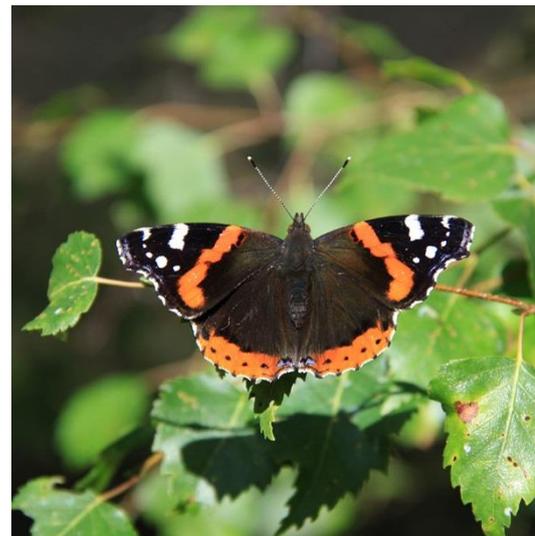




North Wales Authorities Collaborative Project

2019 Air Quality Progress Report

In fulfilment of Part IV of the
Environment Act 1995
Local Air Quality Management



Report for

Isle of Anglesey County Council (IACC);
Conwy County Borough Council (CCBC);
Denbighshire County Council (DCC);
Flintshire County Council (FCC);
Gwynedd Council (GC); and
Wrexham County Borough Council (WCBC).

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2	Final	September 2019





CYNGOR SIR
YNYS MÔN
ISLE OF ANGLESEY
COUNTY COUNCIL



North Wales Authorities Collaborative
Report
2019 Air Quality Progress Report
In fulfillment of Part IV of the Environment Act 1995
Local Air Quality Management

September, 2019

North Wales Authorities Collaborative Report

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North Wales Authorities Collaborative Report

Executive Summary: Air Quality in Our Area

Air Quality in North Wales

Part IV of the Environment Act 1995 places a statutory duty on local authorities to review and assess the air quality within their area and take account of Government Guidance when undertaking such work. This Annual Progress Report is a requirement of the Seventh Round of Review and Assessment and is a requirement for all local authorities. This Progress Report has been undertaken in accordance with the Technical Guidance LAQM.TG (16) and associated tools. It covers the six local authorities which encompass the North Wales region (The North Wales Authorities). The local authorities are as follows:

- Isle of Anglesey County Council (IACC);
- Conwy County Borough Council (CCBC);
- Denbighshire County Council (DCC);
- Flintshire County Council (FCC);
- Gwynedd Council (GC); and
- Wrexham County Borough Council (WCBC).

The North Wales Authorities have not declared any Air Quality Management Areas (AQMAs) and as a result, have not published an Action Plan. Air quality monitoring is undertaken by all six local authorities with a total of five automatic monitoring stations measuring nitrogen dioxide (NO₂) and particulate matter (PM₁₀ and PM_{2.5}) concentrations and 172 NO₂ diffusion tube monitoring sites, located at key locations within town centres and along main transport links. Additionally, benzene (C₆H₆) is monitored at one diffusion tube site in the administrative area of WCBC.

Monitored concentrations are compared with Air Quality Objectives (AQO) as detailed in Appendix B. In 2018 there were no exceedances of the NO₂ annual mean AQO of 40 µg/m³. Having considered each pollutant and reviewed the new developments approved in 2018, it can be concluded that there is no requirement for any of the six North Wales local authorities to undertake a detailed assessment.

Actions to Improve Air Quality

In **WCBC**, during the second half of 2018 the dust monitoring carried out in Chirk in 2016/2017 was repeated (see 2018 Progress Report). This program also relocated a NO₂ diffusion tube to the south of the village. The program concluded that the levels of dust in Chirk had decreased, with the caveat that the wind direction recorded in the six-month monitoring period was considered to be unusual for the area. NO₂ monitoring confirmed that the levels at each site remain below the AQO.

In **CCBC**, three new monitoring sites were introduced at the start of 2018 at sensitive receptor locations as a result of concerns regarding the potential impact of a housing development in Abergele. The monitoring focussed on main routes (both driving and walking) to the nearby schools and towards the town centre. The annual average NO₂ concentrations recorded in 2018 were all significantly below the AQO. Another site which commenced NO₂ monitoring during early 2016, is located at Coed Pella, the site of the CCBC new office redevelopment. The monitoring was initiated to record the background air quality and to monitor any potential changes to local air quality following completion and operation of the development. The new development was opened during October 2018, so the latest monitoring data only reflects a limited period of the year during full operation. The monitoring data has so far shown no significant increase in the annual average NO₂ concentration compared with the pre-development concentration.

CCBC has also started encouraging vehicle drivers to turn off their engines and stop unnecessary idling, outside schools in particular, with the implementation of road signs as pictured below.

Figure 1.1 – No idling road sign in CCBC



Local Priorities and Challenges

The North Wales authorities will continue to maintain their monitoring programmes and ensure new monitoring sites are installed as required. Each year new monitoring sites are introduced primarily in road traffic locations where concerns have been expressed by members of the public, locally elected members or organisations.

How to Get Involved

Further information on air quality in North Wales is available at <https://airquality.gov.wales/>

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1. Actions to Improve Air Quality

1.1 Previous Work in Relation to Air Quality

Previous rounds of review and assessment have identified areas in North Wales where exceedances of various Air Quality Objectives (AQOs) have occurred. Detailed assessments have been carried out when exceedances have been reported to evaluate whether there is a need to declare an Air Quality Management Area (AQMA). There are currently no AQMAs declared in North Wales.

Table 1.1 – Summary of Previous Rounds of Review and Assessment in North Wales

Year	Report Type	Detailed Assessment Recommended	AQMA Declared
2003	Updating and Screening Assessment	No detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2004	Progress Report	Detailed assessment carried out for PM ₁₀ and NO ₂ close to the A494 in FCC. No other detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2005	Progress Report	No detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2006	Updating and Screening Assessment	Detailed assessment required at Trimm Rock and Aberdo Limestone Quarries and at Roadrunner Waste Transfer Station in FCC. No other detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2007	Progress Report	Detailed assessment carried out for sulphur dioxide (SO ₂) 15- minute mean objective for Penrhos Coastal Park in IACC. No other detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.

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Year	Report Type	Detailed Assessment Recommended	AQMA Declared
2008	Progress Report	No detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2009	Updating and Screening Assessment	<p>Detailed assessment no longer required at Trimm Rock and Aberdo Limestone Quarries and at Roadrunner Waste Transfer Station in FCC.</p> <p>Detailed assessment carried out for SO₂ 15-minute mean objective for Holyhead Railway Station in IACC.</p> <p>Detailed assessment required for SO₂ as a result of steam trains in GC.</p> <p>No other detailed assessments required in any Local Authority Area.</p>	No AQMA declared in any Local Authority Area.
2010	Progress Report	<p>Detailed assessment required for the area around Wrexham Road in Cefn Y Bedd in FCC.</p> <p>Detailed assessment carried out for SO₂ as a result of steam trains in GC.</p> <p>No other detailed assessments required in any Local Authority Area.</p>	No AQMA declared in any Local Authority Area.
2011	Progress Report	Detailed assessment carried out for nitrogen dioxide (NO ₂) along Vale Street, Denbigh in DCC.	No AQMA declared in any Local Authority Area.
2012	Updating and Screening Assessment	<p>Detailed assessment no longer required for the area around Wrexham Road in Cefn Y Bedd in FCC.</p> <p>Detailed assessment carried out for the junction of the A5119 and A494 in Mold in FCC.</p> <p>No other detailed assessments required in any Local Authority Area.</p>	No AQMA declared in any Local Authority Area.

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Year	Report Type	Detailed Assessment Recommended	AQMA Declared
2013	Progress Report	No detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2014	Progress Report	No detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2015	Updating and Screening Assessment	No detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2016	Progress Report	No detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2017	Progress Report	No detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.
2018	Progress Report	No detailed assessments required in any Local Authority Area.	No AQMA declared in any Local Authority Area.

1.2 Air Quality Management Areas

AQMAs are declared when air quality is close to or above an acceptable level of pollution, known as the AQO (See Appendix B for details).

After declaring an AQMA the authority must prepare an Air Quality Action Plan (AQAP) within 18 months setting out measures it intends to put in place to improve air quality to at least the AQOs, if not even better. AQMA(s) are seen by local authorities as the focal points to channel resources into the most pressing areas of pollution as a priority.

None of the local authorities in North Wales currently have an AQMA and therefore no AQAPs have been published.

2. Air Quality Monitoring Data and Comparison with Air Quality Objectives

2.1 Summary of Monitoring Undertaken in 2018

2.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how results compare with the AQOs.

IACC undertook automatic (continuous) monitoring at four sites during 2018 (with indicative light-scattering particulate monitors) and there was one site in WCBC.

Table 2.1 presents the details of the sites. National monitoring results are available at <https://airquality.gov.wales/>

Maps showing the locations of the monitoring sites are provided in Figure 2.1 and Figure 2.2. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

The monitoring sites were as follow:

- CM1: Llynfaes – Measuring PM₁₀ and PM_{2.5} at Gwyndy Quarry;
- CM2: Brynteg – Measuring PM₁₀ and PM_{2.5} at Rhuddlan Back Quarry;
- CM3: Felin Cafnan – Measuring PM₁₀ and PM_{2.5} at a National Trust Property located near to the Wylfa Newydd construction site;
- CM4: IVC Penhesgyn – Measuring PM₁₀ and PM_{2.5} at Penhesgyn Recycling Centre; and
- Automatic Urban and Rural Network (AURN): Victoria Road – Measuring NO₂, PM₁₀ and PM_{2.5} at a roadside location in Wrexham.

Since 2017 IACC began utilising a spare Osiris monitor to fill in for other monitors when they are away for calibration. This has greatly improved the capture efficiency.

2.1.2 Non-Automatic Monitoring Sites

In 2018 non-automatic monitoring of NO₂ using passive diffusion tubes were undertaken by all six local authorities at roadside, kerbside, industrial and urban

background locations. Table 2.2 presents the details of the sites. The number of monitoring locations within each local authority is as follows:

- IACC undertook monitoring at 37 locations. Site IACC-058 was moved further along Penmynydd Road and was renamed site IACC-078. Several sites were closed in early 2018 due to the end of funding from the Horizon Nuclear Power Project. Two sites were opened in late 2018. Site IACC-081 has been opened in relation to the proposed extension of Holyhead Port and site IACC-082 has been opened in Pentraeth as this area was identified from a noise perspective following modelling as part of the Welsh Government's 2017 Noise Action Plan.
- CCBC undertook monitoring at 18 locations, three sites were added in Abergele.
- DCC undertook monitoring at 26 locations. Four sites were relocated.
- FCC undertook monitoring at 53 locations, including duplicate diffusion tube monitoring at 3 sites (3 Davies Cottage, 20/22 Glynne Way and Llys Alun) and triplicate diffusion tubes monitoring at one site (South Bank, Aston Park, Queensferry CH5 1XZ). Site 32 was not deployed in 2018 due to works being done on the building it was attached to.
- GC undertook monitoring at 12 locations. A study undertaken by AECOM to assess the impact of the Wylfa Power Station and associated new National Grid connection came to an end in March 2018. This study involved the placement of 10 NO₂ tubes in and around Bangor.
- WCBC undertook NO₂ monitoring at 26 locations, including one triplicate site which is co-located with the Victoria Road AURN station. WCBC also undertook benzene monitoring at one diffusion tube site. Site 47 on Chapel Lane was relocated to Site 48 Church Street in February 2018 and so site 47 has only one month worth of data.

Maps showing the location of the monitoring sites are provided in Figure 2.3 to Figure 2.16. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

Table 2.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Pollutants Monitored	Monitoring Technique	Inlet Height (m)	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y					
IACC										
CM1	Llynfaes (Creigiau)	Rural	N	239692	379774	PM ₁₀ , PM _{2.5}	Light scattering	1.5	11	10
CM2	Brynteg (Chwarelau)	Rural	N	248566	381325	PM ₁₀ , PM _{2.5}	Light scattering	4.0	6	5
CM3	Felin Cafnan, Cemlyn	Rural	N	234355	393310	PM ₁₀ , PM _{2.5}	Light scattering	1.5	221	233
CM4	IVC Penhesgyn	Rural	N	253457	374348	PM ₁₀ , PM _{2.5}	Light scattering	1.5	300	200
WCBC										
AURN	Victoria Road AURN	Roadside	N	332863	349913	NO ₂	Continuous	3.0	24	4
AURN	Victoria Road AURN	Roadside	N	332863	349913	PM ₁₀ , PM _{2.5}	Daily gravimetric	3.0	24	4

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Figure 2.1 – Map of Automatic Monitoring Sites: IACC

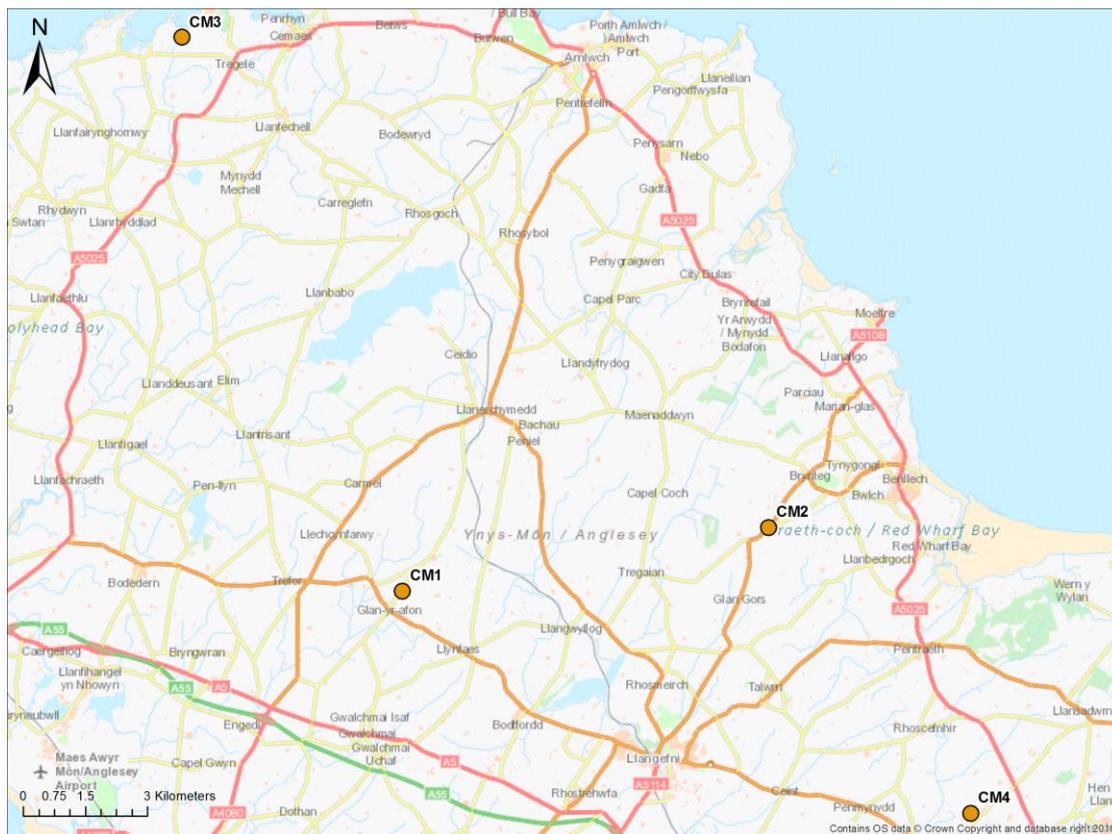


Figure 2.2 – Map of Automatic Monitoring Sites: WCBC



Table 2.2 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
IACC									
IACC-018 (DT1)	Llanfair P.G	Kerbside	N	252567	372057	1.2	N	21.0	1.0
IACC-080 (DT16)	Warren Rd, Rhosneigr	Suburban	N	232074	373807	2.0	N	1.9	1.9
IACC-079 (DT17)	Felin Cafnan	Rural Background	N	234348	393294	2.1	N	N/A	1.8
IACC-046 (DT4)	Llanfair P.G	Roadside	N	253265	372372	1.4	N	33.0	3.0
IACC-047 (DT5)	Bridge A55	Roadside	N	237267	376129	1.8	N	51.2	1.2
IACC-048 (DT6)	A55 J4	Roadside	N	232573	378407	2.4	N	41.5	1.5
IACC-049 (DT7)	Valley	Roadside	N	229513	379321	1.5	N	N/A	1.0
IACC-050 (DT8)	Llanfachraeth	Roadside	N	231593	382274	2.8	N	9.7	1.7

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
IACC-051 (DT9)	Llanfaethlu	Roadside	N	231555	387112	1.9	N	76.5	1.5
IACC-052 (DT10)	Crossroads	Roadside	N	234152	390193	1.9	N	119.7	3.5
IACC-053 (DT11)	Tregele	Roadside	N	235575	392545	2.5	N	16.6	1.6
IACC-054 (DT12)	Cemaes 1	Roadside	N	236752	393090	2.7	N	11.7	1.7
IACC-055 (DT13)	Cemaes J	Roadside	N	236908	393378	2.6	N	11.7	1.7
IACC-056 (DT14)	Amlwch K	Roadside	N	244126	392914	2.8	N	2.4	1.4
IACC-057 (DT15)	Amlwch L	Roadside	N	244270	392498	2.2	N	11.2	1.2
IACC-059 (A1)	A1 Valley	Roadside	N	229457	379255	2.0	N	23.4	1.0
IACC-060 (A2)	A2 Llanfachraeth	Roadside	N	231638	382131	1.5	N	45.1	1.0
IACC-061 (A3)	A3 Llanerchymedd	Roadside	N	241834	384189	2.5	N	N/A	1.0

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
IACC-062 (A4)	A4 Capel Coch	Roadside	N	245860	382097	2.5	N	2.9	1.0
IACC-063 (A5)	A5 Rhosmeirch	Roadside	N	245694	377120	2.5	N	21.1	1.0
IACC-064 (A6)	A6 Llangefni	Roadside	N	245885	375809	2.5	N	8.4	1.0
IACC-065 (A7)	A7 Llangefni	Roadside	N	246044	375712	2.0	N	11.1	1.0
IACC-066 (A8)	A8 Llangefni	Roadside	N	247098	375506	2.0	N	13.5	1.0
IACC-067 (A9)	A9 Caeau Talwrn SSSI	Roadside	N	247755	376974	2.0	N	51.2	3.0
IACC-068 (A10)	A10 Ceint	Roadside	N	248952	374865	1.5	N	29.2	1.0
IACC-069 (A11)	A11 Ffordd Caergybi SSSI	Roadside	N	245410	373461	1.5	N	21.1	1.0
IACC-070 (A12)	A12 Star	Roadside	N	250101	371995	1.5	N	24.0	0.5
IACC-071 (A13)	A13 Star	Roadside	N	251100	371994	2.0	N	39.2	1.5

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
IACC-072 (A14)	A14 Star	Roadside	N	251107	371946	2.0	N	90.2	1.5
IACC-073 (A15)	A15 Llanfair	Roadside	N	252567	372057	1.0	N	21.5	1.5
IACC-074 (A16)	A16 Llanfair	Roadside	N	252942	371387	1.8	N	48.4	1.0
IACC-075 (A17)	A17 Llanfair	Roadside	N	253756	371529	2.0	N	27.8	1.0
IACC-076 (A18)	A18 Llanfair	Roadside	N	253788	371936	2.5	N	18.1	1.0
IACC-077 (A19)	A19 Menai	Roadside	N	254549	372661	2.5	N	18.5	1.0
IACC-078	Penmynydd Road, Penmynydd	Roadside	N	251013	374410	1.1	N	0.5	0.5
IACC-081	Marine Sq. Holyhead	Roadside	N	224942	382866	3.0	N	17.5	2.5
IACC-082	Opp. Panton Arms, Pentraeth	Roadside	N	252360	378402	3.0	N	2.0	0.7
CCBC									

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
DT/CCBC001	Theatre Colwyn, Colwyn Bay	Roadside	N	285119	378817	3.0	N	7.0	3.5
DT/CCBC017	Kingsway, Colwyn Bay	Roadside	N	284526	379417	3.0	N	2.1	1.1
DT/CCBC018	Heol Dewi, Pensarn	Roadside	N	295049	378144	2.1	N	6.5	3.0
DT/CCBC021	Llanfairfechan, A55	Roadside	N	268572	375472	3.0	N	3.1	1.1
DT/CCBC022	Bryn Marl, Mochdre	Roadside	N	282362	378754	3.0	N	3.5	1.5
DT/CCBC026	Chapel Street, Abergele	Roadside	N	294571	377534	3.0	N	2.0	1.0
DT/CCBC027	Llandudno Junction, New Roundabout	Roadside	N	280271	377692	3.0	N	4.0	2.0
DT/CCBC031	Conwy Road East, Llandudno Jcn	Roadside	N	279235	377936	2.5	N	3.8	1.8
DT/CCBC032	Conwy Road West, Llandudno Jcn	Roadside	N	279279	377946	3.0	N	4.0	1.0
DT/CCBC033	Coed Pella Rd, Colwyn Bay	Roadside	N	284789	378985	3.0	N	3.0	1.0
DT/CCBC034	Victoria Drive, Llandudno Jcn	Roadside	N	279245	377995	3.0	N	4.7	2.2

North Wales Authorities Collaborative Report

Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
DT/CCBC035	Ysgol Bod Alaw, Colwyn Bay	Roadside	N	285506	378295	3.0	n	4.2	2.2
DT/CCBC036	Ysgol Tudno, Llandudno	Roadside	N	278131	381907	3.0	N	4.0	1.5
DT/CCBC037	Mochdre Town Centre	Roadside	N	282614	378630	2.4	N	7.5	2.5
DT/CCBC038	Dolwydd, Mochdre	Roadside	N	281863	377844	2.0	N	5.0	2.5
DT/CCBC39	Bridge Street Abergele	Roadside	N	294809	377520	2.7	N	1.4	1.4
DT/CCBC40	Rhuddlan Rd Abergele	Roadside	N	294943	377498	3.0	N	1.7	1.7
DT/CCBC41	Faenol Avenue Abergele	Roadside	N	295077	377682	3.0	N	3.5	2.7
DCC									
DBK1	Wellington Road, Rhyl	Roadside	N	300846	381407	2.3	N	2.7	2.2
DBR2	10 Kinmel Street, Rhyl	Roadside	N	300903	381292	2.5	N	2.8	0.3

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
DBR5	2 Pant Glas, St. Asaph	Suburban	N	302938	374638	2.0	N	37.1	27.5
DBR48	Adj. 1 Vale Street, Denbigh	Roadside	N	305276	366119	2.4	N	1.0	1.0
DBR23	31 Ruthin Road, Denbigh	Suburban	N	305878	366424	2.5	N	3.9	2.5
DBR8	1 Plas Elwy Orchard, The Roe, St. Asaph	Roadside	N	303270	374640	2.0	N	19.4	19.4
DBR9	7 Roe Park, St. Asaph	Roadside	N	303197	374830	2.0	N	14.0	14.0
DBR10	13 Roe Park, St. Asaph	Suburban	N	303263	374867	2.0	N	16.0	16.0
DBR24	Denbigh Cutters, 21 Vale Street, Denbigh	Suburban	N	305330	366160	2.2	N	3.0	3.0
DBR20	25 Park Road, Ruthin.	Roadside	N	312106	358306	2.2	N	5.4	1.4
DBR43	Adj HSBC Bank, Vale Street, Denbigh	Suburban	N	305314	366153	2.6	N	8.0	2.5
DBR44	Opp Rowlands Pharm., Vale Street, Denbigh	Roadside	N	305386	366191	2.6	N	2.9	1.2

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				X	Y				
DBR45	Adj 50 Vale Street, Denbigh	Roadside	N	305467	366246	2.5	N	5.9	2.0
DBR37	Haul Fryn Depot, Ruthin	Roadside	N	312789	358231	2.3	N	4.5	3.5
DBR38	Adj 62 Rhos Street, Ruthin	Roadside	N	312913	358273	2.6	N	2.3	2.3
DBR52	Adj. Swayne Johnston Sol., Vale Street, Denbigh	Roadside	N	305308	366130	2.9	N	N/A	1.8
DBR53	7 Vale Street, Denbigh	Roadside	N	305290	366130	2.3	N	N/A	2.0
DBR31	2 Rhyl Road, Denbigh	Roadside	N	305805	366480	2.4	N	2.1	0.8
DBR32	47 High Street, Denbigh	Roadside	N	305193	366093	2.4	N	N/A	5.9
DBR33	Adj CO-OP, High Street, Denbigh	Kerbside	N	305229	366082	2.3	N	N/A	5.3
DBR34	Adj Fairyburn, Rhyl Road, Denbigh	Roadside	N	305863	366661	2.5	N	12.3	0.9
DBR49	79 High Street, Prestatyn	Roadside	N	306580	382906	2.6	N	N/A	1.0

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
DBR56	Adj. 6-7 Castle Street, Llangollen	Roadside	N	321500	342000	2.7	N	3.8	0.4
DBR58	Adj. 1 Vale View, High Street, Rhuddlan	Roadside	N	302300	378000	2.3	N	4.9	0.5
DBR55	Adj. 7 Berwyn Street, Llangollen	Roadside	N	321500	341900	3	N	1.8	1.0
DBR57	Adj. 48 Church Street, Llangollen	Roadside	N	321800	341900	2.3	N	0.5	0.5
FCC									
Site 1	10A Wrexham Road, Mold	Kerbside	N	323800	363856	2.2	N	1.0	1.0
Site 2	1, St.Davids Close, Ewloe CH5 3AP	Urban	N	329830	366682	1.8	N	35.0	35.0
Site 3	Aston Hill Roadside	Kerbside	N	330718	367350	2.0	N	11.0	1.0
Site 4	Hawarden High School CH5 3DL	Kerbside	N	330614	366195	1.6	N	10.0	3.0
Site 5/9/10	South Bank, Aston Park, Queensferry CH5 1XZ	Kerbside	N	330969	367674	2.2	N	10.0	5.0

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
Site 6	Kelsterton Farm, Kelsterton Lane, Connah's Quay	Rural Background	N	327307	369856	2.2	N	27.0	1.0
Site 7	Kelsterton Road, Connah's Quay	Kerbside	N	327187	371243	1.8	N	10.0	5.0
Site 8	86, Kelsterton Road, Connah's Quay CH5 4BJ	Urban background	N	328032	370647	1.6	N	22.0	22.0
Site 11/47	3 Davies Cottage, Mold Road, Alltami	Kerbside	N	326643	365550	1.6	N	4.0	4.0
Site 12/13	20/22 Glynne Way, Hawarden	Kerbside	N	331648	365730	2.0	N	1.0	1.0
Site 14	Sandycroft CP School Leaches Lane CH5 2EH	Kerbside	N	332500	367357	1.6	N	2.0	1.0
Site 15	Aston Hill, Roadside - Additional Tube within 12m of ADDC/085	Kerbside	N	330727	367354	2.0	N	11.0	1.0
Site 16	4, Belvedere Close, Queensferry CH5 1TG	Urban	N	331663	368028	1.8	N	20.0	20.0

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
Site 17	32 Chester Road West, Shotton	Kerbside	N	330599	368922	2.3	N	4.0	4.0
Site 18	Saltney Ferry CP School CH4 0BN	Kerbside	N	336904	364852	2.0	N	8.0	1.0
Site 19	Gwylfa, Northop Rd., Flint Mountain	Kerbside	N	323864	370368	2.0	N	3.0	3.0
Site 20	Coed Mawr Cott., Mostyn Road, Greenfield CH8 9DN	Kerbside	N	318669	378290	2.2	N	2.0	2.0
Site 21	Sealand CP School Welsh Road CH5 2RA	Kerbside	N	332535	368907	1.8	N	2.0	1.0
Site 22	Green Lane West, Sealand	Rural Background	N	333645	370898	2.2	N	46.0	75.0
Site 23	Second Avenue, Deeside Industrial Estate (Valspar)	Industrial	N	332764	370981	2.0	N	N/A	1.0
Site 24/51	Llys Alun, Wrexham Road, Cefn Y Bedd	Kerbside	N	331079	356100	1.8	N	2.0	2.0

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
Site 25	BASF, Deeside Industrial Park, Sealand	Industrial	N	332031	371562	1.8	N	N/A	20.0
Site 26	Corus rear entrance DIP, Sealand	Industrial	N	329906	370882	1.8	N	N/A	1.0
Site 27	89, Riverside Park, Garden City	Roadside	N	333040	369051	2.2	N	10.0	15.0
Site 28	Ysgol St John Penymynydd CH ₄ OLG	Kerbside	N	330528	362756	2.0	N	5.0	1.0
Site 29	Weighbridge Road, Deeside Industrial Park, Sealand	Industrial	N	330575	371802	2.2	N	N/A	1.0
Site 30	28, Chester Road, Pentre, Deeside CH5 2DT	Kerbside	N	332221	367723	1.8	N	5.0	5.0
Site 31	Trelawney Towers 79 Chester Road, Flint CH6 5DU	Kerbside	N	324935	372722	2.0	N	4.0	4.0
Site 33	133, Main Road, Broughton CH ₄ 0NR	Kerbside	N	333568	363511	2.4	N	1.0	1.0

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
Site 34	2, Coleshill Street, Holywell CH8 7UP	Kerbside	N	318766	375758	2.4	N	1.0	1.0
Site 35	Sycamore House, Greenfield Road, Holywell CH8 7PY	Kerbside	N	318735	376611	2.2	N	1.0	1.0
Site 36	43, Station Road, Queensferry CH5 1SU	Kerbside	N	331806	368271	2	N	5.0	5.0
Site 37	Glendale Lodge, Rhydgaled, Mold A5119	Kerbside	N	324281	364926	2	N	6.0	6.0
Site 38	Castell Alun Fagl Lane Hope LL129PY	Kerbside	N	330705	358429	1.8	N	10.0	2.0
Site 39	Ysgol Y Fron Halkyn St Holywell CH8 7TX	Kerbside	N	318851	375592	1.8	N	5.0	1.0
Site 40	1 Manor Road, Sealand CH5 2SB	Kerbside	N	333731	369079	1.8	N	1.0	10.0
Site 41	Ysgol Y Llan Whitford CH8 9AN	Kerbside	N	314615	378238	2.0	N	5.0	1.0

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
Site 42	RGHS Ffordd Llewelyn Flint CH6 5JZ	Kerbside	N	324838	372198	1.8	N	2.0	1.0
Site 43	Flint HS Fifth Avenue Flint CH6 5LW	Kerbside	N	324357	372008	1.8	N	5.0	1.0
Site 44	413 Chester Road, Oakenholt, Flint CH6 5SF	Kerbside	N	325961	371822	2.2	N	2.0	1.0
Site 45	Ysgol Bryn Coch Victoria Road Mold CH7 1EW	Kerbside	N	323975	363794	1.8	N	5.0	1.0
Site 46	Ewloe Green School CH5 3AU	Kerbside	N	329284	366504	1.8	N	10.0	1.0
Site 48	74, High Street, Saltney CH4 8SQ	Kerbside	N	338283	365032	1.8	N	6.0	6.0
Site 49	31, The Rowans, Broughton CH4 0TD	Kerbside	N	333531	363028	2.0	N	30.0	25.0
Site 50	Ysgol Estyn Hawarden Road Hope LL12 9NL	Kerbside	N	330898	357996	1.8	N	5.0	3.0

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
Site 52	Westwood CP School Padeswood Rd CH7 2JT	Kerbside	N	327843	363856	2.0	N	5.0	1.0
Site 53	17, Mill Lane, Buckley CH7 3HA	Kerbside	N	327849	364146	2.3	N	2.0	1.0
Site 54	Elm Tree Rd Saughall	Kerbside	N	335594	369179	2.3	N	11.0	1.0
Site 55	Ferry Lane, Chester	Kerbside	N	337632	366682	2.2	N	15.0	2.0
Site 56	Deeside Lane, Sealand	Kerbside	N	335292	368346	2.2	N	50.0	1.0
Site 57	Rose Cottage Junction A5119/A494	Kerbside	N	324375	365007	2.2	N	3.0	1.0
S1	Bryn Mair 114 Chester Road Mold CH7 1UQ	Roadside	N	324530	363839	3.0	N	10.0	2.0
S2	30 High Street Mold CH7 1BH	Roadside	N	324562	363840	3.0	N	1.0	1.0
GC									
GCC 002	Roundabout A487, Caernarfon (C1)	Kerbside	N	248273	362132	2.0	N	10.0	1.0

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				X	Y				
GCC 003	Lon Campbell, Caernarfon (C3)	Urban Background	N	248480	363456	2.0	N	5.0	N/A
GCC 005	Ffordd Bangor, Caernarfon (C5)	Kerbside	N	248892	364120	1.8	N	7.0	1.0
GCC 008	A4087, Bangor (B3)	Kerbside	N	257587	371543	1.9	N	2.0	1.0
GCC 011	A5122, Bangor (B5)	Kerbside	N	256292	371663	1.7	N	>25.0	1.0
GCC 012	Faenol Roundabout, Bangor (B6)	Kerbside	N	254286	368835	1.8	N	>25.0	1.0
GCC 013	Bethesda (BETH 1)	Kerbside	N	261529	367380	2.0	N	10.0	1.0
GCC 015	Llanwnda (LL1)	Roadside	N	247770	358663	1.9	N	95.0	2.0
GCC 037	Poolside, Caernarfon (C6)	Kerbside	N	248022	362757	1.9	N	2.0	1.0
GCC 038	A55, Bangor (B4)	Roadside	N	256871	369493	1.3	N	>25.0	2.0
GCC 039	A55, Bangor (CO-LOC)	Roadside	N	256871	369493	1.3	N	>25.0	2.0
GCC 040	Pwllheli (PW1)	Kerbside	N	237517	335217	2.0	N	2.0	1.0
WCBC									

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				X	Y				
WBC-001	Grosvenor Rd, Wrexham	Roadside	N	333200	350600	1.5	N	12	2.0
WBC-010	Ceiriog School, Chirk	Suburban	N	329300	338300	2.0	N	20	2.0
WBC-015	Gardden View, Ruabon	Roadside	N	330300	344600	2.0	N	15.0	6.0
WBC-018	Old Farm Rd, Rhostyllen	Roadside	N	332000	349000	1.6	N	40.0	2.0
WBC-019	Mold Rd, Wrexham	Roadside	N	332600	351000	2.0	N	30.0	7.0
WBC-020	Chester Rd, Wrexham	Intermediate	N	333700	352900	2.0	N	16.0	3.0
WBC-021	Holt Rd, Wrexham	Roadside	N	334100	350700	1.6	N	30.0	2.0
WBC-022	Holyhead Rd, Chirk	Intermediate	N	328900	338700	1.5	N	30.0	2.0
WBC-030	Rhostyllen Roundabout, Wrexham (A483)	Roadside	N	330950	348170	1.2	N	35.0	4.0
WBC-031	Bus Station, Wrexham	Roadside	N	333350	350590	3.0	N	3.0	2.0
WBC-032	The Sycamores, Chester Road	Roadside	N	333887	353222	1.5	N	25.0	N/A

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
WBC-033	Smithfield Road	Roadside	N	333981	350171	1.5	N	4.0	1.0
WBC-034	Coed Poeth	Roadside	N	329017	351002	2.0	N	8.0	9.0
WBC-036	Acrefair	Roadside	N	327630	342990	2.0	N	2.0	2.0
WBC-037	Rossett	Roadside	N	336635	357211	1.5	N	7.0	2.0
WBC-039	Pentre Bach	Roadside	N	331765	350132	1.2	N	4.0	2.0
WBC-040	Overton	Roadside	N	337449	341702	1.5	N	14.0	2.0
WBC-041	Marchwiell	Roadside	N	335407	347890	2.0	N	3.0	2.0
WBC-042	Llan-Y-Pwll	Roadside	N	335359	352178	1.6	N	9.0	5.0
WBC-043	Hightown	Roadside	N	333966	349691	2.0	N	10.0	1.0
WBC-044	Cobden Road	Roadside	N	332935	350278	2.0	N	5.0	1.0
WBC-045	STANSTY	Roadside	N	332214	351503	1.6	N	0.0	8.0
WBC-046	Regent Street	Roadside	N	333063	350587	2.0	N	15.0	1.0
WBC-047	Chapel Lane	Roadside	N	329023	338348	2.0	N	15.0	1.0
WBC-048	Church Street	Roadside	N	329082	337590	1.5	N	5.0	1.0
AURN 1	Victoria Road 1	Roadside	N	332900	349900	2.0	Y	7.0	5.0
AURN 2	Victoria Road 2	Roadside	N	332900	349900	2.0	Y	7.0	5.0

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Site ID	Site Name	Site Type	Associated with AQMA?	OS Grid Reference		Site Height (m)	Collocated with a Continuous Analyser?	Distance from Kerb to Nearest Relevant Exposure (m) ⁽¹⁾	Distance from Kerb to Monitor (m) ⁽²⁾
				X	Y				
AURN 3	Victoria Road 3	Roadside	N	332900	349900	2.0	Y	7.0	5.0
WBC-26 (benzene)	Llwyneinion Rd Rhosllanerchrugog	Urban Background	N	347400	328700	1.5	N	N/A	N/A

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

Figure 2.3 – Map of Non-Automatic Monitoring Sites: IACC

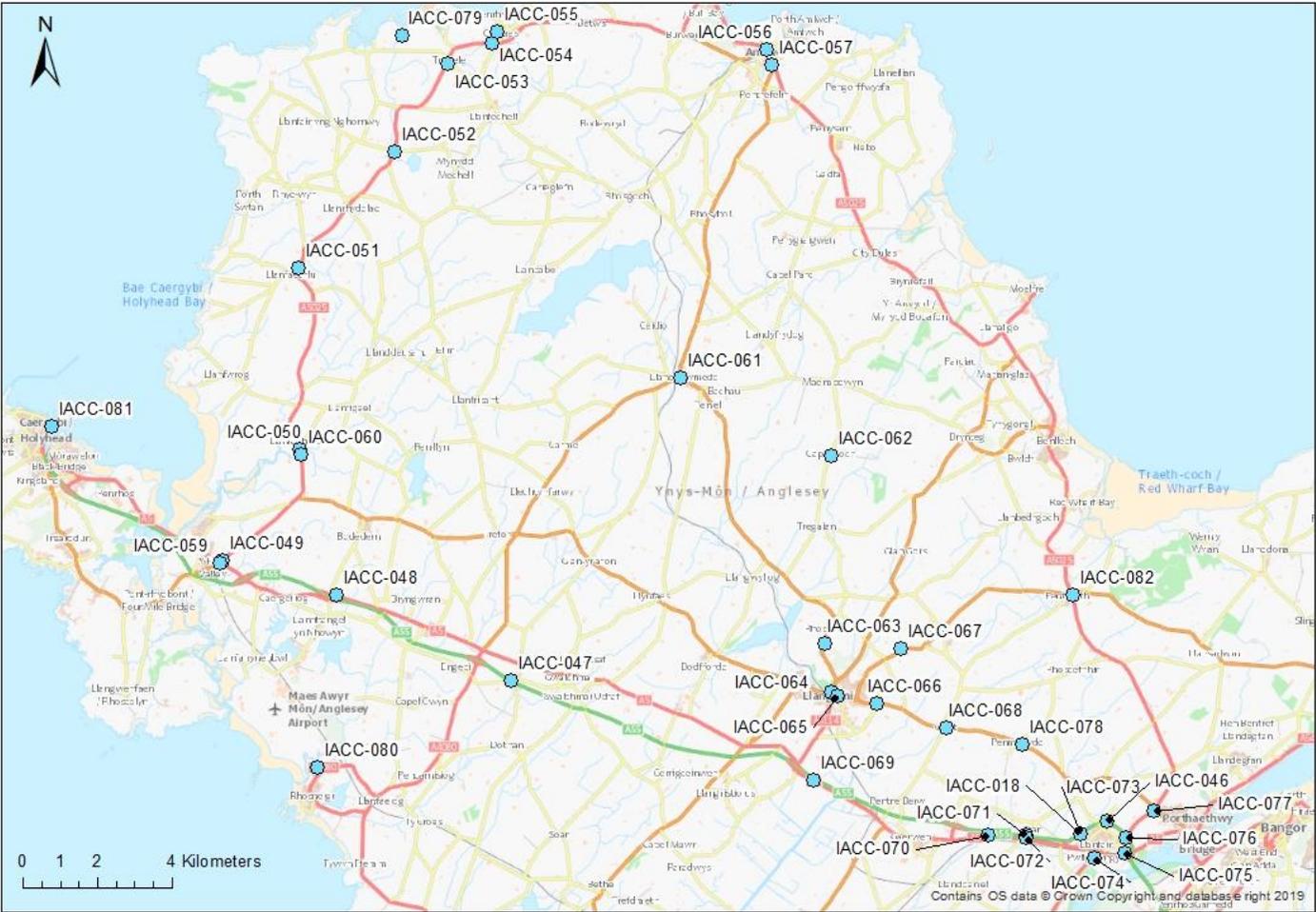


Figure 2.4 – Map of Non-Automatic Monitoring Sites: CBC

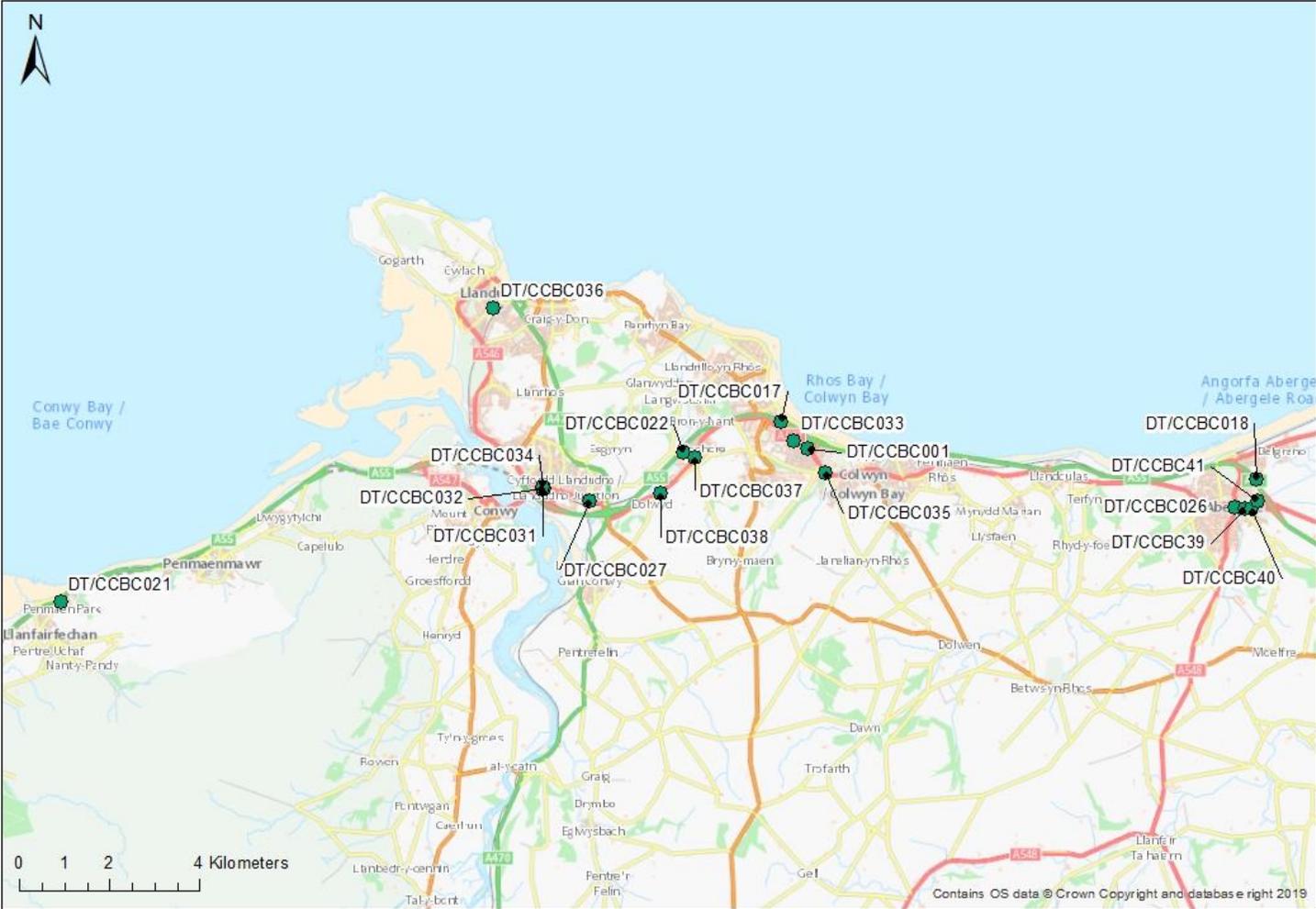


Figure 2.5 – Map of Non-Automatic Monitoring Sites: DCC Ruthin

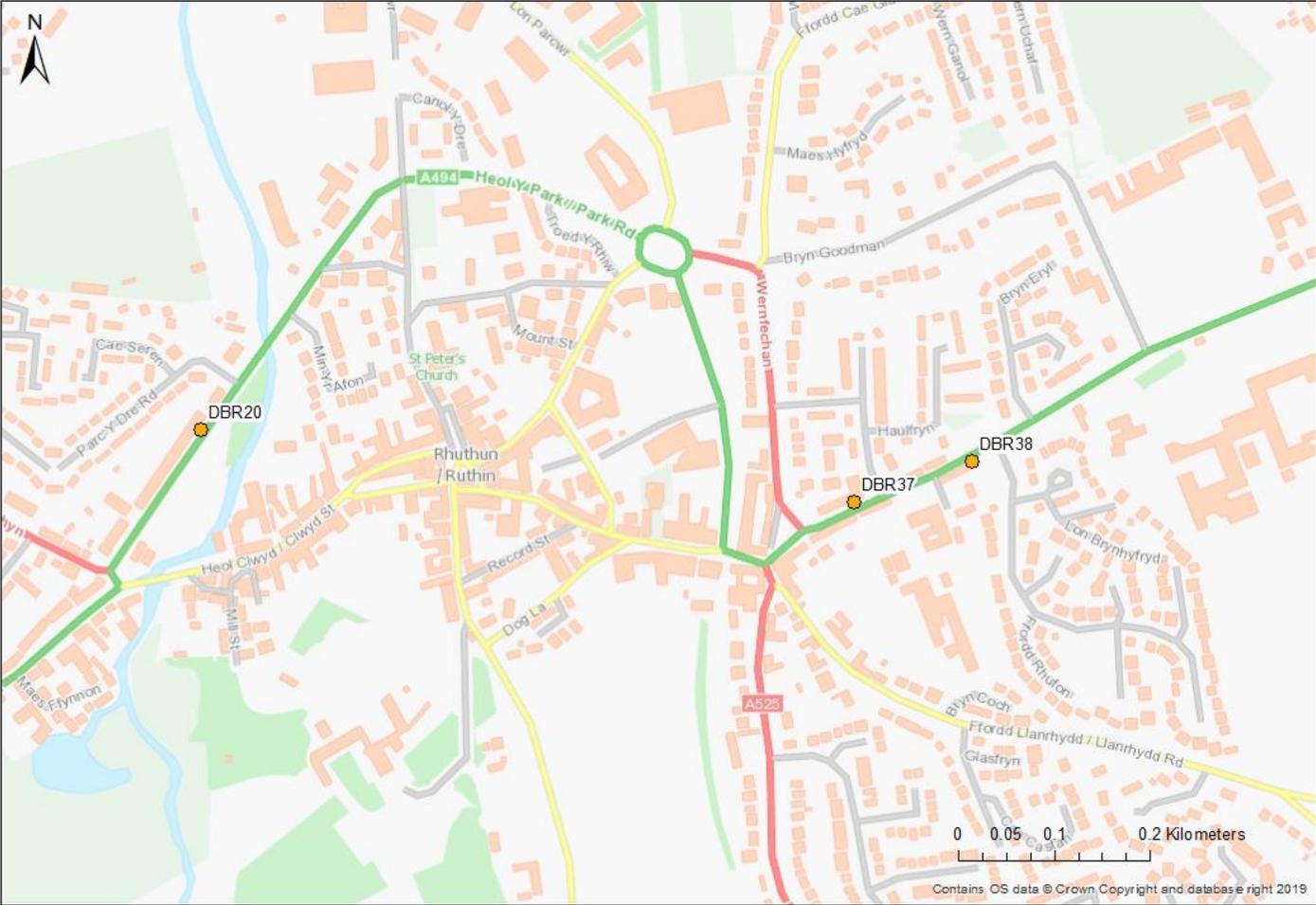


Figure 2.6 – Map of Non-Automatic Monitoring Sites: DCC North

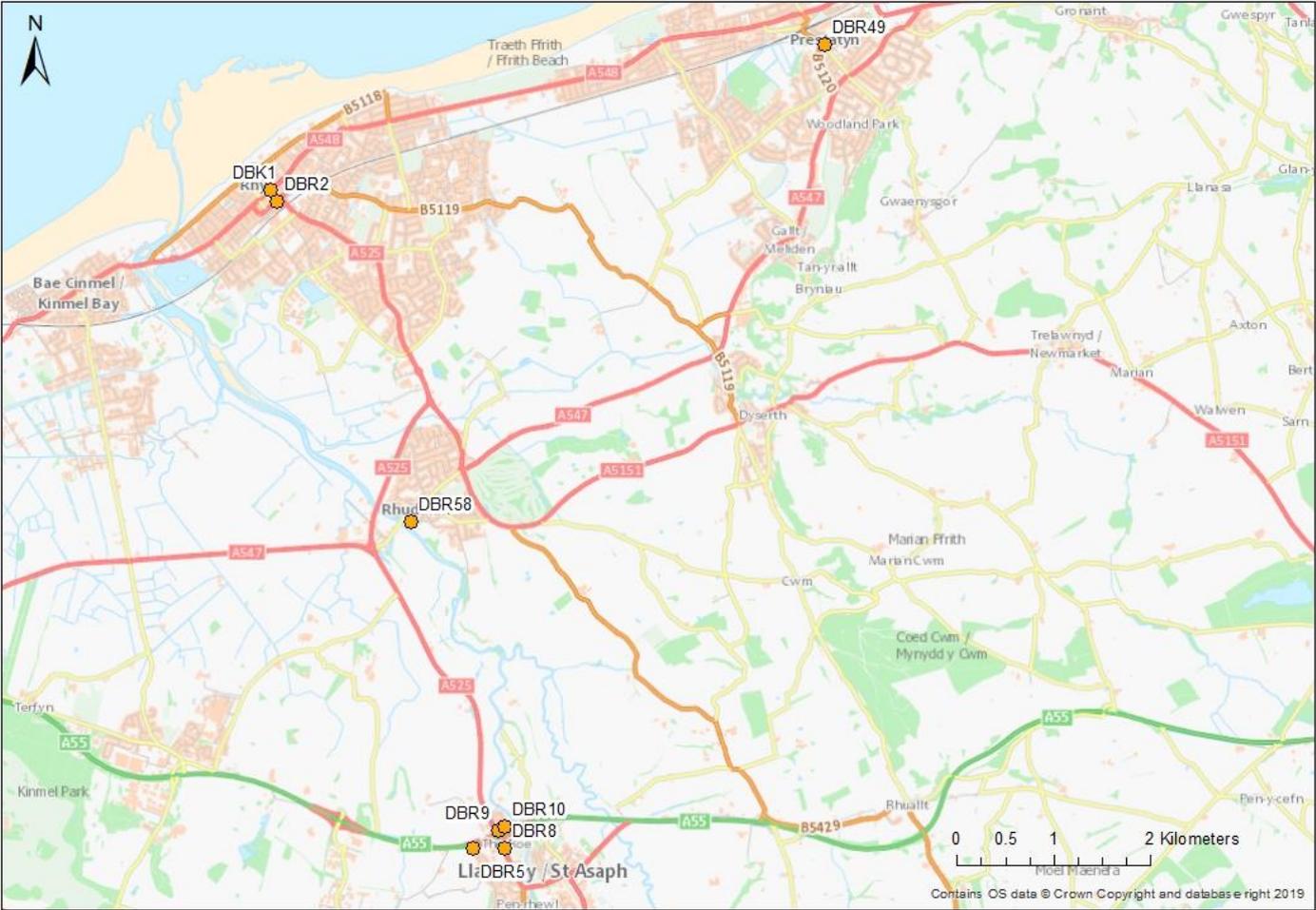


Figure 2.8 – Map of Non-Automatic Monitoring Sites: DCC Llangollen

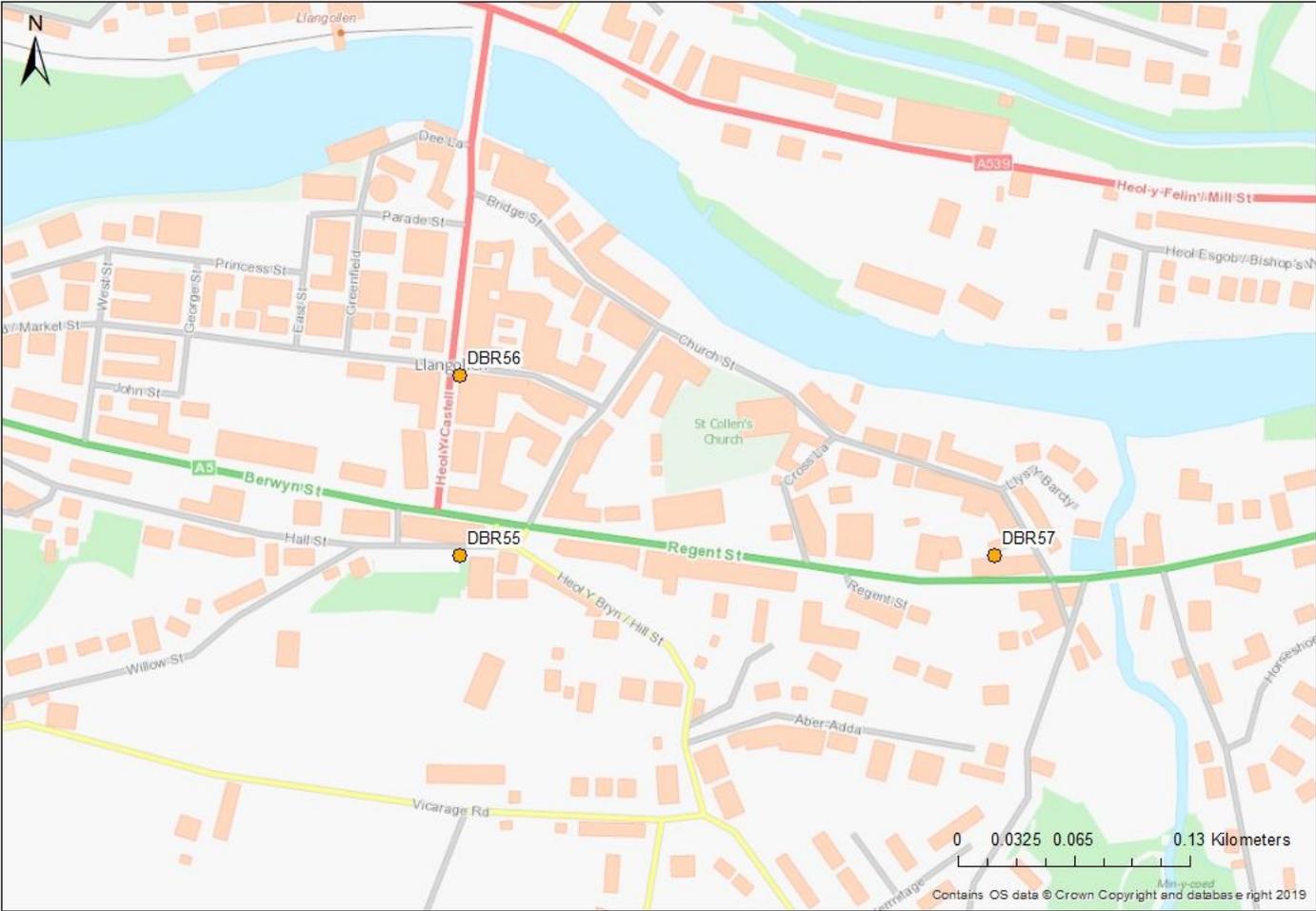


Figure 2.9 – Map of Non-Automatic Monitoring Site: FCC South

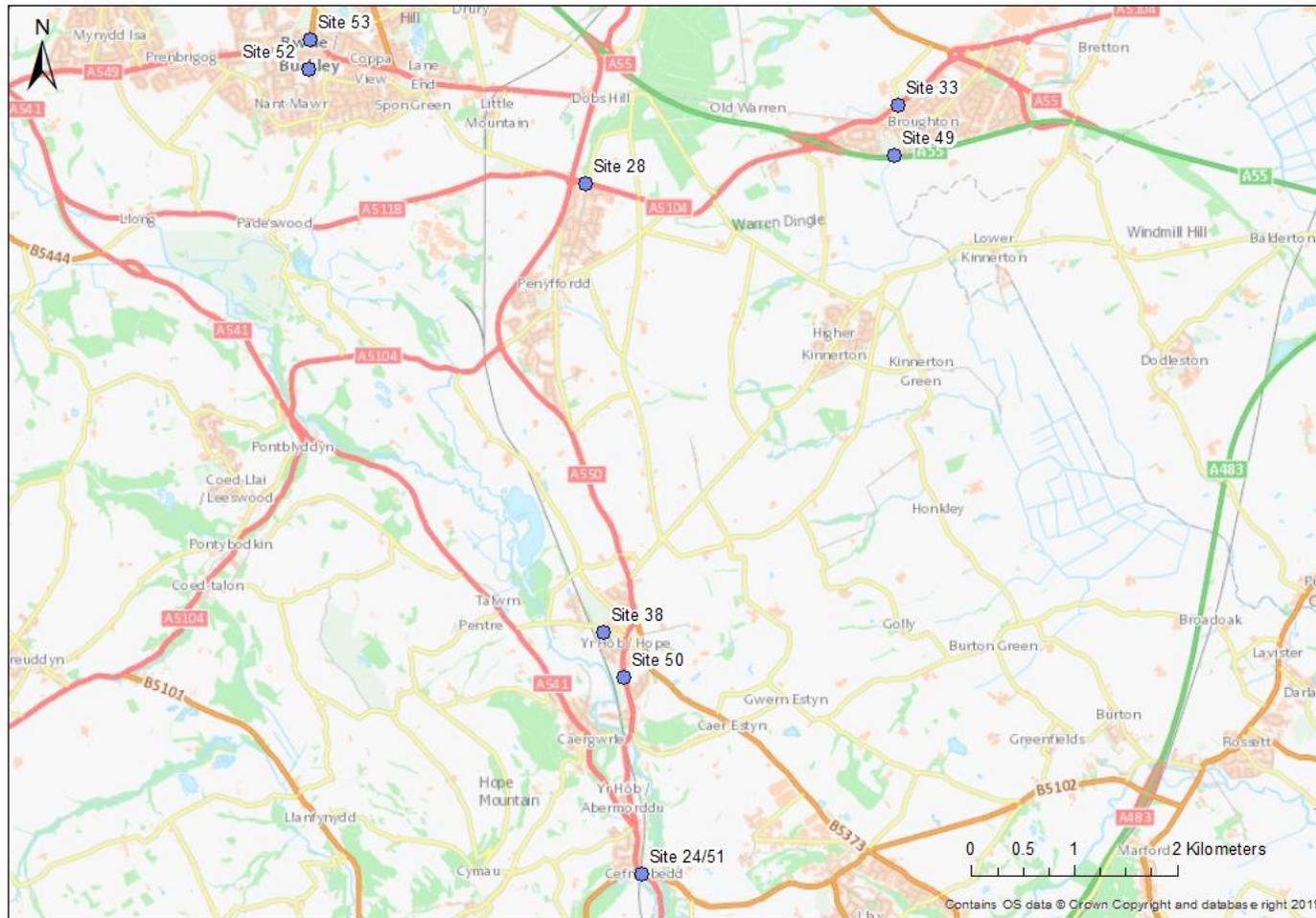


Figure 2.10 – Map of Non-Automatic Monitoring Site: FCC East

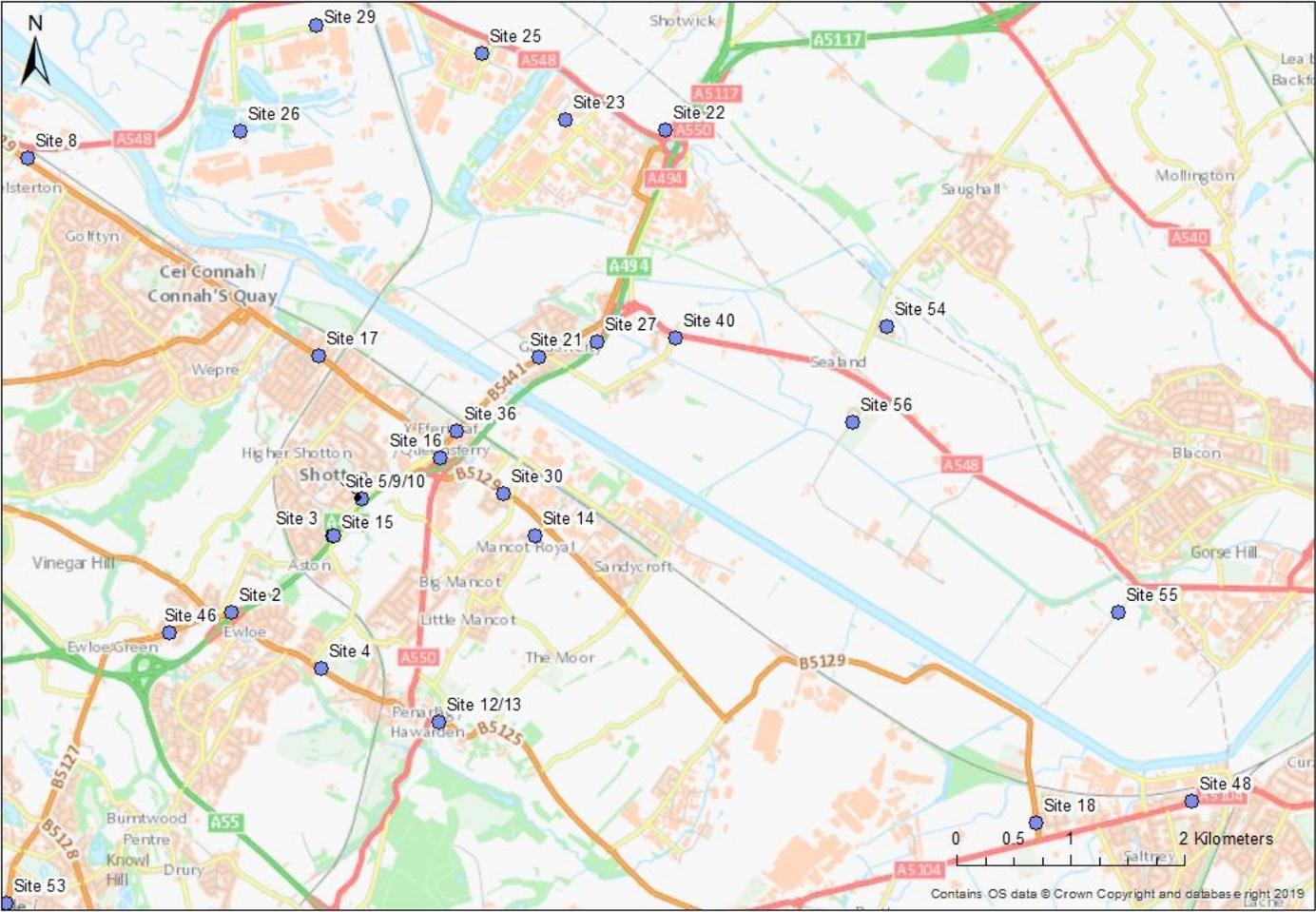


Figure 2.11 – Map of Non-Automatic Monitoring Site: FCC North

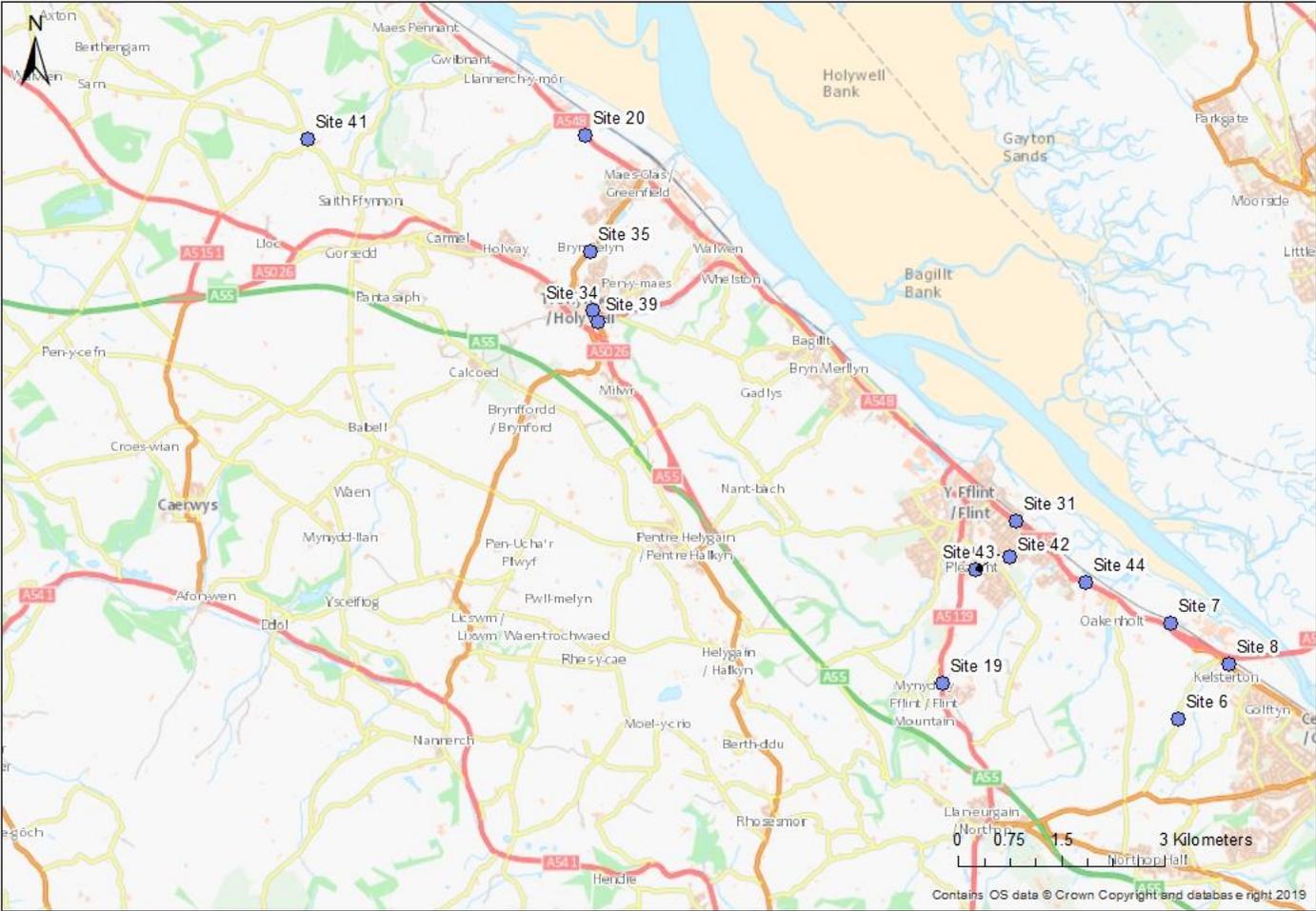


Figure 2.12 – Map of Non-Automatic Monitoring Site: FCC South West

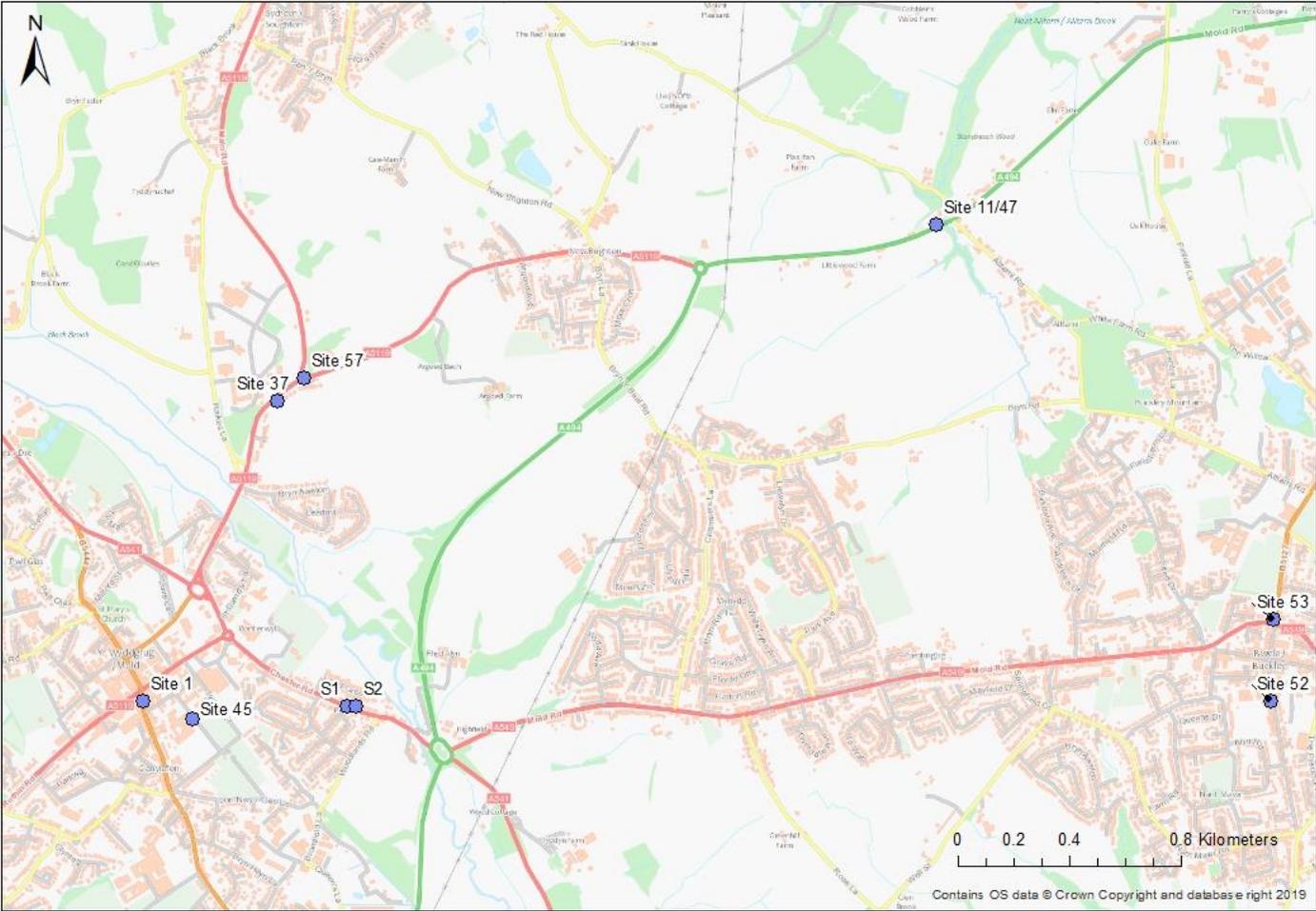


Figure 2.13 – Map of Non-Automatic Monitoring Sites: GC

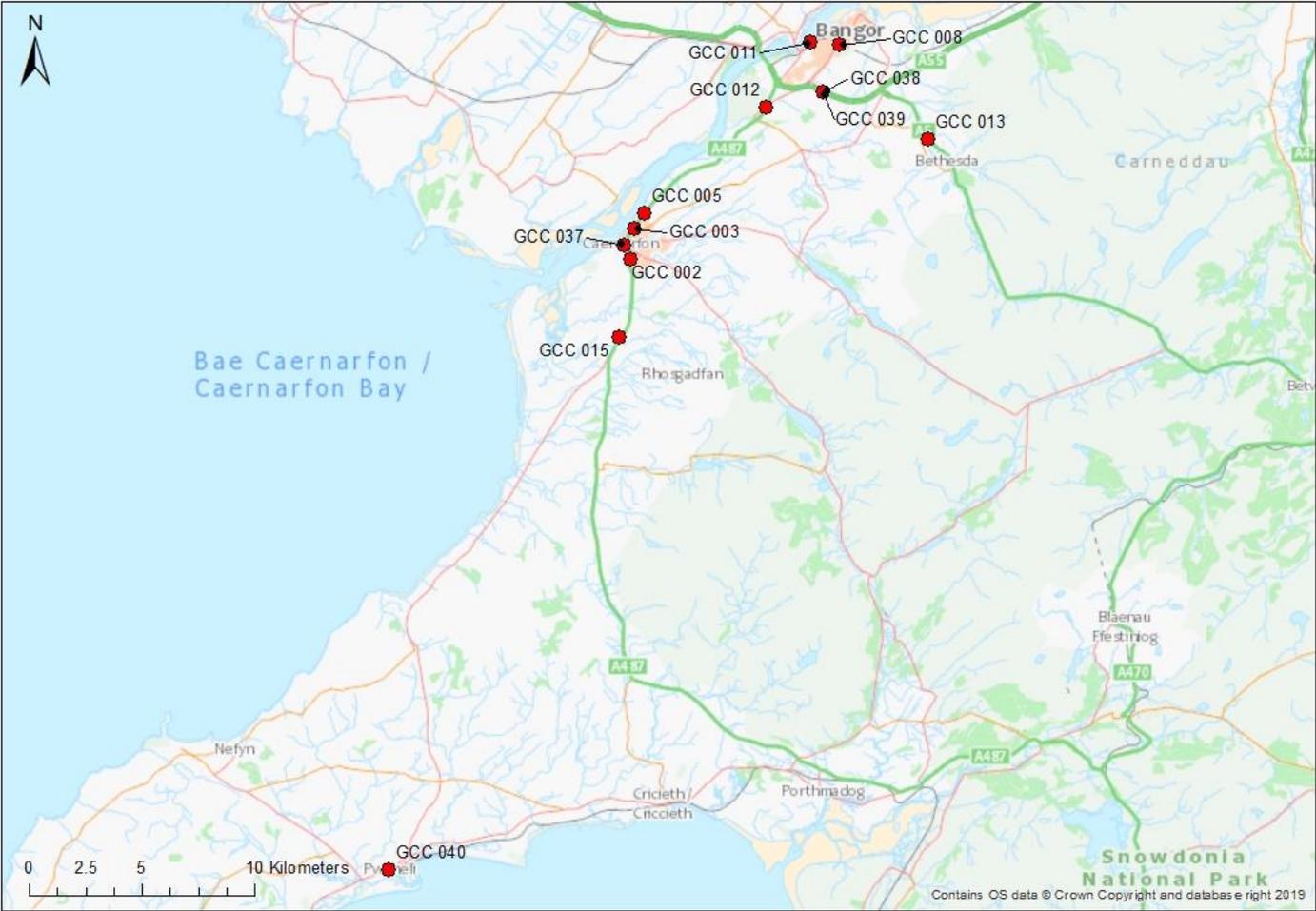


Figure 2.14 – Map of Non-Automatic Monitoring Sites: WCBC Wrexham

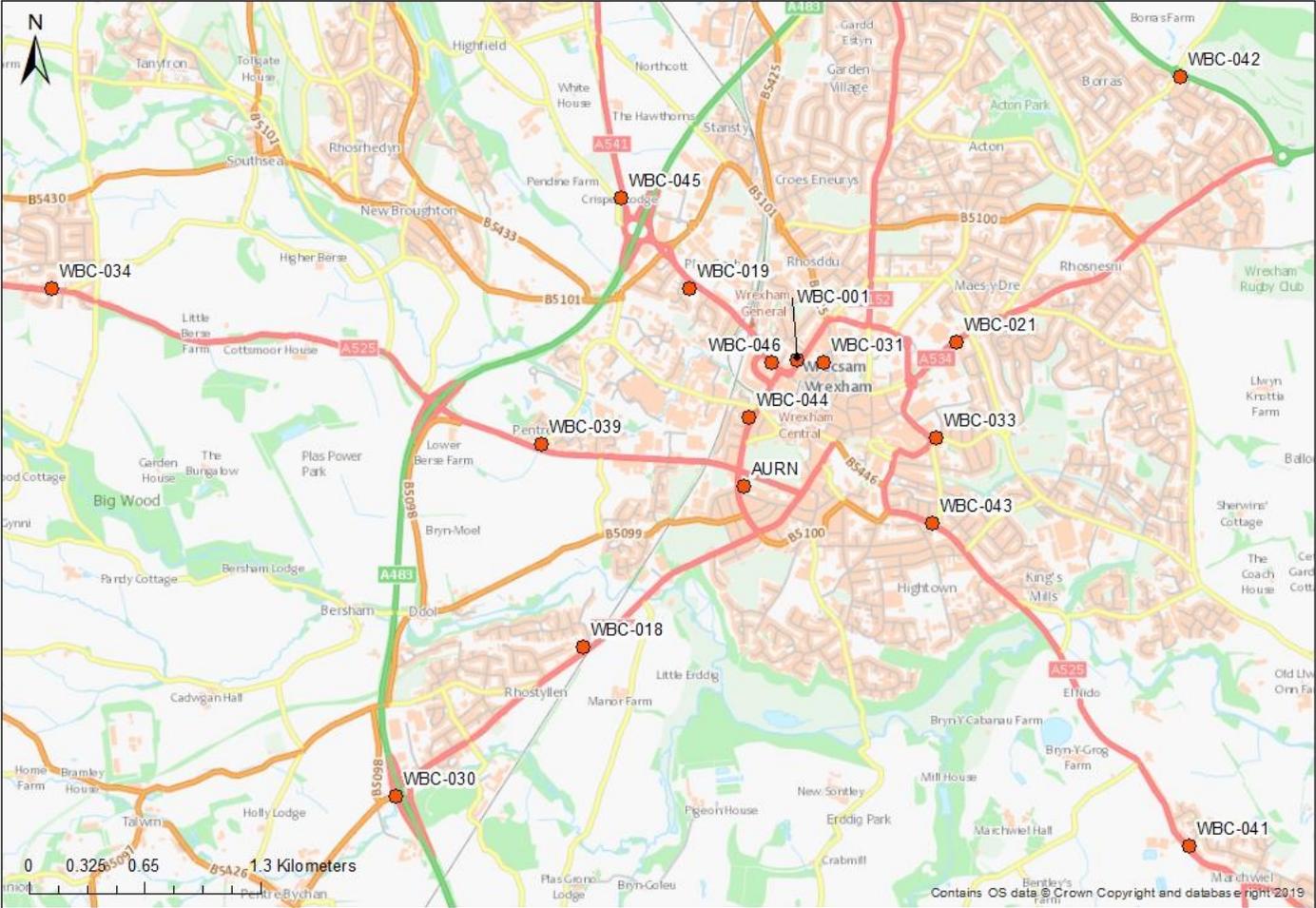


Figure 2.15 – Map of Non-Automatic Monitoring Sites: WCBC North East

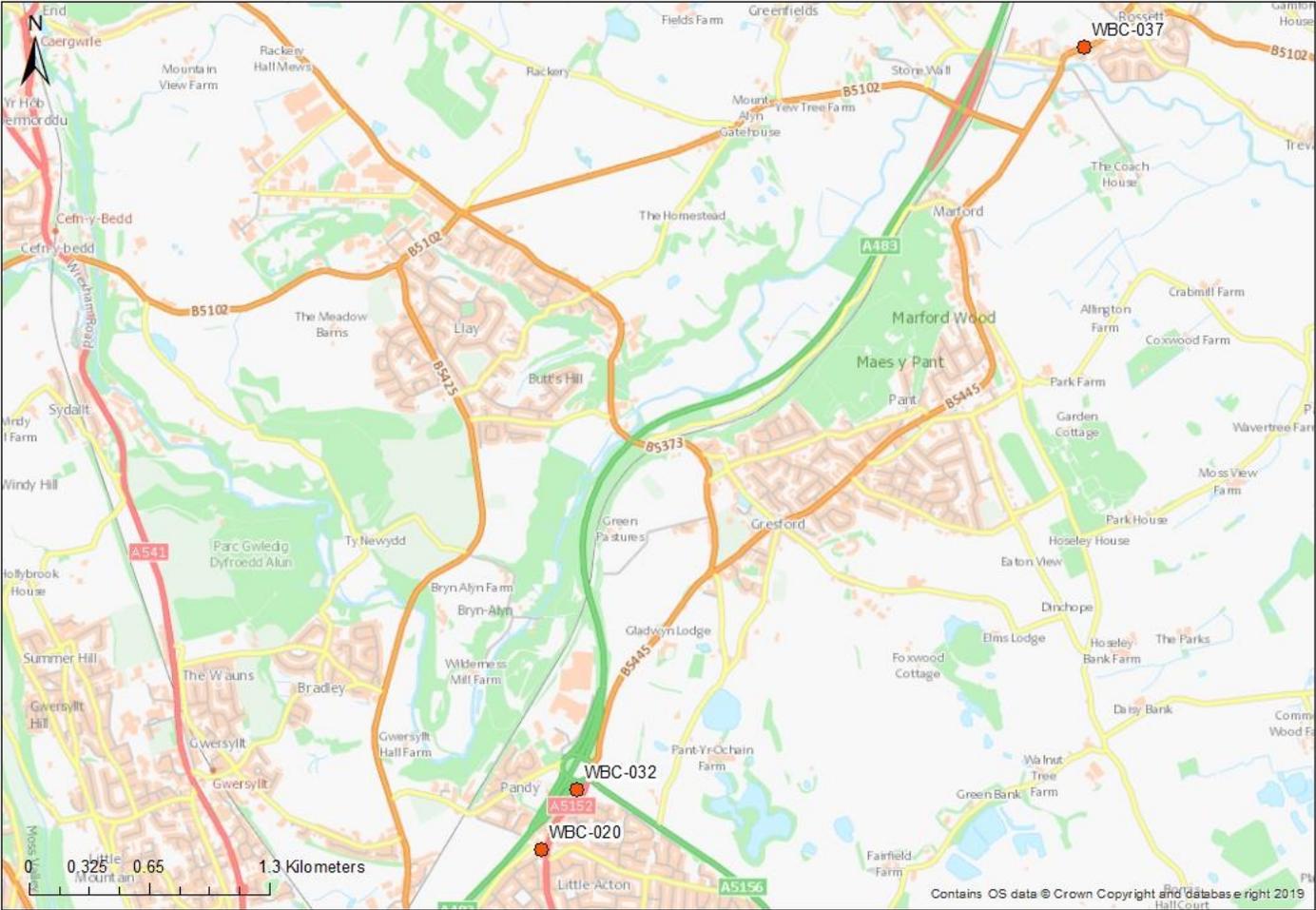
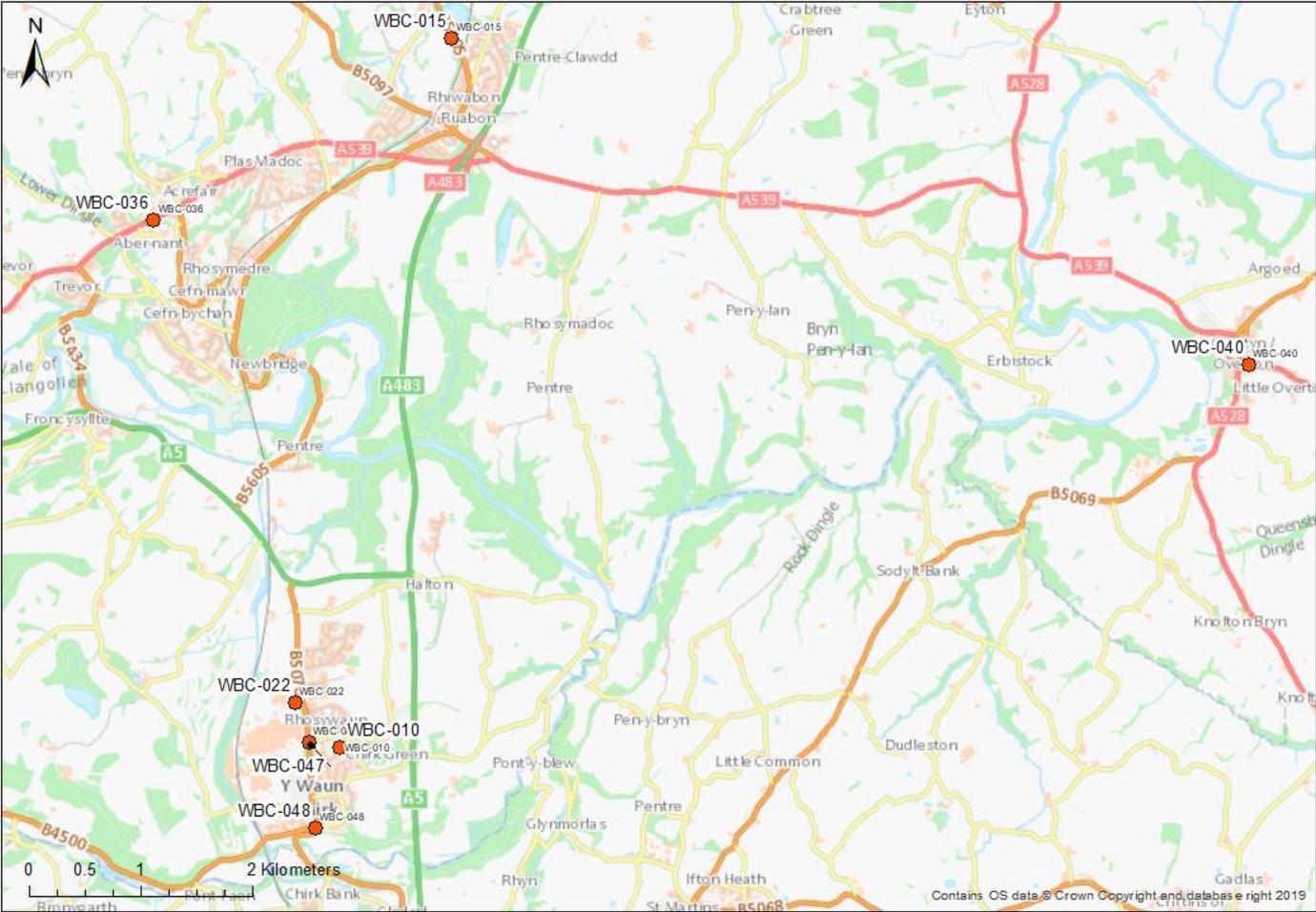


Figure 2.16 – Map of Non-Automatic Monitoring Sites: WCBC South



2.2 2019 Air Quality Monitoring Results

Table 2.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
IACC									
IACC-018	Kerbside	Diffusion Tube	100	100	38.7	38.1	39.7	37.8	35.3
IACC-080	Roadside	Diffusion Tube	75	75	-	-	9.5	4.0*	4.4
IACC-079	Suburban	Diffusion Tube	75	75	-	-	-	2.8	4.1
IACC-046	Rural Background	Diffusion Tube	100	100	-	-	-	44.8	37.9
IACC-047	Roadside	Diffusion Tube	100	8	-	-	45.2	9.6	8.5
IACC-048	Roadside	Diffusion Tube	100	8	-	-	9.8	10.2	10.6
IACC-049	Roadside	Diffusion Tube	92	92	-	-	11.3	14.0	13.1
IACC-050	Roadside	Diffusion Tube	100	100	-	-	15.3	8.3	8.8

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
IACC-051	Roadside	Diffusion Tube	100	100	-	-	9.9	8.0	7.9
IACC-052	Roadside	Diffusion Tube	100	8	-	-	9.5	5.5	5.0
IACC-053	Roadside	Diffusion Tube	100	100	-	-	7.0	8.6	8.7
IACC-054	Roadside	Diffusion Tube	100	100	-	-	10.2	7.6	8.2
IACC-055	Roadside	Diffusion Tube	100	100	-	-	9.0	4.7	5.7
IACC-056	Roadside	Diffusion Tube	100	8	-	-	6.7	9.3	11.2 ⁽⁵⁾
IACC-057	Roadside	Diffusion Tube	100	8	-	-	12.7	8.9	9.7 ⁽⁵⁾
IACC-059	Roadside	Diffusion Tube	100	17	-	-	11.2	13.9	17.9 ⁽⁵⁾
IACC-060	Roadside	Diffusion Tube	100	17	-	-	-	5.3 ⁽⁴⁾	8.6 ⁽⁵⁾
IACC-061	Roadside	Diffusion Tube	100	17	-	-	-	11.2	15.4 ⁽⁵⁾

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
IACC-062	Roadside	Diffusion Tube	100	17	-	-	-	4.0	5.7 ⁽⁵⁾
IACC-063	Roadside	Diffusion Tube	100	17	-	-	-	6.4	10.7 ⁽⁵⁾
IACC-064	Roadside	Diffusion Tube	100	17	-	-	-	14.7	21.1 ⁽⁵⁾
IACC-065	Roadside	Diffusion Tube	100	17	-	-	-	12.0 ⁽⁴⁾	17.8 ⁽⁵⁾
IACC-066	Roadside	Diffusion Tube	100	17	-	-	-	7.6 ⁽⁴⁾	10.7 ⁽⁵⁾
IACC-067	Roadside	Diffusion Tube	100	17	-	-	-	5.0 ⁽⁴⁾	8.6 ⁽⁵⁾
IACC-068	Roadside	Diffusion Tube	100	17	-	-	-	6.2	8.2 ⁽⁵⁾
IACC-069	Roadside	Diffusion Tube	100	17	-	-	-	12.4	19.6 ⁽⁵⁾
IACC-070	Roadside	Diffusion Tube	100	17	-	-	-	12.3	18.4 ⁽⁵⁾
IACC-071	Roadside	Diffusion Tube	100	17	-	-	-	14.7	19.3 ⁽⁵⁾

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
IACC-072	Roadside	Diffusion Tube	100	17	-	-	-	11.7	9.3 ⁽⁵⁾
IACC-073	Roadside	Diffusion Tube	100	17	-	-	-	37.1	36.7 ⁽⁵⁾
IACC-074	Roadside	Diffusion Tube	100	17	-	-	-	9.8	14.4 ⁽⁵⁾
IACC-075	Roadside	Diffusion Tube	100	17	-	-	-	13.2	18.1 ⁽⁵⁾
IACC-076	Roadside	Diffusion Tube	100	17	-	-	-	14.8 ⁽⁴⁾	21.1 ⁽⁵⁾
IACC-077	Roadside	Diffusion Tube	100	17	-	-	-	38.1	33.0 ⁽⁵⁾
IACC-078	Kerbside	Diffusion Tube	92	92	-	-	-	-	9.4
IACC-081	Roadside	Diffusion Tube	25	25	-	-	-	-	19.7 ⁽⁴⁾
IACC-082	Roadside	Diffusion Tube	25	25	-	-	-	-	18.6 ⁽⁴⁾
CCBC									
DT/CCBC001	Roadside	Diffusion Tube	100	100	17.5	17.3	19.1	16.9	18.6

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
DT/CCBC017	Roadside	Diffusion Tube	100	100	18.1	19.1	24.4	16.5	17.3
DT/CCBC018	Roadside	Diffusion Tube	100	100	19.4	22.6	20.7	19.8	18.0
DT/CCBC021	Roadside	Diffusion Tube	100	100	15.2	16.8	17.5	14.2	16.3
DT/CCBC022	Roadside	Diffusion Tube	100	100	18.9	19.3	20.4	18.7	18.3
DT/CCBC026	Roadside	Diffusion Tube	100	100	27.4	25.2	27.4	23.0	24.2
DT/CCBC027	Roadside	Diffusion Tube	100	100	13.3	14.3	14.5	14.7	14.8
DT/CCBC031	Roadside	Diffusion Tube	92	92	-	20.8	20.7	20.9	19.5
DT/CCBC032	Roadside	Diffusion Tube	100	100	-	17.7	18.7	17.1	17.8
DT/CCBC033	Roadside	Diffusion Tube	100	100	-	-	13.7	13.0	14.0
DT/CCBC034	Roadside	Diffusion Tube	92	92	-	-	20.8	22.0	20.0

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
DT/CCBC035	Roadside	Diffusion Tube	100	100	-	-	-	15.5	16.5
DT/CCBC036	Roadside	Diffusion Tube	100	100	-	-	-	10.8	11.6
DT/CCBC037	Roadside	Diffusion Tube	92	92	-	-	-	12.7	17.9
DT/CCBC038	Roadside	Diffusion Tube	100	100	-	-	-	15.3	15.0
DT/CCBC039	Roadside	Diffusion Tube	100	100	-	-	-	-	15.2
DT/CCBC040	Roadside	Diffusion Tube	100	100	-	-	-	-	15.8
DT/CCBC041	Roadside	Diffusion Tube	100	100	-	-	-	-	14.1
DCC									
DBK1	Roadside	Diffusion Tube	100	100	25.8	23.1	23.5	24.9	25.3
DBR2	Roadside	Diffusion Tube	100	100	29.1	26.7	26.4	25.7	25.1
DBR5	Suburban	Diffusion Tube	100	100	14.0	14.0	15.5	14.1	14.5

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
DBR48	Roadside	Diffusion Tube	100	100	25.1	25.7	26.7	24.8	24.2
DBR23	Suburban	Diffusion Tube	100	100	17.3	17.2	18.6	19.1	17.0
DBR8	Roadside	Diffusion Tube	100	100	15.1	14.7	15.5	15.2	14.2
DBR9	Roadside	Diffusion Tube	100	100	21.8	21.2	21.1	21.3	19.8
DBR10	Suburban	Diffusion Tube	100	100	16.4	14.5	16.1	15.3	14.0
DBR24	Suburban	Diffusion Tube	100	100	32.6	32.5	33.1	33.1	32.5
DBR20	Roadside	Diffusion Tube	100	100	21.3	21.2	19.8	21.3	20.5
DBR43	Suburban	Diffusion Tube	92	92	31.9	32.8	29.1	32.4	28.0
DBR44	Roadside	Diffusion Tube	100	100	25.9	24.2	25.0	26.3	24.5
DBR45	Roadside	Diffusion Tube	92	92	23.0	21.6	23.3	22.3	21.0

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
DBR37	Roadside	Diffusion Tube	92	92	28.5	28.0	26.6	26.2	23.7
DBR38	Roadside	Diffusion Tube	92	92	17.9	16.5	16.8	17.2	14.6
DBR52	Roadside	Diffusion Tube	100	100	30.3	21.7	24.1	22.2	21.7
DBR53	Roadside	Diffusion Tube	100	100	30.7	28.2	31.2	29.3	28.7
DBR31	Roadside	Diffusion Tube	92	92	18.0	17.0	18.9	17.6	14.7
DBR32	Roadside	Diffusion Tube	100	100	19.1	18.5	18.9	17.8	18.2
DBR33	Kerbside	Diffusion Tube	100	100	22.1	29.0	28.2	25.2	25.1
DBR34	Roadside	Diffusion Tube	92	92	14.7	13.6	15.2	14.1	13.2
DBR49	Roadside	Diffusion Tube	92	92	16.7	16.0	17.1	15.7	14.8
DBR56	TBC	Diffusion Tube	83	83	-	-	-	-	13.7

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
DBR58	TBC	Diffusion Tube	100	100	-	-	-	-	16.4
DBR55	TBC	Diffusion Tube	92	92	-	-	-	-	32.7
DBR57	TBC	Diffusion Tube	100	100	-	-	-	-	10.8
FCC									
Site 1	Kerbside	Diffusion Tube	92	92	25.4	21.1	25.6	23.7	24.4
Site 2	Urban	Diffusion Tube	100	100	20.8	17.4	20.6	17.4	17.2
Site 3	Kerbside	Diffusion Tube	100	100	30.2	26.3	33.7	24.4	28.2
Site 4	Urban Background	Diffusion Tube	100	100	14.1	15.9	18.0	16.0	16.0
Site 5/9/10	Kerbside	Diffusion Tube	28	28	29.8	31.2	33.2	20.1	18.7 ⁽⁴⁾
Site 6	Rural Background	Diffusion Tube	100	100	14.6	9.3	14.0	8.1	10.5
Site 7	Kerbside	Diffusion Tube	100	100	14.7	14.9	15.0	13.2	14.9

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
Site 8	Urban background	Diffusion Tube	100	100	13.8	12.9	14.5	11.7	12.6
Site 11/47	Kerbside	Diffusion Tube	100	100	31.5	32.9	35.6	29.3	28.2
Site 12/13	Kerbside	Diffusion Tube	100	100	33.4	35.4	34.0	34.5	33.9
Site 14	Rural Background	Diffusion Tube	92	92	8.7	8.6	12.7	13.4	14.7
Site 15	Kerbside	Diffusion Tube	100	100	27.3	27.9	27.9	25.9	26.7
Site 16	Urban	Diffusion Tube	100	100	26.8	26.2	26.7	24.4	24.7
Site 17	Kerbside	Diffusion Tube	100	100	23.9	24.8	29.2	23.8	24.8
Site 18	Urban Background	Diffusion Tube	83	83	12.1	11.5	14.5	13.9	14.5
Site 19	Kerbside	Diffusion Tube	100	100	22.1	20.7	25.0	19.5	22.6
Site 20	Kerbside	Diffusion Tube	100	100	21.5	20.7	23.4	22.0	20.7

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
Site 21	Urban Background	Diffusion Tube	100	100	13.7	13.0	15.2	18.0	20.0
Site 22	Rural Background	Diffusion Tube	100	100	19.4	18.7	18.6	14.6	17.6
Site 23	Kerbside	Diffusion Tube	83	83	21.8	21.4	24.4	23.2	24.4
Site 24/51	Kerbside	Diffusion Tube	100	100	34.9	34.9	31.4	31.1	32.0
Site 25	Industrial	Diffusion Tube	100	100	16.9	18.1	21.3	16.0	17.2
Site 26	Industrial	Diffusion Tube	100	100	14.5	15.0	16.3	13.8	14.2
Site 27	Urban Background	Diffusion Tube	83	83	21.8	21.7	21.3	20.0	20.8
Site 28	Industrial	Diffusion Tube	100	100	15.7	17.4	15.5	18.6	17.9
Site 29	Industrial	Diffusion Tube	100	100	17.6	15.8	18.0	16.6	16.6
Site 30	Kerbside	Diffusion Tube	92	92	25.0	23.2	24.9	23.9	24.0

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
Site 31	Kerbside	Diffusion Tube	92	92	22.2	20.3	23.6	21.3	20.2
Site 33	Kerbside	Diffusion Tube	92	92	23.1	25.1	26.9	23.8	24.8
Site 34	Kerbside	Diffusion Tube	100	100	23.5	24.7	25.3	21.4	21.3
Site 35	Kerbside	Diffusion Tube	100	100	17.5	18.3	21.0	18.4	19.8
Site 36	Kerbside	Diffusion Tube	100	100	22.0	21.5	23.2	20.8	20.9
Site 37	Kerbside	Diffusion Tube	33	33	25.3	26.2	26.3	21.3	21.5 ⁽⁴⁾
Site 38	Urban	Diffusion Tube	100	100	16.6	16.8	19.1	12.9	11.6
Site 39	Kerbside	Diffusion Tube	100	100	16.7	15.9	17.2	16.2	17.3
Site 40	Kerbside	Diffusion Tube	100	100	14.9	15.7	16.8	14.9	14.9
Site 41	Kerbside	Diffusion Tube	83	83	10.6	9.9	12.0	8.9	8.6

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
Site 42	Kerbside	Diffusion Tube	92	92	11.9	10.6	12.3	9.9 ⁽⁴⁾	11.9
Site 43	Urban Background	Diffusion Tube	58	58	8.6	9.3	9.2	9.6*	12.2*
Site 44	Urban Background	Diffusion Tube	67	67	24.7	25.6	25.5	27.9*	22.3*
Site 45	Kerbside	Diffusion Tube	33	33	17.5	16.1	17.8	11.4	9.5*
Site 46	Urban Background	Diffusion Tube	83	83	11.6	12.5	12.7	17.5	17.8
Site 48	Kerbside	Diffusion Tube	100	100	18.1	23.0	36.6	18.4	18.4
Site 49	Kerbside	Diffusion Tube	100	100	19.3	17.8	18.8	16.2	16.6
Site 50	Kerbside	Diffusion Tube	92	92	14.3	15.1	16.9	15.3	16.6
Site 52	Kerbside	Diffusion Tube	92	92	17.2	15.1	16.6	9.3	12.2
Site 53	Kerbside	Diffusion Tube	100	100	24.2	25.3	26.7	23.4	23.3

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
Site 54	Kerbside	Diffusion Tube	92	92	-	10.5	13.2	10.9	11.2
Site 55	Kerbside	Diffusion Tube	92	92	-	10.5	13.0	8.2	10.3
Site 56	Kerbside	Diffusion Tube	58	58	-	12.7	13.2	10.3 ⁽⁴⁾	11.3 ⁽⁴⁾
Site 57	Kerbside	Diffusion Tube	100	100	34.8	35.9	37.8	37.4	37.6
S1	-	Diffusion Tube	92	92	-	-	-	34.8 ⁽⁴⁾	27.0
S2	-	Diffusion Tube	83	83	-	-	-	29.1 ⁽⁴⁾	18.7
GC									
GCC 002	Kerbside	Diffusion Tube	100	100	34.3	31.1	31.4	31.4	31.2
GCC 003	Urban background	Diffusion Tube	92	92	12.6	11.3	10.5	9.9*	10.2
GCC 005	Kerbside	Diffusion Tube	92	92	33.0	29.6	27.6	27.1	27.9
GCC 008	Kerbside	Diffusion Tube	100	100	25.6	23.4	22.8	22.5	23.4

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
GCC 011	Kerbside	Diffusion Tube	92	92	23.7	21.8	23.8	21.5	25.1
GCC 012	Kerbside	Diffusion Tube	92	92	27.5	25.3	26.9	26.1	26.8
GCC 013	Kerbside	Diffusion Tube	100	100	21.0	19.6	21.9	20.3	20.0
GCC 015	Roadside	Diffusion Tube	100	100	23.9	21.4	24.8	21.7	22.3
GCC 037	Kerbside	Diffusion Tube	75	75	31.5	27.1	25.5	32.6 ⁽⁴⁾	25.2
GCC 038	Roadside	Diffusion Tube	100	100	29.9	27.5	28.6	27.5	28.1
GCC 039	Roadside	Diffusion Tube	75	75	28.0	27.7	28.4	27.1	28.6
GCC 040	Kerbside	Diffusion Tube	100	100	19.6	18.9	19.1	18.0	18.5
WCBC									
AURN	Roadside	Automatic	89	89	21.0	19.1	18.8	16.5	18.2
WBC-001	Roadside	Diffusion Tube	100	100	17.9	18.4	27.8	27.3	24.9

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
WBC-010	Suburban	Diffusion Tube	100	100	13.1	12.2	13.2	12.5	11.8
WBC-015	Roadside	Diffusion Tube	100	100	15.8	15.7	16.4	14.7	16.4
WBC-018	Roadside	Diffusion Tube	100	100	18.8	17.0	16.9	18.3	17.2
WBC-019	Roadside	Diffusion Tube	100	100	21.6	20.1	21.4	18.0	19.9
WBC-020	Intermediate	Diffusion Tube	100	100	25.6	24.2	25.5	23.5	23.1
WBC-021	Roadside	Diffusion Tube	100	100	22.3	18.8	19.9	17.8	18.8
WBC-022	Intermediate	Diffusion Tube	100	100	17.3	16.4	16.3	15.9	15.7
WBC-030	Roadside	Diffusion Tube	100	100	39.9	36.9	35.8	33.1	34.9
WBC-031	Roadside	Diffusion Tube	92	92	33.9	37.5	35.9	31.8	28.6
WBC-032	Roadside	Diffusion Tube	100	100	27.6	25.7	29.1	26.7	27.2

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Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
WBC-033	Roadside	Diffusion Tube	100	100	20.2	17.8	19.2	17.5	18.5
WBC-034	Roadside	Diffusion Tube	100	100	15.2	14.5	14.6	14.2	14.5
WBC-036	Roadside	Diffusion Tube	100	100	21.6	19.6	20.0	19.5	17.3
WBC-037	Roadside	Diffusion Tube	100	100	21.7	24.3	22.3	20.8	20.3
WBC-039	Roadside	Diffusion Tube	100	100	-	-	19.7	18.7	18.4
WBC-040	Roadside	Diffusion Tube	100	100	13.3	11.4	11.9	10.9	12.1
WBC-041	Roadside	Diffusion Tube	100	100	16.5	14.3	15.2	15.0	15.4
WBC-042	Roadside	Diffusion Tube	100	100	23.0	24.6	25.6	24.4	23.2
WBC-043	Roadside	Diffusion Tube	100	100	25.6	19.1	17.9	18.4	19.3
WBC-044	Roadside	Diffusion Tube	100	100	-	22.7	23.6	21.9	22.7

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
WBC-045	Roadside	Diffusion Tube	100	100	-	18.8	19.8	17.6	19.4
WBC-046	Roadside	Diffusion Tube	100	100	-	22.4	24.1	23.0	24.4
WBC-047	Roadside	Diffusion Tube	100	8	-	-	21.2	24.6	36.5⁽⁵⁾
WBC-048	Roadside	Diffusion Tube	92	92	-	-	-	-	18.3
AURN	Roadside	Diffusion Tube	100	100	17.2	15.6	16.7	15.1	16.3

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) Means for diffusion tubes have been corrected for bias.

(4) Means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 as valid data capture for the full calendar year was less than 75%. See Appendix C for details.

(5) Site had less than 3 months worth of data and could not be annualised. Mean presented is for the period of monitoring rather than for the whole year.

Figure 2.17 – Trends in Annual Mean NO₂ Concentrations: IACC

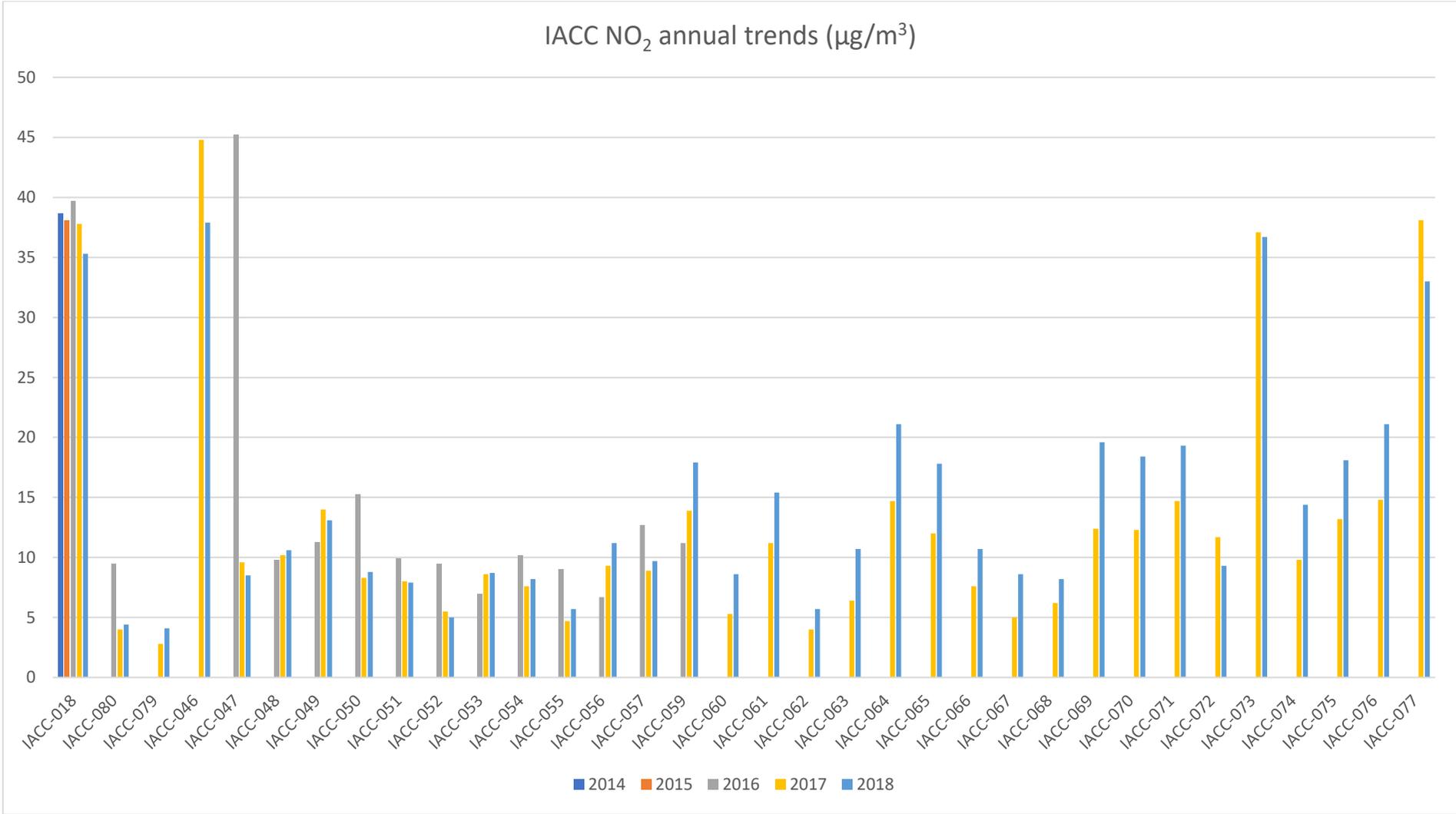


Figure 2.18 – Trends in Annual Mean NO₂ Concentrations: CCBC

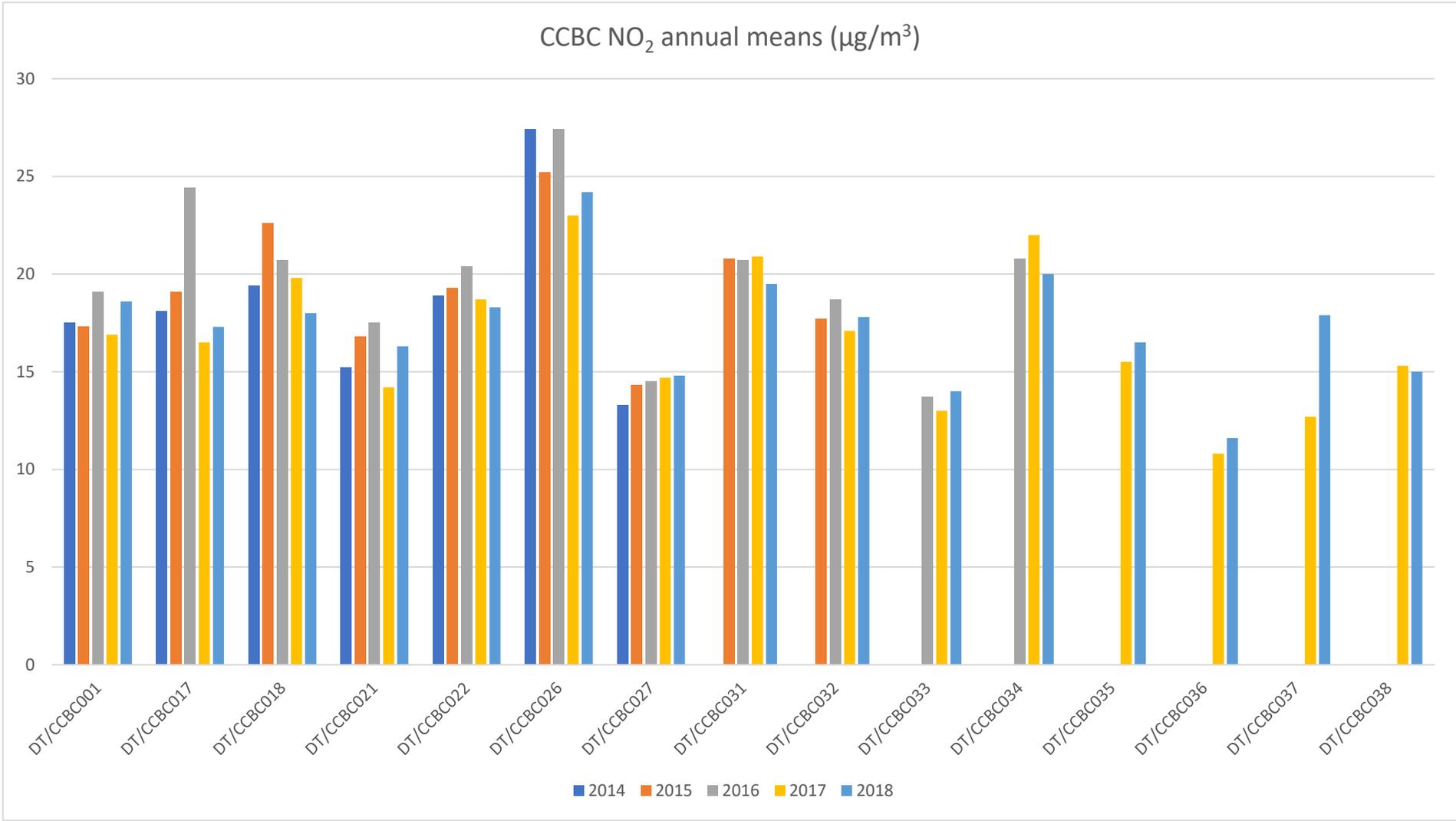


Figure 2.19 – Trends in Annual Mean NO₂ Concentrations: DCC

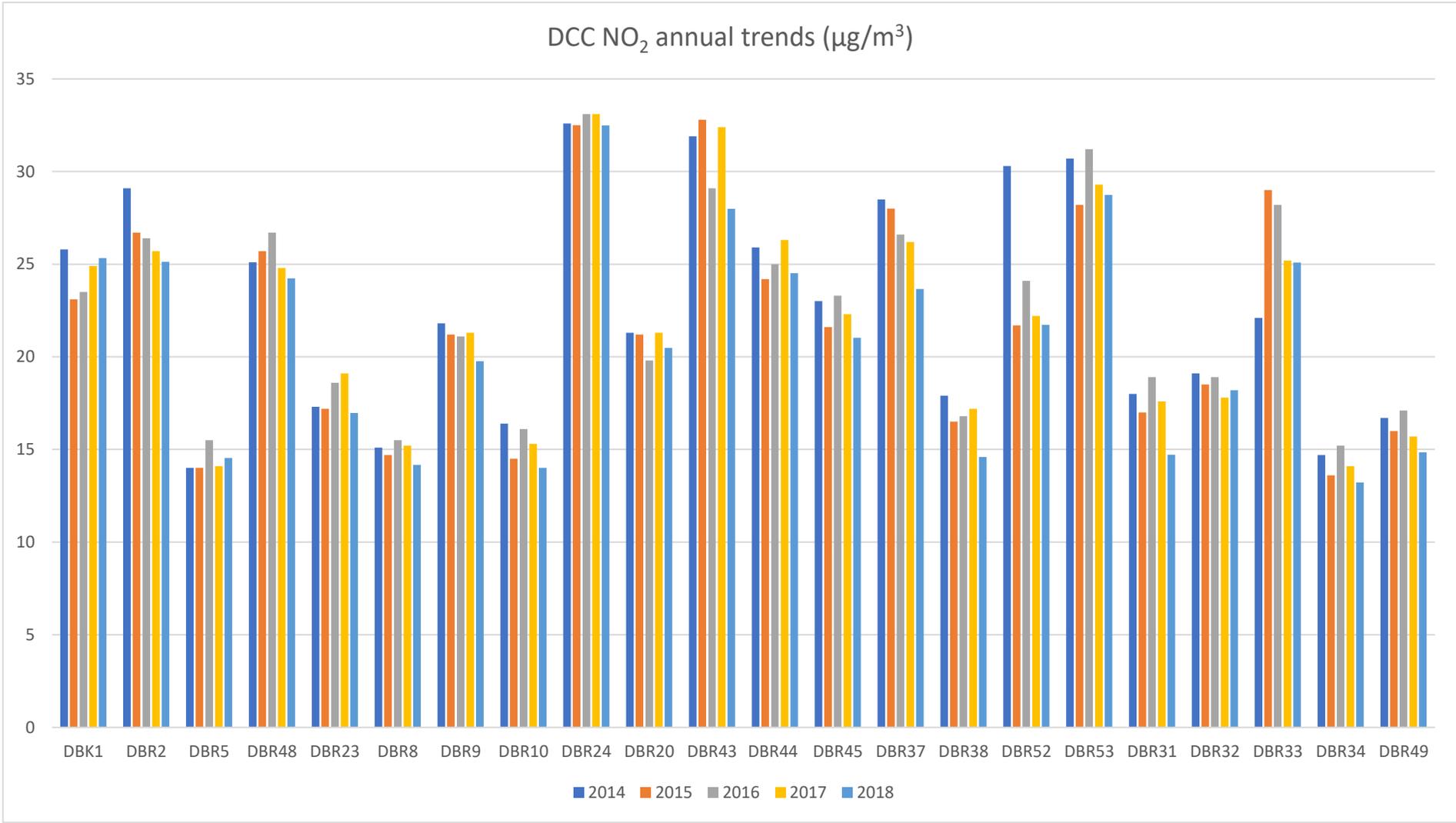
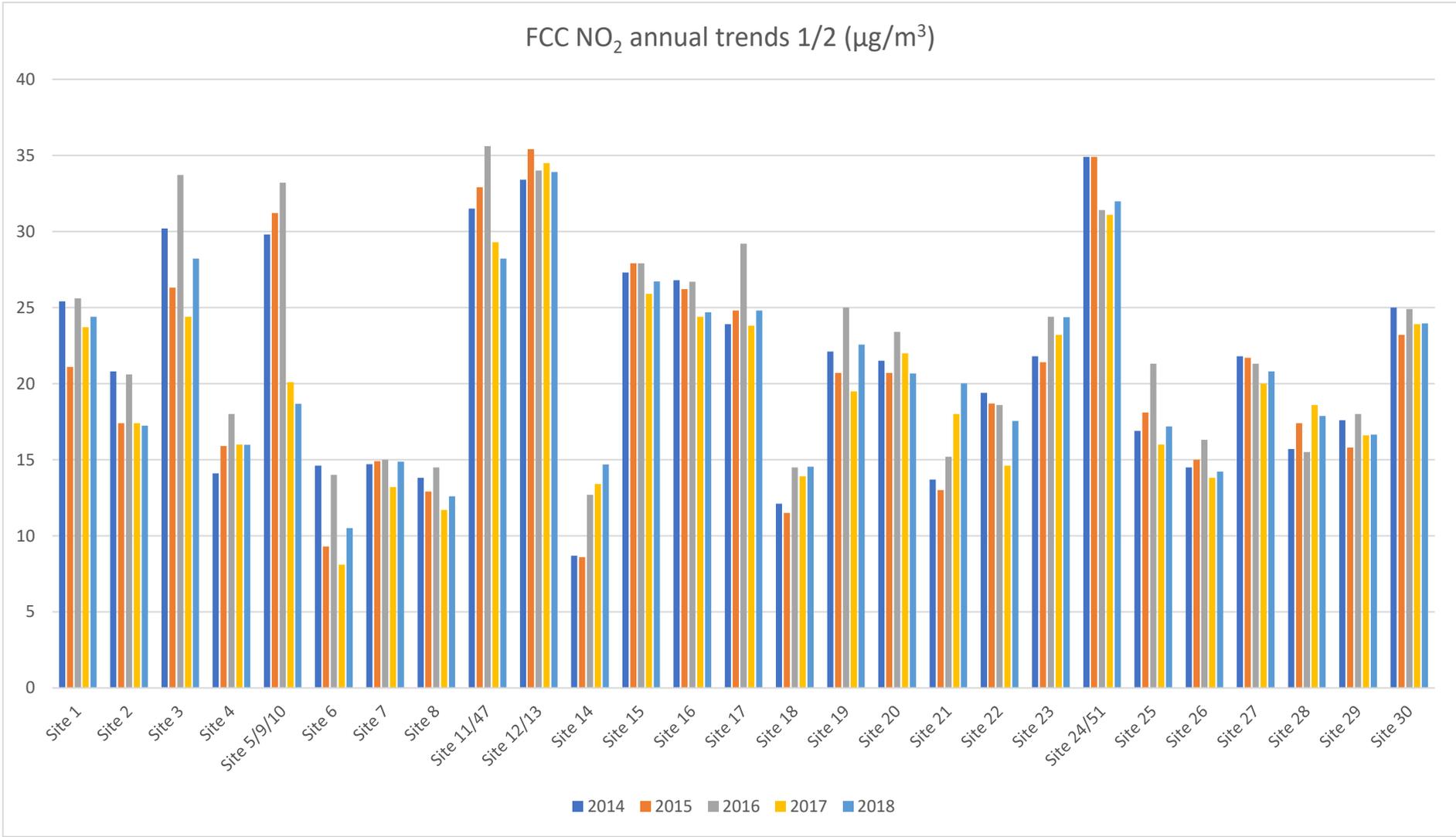


Figure 2.20 – Trends in Annual Mean NO₂ Concentrations: FCC



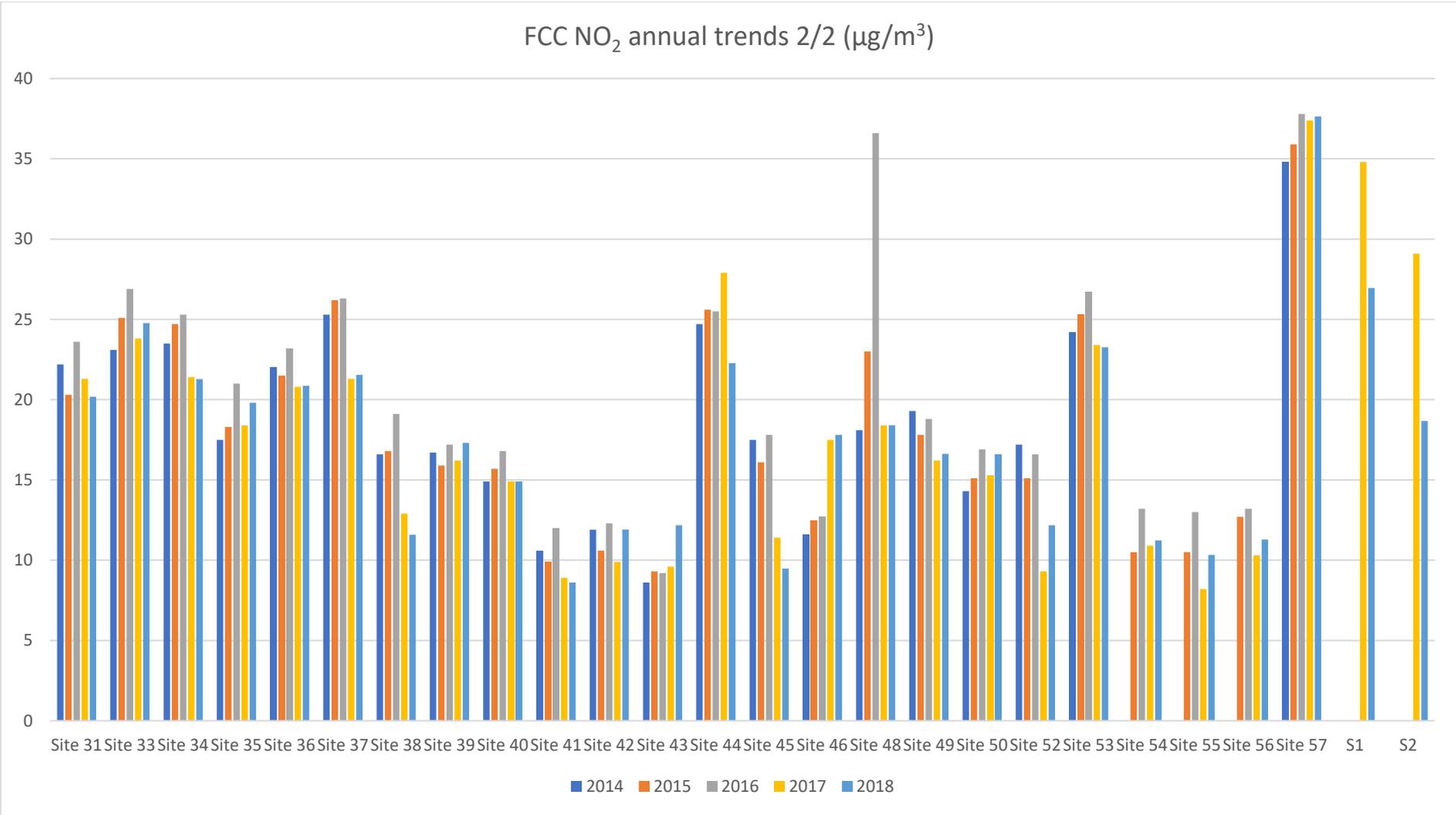


Figure 2.21 – Trends in Annual Mean NO₂ Concentrations: GCC

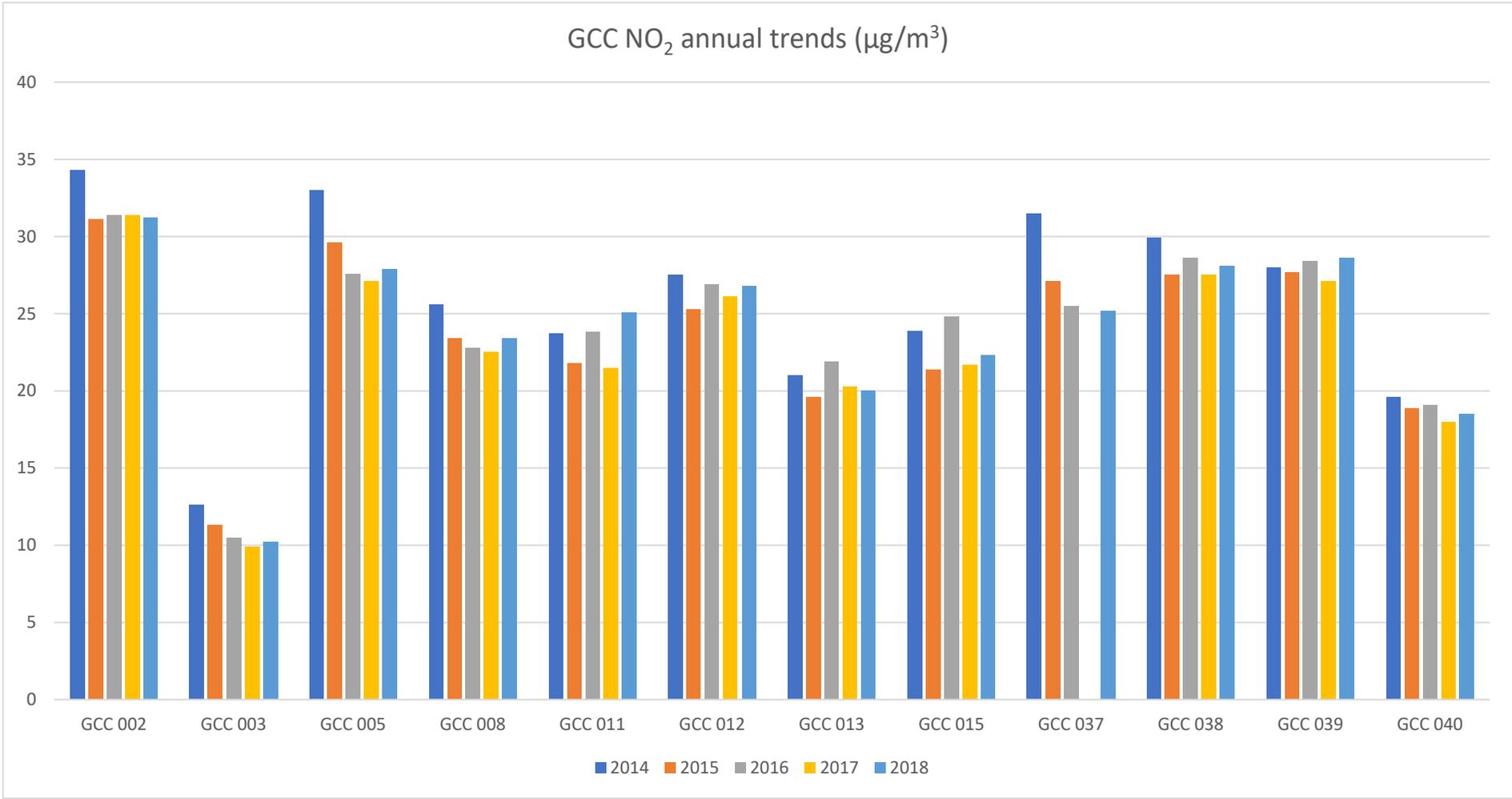


Figure 2.22 – Trends in Annual Mean NO₂ Concentrations: WCBC

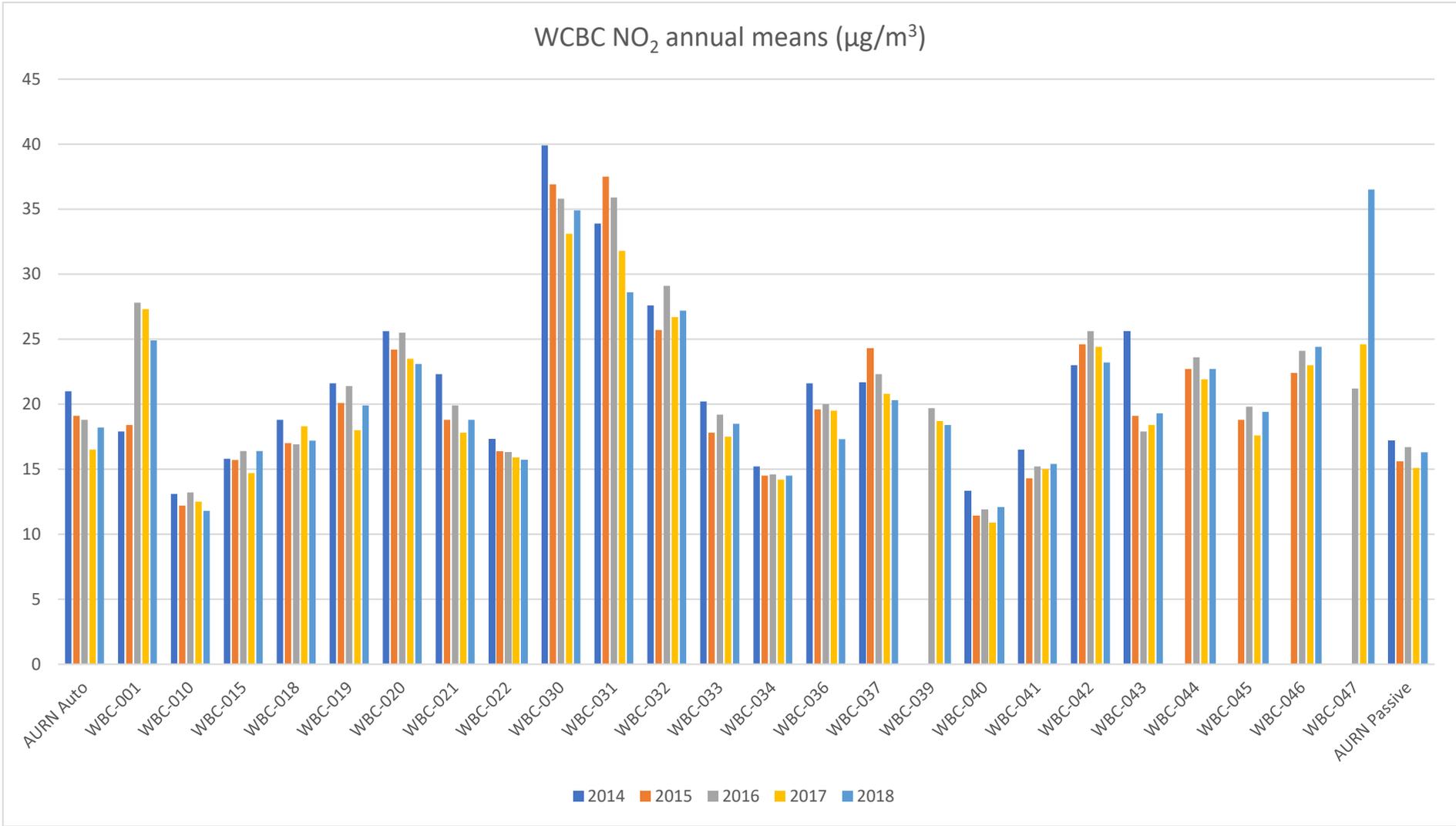


Table 2.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2014	2015	2016	2017	2018
AURN	Roadside	Continuous	89	89	0	0	0	0	0

Notes:

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

Table 2.5 – Annual Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2014	2015	2016	2017	2018
IACC								
CM1	Rural	100	100	13.8	17.2	18.8	13.2	13
CM2	Rural	82	82	17.6	13.1	8.1	11.0	10.1
CM3	Rural	100	100	-	34.8	14.9	13.3	14.1
CM4	Rural	100	100	-	-	-	8.1*	9.5
WCBC								
AURN	Roadside	88	88	14.1	13.3	12.2	11.5	13.1

Notes:

Exceedances of the PM₁₀ annual mean objective of 40µg/m³ are shown in **bold**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

*Site was opened in November 2017.

Figure 2.23 – Trends in Annual Mean PM₁₀ Concentrations

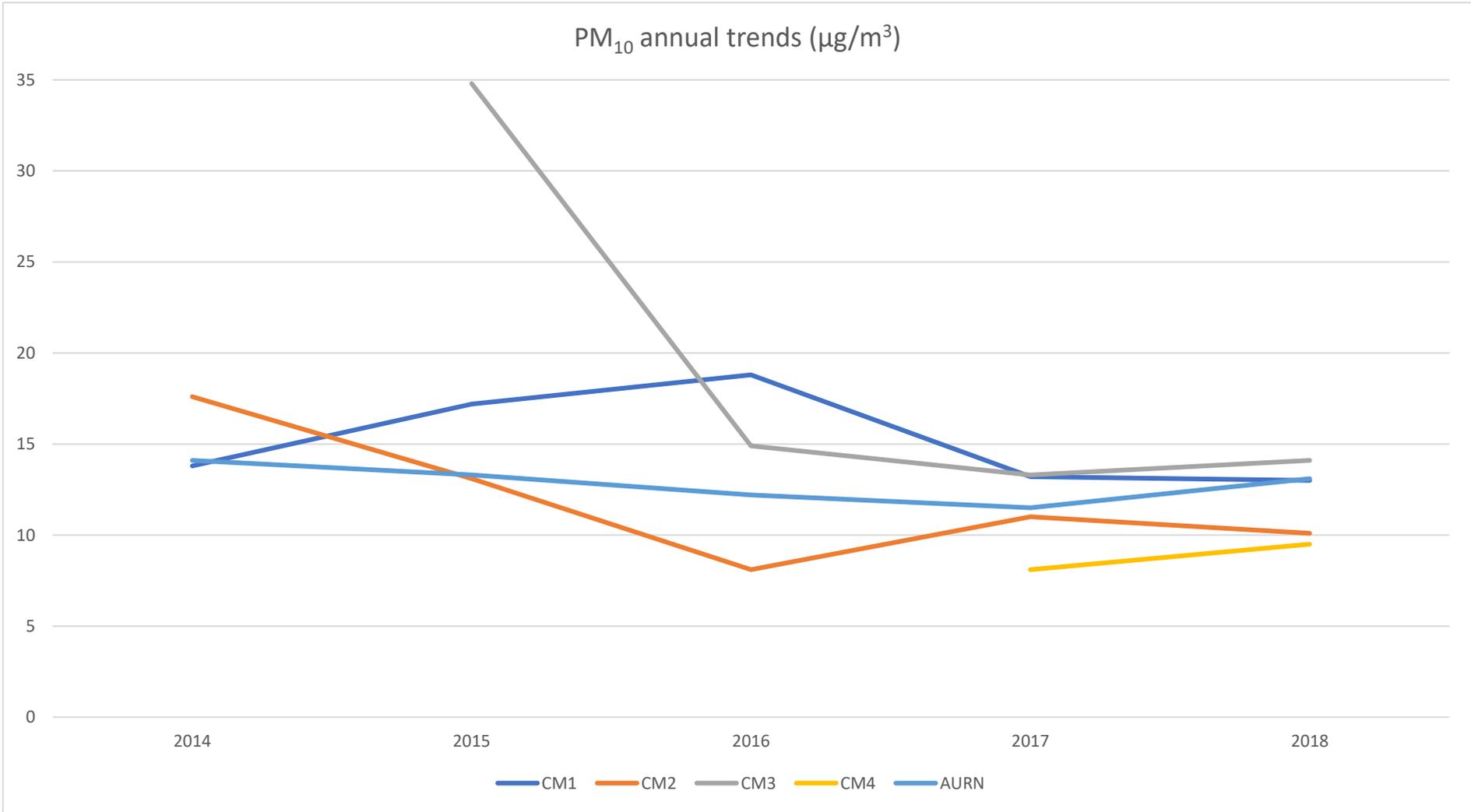


Table 2.6 – 24-Hour Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	PM ₁₀ 24-Hour Means > 50µg/m ³ ⁽³⁾				
				2014	2015	2016	2017	2018
IACC								
CM1	Rural	100	100	2	2	4	0	0
CM2	Rural	82	82	6	3	0	0	2
CM3	Rural	100	100	-	3	4	0	0
CM4	Rural	100	100	-	-	-	0	0
WCBC								
AURN	Roadside	88	88	8	3	0	4	1

Notes:

Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

Table 2.7 – PM_{2.5} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	PM _{2.5} Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2014	2015	2016	2017	2018
IACC								
CM1	Rural	100	100	-	-	6.1	8.6	8.4
CM2	Rural	82	82	-	-	4.0	6.4	6.8
CM3	Rural	100	100	-	-	7.4	8.5	8.8
CM4	Rural	100	100	-	-	5.4	6.7*	6.5
WCBC								
AURN	Roadside	85	85	9.3	8	7.8	6.6	7.1

Notes:

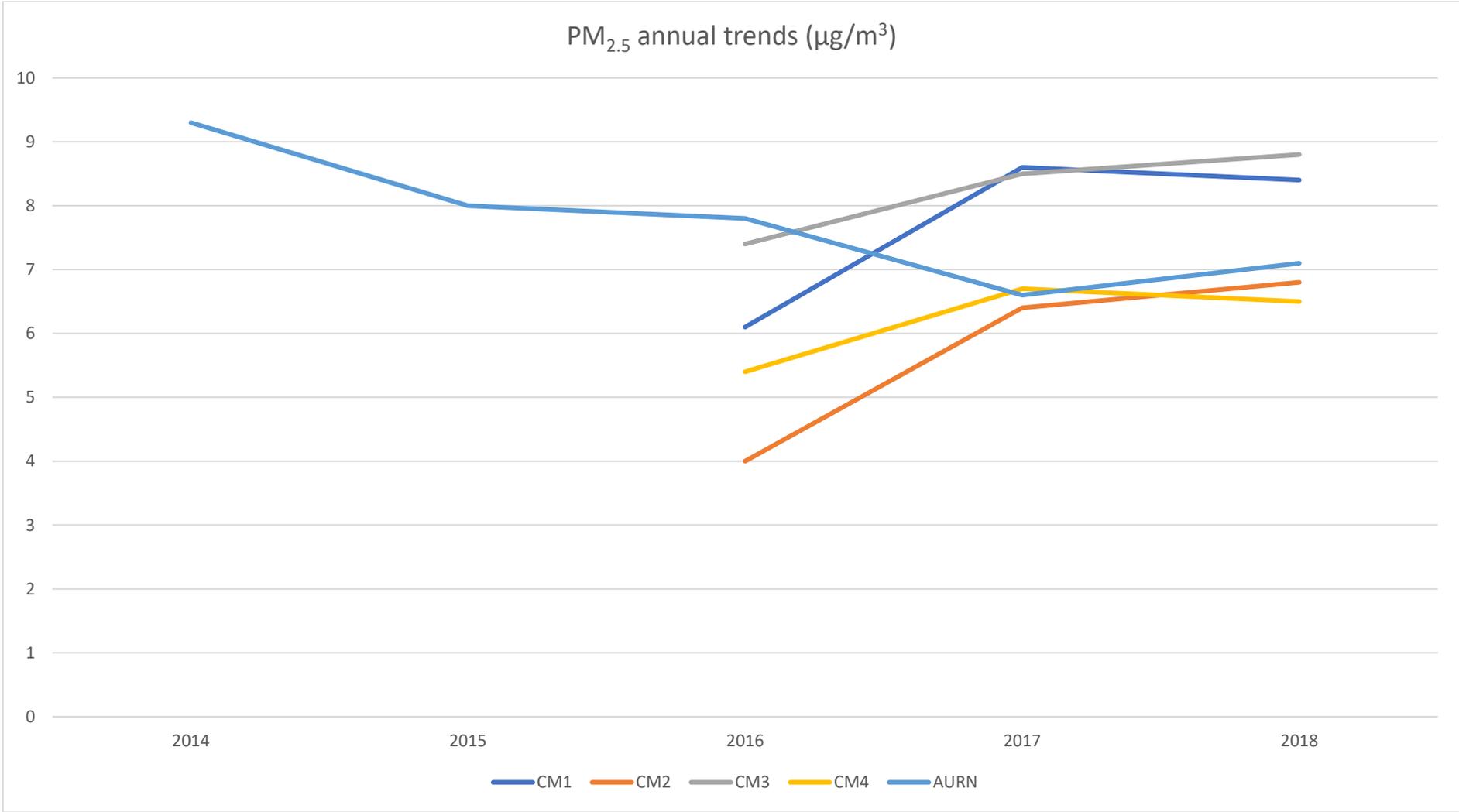
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

*Site was opened in November 2017

Figure 2.24 – Trends in Annual Mean PM_{2.5} Concentrations



2.3 Comparison of 2018 Monitoring Results with Previous Years and the Air Quality Objectives

2.3.1 Nitrogen Dioxide (NO₂)

Table 2.3. presents the annual mean NO₂ concentrations for 2018. Figure 2.17 to Figure 2.22 represent the annual trends in NO₂ concentrations. These show a general decrease in NO₂ concentration at the majority of sites. Comparison with the 1-hour mean AQO at the AURN station is included in Table 2.4.

Annual means at sites which recorded a data capture between 25% and 75% (i.e. 3 to 8 months) were annualised according to the method set out in Boxes 7.9 and 7.10 of LAQM.TG16. Several sites which were discontinued in 2018 and had less than 3 months worth of data could not be annualised but their means are presented for indicative purpose.

In 2018 NO₂ was monitored by all six local authorities at 172 diffusion tube sites and at one automatic monitoring site in WCBC. No exceedances of the annual mean AQO were recorded at any sites.

Annual mean concentrations were within 10% of the annual mean AQO at four sites and those concentrations were distance corrected to predict concentrations at sensitive receptor locations (See Appendix C).

The 2018 annual mean concentration at the Automatic Urban and Rural Network (AURN) automatic monitoring station in WCBC was 18.2 µg/m³ with a data capture of 89%. This is well below the annual mean AQO of 40 µg/m³. There was also no exceedance of the 1-hour mean AQO of 200 µg/m³ (not to be exceeded more than 18 times per year).

2.3.2 Particulate Matter (PM₁₀)

In 2018 PM₁₀ was monitored at four automatic monitoring stations in IACC and at one in WCBC. The annual means recorded at all stations were well below the annual mean AQO of 40 µg/m³. The highest concentration recorded was 14.1 µg/m³ at IACC's CM3.

The number of exceedances of the 24-hour mean AQO of 50 µg/m³ was also largely below 35 at all monitoring sites.

Annual mean PM₁₀ concentration are included in Table 2.6 and comparison with 24-hour mean AQO are included in Table 2.7. Figure 2.23 represents the annual trends in annual mean PM₁₀.

2.3.3 Particulate Matter (PM_{2.5})

In 2018 PM_{2.5} was monitored at four automatic monitoring stations in IACC and at one in WCBC. The annual mean recorded at all stations were below the annual mean standard of 25 µg/m³. The highest concentration recorded was 8.8 µg/m³ at IACC's CM1. Table 2.7 includes the annual mean PM_{2.5} concentrations and Figure 2.24 represents the trend in annual mean concentrations.

2.3.4 Other Pollutants Monitored

Benzene

Benzene monitoring is only carried out in WCBC who maintain one diffusion tube for monitoring benzene near to an acid tar lagoon. It has been placed in this location to monitor for benzene levels that may be released from the lagoon. Table 2.9 includes the annual mean concentration from the benzene monitoring site. The 2018 concentration was well below the annual mean AQO of 5µg/m³.

Table 2.8 – Benzene Monitoring Results

Site ID	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	Benzene annual Mean Concentration (µg/m ³)				
			2014	2015	2016	2017	2018
WCBC							
AURN	100	100	0.9	0.8	0.7	0.9	0.7

2.4 Summary of Compliance with AQS Objectives as of 2018

The local authorities in North Wales (IACC, DCC, FCC, CBC, GC, WCBC) have examined the results from monitoring in 2018. Concentrations at all sites are below the Air Quality Objectives, therefore no further action is required.

3. New Local Developments

3.1 Road Traffic Sources (& other transport)

In **IACC**, the RAF Valley runway refurbishment and extension was completed in September 2017. This resulted in perceptible and increased air traffic now using both RAF Valley and RAF Mona airfields in Anglesey. Both airfields now host Hawk T2 Training, Griffin HAR2 multi role helicopters and since February 2018 Texan T6C propeller training aircraft.

3.2 Industrial / Fugitive or Uncontrolled Sources / Commercial Sources

In **IACC**, Parc Bach petrol station opened in Benllech in November 2017 under the Environmental Permitting Regulation (EPR). Bwlch Gwyn quarry in Gaerwen reopened during August 2018. The quarry includes a concrete batching plant based on-site (EPR permitted installation from June 2019).

In **FCC**, an Energy Recovery Facility (EFR) at Weighbridge Road, Deeside Industrial Park is currently being commissioned (Planning Ref: 052626).

3.3 Planning Applications

DCC granted a planning permission for Blazers Fuel second Combustion Heating Plant (CHP) at Brickfield Lane in Ruthin. An Air Quality Assessment was undertaken (Planning Ref: 02/2018/0497).

WCBC received a planning application from Kronospan (Planning Ref: P/2018/0551) to create a new Orientated Strand Board facility in Chirk. An Air Quality Assessment accompanied this application (both for planning and for their Environmental Permit. Modelling concluded that there would be a negligible impact from the proposal.

3.4 Other Sources

A week-long wildfire was observed in July 2018 in Llantysilio Mountain and the Horseshoe Pass in Llangollen. Residents living as far as 30 miles away have reported a strong smell of smoke.

In **IACC**, there were 16 complaints recorded in 2018 as potential statutory nuisances relating to bonfires, but there were no enforcement actions noted or abatement notices served.

FCC also recorded an increase in complaints related to bonfires.

The local authorities in North Wales confirm that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

The authorities in North Wales confirm that all the following have been considered:

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

4. Policies and Strategies Affecting Airborne Pollution

4.1 Local / Regional Air Quality Strategy

There are no AQMAs declared in North Wales. Therefore, there are currently no active AQAPs. As air quality is considered to be good within all six local authority areas, there have been no local policies specifically related to air quality developed.

4.2 Air Quality Planning Policies

IACC has published Wylfa Newydd: Supplementary Planning Guidance (SPG) in May 2018. This documents sets out the County Council's response to national and local policy and strategies in the context of the Wylfa Newydd Project (available at <https://www.anglesey.gov.uk/documents/Docs-en/Planning/Planning-policy/Wylfa/Wylfa-newydd-spg.pdf>).

Air quality is also considered in the wider context in several local policies including:

IACC and **GC** have adopted a joint Local Development Plan which provides the land use strategy for the next 15 years. The plan addresses the need to maintain good air quality in the area and ensure new development does not cause adverse impacts.

The Conwy Local Development Plan 2007-2022 includes strategic policies (NTE/1) to ensure natural resources including air quality are protected (available at http://spp.conwy.gov.uk/upload/public/attachments/629/Conwy_Adopted_LDP_2007_2022_English_.pdf).

The **DCC** Local Development Plan 2006-2021 was adopted in 2013 and includes a commitment to avoid reaching critical air quality levels. It acknowledges that assessments of the environmental impact of transport proposals will need to also include air pollution along with noise and ecological impacts.

FCC is currently preparing their Local Development Plan. However, in the interim their Unitary Development Plan for the 15-year period, from 2000 to 2015 remains adopted. The plan identifies sites where new housing, employment and other development can take place, as well as setting out policies to protect important countryside, habitats, resources and heritage. Specific to air quality, Policy STR1 addresses the need to minimise pollution to air, water and land when proposing new developments and STR7 highlights the need to safeguard the natural environment.

WCBC is currently preparing the Local Development Plan 2 2013 to 2028 which will replace the adopted Unitary Development Plan 1996 to 2011. The plan is a long-term land use and development strategy focused on achieving sustainable development. It will set out policies that will be used to decide planning applications and safeguard areas of land requiring protection including strategies to ensure the environment is protected from adverse effects of pollution.

4.3 Local Transport Plans and Strategies

North Wales Joint Local Transport Plan (LTP) (2015-2025) has been jointly produced by the six North Wales local authorities in response to the Welsh Government requirement for LTPs to be submitted by the end of January 2015. The plan preparation has been overseen by Taith as a Joint Committee of the local authorities for transport. The Plan is a statutory document for transport in the region.

A review of the Wales Transport Strategy Objectives, the Welsh Government targets for investment and the Regional Transport Plan priorities, together with the review of issues and opportunities led to the drafting of outcomes for the Local Transport Plan. The Local Transport Plan Outcomes that relate to bringing about air quality improvements includes:

- Connections to Key Destinations and Markets: Support for Economic Growth through an improvement in the efficiency, reliability, resilience, and connectivity of movement, including freight, within and between North Wales and other regions and countries (with a particular focus on accessibility to the Enterprise Zones and an improvement in the vitality and viability of towns and other key centres);
- Benefits and Minimised Impacts on the Environment: the potential for transport improvements to positively affect the local and global natural and built environment will have been maximised and negative impacts minimised, including adaptation to the effects of climate change.

A set of higher level interventions have been developed which together aim to deliver the vision and outcomes sought for the LTP:

- Transport network resilience improvements – Improvements to key county corridors to remove/ improve resilience problems

- Integration with strategic public transport services – Schemes to improve access to rail stations including road access and bus services and interchange facilities, support for park and ride, walking and cycling routes and facilities.
- Improved links to Employment – Schemes to provide improved access to Enterprise Zones (EZs), ports, employment sites and town centres
- Access to services – Range of integrated transport measures to improve access to education, health, community, shopping and other services by public transport, walking and cycling as well as community transport, taxi, car share sites.
- Encouraging sustainable travel – Infrastructure improvements and promotional initiatives to increase levels of walking and cycling both for travel and for leisure as well as public transport. May include road and rail bridges/ crossings, cycle routes, footway/ footpath provision, safe routes to school, travel planning as well as road safety measures to assist vulnerable users.

4.4 Local Authorities Well-being Objectives

IACC and **GC** have published Wellbeing Plans (available at <https://www.llesiantgwyneddaron.org/eN/Asesiad-Llesiant/Asesiad-Llesiant/>) the report recognises that the population of Anglesey considers that the natural Environment improves well-being and contributes towards quality of life. As a consequence, the Board recognised the importance of protecting the natural environment. While this does not make specific reference to Air Quality, there could be an implied reference and future plans will be required by law to report on progress made.

Well-being objectives are also covered in **IACC** Wylfa Newydd SPG.

4.5 Climate Change Strategies

CCBC has progressively reduced carbon emissions from its vehicle fleet and as a result of energy consumed within its buildings. This reduction is summarised with the Conwy CBC 2017 Environmental Report (available at <https://beta.conwy.gov.uk/en/Council/Strategies-Plans-and-Policies/Corporate->

North Wales Authorities Collaborative Report

[Plan/assets/documents/Environmental-Report-2017-18.pdf](#)). Climate change strategies are also covered in **IACC** Wylfa Newydd SPG.

5. Conclusions and Proposed Actions

5.1 Conclusions from New Monitoring Data

There were no exceedances of the NO₂ annual mean AQO recorded in 2018. Annual mean concentrations were within 10% of the annual mean AQO at four sites and those concentrations were distance corrected to predict concentrations at sensitive receptor locations (See Appendix C).

PM₁₀, PM_{2.5}, SO₂ and benzene concentrations were below the AQO at every monitoring sites.

5.2 Conclusions relating to New Local Developments

There are no new or newly identified local developments which are expected to cause a significant adverse air quality impact on the surrounding area within North Wales.

5.3 Other Conclusions

No detailed assessments are required as a result of exceedances of pollutant concentrations and no AQMA need to be declared. Nonetheless, wider policy documents discussed in Section 4 address air quality issues to ensure concentrations remain below the AQOs.

5.4 Proposed Actions

The recommendations for the coming year are listed below:

- Proceed to the 2020 Updating and Screening Assessment;
- Maintain the air quality monitoring programmes in each local authority; and
- Ensure new monitoring sites are added as required.

References

- Bureau Veritas (2017) North Wales Combined Authority Annual Progress Report 2017. <https://www.denbighshire.gov.uk/en/resident/pests-pollution-and-food-hygiene/pollution/air-quality-reports/north-wales-combined-authority-2017-air-quality-progress-report.pdf>
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- The Anglesey and Gwynedd Joint Local Development Plan. <https://www.gwynedd.llyw.cymru/en/Council/Strategies-and-policies/Environment-and-planning/Planning-policy/Joint-Local-Development-Plan/Joint-Local-Development-Plan.aspx>
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- Wrexham County Borough Council (2016) Annual Status Report
- Wrexham County Borough Council Unitary Development Plan 1996 to 2011.
[https://www.wrexham.gov.uk/english/planning_portal/plan_policy/wxm_udp.htm](#)

Appendices

Appendix A: Monthly Diffusion Tube Monitoring Results

Appendix B: A Summary of Local Air Quality Management

Appendix C: Air Quality Monitoring Data QA/QC

Appendix A: Monthly Diffusion Tube Monitoring Results

Table A.1 – Full Monthly Diffusion Tube Results for 2018

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
IACC															
IACC-018	52.8	51	48.8	46.5	42.2	42.9	41.3	37.8	45.6	43.7	50.3	53.9	46.4	35.3	N/A
IACC-080	5.1	7.4	8.3	5.7	4.5	5.5	5.3	3.6	6.7	-	-	-	5.8	4.4	N/A
IACC-079	3.7	7.9	8	4.1	5.2	5.5	5.1	3.2	5.4	-	-	-	5.3	4.1	N/A
IACC-046	47.4	49.6	52.1	52.3	49.8	39.4	47.8	50	49.6	54.3	47.3	58.3	49.8	37.9	18.0
IACC-047	11.2	-	-	-	-	-	-	-	-	-	-	-	11.2	8.5	N/A
IACC-048	13.9	-	-	-	-	-	-	-	-	-	-	-	13.9	10.6	N/A
IACC-049	16.9	17.8	17.6	18.4	19.6		18.3	16.6	17.3	16.5	14.7	16.2	17.3	13.1	N/A
IACC-050	10.1	14	13.6	13.1	11.4	11.4	10.7	8.6	8.7	12.8	12.5	11.9	11.6	8.8	N/A
IACC-051	10	9.1	11.8	13.7	10.8	9.4	9.6	8.5	17.5	6.7	8.5	9.5	10.4	7.9	N/A
IACC-052	6.6	-	-	-	-	-	-	-	-	-	-	-	6.6	5.0	N/A
IACC-053	9.2	8.6	12.8	14.5	11.8	12.2	12.3	13.7	10.2	9.5	11.4	11.9	11.5	8.7	N/A

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
IACC-054	9.2	11	15.4	13.2	10	10	8.7	8.4	8.4	9.9	13.1	11.8	10.8	8.2	N/A
IACC-055	7.1	6.9	12.6	10	6.5	7.6	6	4.4	4.6	5.7	11.3	7.2	7.5	5.7	N/A
IACC-056	14.7	-	-	-	-	-	-	-	-	-	-	-	14.7	11.2	N/A
IACC-057	12.8	-	-	-	-	-	-	-	-	-	-	-	12.8	9.7	N/A
IACC-059	18.6	20.3	-	-	-	-	-	-	-	-	-	-	19.5	17.9	N/A
IACC-060	9.1	9.6	-	-	-	-	-	-	-	-	-	-	9.4	8.6	N/A
IACC-061	14.9	18.6	-	-	-	-	-	-	-	-	-	-	16.8	15.4	N/A
IACC-062	5.6	6.8	-	-	-	-	-	-	-	-	-	-	6.2	5.7	N/A
IACC-063	10.5	12.7	-	-	-	-	-	-	-	-	-	-	11.6	10.7	N/A
IACC-064	21.4	24.5	-	-	-	-	-	-	-	-	-	-	23.0	21.1	N/A
IACC-065	18.1	20.7	-	-	-	-	-	-	-	-	-	-	19.4	17.8	N/A
IACC-066	11.4	11.8	-	-	-	-	-	-	-	-	-	-	11.6	10.7	N/A
IACC-067	9.6	9	-	-	-	-	-	-	-	-	-	-	9.3	8.6	N/A
IACC-068	9.1	8.8	-	-	-	-	-	-	-	-	-	-	9.0	8.2	N/A

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
IACC-069	18.1	24.6	-	-	-	-	-	-	-	-	-	-	21.4	19.6	N/A
IACC-070	19.7	20.3	-	-	-	-	-	-	-	-	-	-	20.0	18.4	N/A
IACC-071	22	19.9	-	-	-	-	-	-	-	-	-	-	21.0	19.3	N/A
IACC-072	17.3	2.9	-	-	-	-	-	-	-	-	-	-	10.1	9.3	N/A
IACC-073	39.7	40	-	-	-	-	-	-	-	-	-	-	39.9	36.7	18.2
IACC-074	14.8	16.6	-	-	-	-	-	-	-	-	-	-	15.7	14.4	N/A
IACC-075	18.2	21.2	-	-	-	-	-	-	-	-	-	-	19.7	18.1	N/A
IACC-076	21.4	24.5	-	-	-	-	-	-	-	-	-	-	23.0	21.1	N/A
IACC-077	33.6	38.1	-	-	-	-	-	-	-	-	-	-	35.9	33.0	N/A
IACC-078	11.7	15.7	15.5	12.1	11.6	15.1	13.4	10.7	13.1	13.7	-	2.9	12.3	9.4	N/A
IACC-081	-	-	-	-	-	-	-	-	-	24.2	35.4	27.3	29.0	19.7	N/A
IACC-082	-	-	-	-	-	-	-	-	-	25.7	26	30.3	27.3	18.6	N/A
CCBC															
DT/CCBC001	22.7	25.0	29.7	26.2	28.2	28.2	21.3	16.3	17.8	24.7	27.0	26.9	24.5	18.6	N/A

Site ID	NO ₂ Mean Concentrations (µg/m ³)															
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean			
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾	
DT/CCBC017	18.7	23.5	30.5	26.3	31.6	25.0	22.0	15.3	14.4	19.8	23.4	23.4	22.8	17.3	N/A	
DT/CCBC018	22.8	25.3	23.7	21.8	22.0	21.8	23.0	24.6	22.8	24.0	25.4	27.2	23.7	18.0	N/A	
DT/CCBC021	17.0	17.3	23.6	22.9	28.8	25.5	25.4	22.7	18.2	20.1	18.2	18.3	21.5	16.3	N/A	
DT/CCBC022	24.9	25.1	29.2	23.7	24.0	22.6	20.3	22.4	22.8	26.8	22.0	25.0	24.1	18.3	N/A	
DT/CCBC026	28.8	38.7	40.1	36.4	33.5	31.0	24.6	22.1	22.2	30.6	38.4	35.0	31.8	24.2	N/A	
DT/CCBC027	21.2	22.4	26.4	19.2	19.0	16.8	13.7	13.5	15.7	19.8	22.3	23.6	19.5	14.8	N/A	
DT/CCBC031	28.6	26.8	32.3	24.3	22.3	22.0	21.6	22.4	24.4	25.3	-	32.2	25.7	19.5	N/A	
DT/CCBC032	21.2	26.4	29.0	24.4	24.1	21.7	20.3	18.3	17.7	23.1	-	28.5	23.5	17.8	N/A	
DT/CCBC033	15.4	21.1	26.2	19.1	22.4	22.5	15.3	11.9	11.2	16.7	20.2	18.7	18.4	14.0	N/A	
DT/CCBC034	-	30.9	31.4	24.8	25.6	23.0	25.2	6.8	29.6	26.6	30.1	35.2	26.3	20.0	N/A	
DT/CCBC035	-	21.9	25.7	25.0	25.8	23.0	20.0	12.2	17.9	23.1	25.8	23.3	21.7	16.5	N/A	
DT/CCBC036	16.8	17.0	19.1	15.9	15.3	13.4	11.0	8.5	8.8	18.1	21.1	18.0	15.3	11.6	N/A	
DT/CCBC037	18.8	-	23.8	24.0	23.0	20.7	22.1	20.3	23.9	26.8	31.0	25.0	23.6	17.9	N/A	
DT/CCBC038	19.3	-	27.0	17.1	21.3	21.7	18.7	16.3	15.8	21.1	17.1	21.0	19.7	15.0	N/A	

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
DCC															
DBK1	32.7	42.4	38.2	41.3	36.3	27.1	28.8	24.3	25.6	28.0	42.0	33.2	33.3	25.3	N/A
DBR2	38.7	38.6	36.8	39.4	32.1	26.4	28.2	26.2	25.3	33.2	35.3	36.5	33.1	25.1	N/A
DBR5	17.1	21.4	23.1	21.7	22.7	17.7	18.6	15.6	17.1	20.8	16.9	16.9	19.1	14.5	N/A
DBR48	32.7	36.7	37.2	35.7	35.4	29.8	32.5	21.3	24.1	31.4	33.1	32.8	31.9	24.2	N/A
DBR23	27.8	28.1	26.1	20.1	19.2	17.0	19.1	16.9	19.2	25.1	24.8	24.6	22.3	17.0	N/A
DBR8	21.6	27.6	19.7	19.4	18.0	13.7	16.1	13.5	14.5	19.4	19.0	21.1	18.6	14.2	N/A
DBR9	29.1	39.4	29.4	32.2	24.1	18.9	20.1	19.2	16.6	22.7	34.8	25.6	26.0	19.8	N/A
DBR10	16.2	28.9	22.9	21.1	15.5	13.1	14.0	13.0	13.2	20.3	23.7	19.2	18.4	14.0	N/A
DBR24	44.4	50.7	42.3	41.6	44.4	38.5	43.0	35.4	42.2	43.1	39.3	48.1	42.8	32.5	N/A
DBR20	27.3	35.7	24.2	27.3	26.2	23.5	25.0	19.7	25.9	31.5	27.0	30.2	27.0	20.5	N/A
DBR43	-	50.9	45.0	41.8	35.1	30.5	37.8	32.9	37.5	43.4	41.9	45.0	40.2	30.5	N/A
DBR44	36.0	36.1	34.2	33.9	34.4	25.8	30.2	24.1	27.7	36.6	32.5	35.6	32.3	24.5	N/A
DBR45	31.9	37.0	32.2	28.8	30.4	-	27.4	21.7	24.5	30.9	31.9	35.3	30.2	22.9	N/A

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	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean			
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾	
DBR37	36.0	44.7	37.6	34.4	-	34.3	34.2	23.3	32.8	34.7	28.4	33.1	34.0	25.8	N/A	
DBR38	26.1	29.4	19.6	21.0	-	18.1	18.7	14.2	21.7	21.5	23.6	16.6	21.0	15.9	N/A	
DBR52	32.0	36.0	31.7	29.8	26.1	22.4	24.9	20.0	22.0	31.2	33.1	33.8	28.6	21.7	N/A	
DBR53	41.9	48.0	39.5	38.5	34.8	30.9	36.1	28.7	33.4	43.2	37.6	41.1	37.8	28.7	N/A	
DBR31	22.6	28.6	27.2	24.7	19.8	-	20.7	15.1	16.2	3.1	27.6	26.8	21.1	16.1	N/A	
DBR32	25.0	29.7	27.3	21.7	21.3	19.4	22.8	17.8	19.9	26.3	25.7	30.5	24.0	18.2	N/A	
DBR33	37.5	39.6	37.8	38.0	29.8	25.7	27.3	25.2	24.6	34.3	36.3	40.1	33.0	25.1	N/A	
DBR34	20.1	23.9	22.6	21.7	-	14.8	15.5	12.4	14.3	20.3	27.7	15.3	19.0	14.4	N/A	
DBR49	20.5	27.0	22.6	26.4	-	21.1	18.8	16.5	13.5	20.5	23.9	23.6	21.3	16.2	N/A	
DBR56	20.9	29.2	16.6	24.8	23.8	-	-	13.9	16.3	24.6	23.4	22.3	21.6	16.4	N/A	
DBR58	22.8	29.5	24.2	22.5	24.2	17.5	20.4	16.9	17.4	22.7	21.2	20.2	21.6	16.4	N/A	
DBR55	36.3	55.5	43.2	54.0	-	44.8	52.1	37.5	42.8	47.3	54.2	48.3	46.9	35.7	N/A	
DBR57	12.3	20.9	16.9	16.3	11.1	9.7	10.3	8.2	11.0	17.3	19.3	17.8	14.3	10.8	N/A	
FCC																

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													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾	
Site 1		31.1	37.2	31.3	36.5	38	28.1	22.4	23.4	27.3	43	34.7	32.1	24.4	N/A	
Site 2	25.8	30.4	30.3	26.3	15	20.1	17.2	2.1	17.3	20.1	36.7	30.9	22.7	17.2	N/A	
Site 3	40.9	38.2	44.1	45	36.9	32.8	25.3	22.7	23	33.1	57.8	45.7	37.1	28.2	N/A	
Site 4	22.8	25.3	20.1	18.9	21	17.6	18.9	16	17.5	21	26.9	26.4	21.0	16.0	N/A	
Site 5	31	-	-	32.8	-	-	-	-	-	-	30.2	25	29.8	18.6	N/A	
Site 6	14.7	16.2	18.6	13	14.9	10.6	10.6	7.8	8.2	11.3	22.2	17.7	13.8	10.5	N/A	
Site 7	23.6	21.5	24.1	16.9	19.4	16.6	15.1	14	14.6	18.3	26.7	23.9	19.6	14.9	N/A	
Site 8	18.7	19.6	21.2	16.3	16.2	12.8	12.3	11.1	12.6	16.6	24.6	17	16.6	12.6	N/A	
Site 9	29.3	-	-	29.7	-	-	-	-	-	17.3	23.2	22.7	24.4	15.9	N/A	
Site 10	28.3	-	-	-	-	-	-	-	-	-	-	-	28.3	21.5	N/A	
Site 11	42.7	34.9	49	34.3	43.1	37.3	33	33.4	37.7	41.4	37.5	27.3	37.6	28.6	N/A	
Site 12	45.5	46.2	46.4	46.3	42.3	37.6	35.5	36.5	37.6	41.7	54.6	51.4	43.5	33.0	N/A	
Site 13	54.1	51.1	51.9	45.8	43.3	38.9	37.2	31.3	40.9	42.7	56.1	55.5	45.7	34.8	N/A	
Site 14	20.2	22.4	21.6	19.3	19.7	17.1	14.4	12.5	-	18.7	23.5	23.2	19.3	14.7	N/A	

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													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾	
Site 15	33.6	42	48.4	40.2	32.2	28.4	30.4	25.5	-	34.2	36.1	41.3	35.1	26.7	N/A	
Site 16	29.2	39.2	37.4	30.7	33.3	28	25.1	25.9	29.7	32.6	39.1	39.7	32.5	24.7	N/A	
Site 17	31.2	37	39.1	34.2	36.1	30.4	29.2	23.7	22.7	33.1	38.6	36.4	32.6	24.8	N/A	
Site 18	-	25.3	24.3	15.9	17.9	14.1	14.5	12.9	-	15.4	26.4	24.6	19.1	14.5	N/A	
Site 19	-	31.7	34.1	30.8	34.6	27.1	24.9	20.1	-	26.8	40.6	30.5	29.7	22.6	N/A	
Site 20	32.8	29.9	34.3	29.7	28.6	20.8	23.6	20.5	21.7	23	30.8	30.6	27.2	20.7	N/A	
Site 21	28.7	31.6	31.8	28.8	21	20.6	19.4	17.5	20.5	23	39.6	33.6	26.3	20.0	N/A	
Site 22	12.4	26.6	25.7	24	22.6	18.4	30.3	16.1	18.9	17.9	32.5	31.8	23.1	17.6	N/A	
Site 23		33.4	37.1	30.5	-	28.3	15.3	27.9	28.9	33.7	45.4	40.1	32.1	24.4	N/A	
Site 24	46.7	51.6	44.3	44	-	38.7	38.7	35.3	38	34.7	53.7	53.7	43.7	33.2	N/A	
Site 25	29.7	26.8	23.1	21.5	21.4	15.3	15.7	16.5	18.6	19.5	32.3	30.9	22.6	17.2	N/A	
Site 26	23.3	21.4	25.2	16.9	17.3	12.3	11.6	10.7	13.5	18.1	32.5	21.6	18.7	14.2	N/A	
Site 27	-	32	31.1	25.3	30.8	23.6	21.4	21.9	21.3	24.6	41.6	-	27.4	20.8	N/A	
Site 28	-	29.2	23.6	22.6	24	21.6	17.3	18.8	23.7	20.6	23.5	-	23.5	17.9	N/A	

Site ID	NO ₂ Mean Concentrations (µg/m ³)															
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													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾	
Site 29	25.1	24.8	29.9	20	19.4	16.1	16.2	14.9	15	23	34.9	23.5	21.9	16.6	N/A	
Site 30	31.5	39.3	-	31.3	34	28.6	28.6	25	26.8	34.9	35.4	31.3	31.5	24.0	N/A	
Site 31	24.2	29.1	-	27	26.4	22	20.4	20.4	-	24.9	32.8	35.5	26.6	20.2	N/A	
Site 33	-	37.3	38	33.3	31.4	30	27	24.7	-	30.2	39.7	38.9	32.6	24.8	N/A	
Site 34	-	27.3	24.1	26.3	30.5	26.2	23.6	23	25.4	27.1	34.9	36.3	28.0	21.3	N/A	
Site 35	31.5	29	37.6	26.5	24	22.9	19.9	17.8	20.2	21.5	32.2	29.5	26.1	19.8	N/A	
Site 36	29.6	30	32.1	24.4	28.4	20.8	21.7	20.2	21.6	26.6	37.5	36.5	27.5	20.9	N/A	
Site 37	32.9	32.4	37.0	35.4	-	-	-	-	-	-	-	-	34.4	21.5	N/A	
Site 38	18.4	18.2	17.0	15.9	14.3	12.1	11.4	9.2	10.9	13.3	25.1	17.2	15.3	11.6	N/A	
Site 39	25.4	21.2	25.6	21.8	22.7	18	18.8	18.3	18.3	24	31.4	27.8	22.8	17.3	N/A	
Site 40	26.1	23.1	19	16.2	22.9	18.7	16	14.2	16.6	18.3	20.9	23.4	19.6	14.9	N/A	
Site 41	10.4	11.1	16	11.5	12.5	12.5	10.6	6.9	7.8	-	-	13.9	11.3	8.6	N/A	
Site 42	17.7	15.7	18.7	12.5	16.2	13.6	16.4	8.8	10.1	16.2	26.6	-	15.7	11.9	N/A	
Site 43	-	16.1	22.9	15.9	13.3	-	12.9	-	-	11.5	-	-	16.4	12.2	N/A	

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Site 44	-	30.3	31	26.5	31.9	-	27.3	22.1	-	23.7	-	34.4	28.4	22.3	N/A	
Site 45	16.9	15.5	14.6	13.6	-	-	-	-	-	-	-	-	15.2	9.5	N/A	
Site 46	-	23.5	28.7	22.2	24.9	19.1	18.1		20.2	22.5	30.8	24.2	23.4	17.8	N/A	
Site 47	-	39.6	44	36.3	38.6	40.2	35.5	9.2	36	41	38.3	41.5	36.6	27.8	N/A	
Site 48	28.8	27.6	26.9	22.8	25.7	22.7	20.7	18.3	19.7	23.6	25.4	28.5	24.2	18.4	N/A	
Site 49	27	22.1	26.9	23	20.1	18.9	17.5	14.2	17.1	19.2	27.4	29.2	21.9	16.6	N/A	
Site 50	22.4	26.2	24	21.6	24.1	18.3	19.2	6.9		23.6	27.7	26.5	21.9	16.6	N/A	
Site 51	49.2	48.5	37.8	46.2	44	40.1	37.8	8.8	36.7	40.8	54.5	41.3	40.5	30.8	N/A	
Site 52	17	18.1	22.1	15.6	16.9	12	9.9		8.7	13.4	22.8	19.8	16.0	12.2	N/A	
Site 53	39	30.7	37.1	31.7	33.9	27.5	23.4	22.1	26.5	25.9	32	37.6	30.6	23.3	N/A	
Site 54	11.5	19.6	19.3	14.3	15.2	10.5	9.5		11.1	15.7	21.1	14.7	14.8	11.2	N/A	
Site 55	13.1	17.6	15.5	12.9	13.2	9.2	9.5	8.4	-	13.3	17.7	19.2	13.6	10.3	N/A	
Site 56	-	20	19.8	14.4	17.2	9.6	-	-	-	14.8	23.2	-	17.0	11.3	N/A	
Site 57	-	48	55.4	49.7	53.8	47	43.3	43.8	44.8	49.2	53.5	-	49.5	37.6	30.9	

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S1	39.5	42.9	42.1	-	33.9	26.3	28	25.3	32.6	39.1	42.8	37.7	35.5	27.0	N/A	
S2	38.9	32.7	33.2	-	34.9	27.2	25	24.4	28.2	31		35.8	24.6	18.7	N/A	
GC																
GCC 002	33.5	34.1	39.5	36.8	36.6	31.1	33.3	32.1	32.9	35.9	33.0	28.3	33.9	31.2	N/A	
GCC 003	11.8	13.6	13.0	10.1	11.7	10.1		7.4	8.0	11.7	13.4	11.4	11.1	10.2	N/A	
GCC 005	25.7	28.3	35.6	31.0	40.9		29.0	29.5	29.3	31.8	27.4	25.2	30.3	27.9	N/A	
GCC 008	27.8	28.8	29.3	25.8	28.1	24.5	22.1	19.2	22.0	20.0	30.1	27.0	25.4	23.4	N/A	
GCC 011	27.8	26.6	28.5	25.7	28.1	22.7	-	24.4	27.8	32.0	27.8	28.7	27.3	25.1	N/A	
GCC 012	29.2	29.7	34.1	26.8	35.9	31.6	27.7	24.4	25.6	31.3	-	24.4	29.1	26.8	N/A	
GCC 013	21.8	22.1	25.6	22.1	25.8	21.1	18.3	19.5	19.2	24.1	21.3	20.4	21.8	20.0	N/A	
GCC 015	24.5	26.6	27.0	23.7	27.0	21.2	22.1	23.6	22.1	25.4	27.7	19.6	24.2	22.3	N/A	
GCC 037	32.5	27.8	-	35.8	25.8	-	-	25.0	22.9	14.8	31.5	30.1	27.3	25.2	N/A	
GCC 038	32.1	29.0	30.0	30.3	36.8	35.1	28.2	27.9	27.7	32.2	29.9	27.1	30.5	28.1	N/A	
GCC 039	28.6	-	-	28.4	38.3	39.3	28.6	27.7	29.6	32.3	-	26.7	31.1	28.6	N/A	

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
GCC 040	24.9	18.7	18.2	19.5	20.8	18.3	18.1	18.8	21.9	20.1	19.8	22.1	20.1	18.5	N/A
WCBC															
WBC-001	42.7	42.6	45.2	36.6	28.0	26.8	27.7	27.0	34.5	3.2	35.9	42.3	32.7	24.9	N/A
WBC-010	24.0	17.5	16.1	17.4	12.2	10.0	10.2	11.6	13.9	13.7	17.6	22.7	15.6	11.8	N/A
WBC-015	20.7	23.8	21.9	50.1	15.5	13.8	12.1	18.3	17.4	19.2	25.2	21.0	21.6	16.4	N/A
WBC-018	19.3	24.5	23.6	27.6	24.7	18.8	21.7	13.5	18.6	23.6	27.5	27.7	22.6	17.2	N/A
WBC-019	27.6	31.8	26.8	27.8	21.7	15.8	17.3	18.4	26.4	32.8	33.3	35.1	26.2	19.9	N/A
WBC-020	31.3	37.1	35.0	32.7	30.6	24.2	23.7	22.1	25.9	31.3	36.6	34.0	30.4	23.1	N/A
WBC-021	27.2	34.4	28.4	30.1	17.7	15.2	17.8	15.8	20.4	23.3	31.2	35.3	24.7	18.8	N/A
WBC-022	24.7	24.2	24.0	21.4	17.9	16.1	16.2	15.6	17.2	21.2	25.8	23.8	20.7	15.7	N/A
WBC-030	47.8	50.8	47.4	20.1	54.0	44.1	46.5	40.9	47.9	50.8	52.5	47.9	45.9	34.9	N/A
WBC-031	44.9	29.9	42.4	40.7	35.0	11.6	34.1	36.5	-	44.6	50.7	43.2	37.6	28.6	N/A
WBC-032	39.7	44.5	39.7	35.4	35.2	28.2	28.0	27.3	33.3	37.8	36.3	44.0	35.8	27.2	N/A
WBC-033	27.7	41.7	27.2	21.8	24.1	18.9	20.5	16.7	20.0	24.0	19.6	29.7	24.3	18.5	N/A

Site ID	NO ₂ Mean Concentrations (µg/m ³)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
WBC-034	16.9	27.0	26.5	20.3	18.1	15.8	14.3	11.0	14.0	16.8	31.5	17.1	19.1	14.5	N/A
WBC-036	25.2	26.7	20.3	25.7	21.7	15.6	16.3	15.0	20.0	23.0	30.6	32.9	22.8	17.3	N/A
WBC-037	34.3	35.9	27.9	26.9	25.5	20.8	20.4	19.0	23.0	27.9	27.3	31.4	26.7	20.3	N/A
WBC-039	22.6	29.0	29.0	23.8	25.2	21.6	19.0	18.3	22.6	29.8	20.4	29.6	24.2	18.4	N/A
WBC-040	16.7	19.4	15.8	13.3	11.8	34.2	11.1	10.0	12.6	15.3	12.9	17.6	15.9	12.1	N/A
WBC-041	15.7	26.6	21.7	20.9	22.9	17.2	16.0	13.8	12.6	22.6	29.3	23.6	20.2	15.4	N/A
WBC-042	29.4	37.7	34.8	18.4	30.8	30.9	27.7	27.1	28.2	38.1	29.9	33.4	30.5	23.2	N/A
WBC-043	28.0	25.9	25.4	26.5	21.6	17.5	19.3	18.6	21.8	29.1	33.3	37.1	25.3	19.3	N/A
WBC-044	30.3	35.4	34.2	30.2	33.4	24.8	22.1	22.0	22.3	31.7	31.9	39.7	29.8	22.7	N/A
WBC-045	19.3	34.0	32.2	31.5	33.5	29.1	22.8	17.1	16.9	23.2	22.1	25.0	25.6	19.4	N/A
WBC-046	35.2	35.5	36.1	36.7	28.4	23.6	23.7	21.4	26.0	37.7	38.8	42.5	32.1	24.4	N/A
WBC-047	48.0	-	-	-	-	-	-	-	-	-	-	-	48.0	36.5	21.3
WBC-048	-	30.7	27.5	21.0	21.6	23.6	17.7	19.1	21.5	28.5	24.8	29.5	24.1	18.3	N/A
AURN 1	19.6	28.6	22.4	27.3	22.4	16.1	18.0	14.4	16.2	23.7	27.9	26.3	21.9	16.7	N/A

Site ID	NO ₂ Mean Concentrations (µg/m ³)												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (See Appendix C) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
	AURN 2	14.5	23.5	24.6	20.4	22.2	18.6	17.5	14.1	16.0	23.2	26.4			
AURN 3	19.0	28.3	24.2	23.9	22.4	17.0	16.9	15.6	15.5	21.8	31.0	27.5	21.9	16.7	N/A

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

Table A.2 – Full Monthly Benzene Diffusion Tube Results for 2018 - WCBC

Site ID	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Average mean concentration
WBC-026	2.0	1.0	0.6	0.7	0.4	0.6	0.6	0.5	0.6	0.6	0.5	0.5	0.7

Appendix B: A Summary of Local Air Quality Management

Purpose of an Annual Progress Report

This report fulfils the requirements of the Local Air Quality Management (LAQM) process as set out in the Environment Act 1995 and associated government guidance. 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 being achieved. Where exceedances occur, or are likely to occur, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) within 18 months of declaration setting out the measures it intends to put in place in pursuit of the objectives. Action plans should then be reviewed and updated where necessary at least every 5 years.

For Local Authorities in Wales, an Annual Progress Report replaces all other formal reporting requirements and have a very clear purpose of updating the general public on air quality, including what ongoing actions are being taken locally to improve it if necessary.

Air Quality Objectives

The air quality objectives applicable to LAQM in Wales are set out in the Air Quality (Wales) Regulations 2000, No. 1940 (Wales 138), Air Quality (Amendment) (Wales) Regulations 2002, No 3182 (Wales 298), and are shown in Table B.1.

The table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedances in each year that are permitted (where applicable).

Table B.1 – Air Quality Objectives Included in Regulations for the Purpose of LAQM in Wales

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Nitrogen Dioxide (NO ₂)	200µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40µg/m ³	Annual mean	31.12.2005
Particulate Matter (PM ₁₀)	50µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40µg/m ³	Annual mean	31.12.2004
Particulate Matter (PM _{2.5})	25 µg/m ³ (EU limit) (10µg/m ³ WHO guideline)	Annual mean	-
Sulphur dioxide (SO ₂)	350µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean	31.12.2005
Benzene	16.25µg/m ³	Running annual mean	31.12.2003
	5.0µg/m ³	Annual mean	31.12.2011
1,3 Butadiene	2.25µg/m ³	Running annual mean	31.12.2003
Carbon Monoxide	10.0mg/m ³	Running 8-Hour mean	31.12.2003
Lead	0.25µg/m ³	Annual Mean	31.12.2008

Appendix C: Air Quality Monitoring Data QA/QC

Diffusion Tube Bias Adjustment Factors

Diffusion tubes adjustment factors were obtained from the national bias adjustment calculator v06/19. Tubes were analysed by Gradko or Socotec Didcot as detailed in the table below.

Local authority	Laboratory	Method	2019 Bias adjustment factor	Number of studies
IACC (A1 to A19) GC	Gradko	20% TEA in water	0.92	37
IACC CCBC DCC FCC WCBC	Socotec Didcot	50% TEA in acetone	0.76	28

PM Monitoring Adjustment

The particulate monitoring undertaken in WCBC was via use of daily gravimetric Partisols. These meet the European equivalence testing and therefore are not subject to any correction.

The Osiris instruments run by IACC have not been adjusted. The IACC have previously demonstrated that an adjustment factor of 1.3 would lead to a significant overestimation of the impact of coarse dust (e.g. quarry dust). Therefore, it was deemed inappropriate to adjust the data gathered using the Osiris monitors as these instruments are normally monitoring for the coarse fractions e.g. quarry dust.

Short-Term to Long-Term Data Adjustment

Data capture at all sites which recorded less than 75% data capture during 2018 has been annualised according to the method set out in Boxes 7.9 and 7.10 of LAQM.TG16. The details of the annualisation have been provided in Table C.1.

2018 data for the automatic monitoring station used for the annualisation were obtained from <https://airquality.gov.wales/>.

Table C.1 – NO₂ Short-Term to Long-Term Monitoring Data Adjustment Ratios

	Diffusion tube	Aston Hill (Urban)	Cwmbran (Urban background)	Narberth (Rural)	Swansea Cwm Level Park (Urban background)	Average Ratio
IACC	IACC-081 IACC-082	0.88	0.83	0.93	0.93	0.89
FCC	Site 5	0.80	0.80	0.85	0.84	0.82
	Site 9	0.85	0.81	0.90	0.88	0.86
	Site 37	0.82	0.86	0.83	0.79	0.82
	Site 43	1.01	0.98	0.96	0.95	0.98
	Site 44	1.09	1.02	1.02	1.01	1.03
	Site 45	0.82	0.86	0.83	0.79	0.82
	Site 56	0.75	0.97	0.83	0.95	0.87

QA/QC of Automatic Monitoring

The Victoria Road AURN automatic monitoring station in WCBC is part of the Automatic Urban and Rural Network (AURN). The data ratification and station audit are carried out by Ricardo-AEA under contract with Defra and the Devolved Administrations.

The four PM₁₀ automatic monitoring stations in IACC are run by the local authority. Routine filter changes and air flow checks (600ml/min) on the Turnkey Osiris instruments are carried out normally on a quarterly basis. This is in addition to an annual service and calibration undertaken by Turnkey Instruments under the terms of the service contract.

In 2017 The GSM modems have been replaced with Webservers which continuously upload the data into the AirQWeb website. The software immediately notifies the local authority by email of any issues with the monitors.

This enables the performance of the instrument to be monitored and enables problems to be rectified quickly and with minimum loss of data. Data is normally analysed as 15-minute averages and is exported hourly from AirQWeb into the Welsh Air Quality Website. A visual data ratification process is employed, to safeguard against erroneous peaks etc., before any results are reported. Utilizing a spare Osiris monitor, while normal monitors are away for calibration, has significantly improved data capture.

QA/QC of Diffusion Tube Monitoring

ESG Didcot and Gradko are both UKAS accredited laboratories who participates in the new AIR-PT Scheme (a continuation of the Workplace Analysis Scheme for Proficiency (WASP)) for NO₂ tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO₂ concentrations reported are of a high calibre. The labs follow the procedures set out in the Harmonisation Practical Guidance.

ESG Didcot and Gradko both scored 100% on all results for 2018. The percentage score reflects the results deemed to be satisfactory based upon the z-score of $< \pm 2$.

Results are available at <https://laqm.defra.gov.uk/diffusion-tubes/qa-qc-framework.html>.

Fall-off with Distance Correction of Sites Exceeding and within 10% of the NO₂ Annual Mean Objective

Concentrations at several monitoring site were within 10% of the NO₂ annual mean AQO. Consequently, their annual means were distance-corrected using the NO₂ fall-

off with distance calculator (Version 4.2). Calculations parameters and results are represented in the figure below.

It should be noted that for the IACC sites, the closest receptors are situated more than 20m further from the kerb than the monitor and so results should be treated with caution.



Enter data into the pink cells

Site Name/ID	Distance (m)		NO ₂ Annual Mean Concentration (µg/m ³)			Comment
	Monitoring Site to Kerb	Receptor to Kerb	Background	Monitored at Site	Predicted at Receptor	
FCC Site 57	1.0	3.0	7.3	37.6	30.9	
IACC-046 (DT4)	3.0	33.0	5.9	37.9	18.0	Warning: your receptor is more than 20m further from the kerb than your monitor - treat result with caution.
IACC-073 (A15)	1.5	21.5	5.1	36.7	18.2	Warning: your receptor is more than 20m further from the kerb than your monitor - treat result with caution.
WBC-047	1.0	15.0	8.7	36.5	21.3	

Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the LA intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
APR	Air quality Annual Progress Report
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide