

**REPORT of
DIRECTOR OF PLANNING AND REGULATORY SERVICES**

**to
COMMUNITY SERVICES COMMITTEE
10 JULY 2018**

**AIR QUALITY UPDATE AND PROPOSED DECLARATION OF AIR QUALITY
MANAGEMENT AREA ON MARKET HILL, MALDON**

1. PURPOSE OF THE REPORT

- 1.1 To provide Members with an update of the latest results of the Air Quality monitoring in the district, to advise on the necessity to declare an Air Quality Management Area along Market Hill, Maldon, and to request funding is made available for the subsequent specialist work required.

2. RECOMMENDATIONS

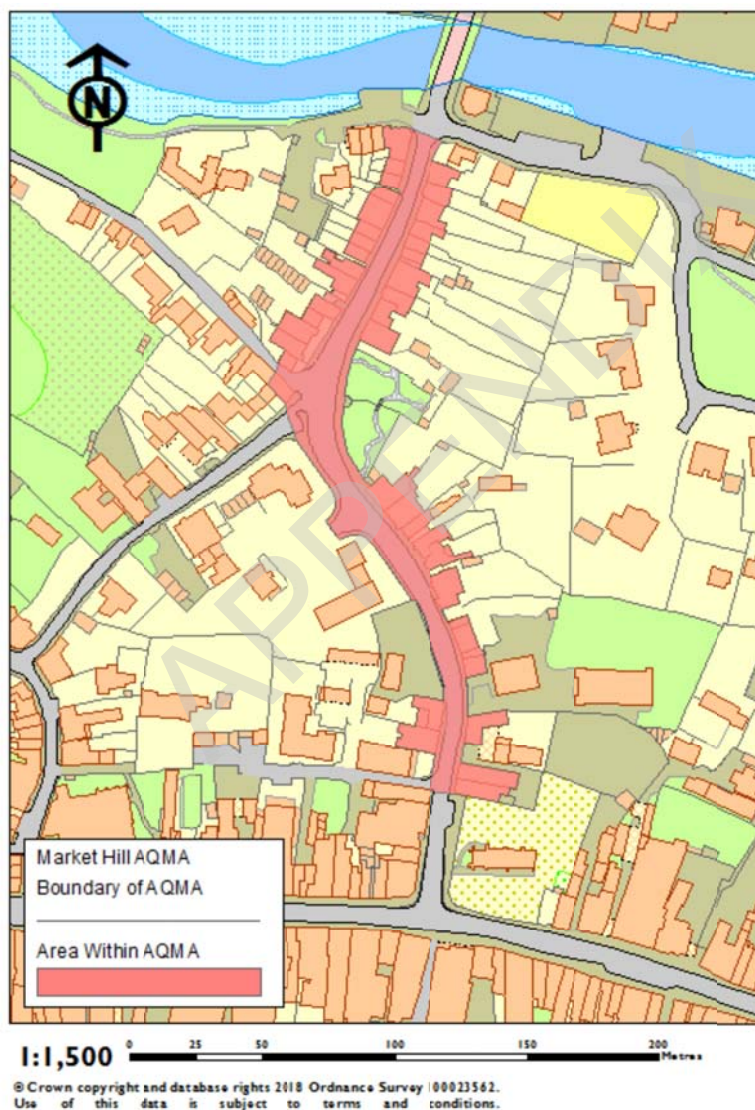
- (i) that Members approve the production of an Air Quality Action Plan for the Market Hill Area as detailed within this report subject to approval of a supplementary estimate of £20k;
- (ii) that subject to (i) above, the Finance and Corporate Services Committee be recommended to approve a Supplementary Estimate of £20k to enable the production of an Air Quality Action Plan to comply with legislation

3. SUMMARY OF KEY ISSUES

- 3.1 Local authorities have a legal requirement to work towards Air Quality Strategy (AQS) objectives under Part IV of the Environment Act 1995 and relevant regulations made under that part and to meet the requirements of the Local Air Quality Management (LAQM) statutory process.
- 3.2 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.
- 3.3 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.
- 3.4 Whilst conducting the LAQM process, the monitoring has identified high concentrations of Nitrogen Dioxide (NO₂) in Market Hill, Maldon. Analysis of roadside air quality monitoring has identified that for the period of July to December 2017 the mean concentration of NO₂ was 55.19µg/m³ and that an exceedance of the

annual mean Air Quality Objectives ($40\mu\text{g}/\text{m}^3$) is highly likely. It has been estimated that the NO_2 concentration at the receptor (façade of residential property) is $52.4\mu\text{g}/\text{m}^3$.

- 3.5 An additional six diffusion monitoring stations have been placed along the route to validate the extent of the area.
- 3.6 In accordance with the legislation, the next steps will be by Statutory Declaration to declare the AQMA and submit this to the Department for the Environment, Food and Rural Affairs (Defra), in conjunction with the Council's Annual Air Quality Status Report (ASR) due for submission after June 2018.
- 3.7 The boundary of the proposed AQMA is as follows and can be reviewed in more detail in the report attached at **APPENDIX 1**.



- 3.8 Failure to declare AQMAs may result in the Council being prosecuted by Defra who, in turn, could be prosecuted by the EU if the UK fails to comply with EU directives.

- 3.9 The Council will have 12 months, from the June submission, to develop and submit an Air Quality Action Plan (AQAP). It is anticipated that the AQAP timeline, development and delivery would likely include the following tasks:

- Creation of a steering group
- Source apportionment & dispersion modelling of area in and surrounding AQMA
- Development and quantification of measures (effectiveness/price)
- Identify how measures would be delivered and funding streams
- Writing of Air Quality Action Plan
- Internal and external consultation

Submit final AQAP to Defra within the formal submission of the 2019 Annual Status Report in June 2019.

- 3.10 Along with a number of other Essex Local Authorities, the Council currently hold a Service Level Agreement with Chelmsford City Council to undertake the preparation of its Annual Status Report due to the technical complexity of the subject matter.
- 3.11 Historically, Essex Local Authorities have used King's College London to prepare reports for submission to Defra; however Chelmsford City Council (CCC) offered this service at a much reduced rate through the Essex Consortium for Air Quality. On this basis a quotation has been sought from CCC for the preparation of the AQAP, as this will be outside of the scope of the technical expertise within the service notwithstanding the lack of resources to complete the work. The quotation is attached at **APPENDIX 2** for information and will form part of a procurement process. It had been anticipated that this would be subject to a subsequent growth bid to the Director of Resources but it is understood that it is appropriate that a request for funding be made with this report at this time.

4. CONCLUSION

- 4.1 The Council is required to declare an AQMA where monitoring dictates it will not meet the set Air Quality targets. It is clear that Market Hill fails to meet the relevant targets and therefore the Council is obliged to declare the area as an AQMA. The Council is required to complete and submit an AQMP within 12 months of the declaration which is at a cost to the Council, as outlined in **APPENDIX 1**.
- 4.2 Further details will be reported to Members following the completion of an appropriate procurement process and progression of this work. However, at this stage, a request is made to Members to confirm that funding will be available for the completion of this work (with the figures contained in **APPENDIX 2** likely to be the approximate amount involved in a worst case, subject to the procurement process).

5. IMPACT ON CORPORATE GOALS

- 5.1 Potentially, the current position could have a negative impact on the corporate goals in particular "Strengthening Communities to be Safe, Active and Healthy" and "Protecting and Shaping the District". By declaring the AQMA and preparing an action plan which aims to develop measures to improve the air quality along Market

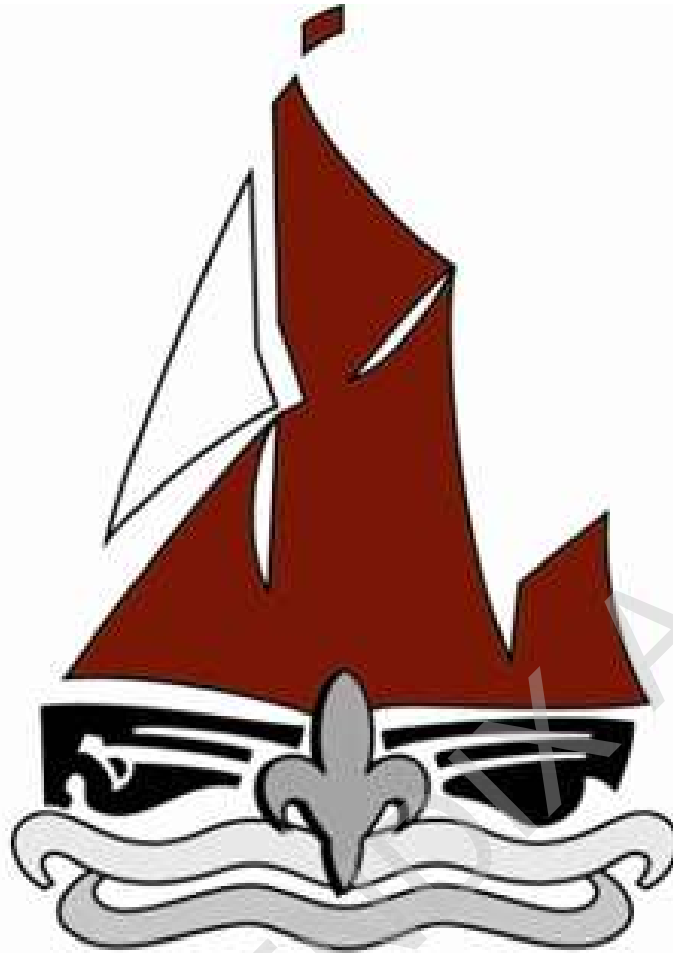
Hill, this will reverse the impact on the corporate goals and comply with the relevant UK Air Quality targets.

6. IMPLICATIONS

- (ii) **Impact on Customers** – By declaring the AQMA and preparing an action plan it will have a positive impact on customers in particular those who reside in the area.
- (iii) **Impact on Equalities** – The Council is committed to providing equal opportunities with no discrimination. There are no identifiable impacts currently although this should be monitored as the action plan is developed.
- (iv) **Impact on Risk** – Failure to declare the AQMA could result in financial penalties against the Council by Government. Failure to prepare and deliver measures set out in the proposed AQMP could impact on public health and an inability to meet the corporate goals.
- (v/vi) **Impact on Resources (financial and human)** – The financial implication is up to £20,000 to prepare and deliver an AQMP. Putting measures in place recommended by the Plan will ensure that residents within the AQMA will benefit from good air quality.
- (v) **Impact on the Environment** – By identifying the AQMA and subsequent action planning to introduce measures to improve air quality this will provide a positive impact on the environment.

Background Papers: None

Enquiries to: Shirley Hall on 01621 875817



MALDON DISTRICT COUNCIL

2018 Air Quality Management Area Preliminary Report

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

February 2018

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Executive Summary

Local authorities have a legal requirement to work towards Air Quality Strategy (AQS) objectives under Part IV of the Environment Act 1995 and relevant regulations made under that part and to meet the requirements of the Local Air Quality Management (LAQM) statutory process.

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.

Whilst conducting the LAQM process, Maldon District Council Environmental Health team have identified high concentrations of Nitrogen Dioxide (NO₂) in Market Hill, Maldon. Analysis of roadside air quality monitoring has identified that for the period of July to December 2017 the mean concentration of NO₂ was 55.19µg/m³ and that an exceedance of the annual mean Air Quality Objectives (40µg/m³) is highly likely. It has been estimated that the NO₂ concentration at the receptor (façade of residential property) is 52.4µg/m³.

This report identifies a suitable boundary for an Air Quality Management Area and sets out a timeline for the process of AQMA declaration and AQAP development.

Alternative Options

There is no alternative option – failure to declare affected areas AQMAs could result in the Council being prosecuted by the Department for the Environment, Food and Rural Affairs (Defra), who in turn, could be prosecuted by the EU if the UK fails to comply with EU directives.

Local Air Quality Management

Diffusion tube monitoring commenced in February 2017 adjacent to a property on Market Hill. Measured concentrations were exceptionally high but the site was located on the corner of a building, slightly set back from the façade where the free circulation of air was affected. This site did not fully comply with the Defra Technical Guidance TG.16 and monitoring at a new roadside site close-by commenced in July 2017 and the existing site was retained for reference.

Table 1 below provides 2017 monitoring data for the two monitoring locations on Market Hill and two nearby locations on the Causeway and junction with the High Street.

Table 1 - Diffusion Tube Monitoring Results



Site ID	Monitoring Address	Nitrogen Dioxide concentrations measured in $\mu\text{g}/\text{m}^3$															
		Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17	Oct-17	Nov-17	Dec-17	Raw Annual Mean	Valid Data Capture rate	Bias Adjusted Annual Mean (0.77)	Estimated Concentration at Adjacent Receptor
MD6	High Street (Market Hill Junction)	54.8	45.7	45.7	34.9	32.5	31.8	26.3	33	34.1	44.5	42.2	37.1	38.55	100%	31.23	31.23
MD14	The Causeway	49.5	51.2	30.8	26.8	34.2	33.8	32.3	34.4	41.5	43.5	50.1	30.3	38.2	100%	30.94	30.94
MD20	Side of 10 Market Hill, Maldon	N/A	141.4	143.1	117.4	84.7	54.8	58.7	68	64.3	119.1	140.9	135.7	102.55	92%	83.07	83.07
MD21A	Front of 10 Market Hill	N/A	N/A	N/A	N/A	N/A	N/A	59.4	81.2	61.9	73.4	60.6	65.5	67.30	50%	54.27	51.59
MD21B	Front of 10 Market Hill	N/A	N/A	N/A	N/A	N/A	N/A	61.2	81.7	70.8	73.3	60.2	65.7	69.44	50%	55.74	52.97
MD21C	Front of 10 Market Hill	N/A	N/A	N/A	N/A	N/A	N/A	64	75.2	63.7	73	*Erroneous Value Removed	67.0	68.98	42%	55.55	52.79

~ Site MD20 is not compliant with TG.16 guidance and has been retained for reference only.

* MD21C November 2017 data point removed. The concentration from the laboratory report was $28.7\mu\text{g}/\text{m}^3$ which when compared with the other tubes, highlighted poor precision and was removed to ensure overall reliability for the data set.

The average of the MD21 monitoring tubes is $52.80\mu\text{g}/\text{m}^3$ which when applying the NO_2 drop off calculation estimates the concentration at the receptor (residential property) as $50.3\mu\text{g}/\text{m}^3$ which is a significant exceedance of the Air Quality Objective ($40\mu\text{g}/\text{m}^3$).

Figure 1 - MD21 Nitrogen Dioxide Drop Off Calculator

Enter data into the red cells

Step 1	How far from the KERB was your measurement made (in metres)?	1.5	metres
Step 2	How far from the KERB is your receptor (in metres)?	2	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	11.77612	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	55.19	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	52.4	µg/m ³

When interpreting these results, it should be noted that there is low capture rate for the triplicate site of MD21 at 47.2% due to the commencement of monitoring in July 2017 however, both summer and winter months are included making the study reasonably representative of a full year's study. A full year's monitoring results could be lower however, it is still highly probable that the result would still exceed the Air Quality Objective (40µg/m³).

Market Hill

Market Hill is the only access between Maldon Town Centre and Heybridge and is a busy route throughout the day.

The road has a steep gradient between Anchorage Hill and Bull Lane. When vehicles travel up inclines, engines are required to work harder to overcome gravity and emissions are significantly higher. The opposite occurs for vehicles travelling downhill however a general increase in emissions usually occurs when compared with flat roads.

Areas of the road have street canyon characteristics which is where the road is flanked by buildings on both sides. Street canyons significantly reduce the dispersal of pollution. The MD21 monitoring site is at a location on Market Hill where the gradient is steep and within a partial street canyon.

Figure 2 - Google Streetview image of Market Hill to indicate street canyon characteristics and gradient



Air Quality Management Area Declaration

Appendix A contains a draft Air Quality Management order which would designate the stretch of Market Hill and properties between Anchorage Hill and Bull Lane as an Air Quality Management Area. This is for likely breaches of the annual mean Air Quality Objective for Nitrogen Dioxide.

Breaches of the 1-hour objective are not considered likely because the monitored annual mean does not exceed $60\mu\text{g}/\text{m}^3$ which can be considered a proxy measurement.

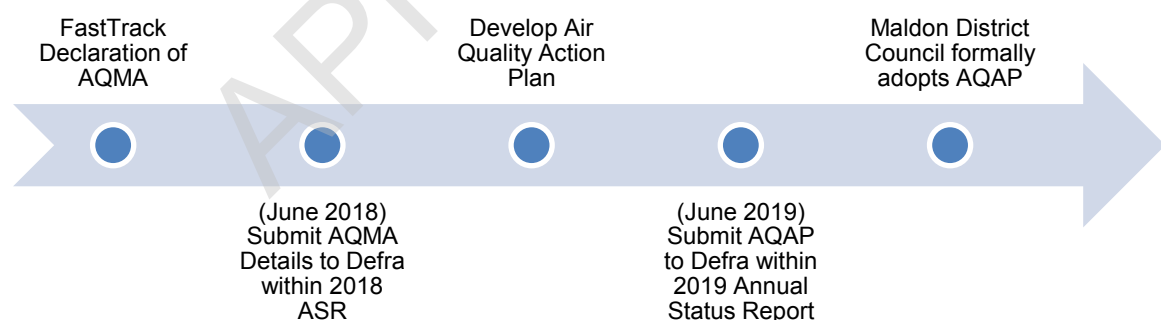
The boundary of the Air Quality Management Area has been chosen using the following information:

- At Anchorage Lane, properties begin to form a street canyon and the gradient increases. Emissions are likely to increase due to the gradient and dispersion will take place at a lower rate than in open areas.
- Monitoring at the top of Market Hill opposite Bull Lane has never exceeded the Air Quality Objectives. At this location, the gradient levels off meaning lower emissions and the street canyon finishes allowing for better dispersion.

Project Timeline

Development and delivery of the project would take place across the following anticipated timeline:

Figure 3 – Project Timeline



Development of the Air Quality Action Plan would likely include the following tasks:

- Creation of steering group
- Source apportionment & dispersion modelling of area in and surrounding AQMA
- Development and quantification of measures (effectiveness/price)
- Identify how measures would be delivered and funding streams
- Writing of Air Quality Action Plan
- Internal and external consultation

Appendix A: Draft Air Quality Management Area Order

Environment Act 1995 Part IV Section 83(1)
Maldon District Council
Air Quality Management Order

Maldon District Council in exercise of the powers conferred upon it by Section 83(1) of the Environment Act 1995, hereby makes the following Order.

This Order may be cited/referred to as the Maldon District Council Air Quality Management Area number 1.

Area 1 – Market Hill, Maldon.

And shall come into effect on **[date]**.

The areas shown on the attached maps in red are to be designated as air quality management area 1. The designated area incorporates the stretch of road and properties between Anchorage Hill and Bull Lane.

The map may be viewed at the Council Offices.

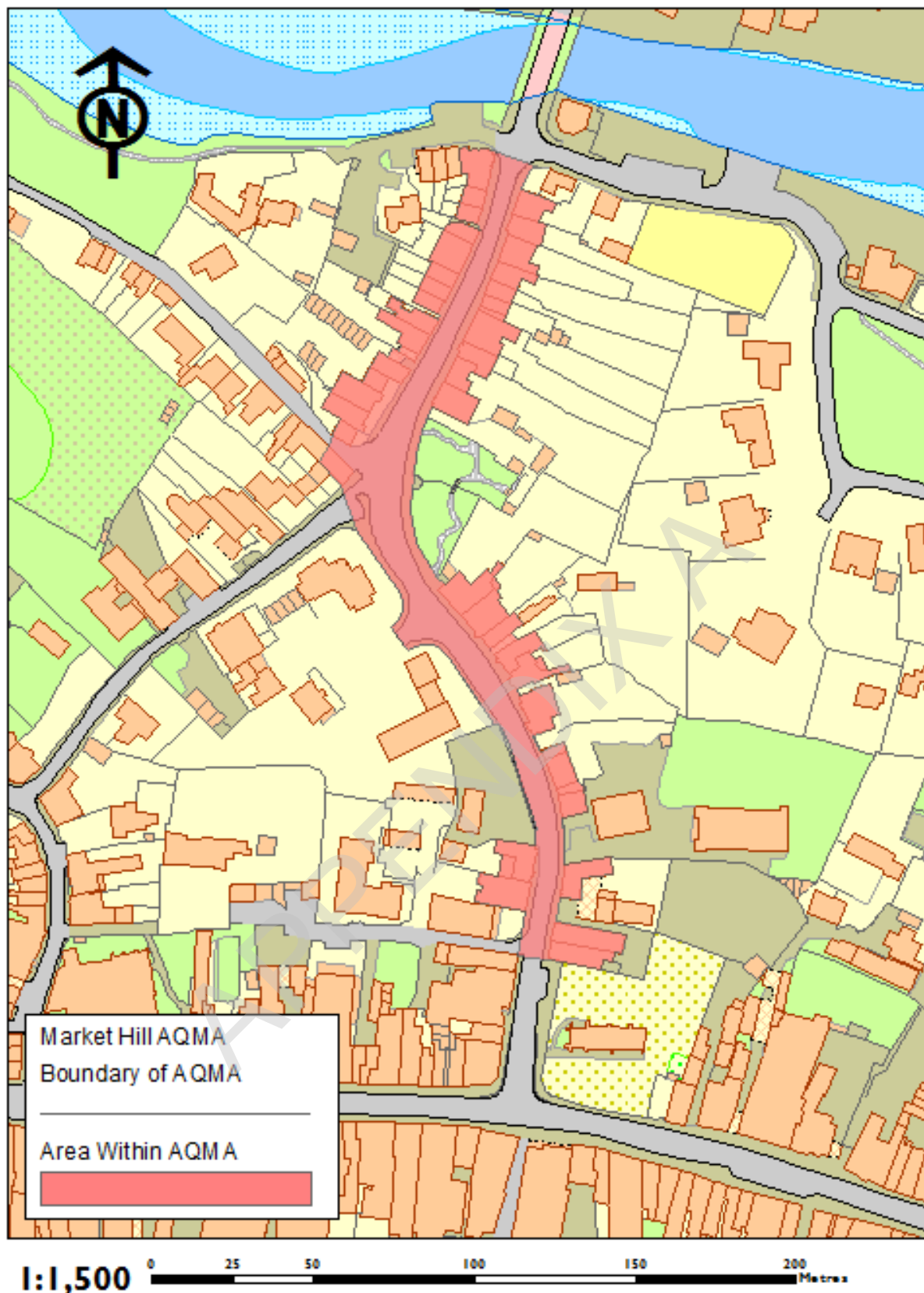
Area 1 is designated in relation to the likely breach of the nitrogen dioxide annual mean as specified in the Air Quality Regulations 2000.

This Order shall remain in force until it is varied or revoked by a subsequent order.

The Common Seal of Maldon District Council was hereunto affixed in the presence of:

Authorised signatory

.....



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Appendix B: Summary of Air Quality Objectives in England

Table B.2 – Air Quality Objectives in England

Pollutant	Air Quality Objective ¹	
	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

¹ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary

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	Air Quality Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
EU	European Union
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
Street Canyon	Road which is flanked by buildings resembling a canyon

References

Defra Diffusion Tube Bias Adjustment Factors Spreadsheet available at;

<https://laqm.defra.gov.uk/assets/databasediffusiontubebiasfactorsv0917final.xls>

Defra LAQM Policy Guidance LAQM.PG16 available at;

<http://laqm.defra.gov.uk/documents/LAQM-PG16-April-16-v1.pdf>

Defra LAQM Technical Guidance LAQM.TG16 available at;

<http://laqm.defra.gov.uk/documents/LAQM-TG16-April-16-v1.pdf>

Essex Air Quality Consortium available at; <http://www.essexair.org.uk/Default.aspx>

Google Streetview of Market Hill available at;

<https://www.google.co.uk/maps/@51.7339001,0.6785149,3a,75y,205.31h,82.44t/data=!3m6!1e1!3m4!1svCP7SOGTBYeQHUHTlqxobw!2e0!7i13312!8i6656>

Defra Nitrogen Dioxide Fall Off With Distance Calculator available at;

<https://laqm.defra.gov.uk/documents/NO2-Fall-Off-With-Distance-from-Roads-Calculator-v4.1.xls>

Maldon District Council Air Quality Annual Status Report 2017 available at;

http://www.essexair.org.uk/Reports/Maldon_ASR_2017.pdf

Proposal to Produce an Air Quality Action Plan for Maldon District Council

Introduction

In 2017, Maldon District Council monitored nitrogen dioxide concentrations that exceeds the Air Quality Objectives of 40µg/m³ at relevant exposure. Under Local Air Quality Management (LAQM) requirements, the Council must declare an Air Quality Management Area (AQMA). The process of declaration will run alongside the submission of the 2018 Air Quality Status Report (ASR).

Following declaration of the AQMA, Maldon District Council has 12 months to develop an Air Quality Action Plan (AQAP).

Chelmsford City Council proposed support:

Production of an AQAP to work towards compliance with the air quality objectives.

Development work may include:

- Inception Meeting
- Formation of a steering group tasked with developing an AQAP
- Developing methodology for baseline modelling and assist with procurement of dispersion modelling consultant
- Interpretation of baseline modelling and production of a summary report
- Development of broad action plan measures and undertaking screening process
- Preparation of draft AQAP
- Develop Consultation
- Production of final AQAP
- Committee attendance to present/defend AQAP

Resource requirements

- Air Quality Action Plan Development by Chelmsford City Council Scientific Team: £6,000+vat
- Provision of traffic data (Essex Highways). Costs may depend on MDC arrangements with ECC/Essex Highways.
- Source Apportionment and baseline modelling. Depending on scope: approx. £5-10,000 (Dispersion modelling consultant). Likely to include meteorological data otherwise approx. £500
- Modelling of final action plan (main) measures: Approx. £1,000 per measure. Total: £3-4,000 (Dispersion modelling consultant)

Project Team		
Name	Representing	Role
Tim Savage	CCC Scientific Team	Project Manager
Kerry Mackay	CCC Scientific Team	Project Officer