.92	2019 (Bias Adjustment Factor = 0.91	2020 (Bias Adjustment Factor = 0.81	2021 (Bias Adjustment Factor = 0.84
Upper Irish Street, Armagh	Roadside	Yes	-	34.93	33.39	26.73	28.05
Bridge St Portadown	Roadside	Yes	34.6	35.09	34.49	26.30	24.97
Ardbe Drive	Urban_Background	Yes	9.6	10.07	12.62	7.48	7.75
Ballyhannon Road	Urban_Background	Yes	8.03	8.72	7.95	6.55	9.56
Flush Place	Roadside	Yes	30.7	30.27	26.98	24.16	22.22
Springfields Banbridge	Urban_Background	Yes	12.4	13.46	14.06	8.80	10.70
Fortfield Drive	Urban_Background	Yes	11.6	11.63	12.17	8.09	9.40

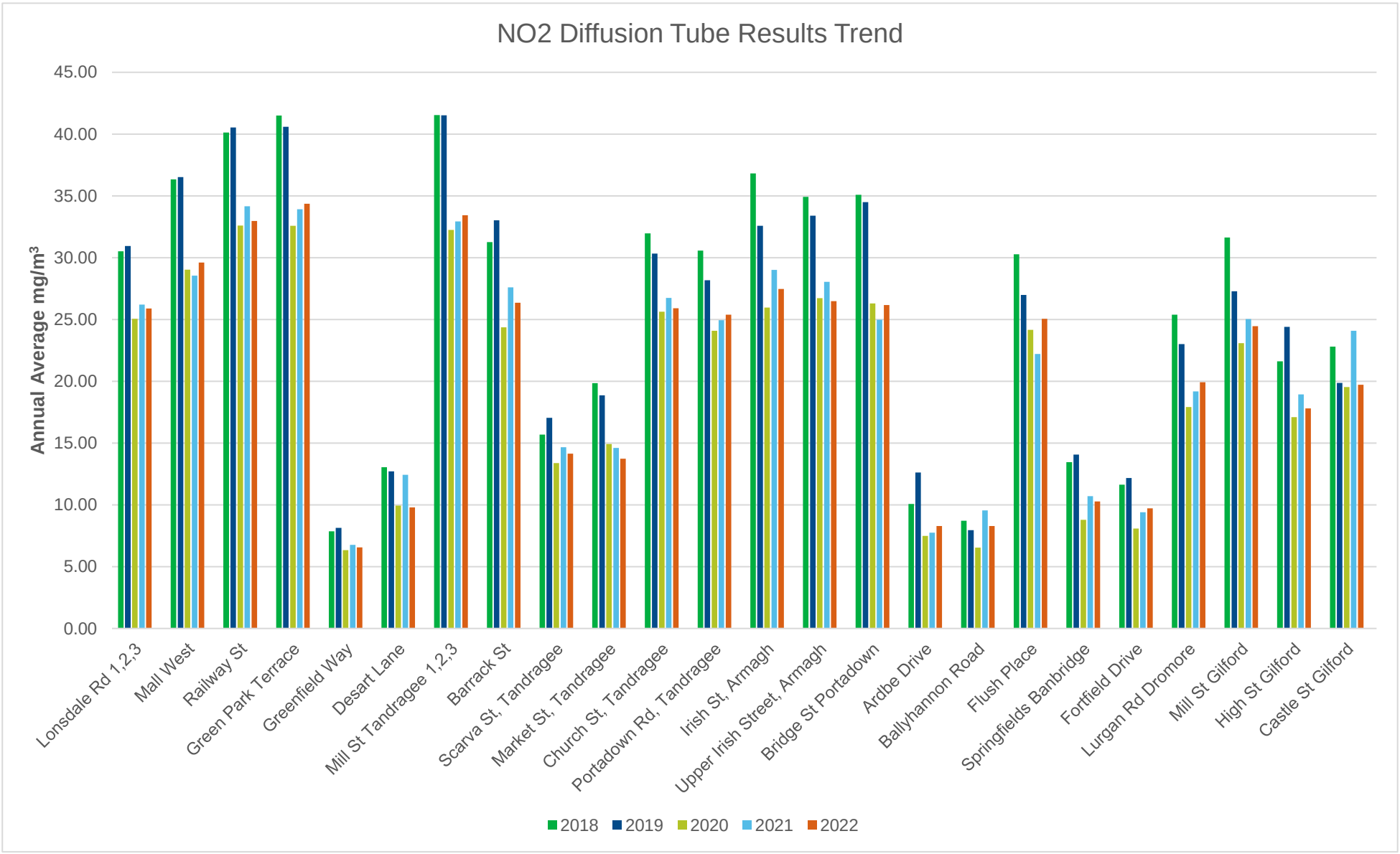
Site ID	Site Type	Within AQMA?	Annual Mean Concentration (µg/m^3) - Adjusted for Bias [a]				
			2017 (Bias Adjustment Factor = 0.87	2018 (Bias Adjustment Factor = 0.92	2019 (Bias Adjustment Factor = 0.91	2020 (Bias Adjustment Factor = 0.81	2021 (Bias Adjustment Factor = 0.84
Lurgan Rd Dromore	Roadside	Yes	24.2	25.39	23.00	17.91	19.18
Mill St Gilford	Roadside	Yes	30.4	31.63	27.29	23.09	25.03
High St Gilford	Roadside	Yes	-	21.62	24.40	17.10	18.94
Castle St Gilford	Roadside	Yes	-	26.52	19.87	19.53	24.08

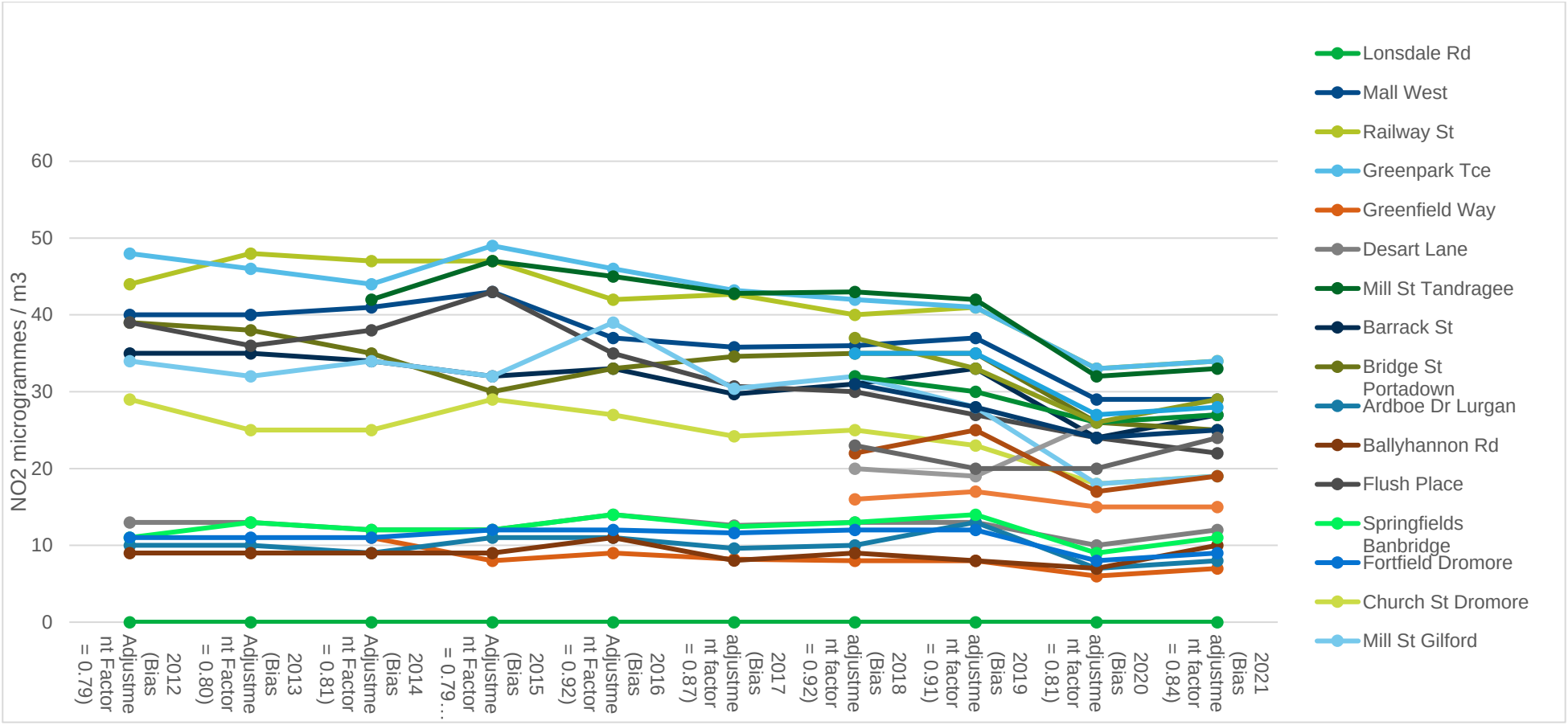
In bold, exceedance of the NO_2 annual mean AQS objective of 40µg/m^3

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.TG22, if full calendar year data capture is less than 75%

Figure 2-4 Trends in Annual Mean Nitrogen Dioxide Concentrations Measured at Diffusion Tube Monitoring Sites




NO2 micrograms / m3
60
50
40
30
20
10
0
Adjustment Factor = 0.79)
2012 (Bias Adjustment Factor = 0.80)
2013 (Bias Adjustment Factor = 0.81)
2014 (Bias Adjustment Factor = 0.79…
2015 (Bias Adjustment Factor = 0.92)
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2017 (Bias adjustment factor = 0.92)
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2021 (Bias adjustme
Lonsdale Rd
Mall West
Railway St
Greenpark Tce
Greenfield Way
Desart Lane
Mill St Tandragee
Barrack St
Bridge St
Portadown Ardboe Dr Lurgan
Ballyhannon Rd
Flush Place
Springfields
Banbridge Fortfield Dromore
Church St Dromore
Mill St Gilford

2.2.2 Particulate Matter (PM_{10})

Particulate matter is monitored at the Lonsdale Road AURN station wholly for the purposes of DAERA / DEFRA data collection.

PM_{10} concentrations have never exceeded the objectives at this location despite its situation within an AQMA declared for traffic source NO_2

The following tables provide information on particulate matter which is monitored at the automatic station on Lonsdale Road, Armagh.

Table 2-7 Results of Automatic Monitoring for PM_{10}: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2021 %	Confirm Gravimetric Equivalent (Y or N/A)	Annual Mean Concentration (µg/m^3)				
						2017	2018	2019	2020	2021
Armagh Lonsdale Road	Roadside	Y	98	98	Y	14	19	17	17	16

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

Figure 2-5 Trends in Annual Mean PM_{10} Concentrations

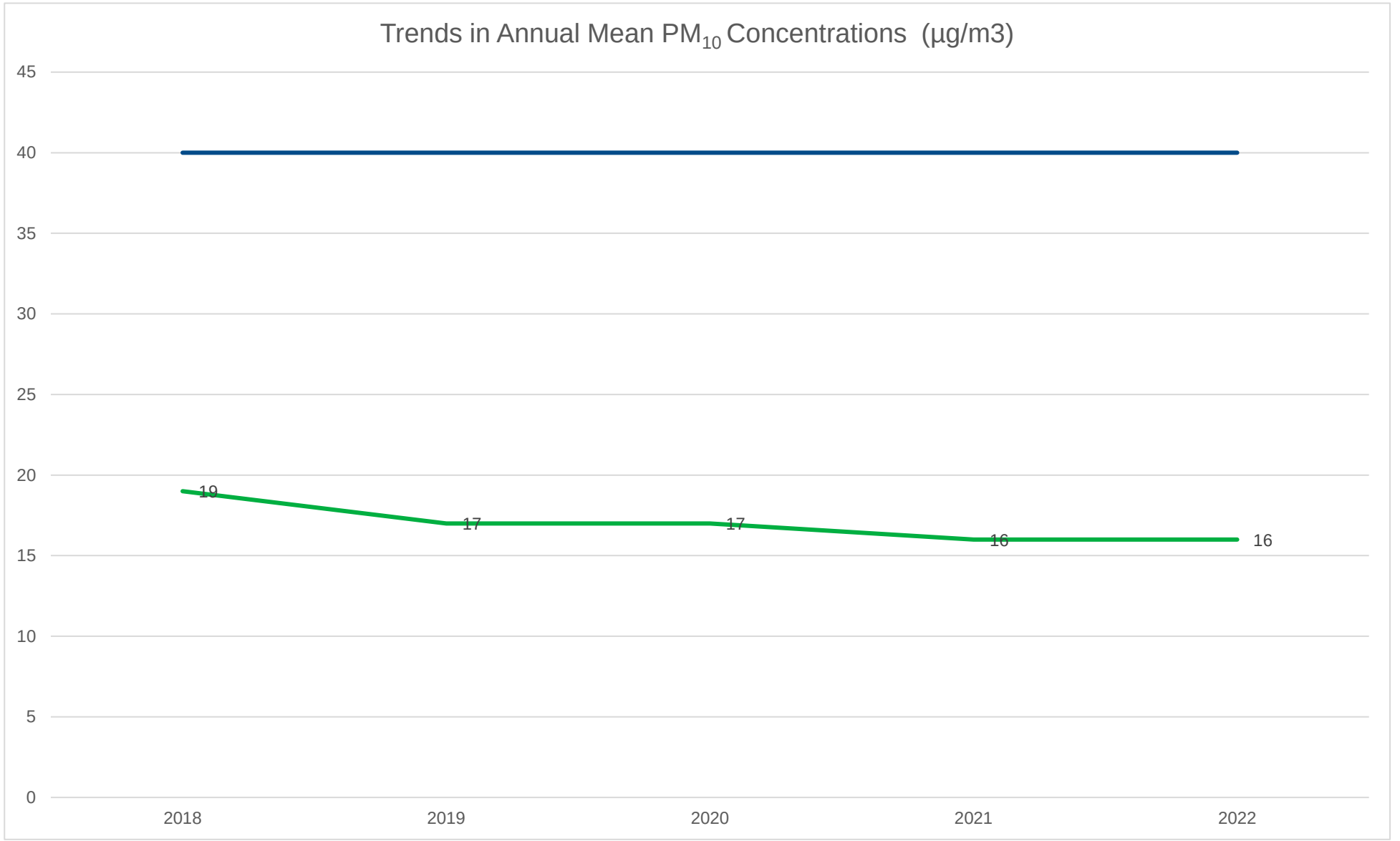

Table 2-8 Results of Automatic Monitoring for PM_{10}: Comparison with 24-hour Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for Monitoring Period %	Valid Data Capture 2021 %	Confirm Gravimetric Equivalent (Y or N/A)	Number of Daily Means > 50µg/m^3				
						2017	2018	2019	2020	2021
Armagh Lonsdale Road	Roadside	Y	98	98	Y	0	0	0	0	0

In bold, exceedance of the PM10 daily mean AQS objective (50µg/m3 – not to be exceeded more than 35 times per year)

2.2.3 Summary of Compliance with AQS Objectives

Armagh City, Banbridge and Craigavon Borough Council has examined the results from monitoring in the Borough for 2021.

Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment.

This Borough takes an exposure reduction approach to Local Air Quality Management.

3 New Local Developments

Any Planning Application for development of infrastructure with potential to impact air quality is screened and assessment requested as part of the consultation process by Environmental Health Department and Planning Departments

3.1 Road Traffic Sources

No New road sources

3.2 Other Transport Sources

No new transport sources

3.3 Industrial Sources

No significant air quality impacting industrial developments

3.4 Commercial and Domestic Sources

No significant air quality impacting commercial or domestic developments

3.5 New Developments with Fugitive or Uncontrolled Sources

No new relevant developments

Armagh Banbridge Craigavon 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.

Armagh Banbridge Craigavon 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.**

4 Local / Regional Air Quality Strategy

The Council is aware that Government intends to produce an Air Quality Strategy for Northern Ireland – we would strongly welcome such a strategy. This should sit along with an Energy Strategy and lead to a replacement for the Clean Air (NI) Order 1981 which takes the focus of enforcement away from furnaces and chimney heights to ensuring that biomass plant and transport emissions can be adequately considered.

5 Planning Applications

All relevant planning applications are screened by the Environmental Health Department and control measures are included to mitigate adverse impacts on local air quality following EPUK guidance.

6 Air Quality Planning Policies

The Council does not have any local planning policies related to air quality. Air quality gets some reference in the Strategic Planning Policy Statement for NI. The Council does not yet have a Local Development Plan.

7 Local Transport Plans and Strategies

Transport Plans and Strategies are a matter for central Government. The Council are aware of the Regional Development Strategy for Northern Ireland 2035 and its daughter strategies. The Council have responded to numerous consultations over recent years highlighting the need for greater public transport investment – including the re-establishment of rail links – as well as new roads and electric vehicle infrastructure. The Armagh rail link remains closed. The Armagh ring-road has not yet been planned. Development of electric vehicle infrastructure is slow.

8 Climate Change Strategies

Armagh City, Banbridge and Craigavon Borough Council has declared a ‘Climate Emergency’. As an organisation the Council has long-established environmental management systems. The Council is presently preparing (2023) a net zero roadmap which will address the climate change impact of activities throughout the Borough. Local Air Quality Management is recognised as congruent with the aims of the net zero strategy under development and the health benefits that can be realised through a reduction in fossil fuel combustions in local areas will be a positive selling point for any measures that may emerge.

9 Implementation of Action Plans

Armagh City, Banbridge and Craigavon Borough Council declared a ‘Climate Emergency’.

A revised air quality action plan was agreed by Council in 2021.

Local Air Quality Management is recognised as congruent with the aims of the net zero strategy under development and the health benefits that can be realised through a reduction in fossil fuel combustions in local areas will be a positive selling point for any measures that may emerge.

Table 9-1 Action Plan Progress

No.	ACTION	LEAD	COUNCIL ACTION	WHEN
1	Undertake sampling and analysis of solid fuel for sale within the Borough to address suspected non-compliance with the Sulphur Content of Solid Fuels Regulations	Armagh City Banbridge and Craigavon Borough Council	Participate in regional exercise to address suspected non-compliance. Advisory messages to import, supply and retail sectors. Test-purchasing to follow.	June 2023
2	Build a consensus for action to improve air quality throughout the Borough and nationally	Armagh City, Banbridge and Craigavon Borough Council	Annual reporting to Members Liaison with other Council Departments Liaison with central Government. Liaison with professional bodies and academics. Use of media requests/publicity to highlight air quality issues	2023 and annually thereafter
3	Road infrastructure development in Armagh and improved rail connectivity for the Borough	HM Treasury & DfI. Mid South West region Growth Deal	Support and lobby for same Infrastructure development included in Regional Growth Deal.	On-going

No.	ACTION	LEAD	COUNCIL ACTION	WHEN
4	Provision of new efficient public transport services for NI	HM Treasury & DfI	Support and lobby for same	On-going
5	New Clean Air Order to address new emission sources including road traffic	UK Government & DAERA	Lobby for same	On-going
6	New Air Quality Strategy for Northern Ireland	NI Executive & DAERA & Councils	Lobby for same	On-going
7	New legislation to facilitate domestic users away from solid fuel heating where affordable and supported by other measures	NI Executive & DfE	Lobby for same	On-going
8	Air pollution monitoring to provide evidence-base for policy change	Councils & DAERA	Deliver high quality monitoring and reporting	On-going
9	Maintenance of AURN monitoring station within the Borough for the purposes of UK compliance with Air Quality Standards	Councils & DAERA	Deliver high quality monitoring and reporting	On-going

No.	ACTION	LEAD	COUNCIL ACTION	WHEN
10	Seek to expand monitoring network to include Poly Aromatic Hydrocarbon monitoring in Armagh as an indicator of household solid fuel emissions	Councils & DAERA	Deliver high quality monitoring and reporting	PAH Analyser installed at Armagh Lonsdale 2022
11	Emerging actions to support UK Government move to zero emission by 2030	HM Treasury, UK Government, NI Executive & Councils	Assist in development and implementation of same	Awaited from UK Government
12	Measures to achieve Indicator 37 in the NI Executive draft PfG – or its successor from a newly formed administration	NI Executive, HM Treasury & Councils	Assist in the development and implementation of same	Awaited from NI Executive
13	Incorporate air quality considerations into Local Development Plan	Armagh City, Banbridge and Craigavon Borough Council	Have regard to the improvement in air quality with the Local Development Plan	By 2023
14	Regulate emissions from all Part C prescribed industrial processes in the Borough	Armagh City, Banbridge and	Ensure emissions within compliance	Annually

No.	ACTION	LEAD	COUNCIL ACTION	WHEN
		Craigavon Borough Council		
15	Regulate emissions from all relevant medium-scale combustion plant and generators in the Borough	Armagh City, Banbridge and Craigavon Borough Council	Ensure emissions within compliance	2023 onwards
16	Have regard to air quality impacts in all development control applications within the Borough	Armagh City, Banbridge and Craigavon Borough Council	Have regard to planning policy and best practice in minimising adverse impact	On-going
17	Enforce all smoke control provisions within the Borough	Armagh City, Banbridge and Craigavon Borough Council	Minimise emissions	On-going
18	Prevent smoke or other air quality nuisances within the Borough	Armagh City, Banbridge and Craigavon Borough Council	Minimise emissions	On-going

No.	ACTION	LEAD	COUNCIL ACTION	WHEN
19	Adhere to regulatory requirements and have regard to guidance and best practice in minimising emissions from Council-owned fleet	Armagh City, Banbridge and Craigavon Borough Council	Adhere to purchasing requirements and vehicle maintenance and emissions standards	On-going
20	Ensure the phasing-out and control of use of Ozone-Depleting Substances and Fluorinated Gases in accordance with Council's statutory duties.	Armagh City, Banbridge and Craigavon Borough Council	Minimise release of powerful climate change gases into the atmosphere	On-going

10 Conclusions and Proposed Actions

10.1 Conclusions from New Monitoring Data

New monitoring data indicates that nitrogen dioxide concentrations have decreased post-covid-19 restrictions but are rising. It is unclear what the extent of increase will be but the Council are optimistic that new ways of working and a less-polluting vehicle fleet will mean that objective values for NO2 are no longer exceeded. However we note and retain concerns regarding potential adverse health impacts at concentrations below the objective value and will continue to monitor throughout our Borough with an increased focus on centres of population (alongside existing sites based on roadside exposure).

10.2 Conclusions relating to New Local Developments

No new local developments require a Detailed Assessment.

10.3 Other Conclusions

Northern Ireland is in significant need of a Clean Air Strategy and Energy Strategy to address air pollution issues – both in terms of an update to Local Air Quality Management but also in relation to the way people heat their homes and power their vehicles. Armagh City, Banbridge and Craigavon Borough Council retain concerns regards the impact of solid fuel burning in domestic settings and have commenced PAH monitoring to provide additional details. Armagh City, Banbridge and Craigavon Borough Council are firmly committed to the reduction of unnecessary uses of fossil fuel combustion anywhere throughout the Borough with the aim of reducing pollution to the lowest practicable level.

10.4 Proposed Actions

Armagh City, Banbridge and Craigavon Borough Council will continue to monitor nitrogen dioxide levels throughout the Borough and will expand the monitoring network to gain a better understanding of the exposure in local towns and villages. Focus will also be given to PAH concentrations to try to understand why the levels modelled by Ricardo for DAERA are disproportionately high in NI. Action Plan measures will be progressed throughout the

year and are reported upon annually to the Environmental Services Committee of the Council. Solid fuel sampling is proposed to be undertaken this year to determine the impact of that fuel upon emissions.

The Council's Local Development Plan remains under development. Strategic work is ongoing on the development of a roadmap to net zero emissions within the Borough by 2030. Air quality considerations are being closely integrated into this roadmap and the eventual outworking of same. Council have participated in the Invest NI Industrial Decarbonisation information finding exercises and we are mindful of the challenges in decarbonising Northern Ireland's industrial bases.

There is an increased awareness of climate change impacts in general and fossil fuel use and air pollution specifically. We will seek to further integrate the Council's Air Quality role and Action Plan into the Council's Community Plan in future years to highlight the importance of the work being undertaken and to build support for the changes required to how we all travel, heat our homes and use power in industry and leisure.

11 References

- Local Air Quality Management Guidance – TG16
- Local Air Quality Management Guidance – TG22

  https://laqm.defra.gov.uk/wp-content/uploads/2022/08/LAQM-TG22-August-22-v1.0.pdf

- Department for Infrastructure (DfI) – Regional Development Strategy for NI 2035

  https://www.infrastructure-ni.gov.uk/publications/regional-development-strategy-2035

- DAERA – Environment Strategy

  https://www.daera-ni.gov.uk/news/poots-approves-finalised-environment-strategy

- DfI – Strategic Planning Policy Statement

  https://www.infrastructure-ni.gov.uk/publications/strategic-planning-policy-statement

- Environment (Northern Ireland) Order 2002. http://www.legislation.gov.uk/nisi/2002/3153/contents/made
- Northern Ireland Air – Air Quality in Northern Ireland website
- http://www.airqualityni.co.uk/

12 Appendices

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

Appendix A: QA/QC Data

QA/QC Diffusion Tube Monitoring

In 2021 Council utilised Gradko to supply and analyse diffusion tubes. Gradko follows the requirements Government Technical guidance for Ambient NO2 monitoring. Tubes are prepared with a 20% triethanolamine solution (TEA) for monitoring ambient nitrogen dioxide. Analysis is by UV spectrophotometry.

Laboratory performance regarding NO2 Proficiency Testing Scheme (May 2020 – June 2021) is assessed under AIR. AIR is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Executive (HSE). AIR PT is a new scheme, started in April 2014, which combined two long running PT schemes: LGC Standards STACKS PT scheme and HSE WASP PT scheme.

Performance documentation for Gradko can be found :

https://laqm.defra.gov.uk/wp-content/uploads/2022/07/LAQM-NO2-Performance-data_Up-to-June-2022_V2.1.pdf

In the AIR PT intercomparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, SOCOTEC currently holds the highest rank of a Satisfactory laboratory.

To further ensure that diffusion tube monitoring data is as accurate as possible. Tubes are co-located at the Armagh Lonsdale Road continuous monitoring station (chemiluminescent).

Diffusion Tube Annualisation

All diffusion tube monitoring locations within Armagh Banbridge Craigavon Borough Council recorded data capture of 75% therefore it was not required to annualise any monitoring data. In addition, any sites with a data capture below 25% do not require annualisation.

Diffusion Tube Bias Adjustment Factors

Armagh Banbridge Craigavon Borough Council have applied a national bias adjustment factor of 0.84 to the 2021 monitoring data. A summary of bias adjustment factors used by Armagh Banbridge Craigavon Borough Council over the past five years is presented in Table A.1.

In order for a consistent approach to data in particular long term trend comparison national factor bias adjustment is used. For reference the local bias adjustment factor calculated from triplicate co-located tubes at Armagh Lonsdale Road using the diffusion tube processing tool was 0.84 for year 2021.

Table A.1 - Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	National	09/23	0.84 (Gradko 34 Studies)
2020	National	09/23	0.81 (Gradko 27 Studies)
2019	National	09/23	0.91 (31 Studies)
2018	National	09/23	0.92 (40 Studies)

NO_2 Fall-off with Distance from the Road

No diffusion tube NO_2 monitoring locations within Armagh Banbridge Craigavon Borough Council required distance correction during 2021.

QA/QC of Automatic Monitoring

Armagh Banbridge Craigavon Borough Council operates a single automatic monitoring site at Armagh Lonsdale Road.

This station forms part of DEFRA's Automatic Urban and Rural Network (AURN) network and provides information for the draft Programme for Government Air Quality Indicator.

As an AURN Network site, to ensure that the data is both accurate and representative, a four-weekly calibration is carried out by Council staff in accordance with the procedures detailed in the DEFRA Automatic Urban and Rural Network local site operators' manual.

Data management, quality assurance and quality control and service and maintenance support are all provided by DEFRA's appointed contractors. The data from our sites is made available to the Department of Agriculture, Environment and Rural Affairs and is reported on the 'Northern Ireland Air' website in near real time.

All data is validated and corrected in accordance with Government technical guidance, such as Bata Attenuation Monitoring (BAM) for PM10.

For consistency, all automatic monitoring data reported in this progress report has been obtained from the 'Northern Ireland Air Quality' website.

Automatic data reported in this report relates to the calendar year (i.e. January – December) and data capture levels exceed substantially the Department's 75% data capture threshold for the calculation of annual statistics.