North East Lincolnshire Council
Annual Status Report 2019

Bureau Veritas

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2019 Air Quality Annual Status Report (ASR)

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

June 2019

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Executive Summary: Air Quality in Our Area

Air Quality in North East Lincolnshire

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

The main sources of air pollution within North East Lincolnshire (the Council) is from road traffic and local background that includes sources from domestic, institutional and commercial space heating, rail, industry, aircraft and roads, point sources and other sources (ships and off-road emissions). In addition, industrial emissions arise from the industrial areas in and around the ports of Grimsby and Immingham.

The Council has one AQMA, which is located at Cleethorpe Road / Riby Square, within Grimsby. The AQMA was declared in 2010. An Air Quality Action Plan (AQAP) was produced in 2012 setting out measures aimed at reducing levels of NO_2 within the AQMA area. The 2012 AQAP is currently being reviewed and a revised AQAP will be issued later this year. In 2018, dispersion modelling was carried out for the Cleethorpe Road AQMA. The 2017 base year model results for discrete and gridded receptors suggest that there are exceedances of the annual mean NO_2 objective within the Cleethorpe Road AQMA, therefore, the AQMA should be retained. This is consistent with 2017 monitoring result at DIF11/12/13 monitoring site where the exceedances of annual mean NO_2 objective were recorded within the AQMA. The source apportionment across all the selected receptors show that Local Background is the largest contributor at 59.3%, followed by Local Road Sources at 22.2%, then Regional Background at 18.5%. When considering the average NO_x concentration at receptors within the AQMA, emission from cars is the largest contribution of local road emission, followed by the emission contribution from HGVs.

[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

Real-time automatic monitoring was not undertaken by the Council during 2018. However, a background AURN monitoring station, operated by the Environment Agency, was installed in November 2017 in Immingham, on Woodlands Avenue. The NO_2 concentration data reported at this station has been provided in the report and can also be viewed in real-time at https://uk-air.defra.gov.uk/data/. Furthermore, NO_2 diffusion tube monitoring was completed at 26 locations throughout the borough.

The diffusion tubes DIF 10 and DIF 30 were relocated to Aylesby Road Grimsby and Victoria Street South, Grimsby respectively due to the concern raised after pre-planning application were submitted for two developments.

The national bias adjustment factor of 0.76 was applied for all the diffusion tube results in 2018 as there are no co-located sites within the Council area in 2018.

In 2018, all the diffusion tubes except DIF 9 have seen a decrease in annual mean NO_2 concentrations when compared to the 2017 monitoring results. DIF 9 reported a slight increase of 0.1.µg/m^3.

In 2018, there were no exceedances of the annual mean NO_2 objective and there was only one location where the annual mean concentration for NO_2 was within 10% of the annual mean NO_2 objective. This is at the triplicate diffusion tubes site DIF 11/12/13, which is located within the designated Air Quality Management Area (AQMA). The location reported an annual mean NO_2 concentration of 38.0µg/m^3. The diffusion tubes are located at the relevant exposure and therefore no distance correction is required for this location.

The annual mean NO_2 concentration did not exceed 60µg/m^3 at any non-automatic monitoring site. Therefore exceedances of the 1-hour mean objective are unlikely at all monitoring locations. Furthermore, there were no exceedances of the 1-hour mean NO_2 objective reported at the AURN Site.

Actions to Improve Air Quality

The Air Quality Steering Committee that was set up in 2016 has continued to meet on a quarterly basis through 2018. The meetings include representatives from the Planning, Public Health, Transport, Highways, Communications and Carbon Reduction Teams. Feedback continues to be positive from these meetings as they provide an opportunity for all parties to share ideas and develop a collective approach towards some of the current air quality issues within the borough.

Work on the Electric Vehicle (EV) strategy has been carried out and this is expected to be completed in 2019. This is North East Lincolnshire wide and will be based on demand ultra-low vehicles for up to 5 years. The policy will include resident parking, EV charging points, tourism and commercial opportunities for both NELC and Engie.

Work has begun on an air quality planning guidance document since the North East Lincolnshire Local Plan was adopted, and finalisation of the revised Air Quality Strategy is to be completed once a review and update of the 2012 Cleethorpe Road Air Quality Action Plan has been completed.

The Council vehicle fleet continues to be enhanced, with twenty eight electric vehicles now included within the fleet. This enhancement is set to continue for personal use and also for commercial use.

The Council ran a social media campaign in June 2018 to promote Clean Air Day. A free event was held in Freshney Place Shopping Centre for Clean Air Day on the 21st of June that included:

- Pledge making for National Clean Air Day;
- Information and advice on energy saving tips for your home, Home Energy schemes that are available and how to get cheaper energy bills; and
- Sustainable travel and transport information.

Conclusions and Priorities

The monitoring results in 2018 show that there are no exceedances of the annual mean NO_2 objective, and there is only one location where the annual mean concentration was within 10% of the annual mean objective.

The following points provide a summary of conclusions and the priorities for 2019:

- The Council will continue to monitor NO_2 within the existing diffusion tube monitoring network, continually reviewing the positioning of diffusion tubes to monitor any possible hotspots in pollutant concentrations;
- The current 2012 Cleethorpe Road Air Quality Action Plan is currently being revised and work to take this forward is to be completed during 2019;
- The Air Quality Strategy will be finalised upon completion of the revised Cleethorpe Road Air Quality Action Plan;

- The Council will continue to assess any new developments in terms of its impact upon local air quality to ensure that developments do not result in a negative impact. An air quality guidance document in the form of a Supplementary Planning Document is currently being developed; and
- Currently the Council are in the process of procuring new automatic monitoring equipment and a maintenance and service contract. It is envisaged that the Council will recommence real-time monitoring in 2019.

Local Engagement and How to get Involved

Everyone contributes to the release of air pollution, and localised behavioural changes can help to reduce local concentrations or air pollutants on a wider scale. Many of the possible measures will save money and improve general fitness through increased exercise.

Everyday initiatives to help improve air quality:

- Where possible use public transport, walk or cycle. A modal shift in transportation decreases the number of cars on the road, reducing congestion, overall traffic movements and the amount of pollutant emissions;
- Car share to reduce the number of cars on the road, again this reduces congestion, traffic movement and therefore the amount of emissions;
- Driving economically by turning your engine off when stationary saving fuel and reducing emissions; and
- Keeping your vehicle good working order, having well-inflated tyres means your car will be more efficient and use less fuel.

Clean Air Day is a chance to find out more about air pollution, share information with others and help make the environment and air quality cleaner for everyone. Further details on the Clean Air Day can be found at https://www.cleanairday.org.uk/.

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1 Local Air Quality Management

This report provides an overview of air quality in North East Lincolnshire during 2018. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by North East Lincolnshire Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E. 1 in Appendix E.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

AQMAs are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an AQAP within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of the AQMA declared by North East Lincolnshire can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=175. Alternatively, see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides maps of air quality monitoring locations in relation to the AQMA.

During 2018 the highest NO_2 annual mean concentration within the AQMA was recorded as 38.0µg/m^3. This was recorded at the triplicate diffusion tube site (DIF 11/12/13).

The Council has one AQMA, which is located at Cleethorpe Road / Riby Square, within Grimsby. The AQMA was declared in 2010. An Air Quality Action Plan (AQAP) was produced in 2012 setting out measures aimed at reducing levels of NO_2 within the AQMA area. The 2012 AQAP is currently being reviewed and a revised AQAP will be issued in later this year. In 2018, dispersion modelling was carried out for the Cleethorpe Road AQMA. The 2017 base year model results for discrete and gridded receptors suggest that there are exceedances of the annual mean NO_2 objective within the Cleethorpe Road AQMA, therefore, the AQMA should be retained. This is consistent with 2017 monitoring result at DIF11/12/13 monitoring site where the exceedances of annual mean NO_2 objective were recorded within the AQMA. The source apportionment across all the selected receptors show that Local Background is the largest contributor at 59.3%, followed by Local Road Sources at 22.2%, then Regional Background at 18.5%. When considering the average NO_x concentration at receptors within the AQMA, emission from cars is the largest contribution of local road emission, followed by the emission contribution from HGVs.

The measures within the 2012 AQAP were completed in 2015. The AQAP and measures are currently being reviewed and will be updated in due course.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
AQMA Cleethorpe Road	Sep-10	NO_2 Annual Mean	Grimsby	Cleethorpe Road between Freeman Street and Nacton Street	NO	48.4 (2011)(1)	µg/m^3	38.0	µg/m^3	Action Plan 2012 Cleethorpe Road Grimsby	Oct-12	(1)

☒ **North East Lincolnshire confirm the information on UK-Air regarding their AQMA(s) is up to date**

(1) https://www.nelincs.gov.uk/environment-and-community-safety/environmental-health/air-quality/air-quality-management-areas/

2.2 Progress and Impact of Measures to address Air Quality in North East Lincolnshire

Defra's appraisal of last year's ASR concluded that the Council is encouraged to review their AQAP, with the aim of assigning objective KPIs and reduction targets, alongside having more of an emphasis on progress and barriers to implementing measures.

Key actions were completed on measures within 2018:

- Dispersion Modelling has been completed to inform the type of measures that should be implemented in order to reduce the annual mean NO_2 concentration within the Cleethorpe Road AQMA. The source apportionment across all the selected receptors show that local background is the largest contributor at 59.3%, followed by local road sources at 22.2% then regional background at 18.5%. When considering the average NO_x concentration at receptors within the AQMA, emission from cars is the largest contribution of local road emission, followed by the emission contribution from HGVs. Therefore, the intervention measures will be focused on reducing the vehicle emission from cars and local background.
- Quarterly Air Quality Steering Committee meetings have been held to discuss the measures to be included in the AQAP. The meetings include members from the Planning, Public Health, Transport, Highways, Communications and Carbon Reduction Teams; and
- The Council have expanded their electric vehicle fleet to now include 28 vehicles, which increased from 23 vehicles in 2017.

North East Lincolnshire Council is currently reviewing the AQAP and the measures set out in Table 2.2 are proposed in the draft AQAP.

North East Lincolnshire Council's priorities for the coming year are:

- Complete the update of the AQAP;
- Encourage residents and visitors to North East Lincolnshire to use car share and public transport;
- Encourage the uptake of Employer and School Travel Plans within the Borough;

- Ensure that air quality is taken into account in the planning process when located in or close to the AQMAs or in areas marginally below air quality objectives;
- Work together with developers to improve sustainable transport links serving new developments; and
- Undertake local air quality monitoring within the Borough to ensure a high standard of data is achieved.

North East Lincolnshire Council anticipates that the measures in Table 2.2 will achieve compliance and enable the revocation of Cleethorpe Road AQMA.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Improve public transport services, bus stop/train infrastructure & information and interchange facilities	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	NELC & Service Provider	On-going	On-going	Increase in use of public transport based on average numbers of people using the services	NO_2 Emission Reduction	Annual public engagement	On-going	
2	Encourage Council Travel Plan opportunities and seek to facilitate uptake of sustainable modes of transport	Promoting Travel Alternatives	Workplace Travel Planning	NELC & ENGIE	On-going	2019/2020	% modal shift to car share/public transport/walking/cycling	NO_2 Emission Reduction	Discussions on progress made at Internal Steering Group	April 2021	
3	Bus fleet upgrades	Promoting low emission transport	Public vehicle procurement – prioritising uptake of low emission vehicles	NELC & Stagecoach	On-going	On-going	Number of low/zero emission buses	NO_2 Emission Reduction	Continual upgrading of vehicles. Quarterly meeting with NELC & Stagecoach	On-going	Reducing emissions contribution from buses (and cars if bus uptake improves)
4	Improve signage for the Port of Grimsby	Transport Planning and Infrastructure	Other	NELC& ABP	2019/20	2020/2021	A reduced number of HGV's approaching the AQMA	NO_2 Emission Reduction	Signage discussed at meeting with NELC & ABP in May 2019	April2021	

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
5	Continue to promote and facilitate cycling as for both transportation and leisure purposes	Promoting Travel Alternatives	Promotion of cycling	NELC & ENGIE	On-going	On-going	Uptake of cycling incentives and bike purchases	NO_2 Emission Reduction	Promotional events undertaking by ENGIE on a regular basis	On-going	
6	Encouraging residents and visitors to North East Lincolnshire to use car share and public transport	Alternatives to private vehicle use	Car & lift sharing schemes	NELC & ENGIE	On-going	On-going	% modal shift to car share/public transport	NO_2 Emission Reduction	'Travel Links' information on NELC webpages	On-going	Information on NELC website: https://www.nelincs.gov.uk/roads-parking-transport/travel-and-public-transport/car-share/
7	Encourage the uptake of Employer and School Travel Plans within the Borough	Promoting Travel Alternatives	School Travel Plans	NELC & ENGIE	On-going	On-going	No. travel plans in place	NO_2 Emission Reduction	During March 2019 ENGIE engaged with 984 people at promotional events across the borough	On-going	Information on NELC website:https://www.nelincs.gov.uk/roads-parking-transport/travel-and-public-transport/travel-planning/school-travel-plans/
8	Public Air Quality Information	Public Information	Via the Internet	NELC	2019/2020	2020/21	Number of hits on upgraded	Not quantifiable	Design of air quality specific	2022	Information on Clean Air day /current

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
	including promotion of fuel saving measures, residential and commercial, buildings						website per annum		website discussed with IT department. Quote was sourced but due funding restraint no further progress to date.		air quality level, Considering AQ grant application funding,
9	Report on air quality, including making details of the Action Plan measures and annual progress reports available on the Website and inclusion of an Air Quality update in the Corporate Annual Report	Public Information	Via the Internet	NELC	On-going	On-going	Availability of recently published reports online	NO_2 Emission Reduction	2018 Annual Status Report is available on NELC website: https://www.nelincs.gov.uk/wp-content/uploads/2018/10/NE-Lincs-2018-ASR.pdf	Updated annually after DEFRA approval of ASR.	
10	Ensure that air quality is taken into account in the planning process when located in or	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	NELC	On-going	Weekly	Number of planning applications with air quality conditions/assessments	NO_2 Emission Reduction	On-going	2020/2021	Planning policy under review. Part of the continued efforts of NELC Environment

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
	close to the AQMAs or in areas marginally below air quality objectives										al Protection.
11	Work together with developers to improve sustainable transport links serving new developments	Transport Planning and Infrastructure	Other	NELC & Developer	On-going	On-going	% modal shift to public transport	NO_2 Emission Reduction	On-going	On-going	Working with developers at the early stage to influence design to ensure sustainable transport is factored into the plans
12	Work together with developers to promote the inclusion of electric charging points for electric/hybrid vehicles at new development sites	Promoting Low Emission Transport	Producing alternative refuelling infrastructure to promote low emissions vehicles, EV recharging, gas fuel recharging	NELC &ENGIE	On-going	On-going	Number of planning applications where charging points have been secured	NO_2 Emission Reduction	On-going	On-going	Part of continued efforts of NELC Environmental Protection.
13	Consideration of measures to improve air quality in all new strategies	Policy Guidance and development control	Other policy	NELC & ENGIE	On-going	On-going	Air Quality a key topic in released strategy documents	NO_2 Emission Reduction	On-going	On-going	Wider acceptance within the council required to acknowledge the

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
	when a Strategy is reviewed or updated										importance of air quality
14	NELC Vehicle Procurement	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	NELC	On-going	On-going	Number of vehicles replaced (in addition to normal fleet turnover)	Reducing emissions from all council owned vehicles	On-going	On-going	
15	Produce Air Quality Strategies setting out their plans to reduce emissions across the port estate including ship and shore activities.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	NELC &ABP	On-going	On going	Not quantifiable	NO_2 Emission Reduction from Port	Quarterly meetings held	On-going	
16	Local air quality monitoring within the Borough to ensure a high standard of data is achieved	Public information	Other	NELC	On-going	On-going	Number of monitoring locations	NO_2 Emission Reduction	On-going	On-going	Purchase of two new real-time analysers was completed end 2018/19. Installation of one to be within the AQMA.

2.3 $PM_{2.5}$ – Local Authority Approach to Reducing Emissions and/or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of $PM_{2.5}$ (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that $PM_{2.5}$ has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Currently there is no monitoring of $PM_{2.5}$ completed within North East Lincolnshire.

The current Defra 2018 background maps[4] for North East Lincolnshire Council (2017 based) show that all background concentrations of $PM_{2.5}$ are well below the 2020 annual mean objective for $PM_{2.5}$. The highest concentration is predicted to be 9.3µg/m^3 within the 1 x 1km grid square with the centroid grid reference of 528500, 409500 that is set within Grimsby.

The Public Health Outcomes Framework data tool[5] compiled by Public Heath England quantifies the mortality burden of $PM_{2.5}$ within England on a county and local authority scale. 2017 adult mortality attributable to $PM_{2.5}$ pollution for North East Lincolnshire is presented in Table 2.3.

It can be seen from Table 2.3 that in 2017 the percentage of adult mortality attributable to $PM_{2.5}$ pollution within North East Lincolnshire was 0.3% higher than the average fraction for the Yorkshire and Humber region, and 0.6% lower than the average fraction for England. In 2016 the fraction for North East Lincolnshire was 5.2%, there has been a decrease of 0.7% between 2016 and 2017.

Table 2.3 – 2017 Adult Mortality Attributable to $PM_{2.5}$ Pollution

Area	North East Lincolnshire	Yorkshire and the Humber	England
% of Adult Mortality	4.5%	4.2%	5.1%

[4] Defra Background Mapping data for local authorities (2017-based), available online at https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2015

[5] Public Health Outcomes Framework, Public Health England data tool (2016 data), available online at http://www.phoutcomes.info/public-health-outcomes-framework

Although not initially developed to reduce concentrations of $PM_{2.5}$, a number of measures outlined in Table 2.2 that are related to vehicles will help reduce concentrations. A major source of $PM_{2.5}$ is from road traffic, from exhaust emissions, brake and tyre wear, and the re-suspension of existing particles on the road. Therefore, by the reduction of vehicle use, and the introduction of more efficient/less polluting vehicles, the concentrations of $PM_{2.5}$ will be reduced.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

North East Lincolnshire Council did not undertake any independent automatic (continuous) monitoring during 2018. A monitoring station as part of the AURN, and run by the Environment Agency, was installed on Woodlands Avenue in Immingham in November 2017. Table A.1 in Appendix A shows the details of the site. National monitoring results are available at https://uk-air.defra.gov.uk/networks/.

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

3.1.2 Non-Automatic Monitoring Sites

North East Lincolnshire Council undertook non- automatic (passive) monitoring of NO_2 at 26 sites during 2018. Table A.2 in Appendix A shows the details of the sites.

The diffusion tubes DIF 10 and DIF 30 were relocated to Aylesby Road Grimsby and Victoria Street South, Grimsby respectively due to the concern raised after pre-planning application were submitted for two developments.

In January 2018, the triplicate location was relocated from the coordinates (527762, 410427) to the façade of the residential property at the co-ordinates (527761, 410425).

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. “annualisation” and/or distance correction), are included in Appendix C.

3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, “annualisation” and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

For diffusion tubes, the full 2018 dataset of monthly mean values is provided in Appendix B.

Table A.4 in Appendix A compares the ratified continuous monitored NO_2 hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

The national bias adjustment factor of 0.76 was used at all locations as there are no co-located diffusion tube sites with automatic stations carried out within the Council area in 2018.

In 2018 there were no exceedances of the NO_2 annual mean objective and there was only one location where the annual mean concentration was within 10% of the annual mean NO_2 objective. This is at the triplicate diffusion tube location DIF 11/12/13 within the designated AQMA. The diffusion tube reported an annual mean NO_2 concentration of 38.0µg/m^3. As in January 2018, the triplicate location was relocated from the coordinates (527762, 410427) to the façade of the residential property at the co-ordinates (527761, 410425). The monitoring location represents the relevant exposure for the annual mean objective, therefore distance correction is not required.

The annual mean NO_2 concentration did not exceed 60µg/m^3 at any non-automatic monitoring site. Therefore exceedances of the 1-hour mean objective are unlikely at all monitoring locations. Furthermore, there were no exceedances of the 1-hour mean NO_2 objective reported at either of the continuous monitoring stations.

Figure A.1, Figure A.2, Figure A.3 and Figure A.4 present trends in the measured annual mean NO_2 concentrations over the past five years for the NO_2 monitoring completed across North East Lincolnshire. In 2018, the diffusion tubes, except DIF 9, have seen a decrease in the annual mean NO_2 concentrations compared to the 2017 monitoring results. DIF 9 reported a slight increase of 0.1.µg/m^3.

3.2.2 Particulate Matter (PM_{10})

No monitoring for PM_{10} was undertaken in 2018 within the Council area. However, in 2017 PM_{10} was monitored by Beta Attenuation Particulate Monitors (BAMs) at two

different sites within the borough; Fryston House in Grimsby (CM1) and Kings Road in Immingham (CM2). There were no exceedances of the annual mean objective at either of the monitoring sites, nor was the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times a year) exceeded. In 2018 automatic monitoring for PM_{10} was stopped at these locations due to no exceedances being reported for the past five years and no funding being available.

3.2.3 Particulate Matter ($PM_{2.5}$)

North East Lincolnshire currently do not monitor $PM_{2.5}$. The current Defra 2018 background maps[6] for North East Lincolnshire Council (2017 based) show that all background concentrations of $PM_{2.5}$ are well below the 2020 annual mean objective for $PM_{2.5}$. The highest concentration is predicted to be 9.3µg/m^3 within the 1 x 1km grid square with the centroid grid reference of 528500, 409500 that is set within Grimsby.

3.2.4 Sulphur Dioxide (SO_2)

North East Lincolnshire does not carry out any routine monitoring of SO_2 within its area.

[6] Defra Background Mapping data for local authorities (2017-based), available online at https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2015

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
AURN	Woodlands Avenue, Immingham	Urban Background	518277	415116	NO_2	NO	Chemiluminescent	10	4	3

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.

Table A.2 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
DIF 1	The Friary PH Victoria West	Kerbside	526838	409261	NO_2	NO	5	2	NO	2
DIF 2	8 Town Hall Street Grimsby	Roadside	527095	409367	NO_2	NO	5	2	NO	2
DIF 3	1 Town Hall Street Grimsby	Roadside	527100	409400	NO_2	NO	10	2	NO	2
DIF 4/5/6	Fryston House Grimsby	Roadside	526583	408047	NO_2	NO	50	3	NO	2
DIF 7	Peaks Parkway & Welholme Road Grimsby	Kerbside	527574	408108	NO_2	NO	10	2	NO	2
DIF 8	Peaks Parkway & Weelsby Road Grimsby	Kerbside	527403	408666	NO_2	NO	8	1	NO	2
DIF 9	76 Freeman Street Grimsby	Kerbside	527665	410164	NO_2	NO	N/A	2	NO	2
DIF 10	Aylesby Road	Roadside	523284	409883	NO_2	NO	0	2	NO	2
DIF 11/12/13 (3)	112 Cleethorpe Road Grimsby	Roadside	527761	410425	NO_2	YES	0	2	NO	2
DIF 14	113 Cleethorpe Road Grimsby	Kerbside	527754	410445	NO_2	YES	5	<1	NO	2
DIF 15	123 Cleethorpe Road Grimsby	Kerbside	527789	410438	NO_2	YES	5	<1	NO	2
DIF 16	6 Freeman Street Grimsby	Kerbside	527693	410413	NO_2	YES	0	1.5	NO	2
DIF 17	Park Street	Roadside	528725	410102	NO_2	NO	0	3	NO	2
DIF 18	Victor Street	Kerbside	528171	410338	NO_2	NO	7	1	NO	2

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
DIF 19	Victoria Mills A Victoria Street Grimsby	Kerbside	527165	409995	NO_2	NO	0	2	NO	2
DIF 20	Victoria Mills B Victoria Street Grimsby	Kerbside	527182	410092	NO_2	NO	0	2	NO	2
DIF 21	9 Pyewipe Road Grimsby	Roadside	526077	410124	NO_2	NO	0	2	NO	2
DIF 22	Great Coates/ Yarborough Road Grimsby	Roadside	524666	408814	NO_2	NO	5	2	NO	2
DIF 23/24/25	King Road Immingham	Roadside	519193	415279	NO_2	NO	20	1	NO	2
DIF 26	Love Lane Corner	Roadside	528891	408078	NO_2	NO	14	2	NO	2
DIF 27	Hewitts Circus Cleethorpe	Roadside	529532	406835	NO_2	NO	6	2	NO	2
DIF 28	Toll Bar Roundabout New Waltham	Kerbside	527685	404531	NO_2	NO	20	2	NO	2
DIF 29	Louth Road & Waltham Grimsby	Roadside	526465	406334	NO_2	NO	3	2	NO	2
DIF 30	168 Victoria Street South, Grimsby	Roadside	527181	409513	NO_2	NO	0	2	NO	2
DIF 31	Magistrates Court Grimsby	Kerbside	527183	409647	NO_2	NO	3	2	NO	2
DIF 32	Pink Butterfly Grimsby	Kerbside	527189	409621	NO_2	NO	0	2	NO	2

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
In January 2018, the triplicate location was relocated from the coordinates (527762, 410427) to the façade of the residential property at the co-ordinates: (527761, 410425)										

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO_2 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
AURN	Urban Background	Automatic Monitoring	65.8	65.8	-	-	-	16.9(4)	13.9
DIF 1	Kerbside	Diffusion Tube	100.0	100.0	30.6	28.5	29.7	31.9	30.3
DIF 2	Roadside	Diffusion Tube	100.0	100.0	**46.8**	39.0	39.8	36.9	33.6
DIF 3	Roadside	Diffusion Tube	100.0	100.0	**41.5**	34.6	38.4	33.6	32.0
DIF 4/5/6	Roadside	Diffusion Tube	97.2	97.2	28.3	26.0	27.7	27.1	25.1
DIF 7	Kerbside	Diffusion Tube	100.0	100.0	31.6	31.6	31.6	33.5	29.1
DIF 8	Kerbside	Diffusion Tube	100.0	100.0	34.2	31.0	31.9	30.8	28.8
DIF 9	Kerbside	Diffusion Tube	100.0	100.0	23.8	20.2	21.8	21.3	21.4
DIF 10	Roadside	Diffusion Tube	83.3	83.3	-	-	-	-	21.2
DIF 11/12/13	Roadside	Diffusion Tube	100	100	**48.7**	**42.7**	**45.2**	**47.3**	38.0*
DIF 14	Kerbside	Diffusion Tube	91.7	91.7	36.8	34.7	37.3	34.7	33.3
DIF 15	Kerbside	Diffusion Tube	100.0	100.0	38.2	30.8	35.7	37.3	32.9
DIF 16	Kerbside	Diffusion Tube	100.0	100.0	32.2	28.8	33.1	35.2	30.9
DIF 17	Roadside	Diffusion Tube	100.0	100.0	27.3	27.5	30.1	32.8	30.6
DIF 18	Kerbside	Diffusion Tube	100.0	100.0	26.1	24.6	29.5	36.4	33.6
DIF 19	Kerbside	Diffusion Tube	100.0	100.0	38.4	31.7	34.2	34.7	29.8
DIF 20	Kerbside	Diffusion Tube	100.0	100.0	34.8	34.7	37.3	37.4	33.1
DIF 21	Roadside	Diffusion Tube	100.0	100.0	33.2	31.2	33.2	30.6	26.9
DIF 22	Roadside	Diffusion Tube	100.0	100.0	30.7	26.0	28.6	27.0	24.3
DIF 23/24/25	Roadside	Diffusion Tube	100.0	100.0	31.3	30.0	33.3	28.5	26.6

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014	2015	2016	2017	2018
DIF 26	Roadside	Diffusion Tube	100.0	100.0	26.3	21.0	24.4	22.9	21.0
DIF 27	Roadside	Diffusion Tube	100.0	100.0	23.2	24.2	22.1	23.0	19.8
DIF 28	Kerbside	Diffusion Tube	100.0	100.0	30.2	27.2	27.7	30.2	24.9
DIF 29	Roadside	Diffusion Tube	100.0	100.0	26.9	23.9	25.0	23.7	22.5
DIF 30	Roadside	Diffusion Tube	100.0	100.0	-	-	-	-	29.4
DIF 31	Kerbside	Diffusion Tube	91.7	91.7	-	-	28.3	29.8	29.5
DIF 32	Kerbside	Diffusion Tube	100.0	100.0	-	-	29.5	29.2	29.1

☒ **Diffusion tube data has been bias corrected**

☒ **Annualisation has been conducted where data capture is <75%**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 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. All means have been "annualised" as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

(4) Data capture is less than three months.

*The triplicate diffusion tubes DIF11/12/13 has been relocated in 2018. Details of the new location can be found in Table A.2.

Figure A.1 – Trends in Annual Mean NO_2 Concentrations: Immingham

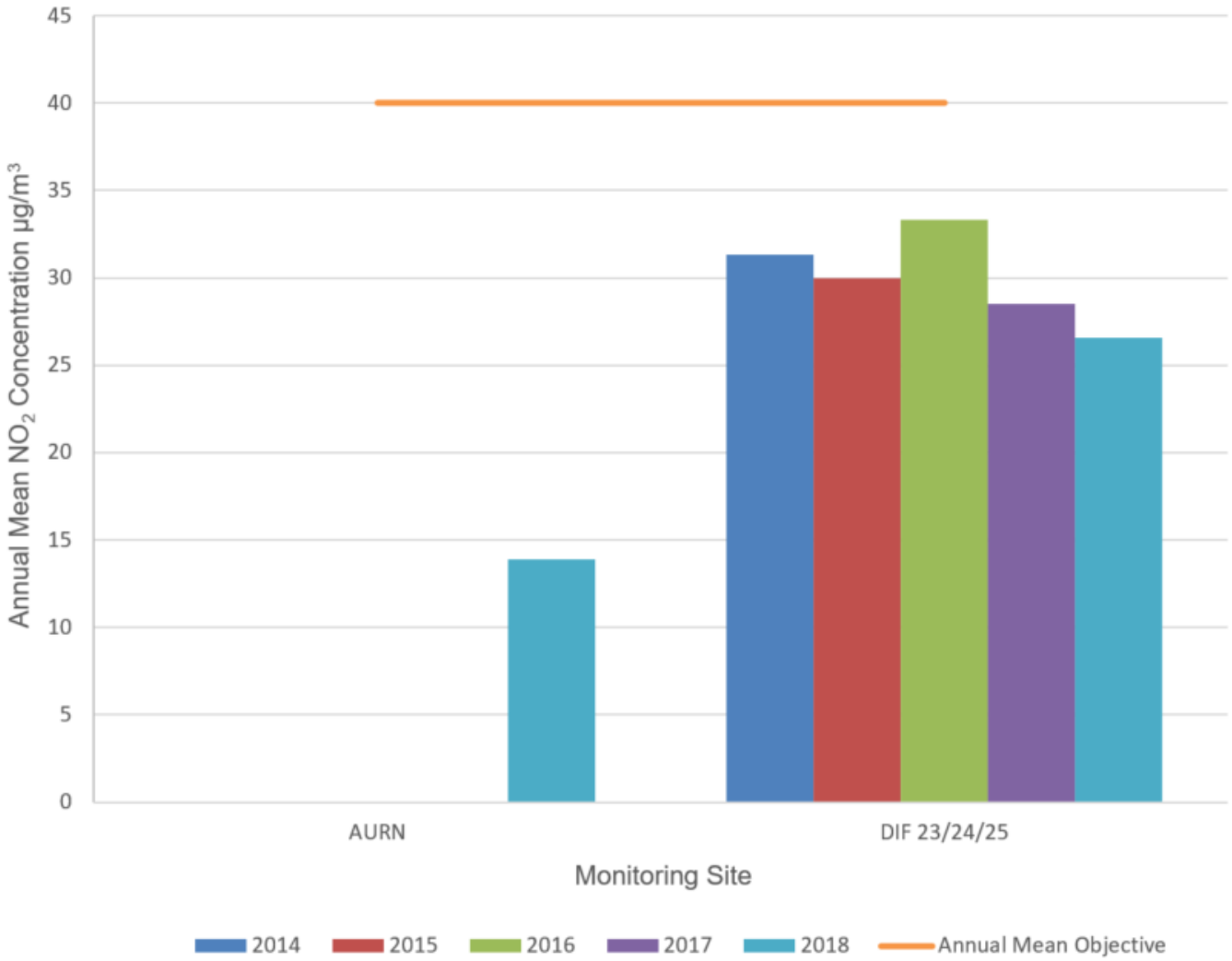


Figure A.2 – Trends in Annual Mean NO_2 Concentrations: Cleethorpe Road AQMA

Note: The triplicate diffusion tube DIF11/12/13 has been relocated in 2018. Details of the new location can be found in Table A.2.

Figure A.3 – Trends in Annual Mean NO_2 Concentrations: Grimsby North

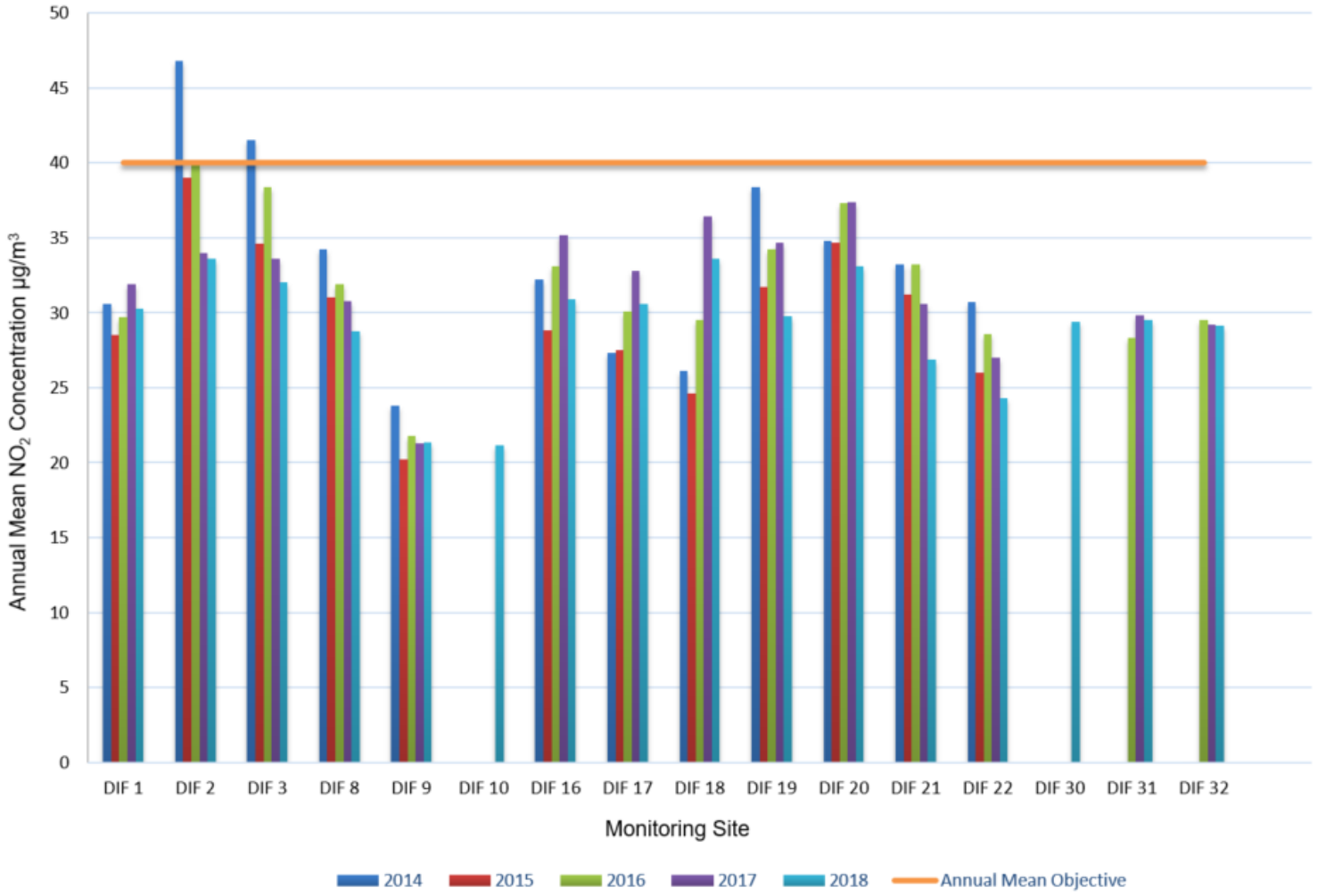


Figure A.4 – Trends in Annual Mean NO_2 Concentrations: Grimsby South

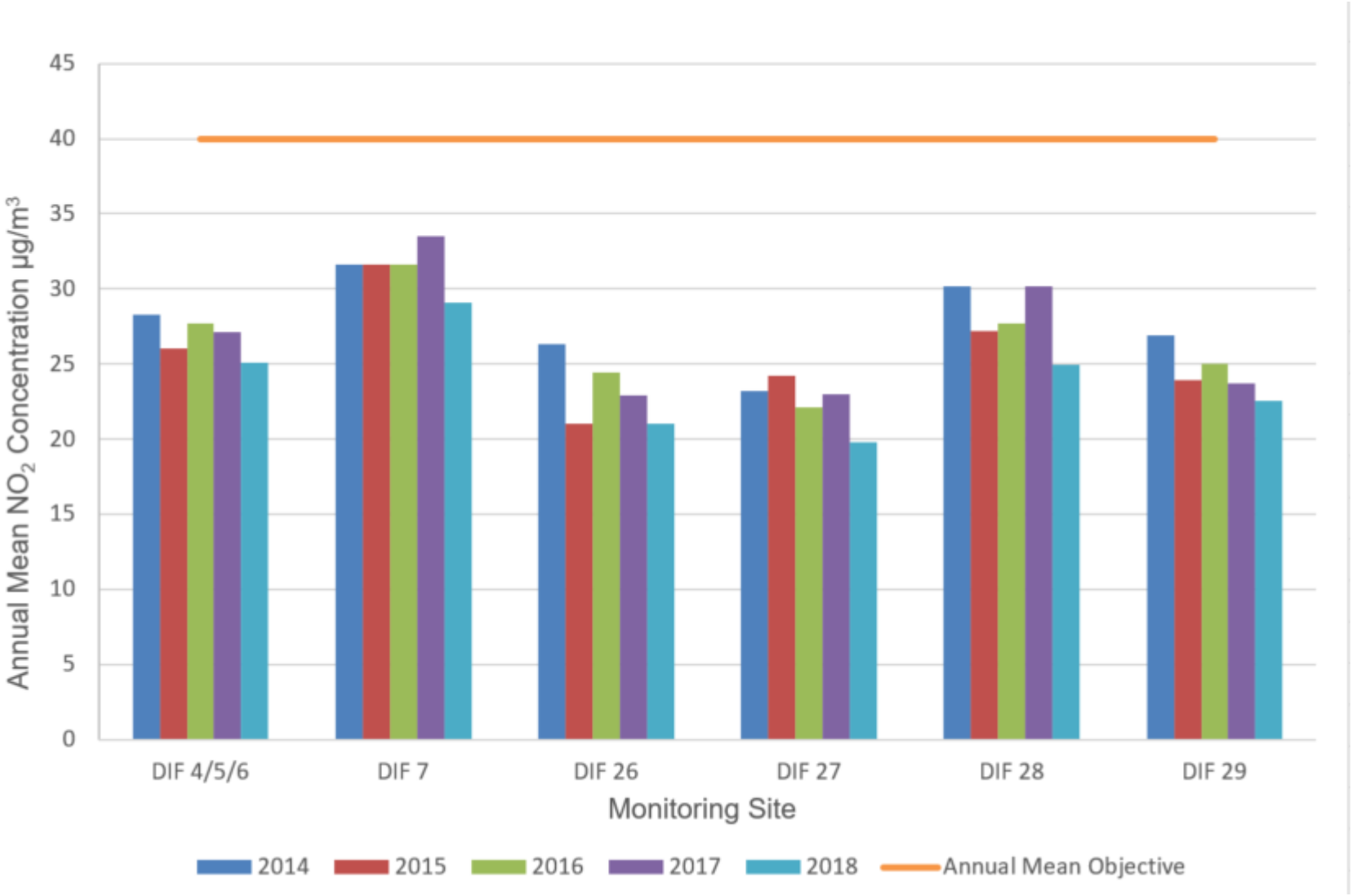


Table A.4 – 1-Hour Mean NO_2 Monitoring Results

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	Urban Background	Automatic Monitoring	65.8	65.8	**-**	-	-	0 (56.8)	0 (27.5)

Notes:

Exceedances of the NO_2 1-hour mean objective (200µg/m^3 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.

Appendix B: Full Monthly Diffusion Tube Results for 2018

Table B.1 – NO_2 Monthly Diffusion Tube Results - 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 (0.76) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
DIF 1	44.3	43.9	45.0	39.0	32.5	33.8	36.1	35.7	38.0	37.9	41.5	50.1	39.8	30.3	-
DIF 2	52.0	49.4	48.1	44.3	40.5	34.9	40.6	40.6	44.1	42.9	43.7	49.3	44.2	33.6	-
DIF 3	44.7	46.7	60.8	41.3	43.7	36.8	36.9	39.4	32.0	37.0	44.4	42.3	42.2	32.0	-
DIF 4	38.8	39.6	42.5	28.8	29.4	25.1	22.6	23.7	33.5	35.3	34.5	41.9	33.0	25.1	-
DIF 5	37.1	38.9	39.5	30.6	28.3	25.5	24.9	26.4	35.2	36.2	32.3	41.7	33.1	25.1	-
DIF 6	38.2	40.8	38.2	31.7	25.4	25.3	25.0	24.3	32.4	36.1	37.3	-	32.2	24.5	-
DIF 7	44.0	43.4	41.8	36.6	29.5	30.3	34.0	32.8	37.1	35.3	41.4	52.6	38.2	29.1	-
DIF 8	45.3	32.2	44.7	34.6	35.8	32.5	35.5	31.7	34.0	36.5	44.7	46.8	37.9	28.8	-
DIF 9	28.2	27.9	31.7	26.2	21.7	22.9	25.1	24.0	26.9	29.6	34.1	39.2	28.1	21.4	-
DIF 10	30.1	34.1	29.9	-	-	19.0	22.0	21.7	27.8	25.3	32.3	36.5	27.9	21.2	-
DIF 11	48.2	58.9	59.3	52.7	47.3	38.7	47.9	49.7	48.4	49.9	55.3	66.1	51.9	39.4	-
DIF 12	50.7	49.5	52.7	55.0	49.0	38.4	53.0	48.9	44.7	48.6	43.7	55.7	49.2	37.4	-
DIF 13	47.5	55.3	56.1	55.0	43.2	39.4	43.0	46.8	44.7	45.1	53.2	59.4	49.1	37.3	-
DIF 14	38.9	47.6	53.9	43.9	45.9	42.5	45.8	35.7	37.3	46.4	44.2	-	43.8	33.3	-
DIF 15	35.7	47.8	55.9	42.7	47.0	38.9	42.7	35.3	36.9	44.2	46.9	45.1	43.3	32.9	-
DIF 16	41.9	46.0	43.9	41.3	35.9	35.6	33.7	37.2	42.8	43.1	37.7	49.1	40.7	30.9	-

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 (0.76) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
DIF 17	44.0	39.5	39.7	41.1	36.9	32.0	36.4	39.9	39.7	37.9	45.0	50.9	40.3	30.6	-
DIF 18	52.4	38.3	54.2	44.4	39.8	34.7	37.7	38.5	45.2	47.1	44.4	54.3	44.3	33.6	-
DIF 19	43.3	43.8	41.9	34.5	34.4	31.3	31.3	33.7	39.1	40.1	45.1	51.9	39.2	29.8	-
DIF 20	37.7	48.9	54.4	40.1	37.7	32.5	35.2	37.7	41.6	44.3	57.5	55.0	43.6	33.1	-
DIF 21	38.8	40.2	39.5	29.5	33.7	32.0	28.4	26.9	32.0	35.9	41.0	46.1	35.3	26.9	-
DIF 22	29.8	40.4	34.0	31.4	27.4	22.7	26.3	26.5	32.8	32.7	35.7	44.0	32.0	24.3	-
DIF 23	40.9	41.6	45.8	36.0	37.9	29.4	24.8	26.2	29.4	37.3	36.8	39.6	35.5	27.0	-
DIF 24	36.0	37.3	46.2	32.4	34.1	22.9	28.7	26.3	32.7	37.6	36.8	43.9	34.6	26.3	-
DIF 25	38.2	42.6	41.3	31.0	33.8	29.4	28.0	25.1	30.1	38.2	36.8	42.8	34.8	26.4	-
DIF 26	29.1	32.6	23.1	29.2	27.9	26.2	29.9	24.5	27.0	26.9	24.5	31.0	27.7	21.0	-
DIF 27	25.4	28.5	26.7	25.6	19.6	20.0	23.9	22.6	25.1	26.2	33.2	35.3	26.0	19.8	-
DIF 28	38.0	31.2	35.3	27.4	22.5	25.0	32.2	34.4	35.0	32.6	38.8	41.3	32.8	24.9	-
DIF 29	28.6	35.6	35.2	25.0	28.6	22.0	24.4	24.5	28.9	30.7	35.5	36.9	29.7	22.5	-
DIF 30	40.7	50.7	41.4	42.7	38.0	33.5	41.6	31.9	29.6	36.3	35.4	42.0	38.7	29.4	-
DIF 31	42.8	47.6	49.0	39.5		25.1	32.4	28.7	28.5	35.4	49.2	49.2	38.9	29.5	-
DIF 32	37.6	44.0	47.9	37.7	34.4	32.9	40.1	29.4	30.6	35.3	47.3	42.8	38.3	29.1	-

☐ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

☒ **Annualisation has been conducted where data capture is <75%**

☒ **Where applicable, data has been distance corrected for relevant exposure**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 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.

Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

Diffusion Tube Bias Adjustment Factors

It is stated within the LAQM section of https://uk-air.defra.gov.uk/ that diffusion tubes are affected by several sources of interference which can cause substantial under or overestimation (bias) compared to a chemiluminescent analyser (the reference method). This can prove to be a problem in any situation where diffusion tube results are compared with the AQS objectives. As a result, local authorities are required to quantify the bias of their diffusion tube measurements and apply an appropriate bias adjustment factor if required.

The bias adjustment factor, which is an estimate of the difference between diffusion tube concentration and continuous monitoring, the latter assumed to be a more accurate method of monitoring has been used to factor the results. LAQM.TG(16) provides guidance with regard to the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

With regard to the application of a bias adjustment factor for diffusion tubes, the Defra Technical Guidance LAQM.TG(16) and the LAQM Helpdesk[7] recommend the use of a local bias adjustment factor where available and relevant to diffusion tube sites.

There is a continuous monitor operated by Environmental Agency within the North East Lincolnshire Council area in 2018, however, a co-location study is not available to derive a local bias factor, thus the national bias adjustment factor spreadsheet[8] has been used.

The diffusion tubes used by North East Lincolnshire Council are supplied and analysed by Socotec (previously Environmental Scientific Group, ESG) and were prepared using

[7] Laqm.defra.gov.uk
[8] National Diffusion Tube Bias Adjustment Factor Spreadsheet, version 03/19 published in March 2019

the 50% TEA in acetone preparation method. The 2018 national bias adjustment factor for Socotec 50% TEA in water is 0.76, based on twenty one studies, as derived from the national bias adjustment factor spreadsheet[9] as presented in Figure C.1.

Figure C.1 – Socotec (ESG) 2018 National Bias Adjustment Factor

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/19

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

This spreadsheet will be updated at the end of June 2019
LAQM Helpdesk Website

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

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

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

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

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

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

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

Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[2] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[5]	Bias Adjustment Factor (A) (Cm/Dm)
SOCOTEC Didcot	50% TEA in acetone	2018	R	Cambridge City Council	12	42	30	40.2%	G	0.71
SOCOTEC Didcot	50% TEA in acetone	2018	R	Canterbury City Council	11	38	28	35.8%	G	0.74
SOCOTEC Didcot	50% TEA in acetone	2018	UB	Canterbury City Council	12	16	12	36.3%	G	0.73
SOCOTEC Didcot	50% TEA in acetone	2018	R	Hambleton District Council	12	21	18	20.8%	G	0.83
SOCOTEC Didcot	50% TEA in acetone	2018	R	Ipswich Borough Council	12	34	29	17.9%	G	0.85
SOCOTEC Didcot	50% TEA in acetone	2018	R	City of York Council	12	41	27	54.2%	G	0.65
SOCOTEC Didcot	50% TEA in acetone	2018	UB	City of York Council	11	22	15	52.0%	G	0.66
SOCOTEC Didcot	50% TEA in acetone	2018	R	City of York Council	12	34	26	30.8%	G	0.76
SOCOTEC Didcot	50% TEA in acetone	2018	R	City of York Council	11	30	23	32.9%	G	0.75
SOCOTEC Didcot	50% TEA in acetone	2018	R	Dumfries and Galloway Council	12	36	30	19.8%	G	0.83
SOCOTEC Didcot	50% TEA in acetone	2018	R	Knowsley MBC	12	47	38	26.5%	G	0.79
SOCOTEC Didcot	50% TEA in acetone	2018	R	Suffolk Coastal DC	11	44	33	32.4%	G	0.76
SOCOTEC Didcot	50% TEA in acetone	2018	R	Thanet District Council	10	26	21	25.4%	G	0.80
SOCOTEC Didcot	50% TEA in acetone	2018	R	Horsham District Council	11	33	23	42.2%	G	0.70
SOCOTEC Didcot	50% TEA in acetone	2018	R	Horsham District Council	12	33	29	17.2%	G	0.85
SOCOTEC Didcot	50% TEA in acetone	2018	R	Horsham District Council	12	30	26	16.1%	G	0.86
SOCOTEC Didcot	50% TEA in acetone	2018	UB	Slough Borough Council	10	38	31	25.6%	G	0.80
SOCOTEC Didcot	50% TEA in acetone	2018	SU	Slough Borough Council	11	32	22	46.7%	G	0.68
SOCOTEC Didcot	50% TEA in acetone	2018	R	Slough Borough Council	11	39	32	22.5%	G	0.82
SOCOTEC Didcot	50% TEA in acetone	2018	R	Vale of Glamorgan	12	39	25	57.8%	G	0.63
SOCOTEC Didcot	50% TEA in acetone	2018	KS	Marylebone Road Intercomparison	9	95	87	9.1%	G	0.92
SOCOTEC Didcot	50% TEA in acetone	2018		Overall Factor[3] (21 studies)					Use	0.76

QA/QC of Diffusion Tube Monitoring

The diffusion tubes for the year 2018 were supplied and analysed by Socotec, the tubes were prepared using the 50% TEA in water preparation method. All results have been bias adjusted and annualised where required before being presented in Table A.3.

Socotec are a UKAS accredited laboratory and analyse their diffusion tubes in line with their Standard Operating Procedure ANU/SOP/1015 that meets the guidelines set out in Defra's best practice guidance[10]. In addition Socotec participate in the AIR-PT Scheme (a continuation of the Workplace Analysis Scheme for Proficiency (WASP)) for NO_2 tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO_2 concentrations reported are of a high calibre. The lab follows the procedures set out in the Harmonisation Practical Guidance. In the latest available AIR-PT results, AIR-PT

[9] National Diffusion Tube Bias Adjustment Factor Spreadsheet version 03/18 available at https://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html
[10] Diffusion Tubes for Ambient NO_2 Monitoring : Practical Guide for Laboratories and Users, AEA Energy & Environment, 2008

AR 0024 (January to February 2018), AIR-PT AR025 (April to May 2018), AIR-PT AR027 (July to August 2018) and AIR-PT AR028 (September to October 2018) Socotec has scored 100% on all results. The percentage score reflects the results deemed to be satisfactory based upon the z-score of < ± 2.

Short-term to Long-term Data Adjustment

All diffusion tube monitoring sites had a data capture greater than 75% in 2018 therefore annualisation was not required at any site.

The AURN continuous monitoring station at Immingham Woodlands Avenue had a data capture lower than 75% in 2018. Therefore, annualisation was required at this site and has been completed in line with Defra Technical Guidance LAQM.TG(16) Box 7.9 and full working details are provided in Table C.1.

In completing the annualisation procedure, data has been taken from two automatic monitoring stations that are within 50 miles of the sites to be annualised: York Bootham and Sheffield Tinsley. These sites form part of the national AURN network and are background monitoring sites. As such, they are not influenced by local sources of air pollution, such as road traffic emissions at roadside monitoring sites. The details of the annualisation have been provided in Table C.1.

Table C.1 – Annualisation for AURN Site

Site ID	Unadjusted Annual Mean (µg/m^3)	AF York Bootham	AF Sheffield Tinsley	Average AF	Annualised Concentration (µg/m^3)
AURN	13.5	1.03	1.04	1.03	13.9

Planning Application

Application Ref Number	Address	Proposal	AQA Undertaken	EV Recommended	Status
DM/0728/18/OUT	Highfield House Stallingborough Road Immingham	Outline planning application for the development of up to 525 residential dwellings together with an extra care facility for the elderly with up to 80 units with access to be considered	An air quality assessment was undertaken and concluded that the impact of development-generated road traffic on local air quality at identified existing and future receptor locations are considered not significant	YES	Awaiting decision
DM/0628/18/FUL	Immingham Railfreight Terminal Scandinavian Way Stallingborough	Partially demolish existing building and erect 20MWE waste to energy power generation facility, 65m stack and associated plant, machinery, parking and external works	An air quality assessment was undertaken and concluded the impact of emissions from the proposed Incineration Plant Facility at Immingham, will not be significant on local air quality in relation to the relevant Air Quality Standards Regulations. There is no predicted exceedance of the relevant ambient air quality standards with the proposed Incineration Plant Facility in operation.	YES	Approval with Conditions
DM/0329/18/FUL	Vireol Plc Energy Park Way Grimsby	Erection of industrial building and adjoined two storey office/control room to create power plant (18MW Energy From Waste) including construction of associated access, hardsurfacing, erection of 65m chimney stack and installation of necessary plant and machinery (AMENDED PLANS/DESCRIPTION)	An air quality assessment was undertaken and the key findings of the assessment of operational impacts concluded that there will be no significant impacts from process emissions on sensitive human receptors or habitat sites for the gasification plant taking into account the worst-case assumptions adopted for the assessment.	NO	Approval with Conditions

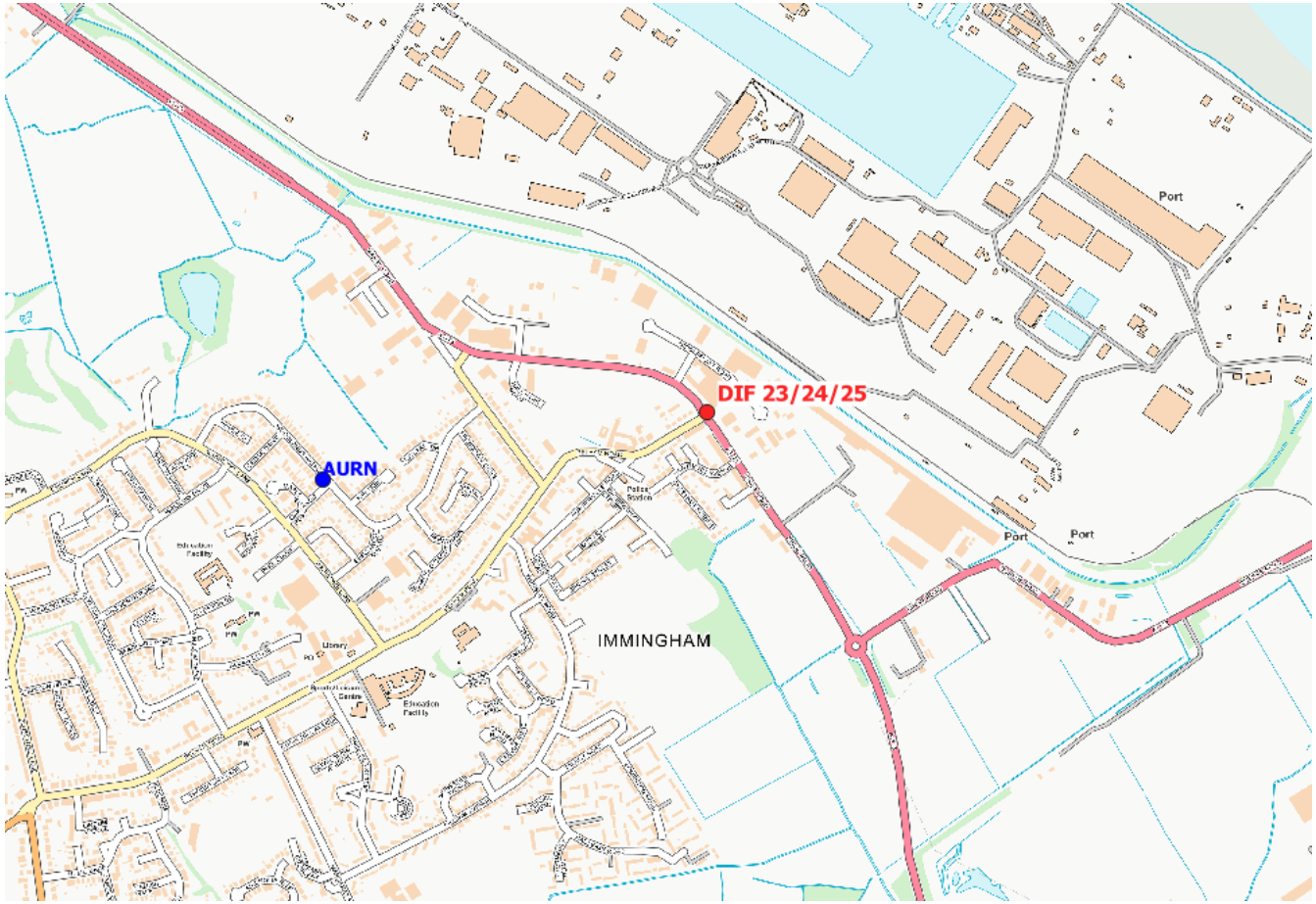
Application Ref Number	Address	Proposal	AQA Undertaken	EV Recommended	Status
DM/1027/18/FUL	Land Off Fenwick Road Grimsby North East Lincolnshire	Erection of 96 dwellings to include associated garaging, parking, landscaping, public open space and play area (Amendment to DC/1463/06/SCA) (amended location and site layout plan January 2019)	An air quality assessment was undertaken and the results suggested the overall significance of potential impacts was determined to be not significant, in accordance with the EPUK and IAQM guidance.	YES	Pending Consideration
DM/0026/18/FUL	Land South Of Queens Road Immingham North East Lincolnshire	Erect an Energy Recovery Facility with an electricity export capacity of up to 49.5MW and associated infrastructure including a stack to 90m high, parking areas, hard and soft landscaping, access road, weighbridge facility and drainage infrastructure.	An air quality assessment was undertaken. In conclusion, the Proposed Development is not predicted to give rise to significant environmental effects on air quality, human health and odour.	YES	Approved with Conditions
DM/0105/18/FUL	Land Off Stallingborough Interchange Kiln Lane Stallingborough North East Lincolnshire	Hybrid application seeking outline consent with access, landscaping and scale to be considered for the development of a 62ha Business Park comprising up to 120,176 sq.m for B1 (Business), B2 (General Industrial) and B8 (Storage and Distribution), associated infrastructure and internal highways. Full application for the creation of a new roundabout, new access roads, associated highway works, substations, pumping stations, drainage and landscaping.	An air quality assessment was undertaken as part of EIA and concluded that no significant effect on local air quality near the development or at any sensitive receptors.	YES	Approved with Conditions

Application Ref Number	Address	Proposal	AQA Undertaken	EV Recommended	Status
DM/0537/18/REM	Former Clifton Bingo Club Site Grant Street Cleethorpes North East Lincolnshire	Reserved matters application seeking approval of layout, appearance, scale and landscaping of the development, following the outline approval of DM/0676/15/LDO for the erection of buildings and use of land primarily for Class C3 with ancillary A1, A2, A3, A4, A5, D2, C1, C2 and C4. The proposal specifically comprises three buildings (building one at 9 storeys high, building two at 11 storeys high and building three at 13 storeys high) totaling 99 apartments and 807 sqm (GIA) of commercial floor space with associated underground parking.	An air quality assessment was undertaken and the results suggested air quality impacts as a result of the operation of the proposals are considered to be not significant, in accordance with the IAQM guidance.	YES	Awaiting decision
DM/1175/17/FUL	Land Off Habrough Fields And Pilgrims Way Immingham North East Lincolnshire	Residential development for 145 dwellings with associated parking, landscaping and emergency vehicular access only onto Mill Lane. (amended plans and documents January 2019)	An air quality assessment was undertaken and the results suggested air quality impacts as a result of the operation of the proposals are considered to be not significant, in accordance with the IAQM guidance.	YES	Awaiting decision
DM/1070/18/FUL	Land Rear Of Power Station Hobson Way Stallingborough North East Lincolnshire	Construction of an energy from waste facility of up to 49.9MWe gross capacity including emissions stack(s), associated infrastructure including parking areas, hard and soft landscaping, the creation of a new access to South Marsh Road, weighbridge facility, and drainage infrastructure, on land at South Humber Bank Power Station	An air quality assessment was undertaken and the results suggested air quality impacts as a result of the operation of the proposals are considered to be not significant, in accordance with the IAQM guidance.	NO	Approval with Conditions

Application Ref Number	Address	Proposal	AQA Undertaken	EV Recommended	Status
DM/0094/18/FUL	Stallingborough Link Road Energy Park Way Grimsby North East Lincolnshire	Construction and modifications of a single carriageway highway link with shared cycle & footway from Moody Lane/Woad Lane junction (to the south east) to Hobson Way Roundabout (to the north west) with associated works including drainage works, street lighting, fencing and landscaping	YES	NO	Approval with Conditions

Appendix D: Map(s) of Monitoring Locations and AQMAs

Figure D.1 – Monitoring Locations: Immingham



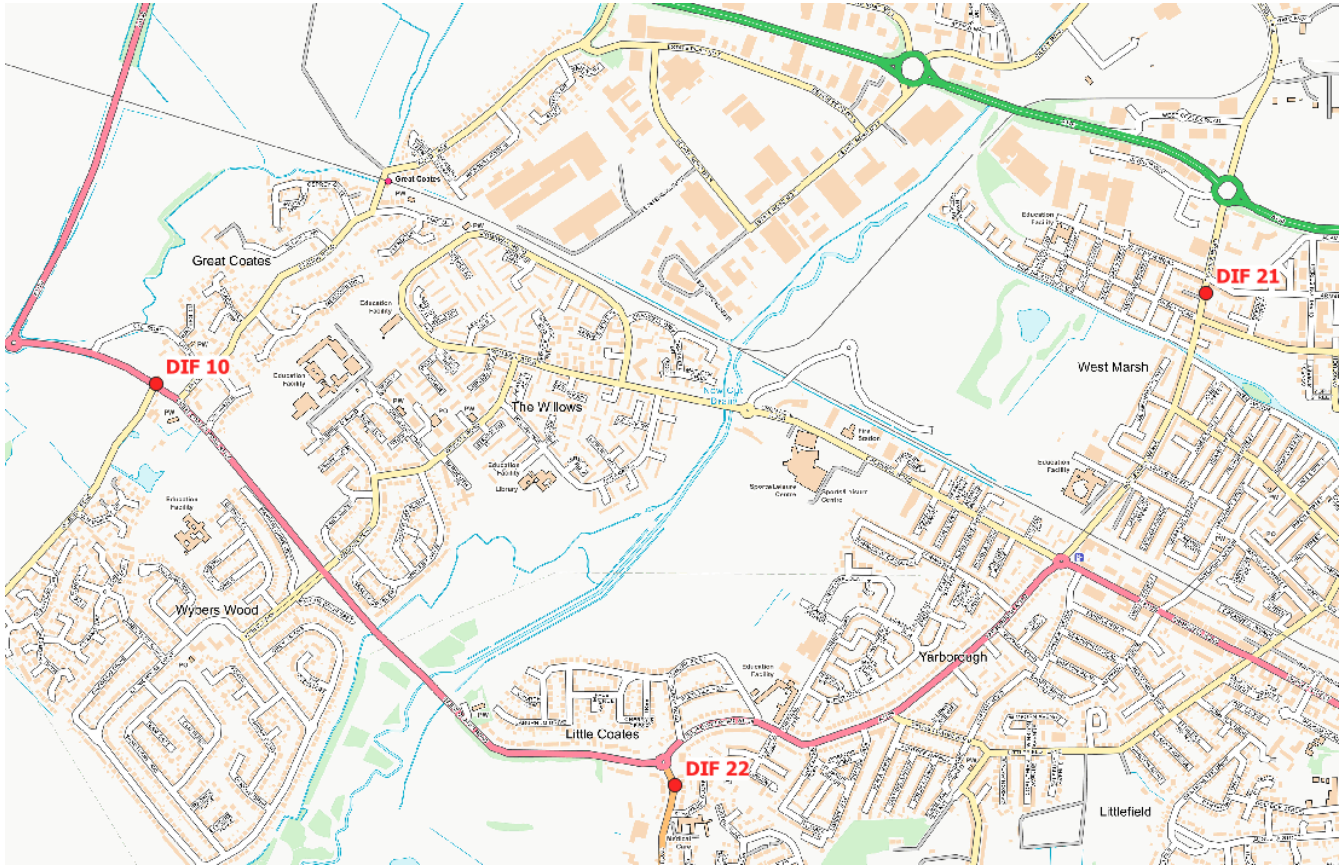
Legend

- Diffusion Tube Location
- Automatic Monitoring

Air Quality
Bureau Veritas
5th Floor
66 Prescot Street
London, E1 8HG

Location	
North East Lincolnshire Council	
Title	
Monitoring Locations: Immingham	
By	**Approved**
FL	HS
Scale	**Job Ref**
Not to Scale	6486270
Date	**Figure No.**
June 2019	D.1

Figure D.2– NO_2 Diffusion Tube Monitoring Locations: Grimsby, Yarborough



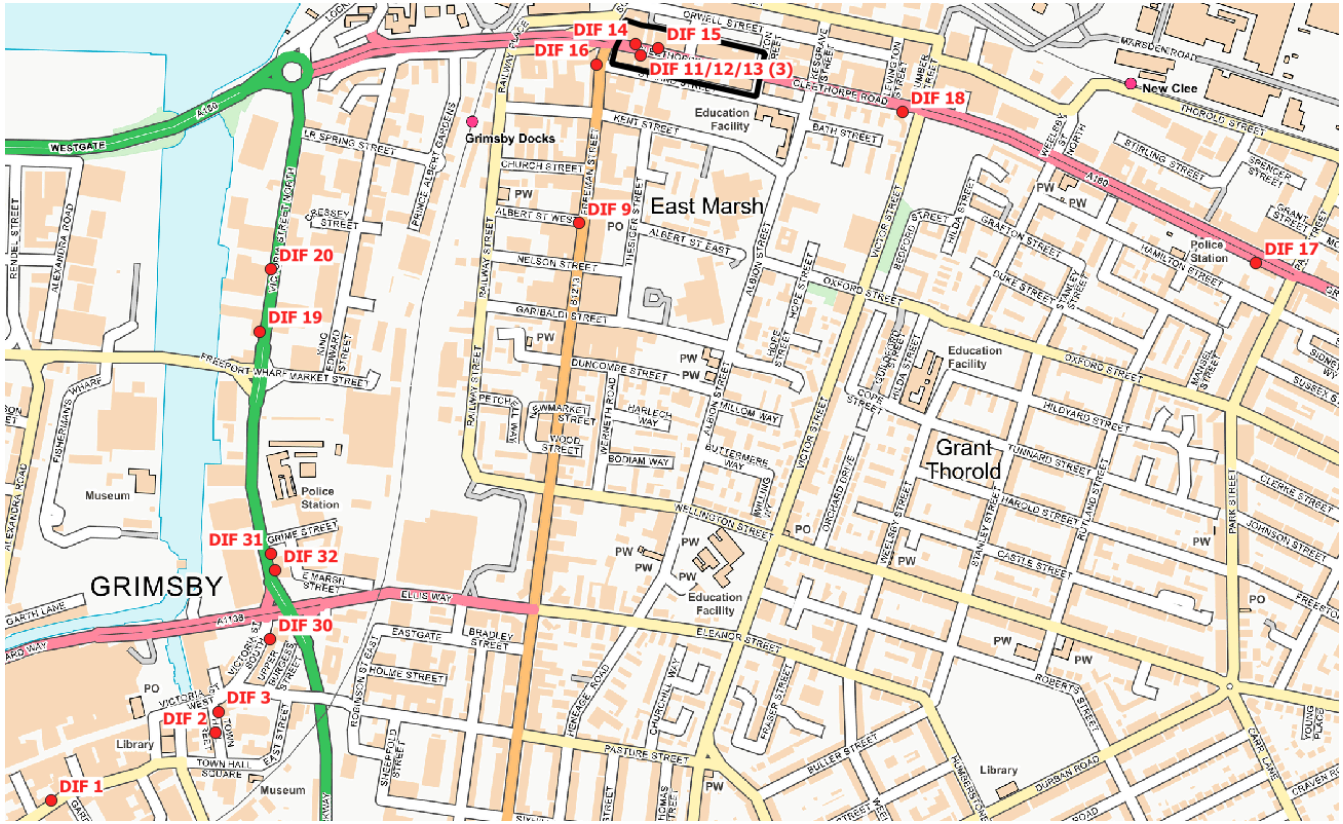
Legend

● Diffusion Tube Location

Air Quality
Bureau Veritas
5th Floor
66 Prescot Street
London, E1 8HG

Location	
North East Lincolnshire Council	
Title	
NO_2 Diffusion Tube Monitoring Locations: Grimsby, Yarborough	
By	**Approved**
FL	HS
Scale	**Job Ref**
Not to Scale	6486270
Date	**Figure No.**
June 2019	D.2

Figure D.3 – NO_2 Diffusion Tube Monitoring Locations: Grimsby North



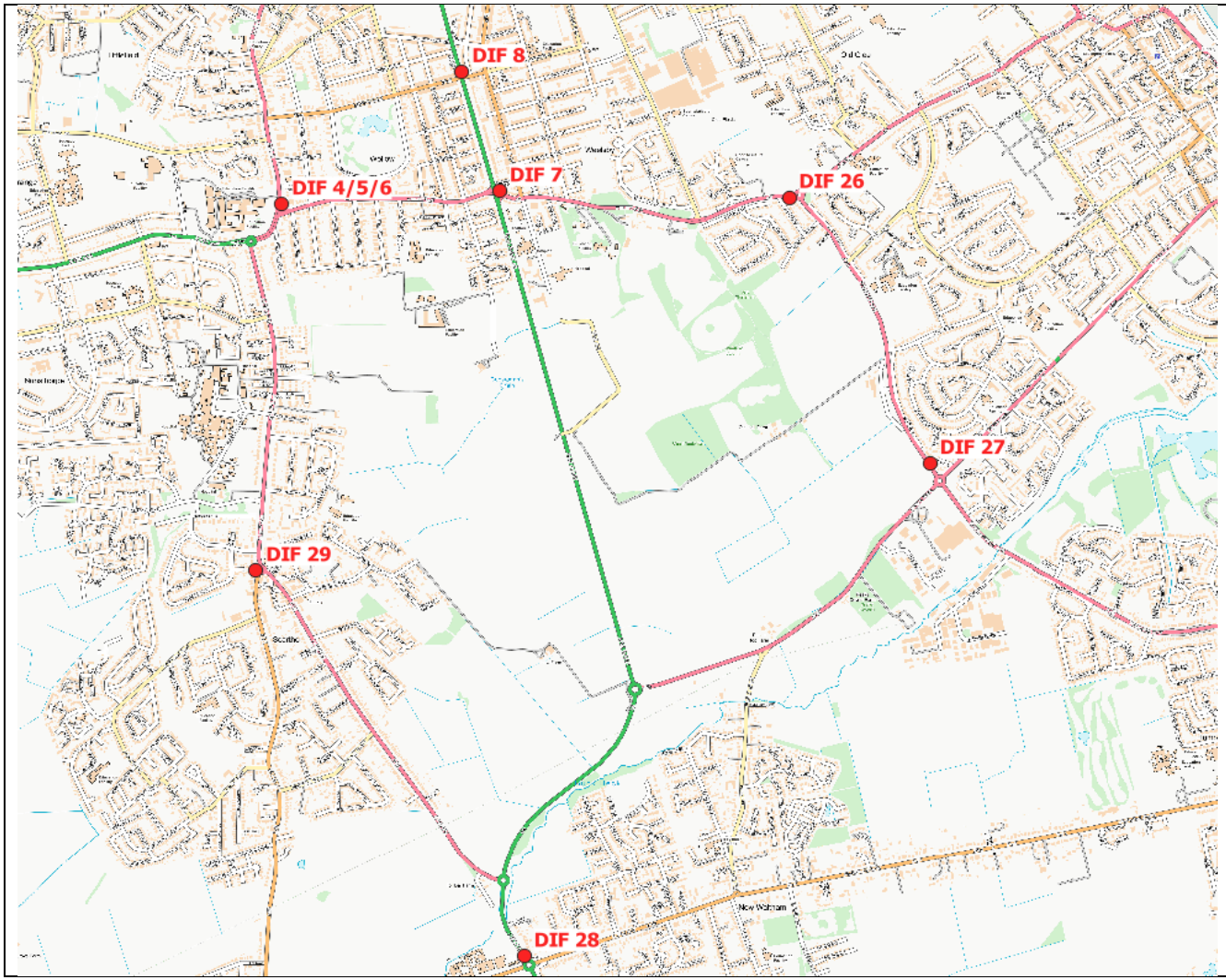
Legend

- AQMA
- Diffusion Tube Location

Air Quality
Bureau Veritas
5th Floor
66 Prescot Street
London, E1 8HG

Location	North East Lincolnshire Council
Title	NO_2 Diffusion Tube Monitoring Locations: Grimsby North
By FL	**Approved** HS
Scale Not to Scale	**Job Ref** 6486270
Date June 2019	**Figure No.** D.3

Figure D.4 – NO_2 Diffusion Tube Monitoring Locations: Grimsby South



Legend

- Diffusion Tube Location

Air Quality
Bureau Veritas
5th Floor
66 Prescot Street
London, E1 8HG

Location	North East Lincolnshire Council
Title	NO_2 Diffusion Tube Monitoring Locations: Grimsby South
By FL	**Approved** HS
Scale Not to Scale	**Job Ref** 6486270
Date June 2019	**Figure No.** D.4

Appendix E: Summary of Air Quality Objectives in England

Table E. 1 – Air Quality Objectives in England

Pollutant	Air Quality Objective[11]	
	Concentration	Measured as
Nitrogen Dioxide (NO_2)	200 µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m^3	Annual mean
Particulate Matter (PM_{10})	50 µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350 µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[11] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

Glossary of Terms

Abbreviation	Description
AIR-PT Scheme	AIR NO_2 Proficiency Testing Scheme
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority 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
ASR	Air quality Annual Status Report
AURN	Automatic Urban and Rural Network
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
EV	Electric Vehicle
ESG	Environmental Scientific Group
FDMS	Filter Dynamics Measurement System
HGVs	Heavy Good Vehicles
LAQM	Local Air Quality Management
NELC	North East Lincolnshire Council
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
TEA	Triethanolamine
UKAS	United Kingdom Accreditation Service
WASP	Workplace Analysis Scheme for Proficiency

References

- Local Air Quality Management Technical Guidance LAQM.TG(16). February 2018. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG(16). May 2016. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- North East Lincolnshire Council Air Quality Action Plan, October 2012.
- North East Lincolnshire Council 2018 Annual Status Report.
- North East Lincolnshire Council 2017 Annual Status Report.
- National Diffusion Tube Bias Adjustment Factor Spreadsheet, version 03/19 published in March 2019.
- North East Lincolnshire Council, Air Quality Strategy 2015-2017.