



Rutland County Council

2023 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995
Local Air Quality Management, as amended by the
Environment Act 2021

Date: June, 2023

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Executive Summary: Air Quality in Our Area

Air Quality in Rutland County Council

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, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas^{1,2}.

The mortality burden of air pollution within the UK is equivalent to 29,000 to 43,000 deaths at typical ages³, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017⁴.

Currently, there are no Air Quality Management Areas (AQMA) in Rutland. To assess the air quality in Rutland a total of thirteen passive NO₂ diffusion tubes were monitored at different locations during 2022 and no automatic monitoring was undertaken.

In Rutland NO₂ has experienced a slight increase since 2021 with an average change across the continuing 11 locations of 1.2 µg/m³ between 2021 and 2022. There have been no exceedances of the NO₂ annual mean concentration at any of the monitoring locations.

No new major sources of emissions have been introduced in 2022, but there is ongoing development in the County. Potential air quality impacts are being addressed through the planning regime.

¹ Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

² Defra. Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

³ Defra. Air quality appraisal: damage cost guidance, January 2023

⁴ Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, there are some areas where local action is needed to protect people and the environment from the effects of air pollution.

The Environmental Improvement Plan⁵ sets out actions that will drive continued improvements to air quality and to meet the new national interim and long-term PM_{2.5} targets. The National Air Quality Strategy, due to be published in 2023, will provide more information on local authorities' responsibilities to work towards these new targets and reduce PM_{2.5} in their areas. The Road to Zero⁶ details the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Moving Forward Rutland, Rutland's Fourth Travel Plan, identifies the significant dependency on cars in the county as public transport and cycling are not appropriate for some journeys particularly as the county is largely rural. However, the initiative aims to encourage behavioural change towards more sustainable modes of transport where possible.

Although air quality is relatively good, the council supports any actions to maintain and improve air quality.

Rutland County Council joined a partnership of five local authorities across the Midlands region, alongside Sub-National Transport Body Midlands Connect to gain £1 million in funding for electric charging points. The funding secured during 2022 will deliver 26 standard and 4 rapid charging points across Rutland, which will in turn support the increasing use of electric vehicles in the area.

⁵ Defra. Environmental Improvement Plan 2023, January 2023

⁶ DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

Conclusions and Priorities

Monitoring conducted during 2022 indicates a slight general increase in NO₂ concentrations across Rutland in comparison to the monitoring results of 2021. However, the levels of NO₂ are lower than those measured in 2019 (pre-pandemic) and remain significantly below the threshold of 40 µg/m³. Work by the Public Protection Section to maintain and improve air quality has helped ensure there are no AQMAs in Rutland. The priorities are ongoing and can be summarised:

- To continue to screen planning applications from the earliest stage, including pre-application enquiries and scoping opinions for Environmental Impact Assessments to ensure potential impacts on air quality are assessed and mitigated where necessary and improvements suggested for schemes.
- To maintain the NO₂ monitoring program and to evaluate where monitoring locations can be changed to seek out potential locations where traffic could adversely impact air quality.

Involvement and consultation on planning applications regarding air quality will continue and consultation on quarrying activities will be conducted as necessary.

Local Engagement and How to get Involved

Residents with open fireplaces and solid fuelled appliances are encouraged to read and follow guidance contained in the Defra document, 'Open fires and wood burning stoves – A practical guide', which can be downloaded from the Rutland County Council [Pollution webpage](#).

The [Sustainable Travel & Smarter Travel Choices](#) initiatives offer advice on sustainable travel reducing use of individual car use and traffic congestion which in turn has a positive effect on the quality of air. Public information provides information on bus travel, travel planning, cycle and walking routes around Rutland to encourage alternative travel arrangements to reduce emissions.

Local Responsibilities and Commitment

This ASR was prepared by the Pollution Control Team a shared service between Peterborough City Council and Rutland County Council with the support and agreement of the following officers and departments:

Lynden Leadbeater, Principal Environmental Health Officer: Environment and Pollution Control, Peterborough City Council.

This ASR has been approved by:

Jacqui Harvey, Head of Operations Environmental Health, Licensing & Trading Standards, Peterborough City Council.



Dated: 30th June 2023

This ASR has not been signed off by a Director of Public Health. Prior approval of the Annual Status Report has been delegated to the Head of Operations Environmental Health & Licensing and has been duly consulted.

If you have any comments on this ASR please send them to the Pollution Control Team at:

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1 Local Air Quality Management

This report provides an overview of air quality in Rutland County Council during 2022. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995), as amended by the Environment Act (2021), 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 order to achieve and maintain the objectives and the dates by which each measure will be carried out. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by Rutland County Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority should prepare an Air Quality Action Plan (AQAP) within 18 months. The AQAP should specify how air quality targets will be achieved and maintained, and provide dates by which measures will be carried out.

Rutland County Council currently does not have any declared AQMAs. A local Air Quality Strategy is under development to prevent and reduce polluting activities.

2.2 Progress and Impact of Measures to address Air Quality in Rutland County Council

Defra's appraisal of last year's ASR concluded:

The report is well structured, detailed, and provides the information specified in the Guidance. The following comments are designed to help inform future reports:

- 1. The report is well structured and clearly outlines air quality in their local area.*
- 2. The RCC could provide further data on how well engaged the community is on helping reduce NO_x and PM concentrations.*
- 3. The Council have used the 09/22 version of national bias adjustment spreadsheet. There has been a 03/23 version released more recently. The Council is reminded to ensure they are using the latest versions of all tools and spreadsheets.*
- 4. From 2023 those authorities who have not had to designate AQMAs and produce AQAPs will be required to draw up a local Air Quality Strategy. The Council is expected to work towards this, and provide an update in future ASRs.*

Rutland County Council has continued comparisons with previous years air quality data to determine any trends or anomalies. Monitoring of the additional sites in Uppingham continued throughout 2021 and early 2022 confirming low NO₂ concentrations in this area remain beyond the travel restrictions experienced during 2020, therefore monitoring at sites 12 and 13 ceased in March 2022.

National Diffusion Tube Bias Adjustment Factor Spreadsheet (v03/23) is the most current spreadsheet available and has been used for the processing of the 2022 data.

Rutland County Council has taken forward a number of direct measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1. six measures are included within Table 2.1, with the type of measure and the progress Rutland County Council have made during the reporting year of 2022 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.1.

Key completed measures are:

Rutland County Council expects the following measures to be completed over the course of the next reporting year:

- Continue to consult and monitor planning applications that may have a significant impact on air quality in Rutland.

Key completed measures include the following Proactive Development Control:

- Rutland County Council provide consultation on applications for mineral extraction with particular focus on potential dust and particulate impacts, evaluate the production and control/mitigation of dust and PM10 during future operations.

2020/0297/MIN Mick George, Greetham Quarry, Stretton Road, Greetham, Oakham, LE15 7NP – ‘North Western extension to Greetham Quarry including the extraction of Limestone and building stone and importation of suitable inert material.

The proposed extension and current quarry area are approximately outlined in Figure 2.1. As can be seen the sensitive receptors i.e. the village of Greetham is within approximately 100m of the proposed site boundary. Both onsite operations producing dust and vehicles tracking material out of the site have been of concern in recent years. Consultation has been made by Rutland County Council on the potential impacts on Air Quality, including PM10 and PM2.5.

Rutland County Council had requested screening for the existing background PM and a detailed assessment of the long-term effects of the proposed development.

Monitoring of PM10 and PM2.5 concentrations within the vicinity of the site was undertaken by Redmore Environmental Ltd⁷ between 13th October 2021 and 13th May 2022. The annualised results are in the table below.

Table 2.1 Table of monitored PM₁₀ and PM_{2.5} in Greetham.

	PM ₁₀ (µg/m ³)	PM _{2.5} (µg/m ³)
Annual Monitored Concentration	7.50	5.70

The monitored results show the current levels do not exceed Air Quality Objectives. The proposed quarry extension is predicted to result in a maximum increase in PM10 and PM2.5 at local receptors by 3.03 µg/m³ and 0.46 µg/m³ respectively during the phased approach. The predicted increases indicate there is not a significant risk to the nearest receptors.

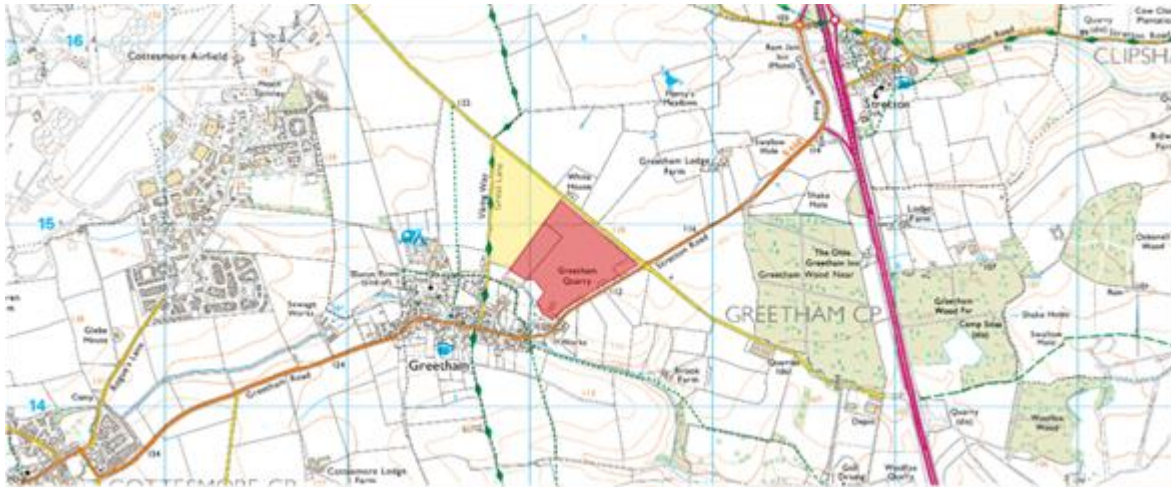


Figure 2.1 Approximate location of limestone quarry, extension at Greetham Quarry, Stretton Road, Greetham, Oakham, LE15 7NP

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Note: Approximate extent of existing quarry shown in red, proposed extension area shown in yellow

Rutland County Council's priorities for the coming year are:

- To ensure planning applications that may have a detrimental impact on air quality are consulted on to either prevent such applications becoming approved or the appropriate mitigation measures are adopted into proposals.
- To provide local support and relevant information to encourage potential sustainable behavioural change and increased understanding of air quality in Rutland.

The principal challenges and barriers to implementation that Rutland County Council anticipates facing are a relatively low level of resource and competing priorities. This means that any work to improve or maintain local air quality is on a limited scale.

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced in AQAP	Estimated / Actual Completion Date	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Proactive Planning Consultations	Policy Guidance and Development Control	Other policy	Ongoing	Ongoing	Environmental Health & Development Control	Local Authority	No	N/A	N/A	N/A	N/A	Implementation ongoing	Ongoing	See Section 2.2 Greetham Quarry
2	Open Fires and Wood Stoves guide added to RCC website	Public Information	Via the Internet	2018	Ongoing	Defra & RCC	RCC	No	N/A	N/A	N/A	N/A	Information published 2018	Implemented	Information remains on website
3	Promotion of Sustainable Travel	Public Information	Via the Internet	2022	Ongoing	RCC	RCC	No	N/A	N/A	N/A	Reduction in Vehicle Emissions	Information published 2022	Implemented	Information remains on website
4	E-Bike Trial Scheme	Transport Planning and Infrastructure	Public Cycle Hire Scheme	2020	Ongoing	RCC Transport Dept.	RCC	No	Fully funded	N/A	Implemented	Reduction in Vehicle Emissions	Implementation ongoing	Implemented	Limited number of bikes available.
5	EV charging points	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	-	-	RCC Transport Dept.	Government Funding	No	Fully Funded	£935,355 (Shared between five Midlands Authorities)	N/A	Reduction in Vehicle Emissions	Installation of EV charging points	Funding secured	Locations to be determined.
6	Provision of Cycling infrastructure	Promoting Travel Alternatives	Cycle Network	Ongoing	Ongoing	RCC	RCC	No	Unknown	N/A	Ongoing implementation	Reduction in Vehicle Emissions	New cycle lane constructed along Burley Road, Oakham during 2022 to provide a safe route for cycling to school or towards town.	Ongoing	Physical barriers of introducing further cycle paths include existing road widths and funding limitations.

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), 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.

Rutland County Council doesn't monitor for PM_{2.5} or PM₁₀. Previous rounds of the Air Quality Review and Assessment process have indicated that particulate (PM₁₀) concentrations in the county are unlikely to exceed air quality objectives. Defra⁷ model maps of background PM_{2.5} concentrations on a 1km x 1km grid for the whole of concentrations predicted for Rutland 2022 is from 7.5 µg/m³ to 10.5 µg/m³. The 1km x 1km grid square with predicted PM_{2.5} concentrations of 10.5 µg/m³ aligns with the north-eastern area of Oakham, including the Burley Parkway ring road.

As detailed in Section 2.2 monitoring of particulate matter was undertaken in Greetham between 13th October 2021 and 13th May 2022. The monitoring determined annual concentrations of 5.7 µg/m³ for PM_{2.5}, below the Defra predicted concentrations for Rutland.

Rutland County Council is taking the following measures to address PM_{2.5}:

- Review and assess potential impacts on Local Air Quality by proposed developments through the Planning regime.
- Publishing Defra's guide 'Open fires and wood-burning stoves' on Rutland County Council's website.
- Reviewing the control of emissions associated with Part B permitted processes.
- Investigation of nuisance complaints for dust and smoke.
- Moving Rutland Forward – Rutland's Fourth Local Transport Plan, sets out the implementation of reducing car dependency and encouraging more sustainable travel to improve air quality.

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

This section sets out the monitoring undertaken within 2022 by Rutland County Council and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

Rutland County Council does not have any Automatic Monitoring Sites.

3.1.2 Non-Automatic Monitoring Sites

Rutland County Council undertook non- automatic (i.e. passive) monitoring of NO₂ at 13 sites during 2022. Table A.1 in Appendix A presents the details of the non-automatic sites.

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 (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

Table A.2 in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. Note that the concentration data presented represents the concentration at the location of the

monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2022 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

The highest annual average NO₂ concentration of 26.6 µg/m³ was found at Site 3 (Uppingham, North Street East), similarly this site had the highest annual average NO₂ concentration in 2021 and 2020. The second highest NO₂ concentration of 21.5 µg/m³ was identified at Site 8 (Burley Park Way). In previous years Site 8 has been associated with some of the higher results in the dataset. Increased development around Oakham and surrounding villages are likely to increase traffic on the Burley parkway which may contribute to this site having peak results in future datasets.

Largely across Rutland the monitoring sites indicate minimal change or a slight increase in NO₂ at these location since the previous monitoring year. However, where monitoring sites were in use in 2019, the comparable data sets continue to show a significant reduction relative to pre-pandemic levels.

Monitoring has ceased at the sites introduced in 2020, 12 (Lockharts Hill, Uppingham, A6003) and 13 (Knoll House, Red Hill, Uppingham, A6003). However, for completeness analysis has been undertaken returning NO₂ concentrations of 10.4 µg/m³ and 8.5 µg/m³ respectively. Similar to the previous year the two measurements are amongst the lower levels of NO₂ at recorded at monitoring sites in Rutland, although it should be noted Site 9 Egleton is intended as a 'rural background' site. While these sites are adjacent to the A6003 (as are Sites 2 and 3) the area is open in nature and lacks features that would result in queuing traffic. Monitoring at sites 12 and 13 ceased March 2022 and the number of monitoring locations returned to 11.

The background site at Egleton continues to show a decline in NO₂ concentrations indicating the area as a whole is experiencing a general improvement in the local air quality.

There are no trends or changes that would indicate an increasing risk of the air quality objective being exceeded.

Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Monitoring Sites

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
1	Caldecott	Kerbside	486720	293460	NO2	No	2.2	1.0	No	2.2
2	Uppingham Market Place	Roadside	486630	299640	NO2	No	2.2	1.2	No	2.2
3	Uppingham North Street East	Roadside	486621	299780	NO2	No	2.2	1.5	No	2.2
4	Tickencote	Rural	499060	309650	NO2	No	2.0	N/A	No	2.0
5	Oakham, Uppingham Rd	Kerbside	486300	308490	NO2	No	2.2	0.2	No	2.2
6	Oakham, Brooke Rd (Nr No 65)	Roadside	485970	308400	NO2	No	2.0	2.0	No	2.0
7	Oakham, Melton Rd	Kerbside	485760	308890	NO2	No	2.2	0.2	No	2.2
8	Oakham, Burley Pk Wy	Roadside	486640	309710	NO2	No	2.2	1.4	No	2.2
9	Egleton	Rural	487910	307540	NO2	No	1.5	N/A	No	1.5
10	Oakham, High St	Kerbside	486206	308740	NO2	No	2.2	1.0	No	2.2

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube Co-located with a Continuous Analyser?	Tube Height (m)
11	Oakham, John Street (Bus Stn)	Roadside	485480	308745	NO2	No	2.0	1.8	No	2.0
12	Uppingham, Lockhard's Hill Junct	Roadside	486602	298779	NO2	No	2.0	2.2	No	2.0
13	Uppingham, Knoll House, Red Hill	Roadside	486667	299033	NO2	No	2.4	1.2	No	2.4

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.

Table A.2 – Annual Mean NO₂ Monitoring Results: Non-Automatic Monitoring (µg/m³)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2022 (%) ⁽²⁾	2018	2019	2020	2021	2022
1	486720	293460	Kerbside	77.13498623	77.1	22.6	22.5	17.1	17.4	17.7
2	486630	299640	Roadside	84.84848485	84.8	29.2	27.3	20.2	20.6	19.8
3	486621	299780	Roadside	76.85950413	76.9			25.1	24.9	26.6
4	499060	309650	Rural	84.84848485	84.8	18.5	13.3	10.6	12.0	12.3
5	486300	308490	Kerbside	84.84848485	84.8	20.4	21.4	16.8	14.6	16.0
6	485970	308400	Roadside	84.84848485	84.8		16.7	11.8	13.1	12.6
7	485760	308890	Kerbside	84.84848485	84.8	21.7	21.1	15.6	18.0	19.2
8	486640	309710	Roadside	77.13498623	77.1	23.7	23.3	18.4	21.7	21.5
9	487910	307540	Rural	42.14876033	42.1	9.0	8.9	7.1	6.1	5.7
10	486206	308740	Kerbside	84.84848485	84.8	23.5	24.8	16.4	19.5	19.7
11	485480	308745	Roadside	84.84848485	84.8		16.5	12.0	12.3	12.3
12	486602	298779	Roadside	100	24.8			11.2	14.0	10.4
13	486667	299033	Roadside	100	24.8			8.3	10.4	8.5

☒ Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.

☒ Diffusion tube data has been bias adjusted .

☒ Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.

Notes:

The annual mean concentrations are presented as µg/m³.

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

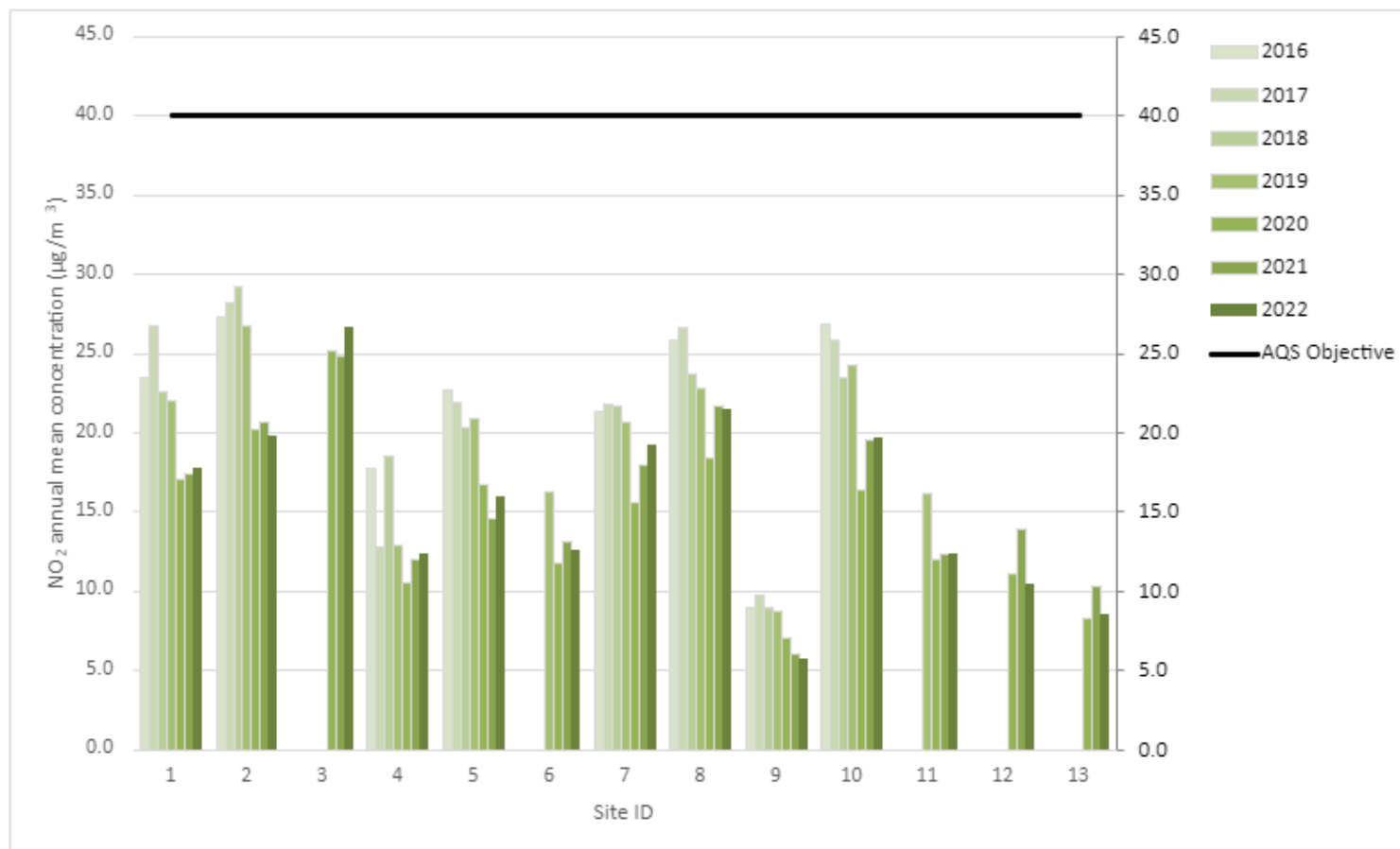
NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(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%).

Figure A.1 – Trends in Annual Mean NO₂ Concentrations

Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO₂ 2022 Diffusion Tube Results (µg/m³)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.83)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	486720	293460		19.8	20.8	19.1			19.7	20.9	19.7	23.3	22.8	25.4	21.3	17.7	16.0	
2	486630	299640	34.6	25.8	24.9	21.5			21.7	25.7	25.2	9.1	24.2	25.9	23.9	19.8	19.1	
3	486621	299780	41.3	33.2	32.2	27.0				26.3	26.6	36.1	33.7	31.8	32.0	26.6	25.7	
4	499060	309650	14.9	10.3	19.7	15.0			8.8	13.2	12.0	24.9	12.0	16.9	14.8	12.3		
5	486300	308490	28.2	15.8	20.3	16.6			14.9	15.5	19.4	17.8	20.3	23.6	19.2	16.0	11.2	
6	485970	308400	20.7	19.4	16.6	12.6			9.8	11.5	14.3	13.0	15.1	18.5	15.1	12.6	11.2	
7	485760	308890	17.5	48.2	24.7	20.5			17.8	19.9	20.6	19.0	20.6	23.0	23.2	19.2	15.2	
8	486640	309710	35.7		27.7	26.2			21.4	23.0	21.0	24.8	25.1	28.3	25.9	21.5	15.7	
9	487910	307540				4.1					6.1	6.8	8.6	10.7	7.3	5.7		
10	486206	308740	30.8	25.2	26.6	19.8			18.9	20.1	22.4	23.1	23.6	26.2	23.7	19.7	18.9	
11	485480	308745	21.7	15.1	17.6	12.0			10.7	12.2	13.6	12.4	14.9	18.1	14.8	12.3	11.6	
12	486602	298779	23.0	13.9	13.8										16.9	10.4	9.0	Monitoring ceased at this location in March 2022.
13	486667	299033	18.9	11.0	11.8										13.9	8.5	7.4	Monitoring ceased at this location in March 2022.

☒ All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1

☒ Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22

☐ Local bias adjustment factor used

☒ National bias adjustment factor used

☒ Where applicable, data has been distance corrected for relevant exposure in the final column

☒ Rutland County Council confirm that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System

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**.

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within Rutland County Council During 2022

Rutland County Council has not identified any new sources relating to air quality within the reporting year of 2023.

Additional Air Quality Works Undertaken by Rutland County Council During 2022

Rutland County Council has not completed any additional works within the reporting year of 2023.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes used in 2022 were supplied and analysed by Gradko International. The tube preparation method is 20% (Triethanolamine)TEA / Water

Gradko International are accredited by the United Kingdom Accreditation Service (UKAS). They comply with ISO17025 'General requirements for the competence of testing and calibration laboratories'.

NO₂ diffusion tubes are stored and collected by Rutland County Council in accordance with the relevant guidance in, 'Diffusion Tubes for Ambient NO₂ Monitoring: Practical Guidance for laboratories and users'.

However, in 2022 there were deviations from the 'NO₂ Diffusion Tube Calendar' and several Diffusion Tubes were determined as not suitable due to spiders and webs present within the tube. As a result, there was a reduction in data capture for the monitoring year of 2022.

Diffusion Tube Annualisation

Annualisation was undertaken for the sites 9, 12 and 13 a rural background site where the annual data capture at these locations was between 25% and 75%. Background locations from the UK monitoring network were utilised to undertake annualisation. To conduct annualisation the data obtained from the locations at Wicken Fen, Northampton Spring Park and Leicester University were utilised. Wicken Fen is recorded as a rural background site. Although Northampton Spring Park is an urban location it is on the northern outskirts of the city and therefore less influenced from city centre traffic. A third annualisation site was assessed at Leicester University, located centrally within Leicester.

Table C.1 – Annualisation Summary (concentrations presented in $\mu\text{g}/\text{m}^3$)

AF- Annualisation Factor

Site ID	AF Wicken Fen	AF Northampton Spring Park	AF Leicester University	Average AF	Raw Data Annual Mean	Annualised Annual Mean
9	1.0132	0.8993	0.9428	0.9518	7.3	6.9
12	0.6633	0.7580	0.7981	0.7398	16.9	12.5
13	0.6633	0.7580	0.7981	0.7398	13.9	10.3

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2023 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 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.

Rutland County Council have applied a national bias adjustment factor of 0.83 to the 2022 monitoring data. A summary of bias adjustment factors used by Rutland County Council over the past five years is presented in Table C.2.

Table C.2 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	3/23	0.83
2021	National	09/22	0.84
2020	National	09/20	0.81
2019	National	09/19	0.91
2018	National	09/19	0.92

NO₂ Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO₂ fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO₂ concentrations corrected for distance are presented in Table B.1.

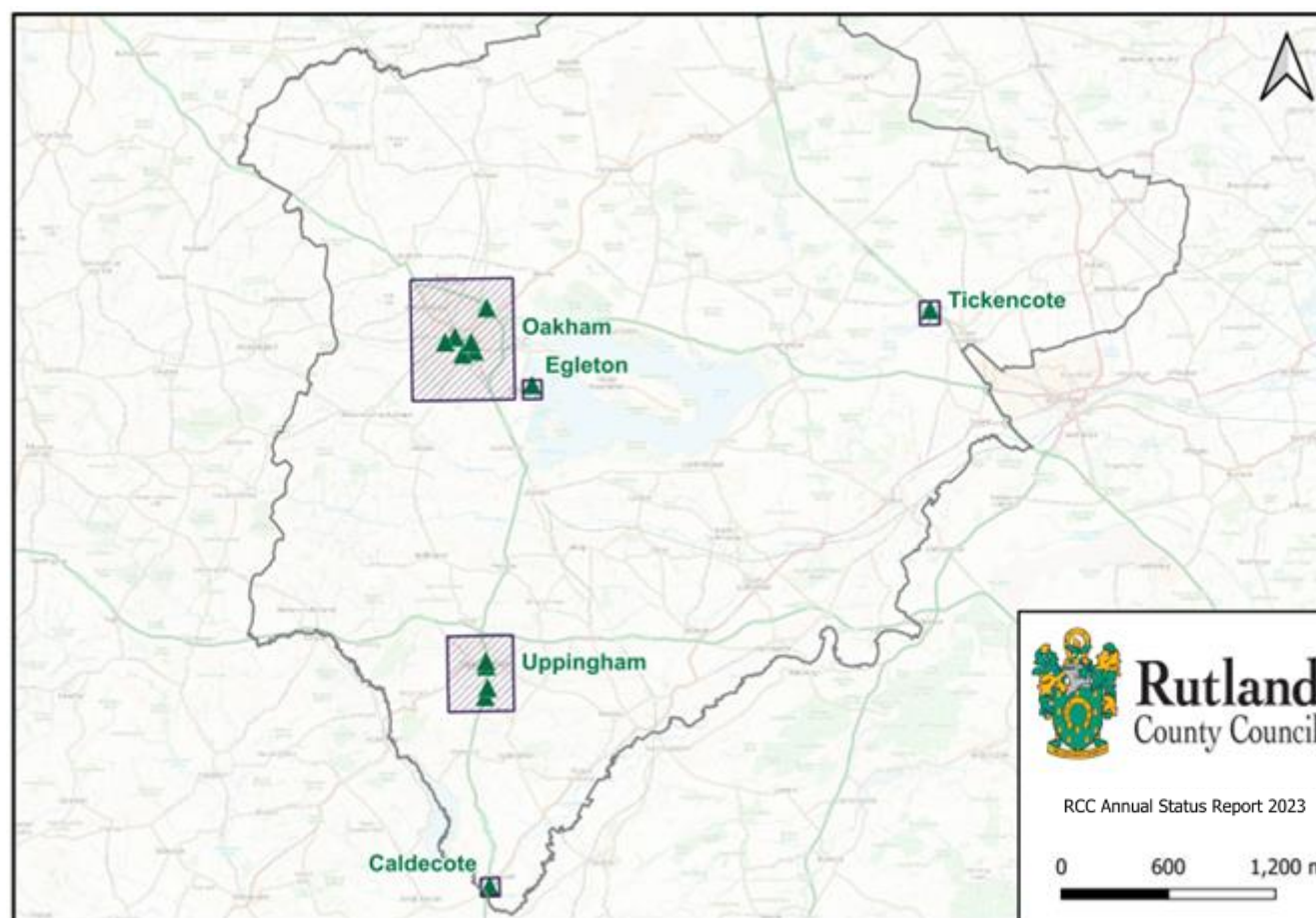
It is noted that whilst none of the NO₂ non-automatic monitoring sites annual mean concentrations were at 36µg/m³ or above, meaning an exceedance of an objective is very unlikely and there was no requirement in the Technical Guidance to do so, this has been calculated for completeness as in previous years reports.

Table C.3 – NO₂ Fall off With Distance Calculations (concentrations presented in µg/m³)

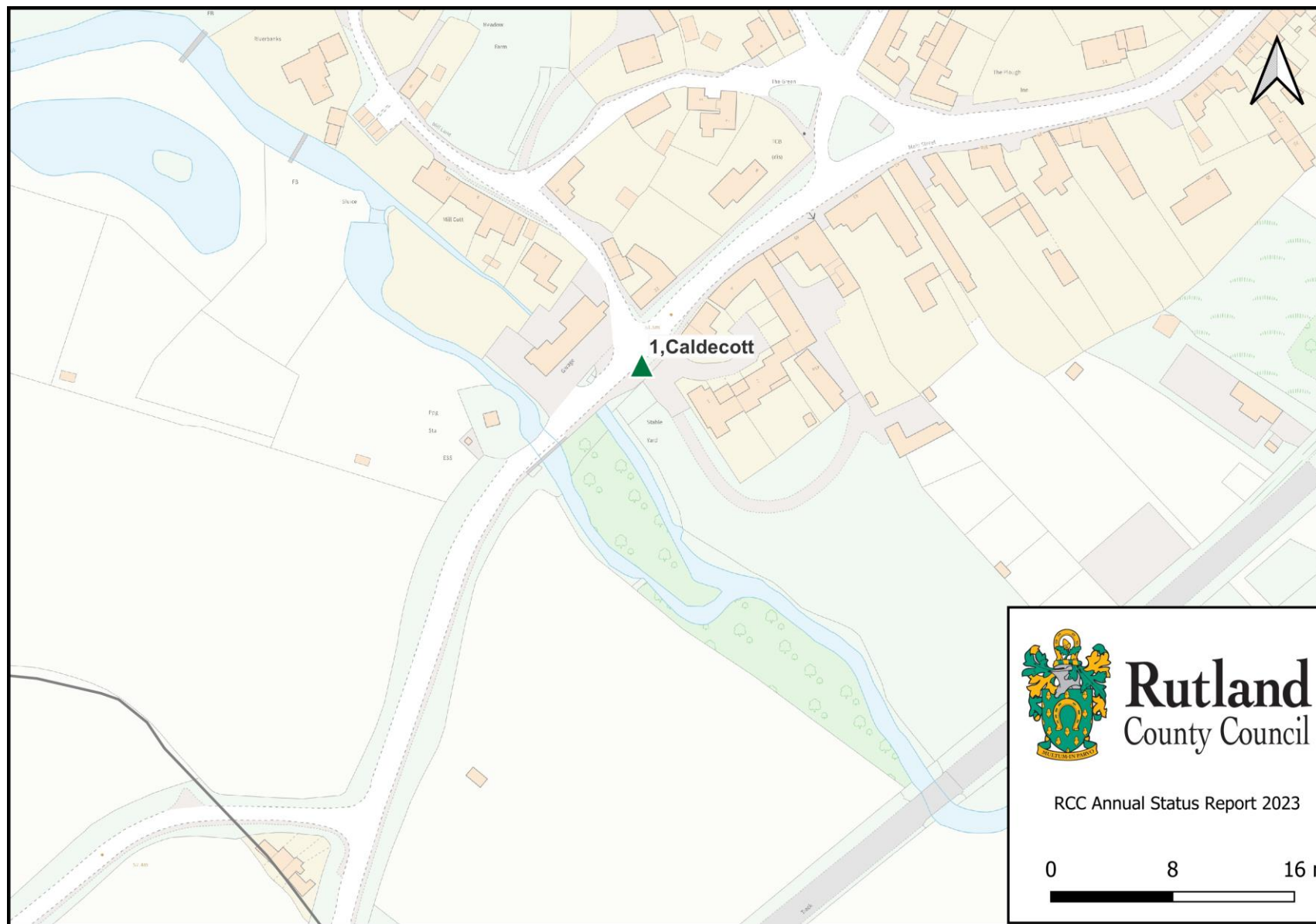
Site ID	Distance (m): Monitoring Site to Kerb	Distance (m): Receptor to Kerb	Monitored Concentration (Annualised and Bias Adjusted)		Background Concentration	Concentration Predicted at Receptor	Comments
1.0	1.0	2.0	17.7	5.7	16.0		
2.0	1.2	1.5	19.8	5.7	19.1		
3.0	1.5	1.8	26.6	5.7	25.7		
5.0	0.2	4.2	16.0	5.7	11.2		
6.0	2.0	4.7	12.6	5.7	11.2		
7.0	0.2	1.4	19.2	5.7	15.2		
8.0	1.4	7.7	21.5	5.7	15.7		
10.0	1.0	1.3	19.7	5.7	18.9		
11.0	1.8	2.8	12.3	5.7	11.6		
12.0	2.2	7.7	10.4	5.7	9.0		
13.0	1.2	7.7	8.5	5.7	7.4		

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

Figure D.1 – Map of Non-Automatic Monitoring Site



Site 1 Caldecott (grid ref 486720 293460)

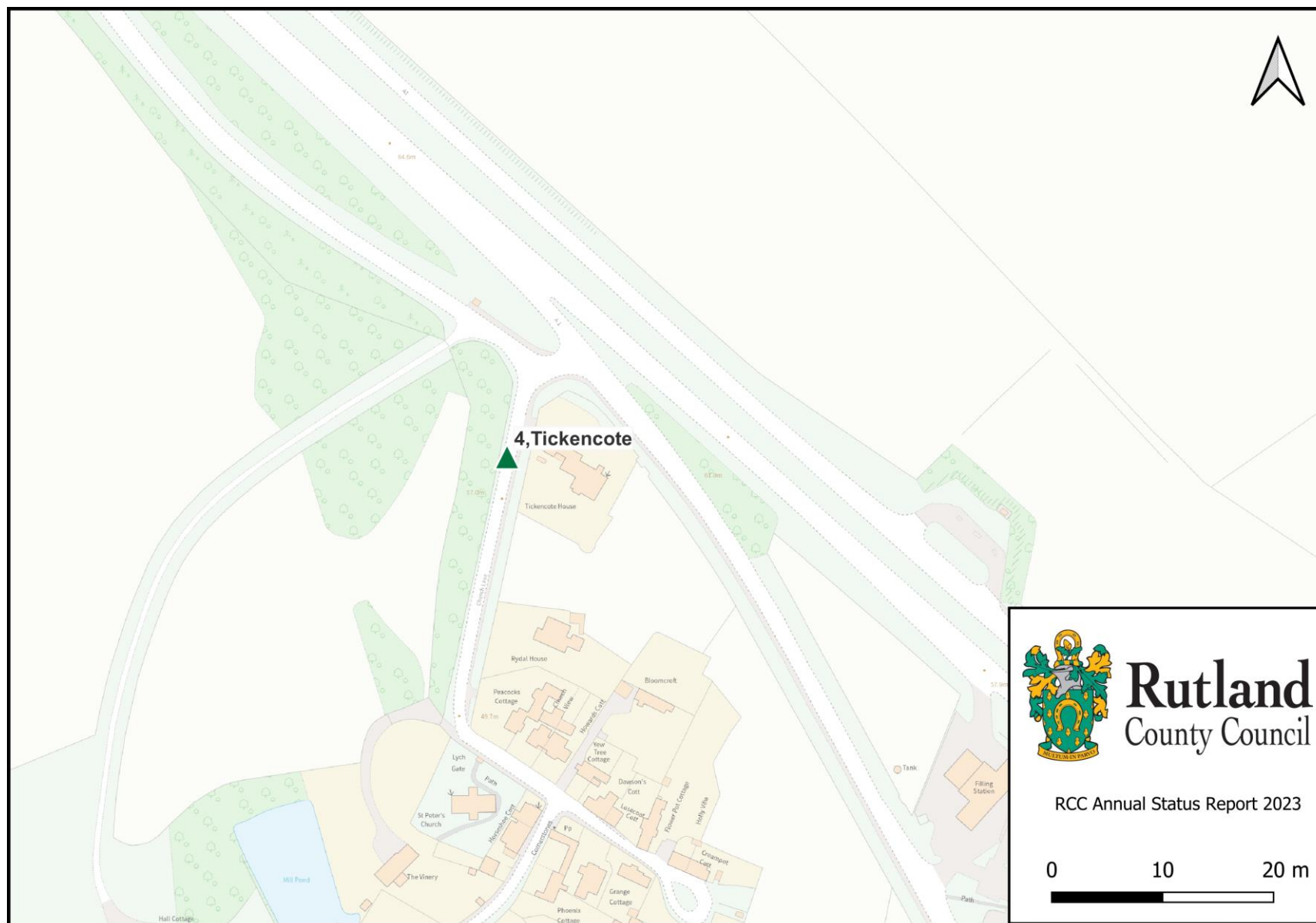


Site 2 Uppingham A6003, Market Place (grid ref 486630 299640)

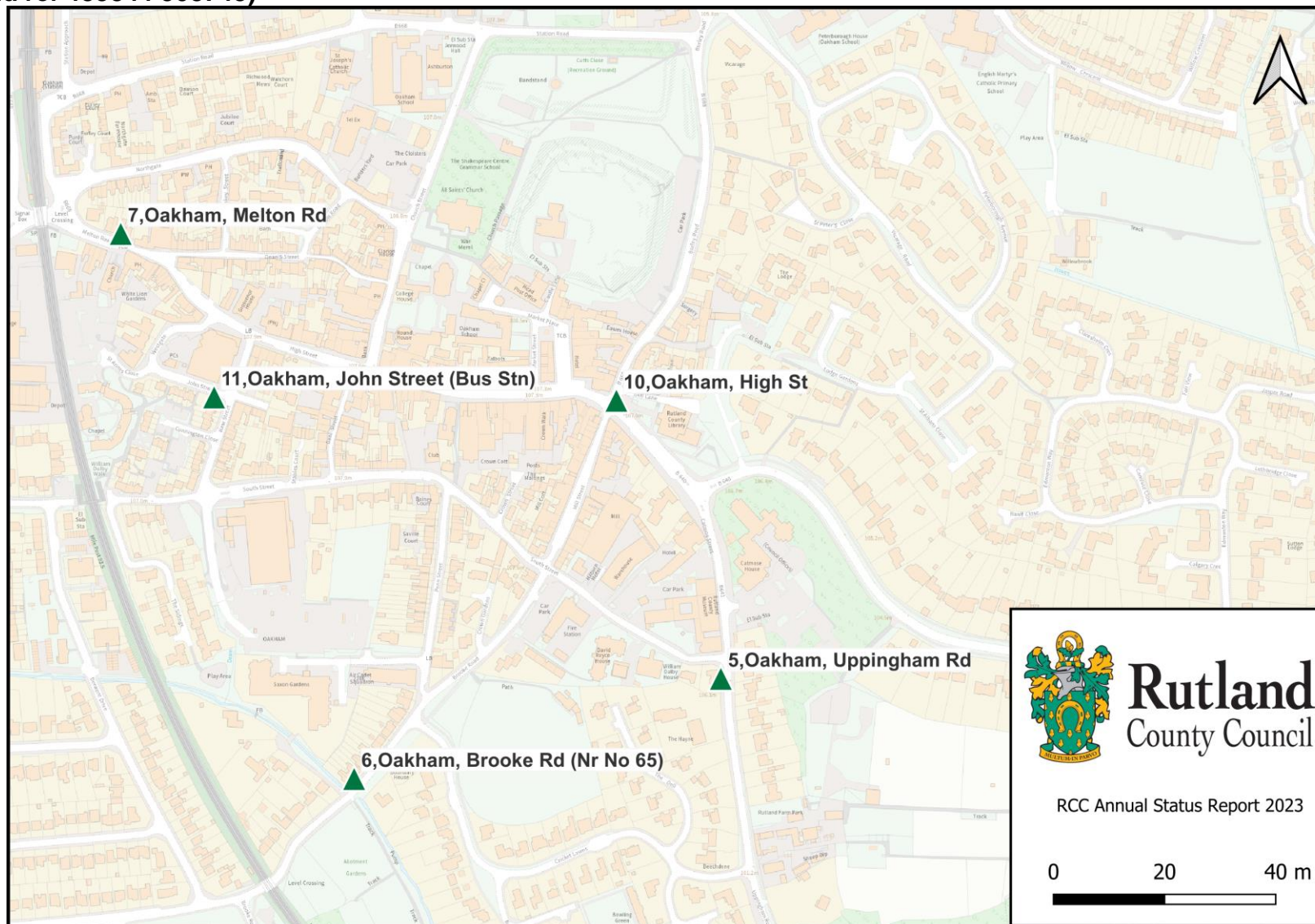
Site 3 Uppingham, North Street East (grid ref 486621, 299780)



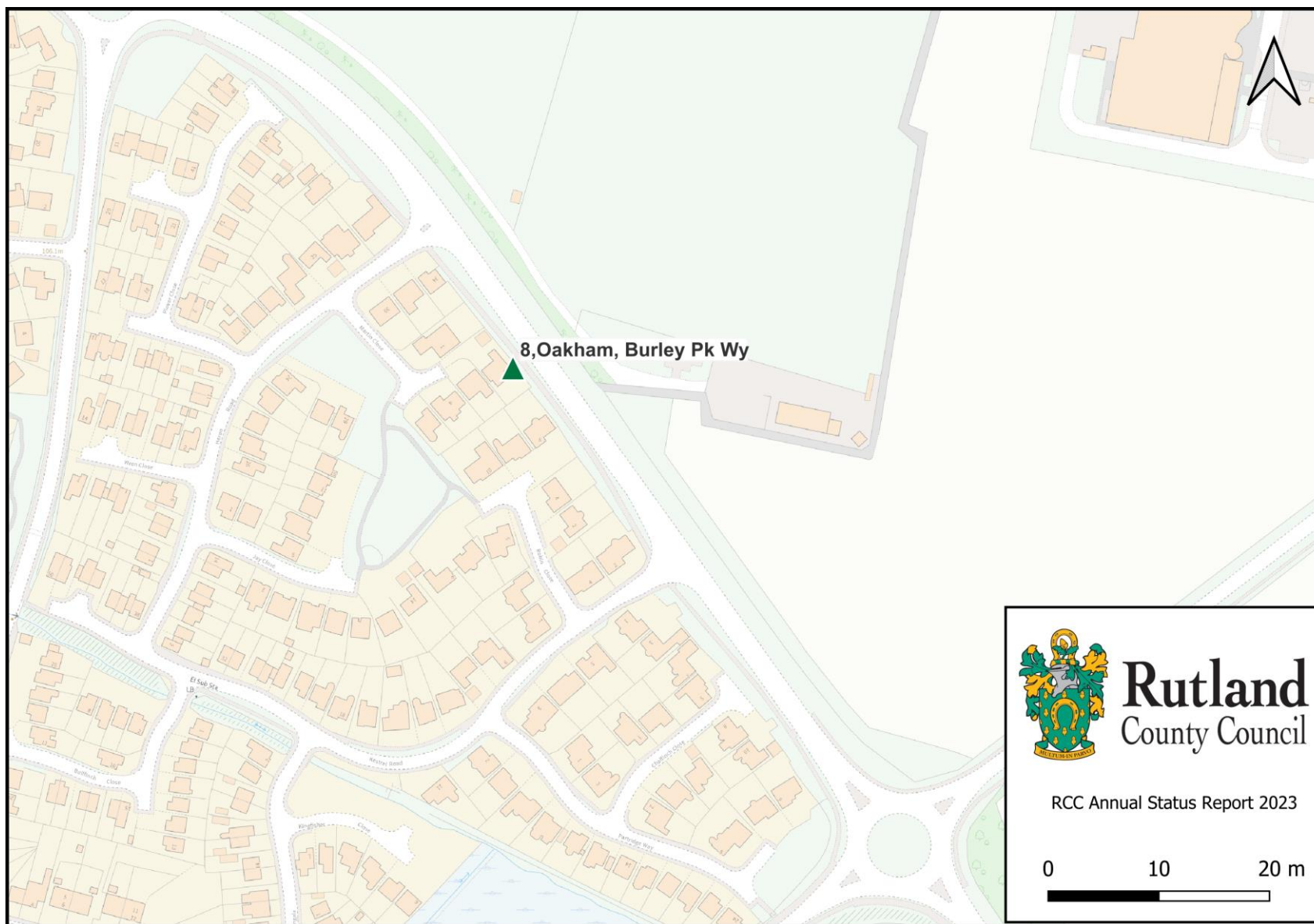
Site 4 Tickencote (grid ref 499060 309650)



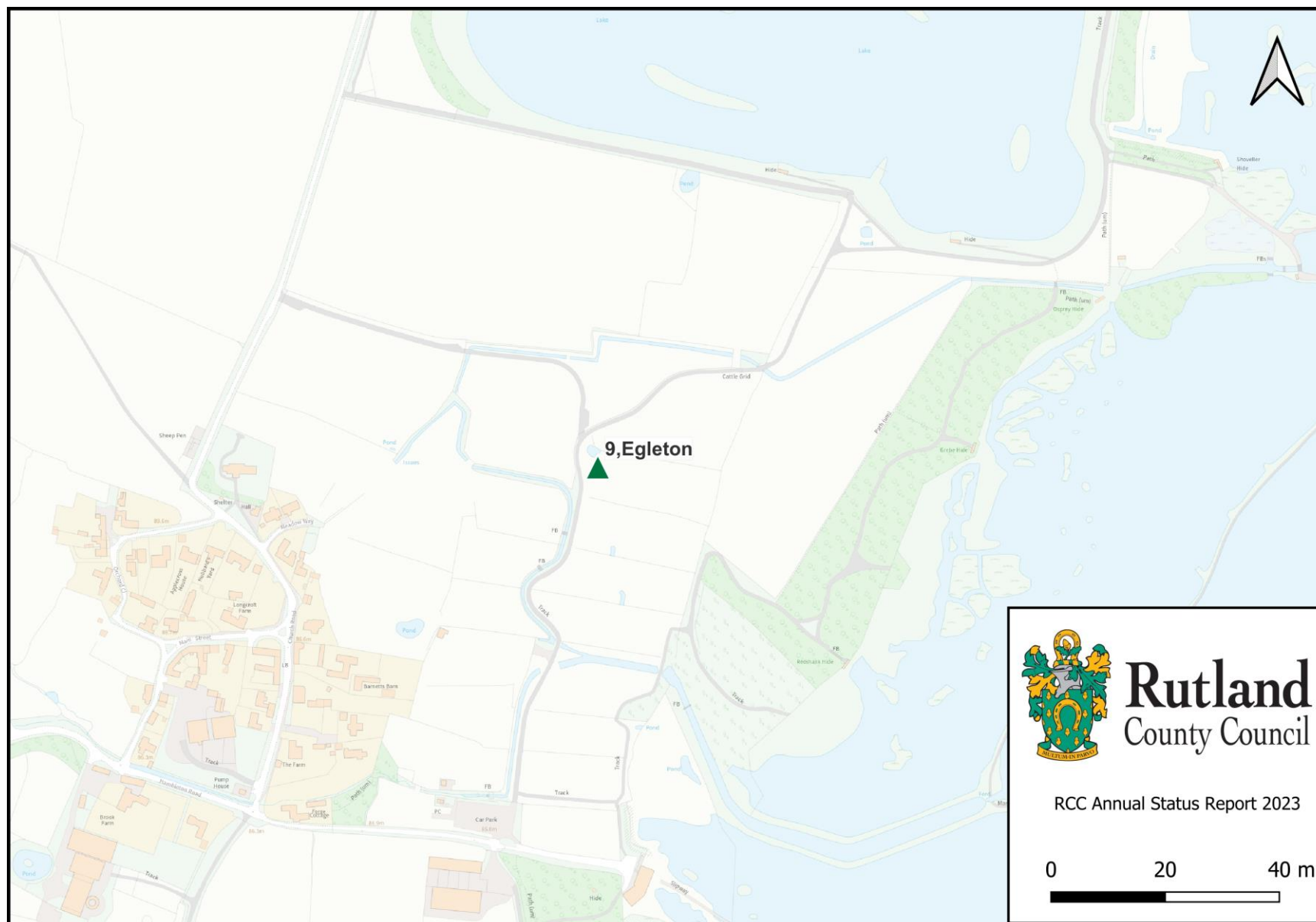
Site 5 Oakham, Uppingham Road (grid ref 486300 308490), Site 6 Oakham, Brooke Road (near 65) (grid ref 485971 308397), Site 7 Oakham, Melton Road (grid ref 485760 308890), Site 10 Oakham, High Street (grid ref 486206 308740), Site 11 Oakham, John Street (grid ref 485844 308743)



8 Oakham , Burley Park Way, A606 (grid ref 486640 309710)

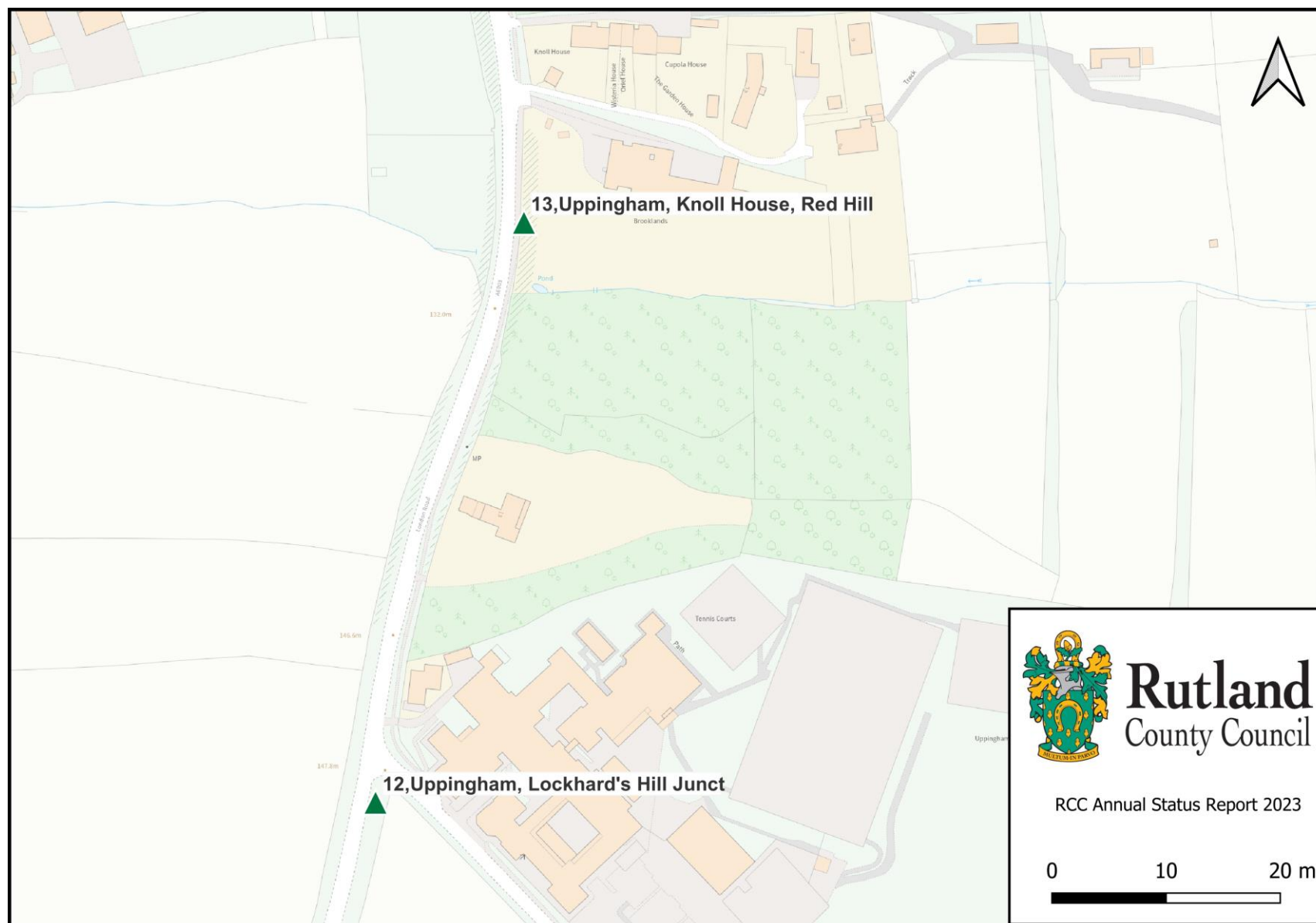


9 Egleton (grid ref 487910 307540)



Site 12 Uppingham, A6003, Lockhard's Hill Junction (grid ref 486602, 298779)

Site 13 Uppingham, A6003, Knoll House, RedHill (grid ref 486667, 299033)



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England⁷

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO ₂)	200µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO ₂)	40µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM ₁₀)	40µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO ₂)	125µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO ₂)	266µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

⁷ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
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	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
EU	European Union
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 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

References

- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022.
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.PG22. August 2022.
Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- National Diffusion Tube Bias Adjustment Factor Spreadsheet (v03/23)