CABINET

9 MAY 2017

DECLARATION OF FOUR ELMS HILL AIR QUALITY MANAGEMENT AREA

Portfolio Holder:	Councillor Jane Chitty, Planning, Economic Growth and Regulation
Report from:	Richard Hicks, Director of Regeneration, Culture, Environment and Transformation
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Summary

The purpose of the report is to inform Cabinet that there is a need to declare a new Air Quality Management Area (AQMA) at Four Elms Hill and to seek approval from Cabinet to undertake a consultation with statutory consultees and members of the public prior to the formal declaration of the AQMA. The area needs to be declared to satisfy the requirements of the Environment Act 1995 and the declaration will be a publically available document.

1. Budget and Policy Framework

1.1 The Council has a statutory duty under the requirements of the Environment Act 1995 to declare the area as an AQMA. The recommendation to declare the area as an AQMA is one which needs to be made by Cabinet.

1.2 Air quality is referenced within the Local Transport Plan under Priority 2 – To support a healthier natural environment by contributing to tacking climate change and improving air quality, and Transport Objective 4 – Encouraging active travel and improving health. This objective links to air quality legislation. Air quality in general terms features in the Local Plan 2003 and Policy BNE24 deals with air quality. If approval is obtained from Cabinet, the formal declaration of the new AQMA will be submitted to Defra.

2. Background

2.1 Local authorities have a duty under the Environmental Act 1995 to declare an AQMA where the air quality objectives are not being met. It is important that a local authority is confident it has identified an exceedance of the objectives; usually through a combination of monitoring and modelling data.

2.2 Once an AQMA has been designated local authorities are required to develop an Action Plan, detailing the measures it will implement to tackle the problem. Development of the plan should take no longer than 12 months from the time

of declaration. It is envisaged that the measures within the current Medway Air Quality Action Plan (AQAP) (approved by Cabinet on 15 December 2015) will also have a positive impact on the new AQMA. The AQAP will need to be amended to accommodate the new AQMA and any new corresponding measures, as appropriate.

2.3 The monitoring data for 2015 shows that annual average levels of nitrogen dioxide have exceeded the Government's limits at Four Elms Hill, Chattenden. This area is currently outside of any of the declared Medway AQMAs.

2.4 Medway's Annual Status Report for 2016, which was submitted to Defra on 12 August 2016, recommended that a Detailed Assessment was undertaken to:

- Confirm the need to declare an AQMA at Four Elms Hill,
- Determine the spatial extent of the AQMA,
- Provide relevant information for the development of action plan measures

2.5 The Detailed Assessment (Appendix 1) was completed in November 2016 and confirmed the need to declare a new AQMA at Four Elms Hill, and identified that 24 residential properties are likely to lie within the exceedance area.

2.6 The council is required to undertake a statutory consultation on the AQMA declaration prior to the formal declaration of the AQMA by legal order. Schedule 11 of the Environment Act 1995 lists the statutory consultees on AQMA declarations. The consultation will also include members of the public and any other relevant local groups and will be undertaken for a period of 6 weeks. The consultation will need to include the extent of the AQMA to be declared and approval of the extent of the AQMA is sought from Cabinet.

3. Options

3.1 The options given below relate to the extent of the AQMA to be declared and which option should be included within the consultation. There is no set way to define the size and shape of an AQMA. Government guidance only requires, as a minimum, that an AQMA covers the areas where the objectives are not being met. However, practical considerations may mean that an AQMA covers a larger geographical area than just the area where pollution levels are elevated.

Option 1: Technical exceedance area

3.2 Declaration of a discrete AQMA based upon the area where air quality is above the objective level. The most significant advantage of this option is that should air quality improve sufficiently in future years across the whole AQMA, then the council may be in a position to revoke the AQMA. An example of this potential is demonstrated with the current Pier Road AQMA. Monitoring in this location is showing that levels of nitrogen dioxide have been declining. Recent feedback from Defra has highlighted this positive trend, and stated that the council may be in a position to revoke this AQMA in due course. The disadvantage of declaring a larger AQMA, or joining it with another AQMA, would increase the area where the council would need to demonstrate

pollution levels are within the objectives. This could involve increased monitoring, and more complex assessment studies to demonstrate overall achievement of the objectives. The council currently has sufficient monitoring in place to cover the technical exceedance area, and provide evidence to support a revocation. Appendix 2 shows the area of AQMA for Option 1.

Option 2: Link to Central Medway AQMA

3.3 The Central Medway AQMA is the closest AQMA to Four Elms Hill and these two AQMAs could be linked. The disadvantage of this option is that the larger joined up AQMA would unnecessarily blight properties where the air quality objectives are being achieved. Monitoring has shown that there are currently no locations in the areas between the Central Medway AQMA and the proposed Four Elms Hill AQMA where people are being exposed to levels of nitrogen dioxide above the objectives. As stated above in Option 1, joining these AQMAs would also present difficulties in demonstrating achievement of the air quality objectives as opposed to a more discrete AQMA. A larger AQMA would also reduce focus on individual hotspot areas in the development and implementation of action plan measures. Appendix 3 shows the location of the Central Medway and Pier Road AQMAs in respect to the new Four Elms Hill AQMA (option 1).

Option 3: Revoke all existing AQMAs and declare all urban areas

3.4 The disadvantage with this option is that air quality would have to improve and be achieved across the urban areas covered by the AQMA for it to be revoked in future years. Monitoring shows improvements in certain parts of the existing AQMAs (for example Pier Road); however, this overall improvement is not being replicated elsewhere. The level of blight created by a large urban area AQMA would be considerable. The revocation of the Pier Road AQMA under this Option would not be readily possible because it would be absorbed into a single urban area AQMA.

4. Advice and analysis

4.1 To ensure Medway's statutory duty under the requirements of the Environment Act 1995 is met, officers would recommend that consultation on Option 1 be approved by Members and officers should undertake the necessary consultation and report back to Cabinet on 5 September to gain approval for the formal declaration of the AQMA.

4.2 The Corporate Sustainability Plan recognises that traffic growth can impact at a local level though poor air quality, noise pollution and busier roads. The formal designation of a new AQMA will require the development of an Action Plan detailing the measures it will implement to tackle the problem. The measures in the current AQAP encourage people to use public transport, supporting sustainable development in respect to air quality and promoting eco-driving and car sharing, so support the Corporate Sustainability Plan.

4.3 A Diversity Impact Assessment has been undertaken on the proposals, this has highlighted that there will be both negative and positive impacts. The negative impact will be that the area will be identified as an area of poor air quality in respect to nitrogen dioxide, however, this will mean that an Action

Plan will be developed to work towards improving the air quality within the area, which will have a positive impact on residents health and improve air quality within Medway. In particular the young, elderly and all others that suffer from respiratory conditions will benefit (Appendix 4).

5. Risk management

Risk	Description	Action to avoid or mitigate risk	Risk rating
Not fulfilling Statutory Duty (This poses both a reputational and financial risk to The Council)	The Council has a statutory duty under the requirements of the Environment Act 1995 to declare an AQMA where the air quality objectives are not being met and to undertake a statutory consultation on the AQMA declaration prior to formal declaration. The Secretary of State also has the power to direct local authorities under Section 85 of the Environment Act 1995 to take specified steps, including to declare an AQMA.	Approve and undertake consultation on new AQMA declaration.	C3
Infraction fines being passed down to the local authority by Central Government (This poses both a reputational and financial risk to The Council)	The European Commission has launched infraction proceedings against the UK for breach of nitrogen dioxide limit values under the EU Air Quality Directive and a final warning was issued in February 2017. Central Government is seeking to work with local authorities to avoid the fines. However discretionary power in Part 2 of the Localism Act enables the Government to require responsible authorities to pay all or part of an infraction fine. If the Council does not fulfil its statutory duties under the Environment Act 1995, they will not be able to show that they are working towards improving the air quality and reducing nitrogen dioxide levels within the area and could be liable for these fines.	Approve and undertake consultation on new AQMA declaration. Then formally declare the new AQMA at Four Elms Hill and report to DEFRA.	C2

6. Consultation

6.1 The council is required to undertake a statutory consultation on the AQMA declaration prior to the formal declaration of the AQMA by legal order. Schedule 11 of the Environment Act 1995 lists the statutory consultees on AQMA declarations. The consultation will also include members of the public and any other relevant local groups and will be undertaken for a period of 6 weeks. The consultation will include the extent of the AQMA which is to be declared.

6.2 The consultation will be promoted on the council website. Consultation letters will be sent to the individual properties which are within the new AQMA. Consultation information will also be sent to other relevant local groups including MASH (Medway Asthma Self Help group) and the Rural Liaison Committee. Due to the time frame for the August edition of Medway Matters, this will not be used to promote the consultation but an informative article will be placed in this edition.

6.3 It is proposed that the outcome of the consultation will be reported to the Regeneration, Culture and Environment Overview and Scrutiny Committee on 17 August 2017.

7. Financial implications

7.1 By approving the consultation of the declaration of the new AQMA, Cabinet is not being asked for additional funding.

7.2 The cost of undertaking the consultation will be minimal as the Council has undated material from 2015 that can be re-used and will be met within the existing budget.

8. Legal implications

8.1 The Environment Act 1995 gives local authorities duties and responsibilities that are designed to secure improvements in air quality, particularly at the local level. This is carried out under the Local Air Quality Management regime. It includes the review and assessment of key pollutants in the local area on an annual basis. If it appears that any of the air quality objectives set by government are not likely to be achieved, resulting in members of the public being exposed to the pollution, the local authority must by order designate any part of its area so affected as an AQMA. It must then prepare and implement a remedial Action Plan of measures to reduce air pollution levels in the AQMAs.

8.2 UK Government is currently in breach of EU air quality limit values for annual average nitrogen dioxide and the European Commission has formally launched infraction proceedings and a final warning was issued in February 2017. Central Government is seeking to work with Local Authorities to avoid the fines. However, it should be noted that discretionary power in Part 2 of the Localism Act enables the Government to require responsible authorities to pay all or part of an infraction fine. Guidance on the procedures is set out in a policy statement published by Department for Communities and Local Government. It is unclear at this time if or how this could affect Medway Council.

9. Recommendation

9.1 It is requested that Cabinet approves the consultation on the proposal to declare a new Air Quality Management Area (AQMA) at Four Elms Hill (Option1), as set out in paragraph 3.2 of the report.

9.2 It is requested that Cabinet asks officers to report back to Cabinet on 5 September 2017 to report on the outcome of consultation and to seek approval for the formal declaration of the Air Quality Management Area for Four Elms Hill.

10. Suggested reasons for decision(s)

10.1 Medway has a statutory duty under the Environmental Act 1995 to declare an AQMA where the air quality objectives are not being met.

10.2 By Cabinet approving the consultation this would also provide Medway with some protection against potential infraction fines being passed down to the local authority by Central Government.

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Appendices

Appendix 1 – Detailed Assessment
Appendix 2 – Four Elms Hill AQMA Option 1 area
Appendix 3 – Location of the Central Medway and Pier Road AQMAs in respect to the new Four Elms Hill AQMA (option 1)
Appendix 4 – Diversity Impact Assessment

Background papers

Environment Act (1995)
http://www.legislation.gov.uk/ukpga/1995/25/contents

Air Quality Strategy for England, Scotland, Wales and Northern Ireland
https://www.gov.uk/government/publications/the-air-quality-strategy-for-england-scotland-wales-and-northern-ireland-volume-1

Local Air Quality Management Technical Guidance LAQM TG(16),April 2016.
https://laqm.defra.gov.uk/technical-guidance/

Local Air Quality Management Policy Guidance LAQM PG(16),April 2016.
https://democracy.medway.gov.uk/mgIssueHistoryHome.aspx?IId=19351&PlanId=272

Air Quality (England) Regulations 2000
http://www.legislation.gov.uk/uksi/2000/928/pdfs/uksi_20000928_en.pdf

The Air Quality (England) (Amendment) Regulations 2002
http://www.legislation.gov.uk/uksi/2002/3043/pdfs/uksi_20023043_en.pdf

Air Quality CONSULTANTS

Detailed Assessment of Air Quality at Four Elms Hill, Chattenden for Medway Council

November 2016

Experts in air quality management & assessment

Document Control

Client	Medway Council	**Principal Contact**	Stuart Steed

Job Number	J2701

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Document Status and Review Schedule

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Contents

Medway Council confirms that it accepts the recommendations made in this report.

1 Introduction

1.1 Air Quality Consultants Ltd has been commissioned by Medway Council to undertake a Detailed Assessment of air quality near Four Elms Hill in Chattenden. In 2016, Medway Council completed an Annual Status Report for air quality, which concluded that a Detailed Assessment was required as a result of measured exceedences of the nitrogen dioxide annual mean objective along Four Elms Hill in Chattenden.

1.2 The aim of this Detailed Assessment is to determine whether the annual mean nitrogen dioxide objective is exceeded at relevant locations and, if so, the extent of exceedences and the boundary of the Air Quality Management Area (AQMA) required. Where this study has determined the requirement for an AQMA to be declared, the source contributions to exceedences of the annual mean nitrogen dioxide objective have been quantified, via a Source Apportionment Study. The reduction in emissions required to meet the annual mean nitrogen dioxide objective will also be assessed at receptor locations where the highest concentrations are predicted.

Background

1.3 The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Defra, 2007) sets out a framework for air quality management, which includes a number of air quality objectives. National and international measures are expected to achieve these objectives in most locations, but where areas of poor air quality remain, air quality management at a local scale has a particularly important role to play. Part IV of the Environment Act 1995 requires local authorities to periodically review and assess air quality in their areas. The role of this process is to identify areas where it is unlikely that the air quality objectives will be achieved. These locations must be designated as AQMAs and a subsequent Air Quality Action Plan (AQAP) developed in order to reduce pollutant emissions in pursuit of the objectives.

1.4 Local Authorities in England are required to produce Annual Status Reports (ASR) detailing progress of Action Plan measures, air quality monitoring data and screening of changes to pollutant emissions within its administrative area.

1.5 Technical Guidance for Local Air Quality Management (LAQM.TG(16)) (Defra, 2016a) sets out a streamlined approach to the Review and Assessment process. This prescribes the submission of a single Annual Status Report (ASR) which all local authorities in England and Scotland must submit each year by the 30th June. It should identify new non-compliant areas and report progress made within existing AQMA's. When an exceedence has been identified, the local authority can either use the "Fast Track Option" and immediately declare an AQMA, or obtain further information and/or data before deciding on the declaration of an AQMA.

1.6 The purpose of the Detailed Assessment is to determine whether an exceedence of an air quality objective is likely and the geographical extent of that exceedence. If the outcome of the Detailed Assessment is that one or more of the air quality objectives are likely to be exceeded, then an Air Quality Management Area (AQMA) must be declared, and an Air Quality Action Plan put in place to identify measures to improve air quality within the AQMA. In order to inform the Action Plan process, source apportionment should be undertaken to ascertain the sources contributing the exceedences and the magnitude of reduction in emissions required to achieve the objective should also be calculated.

1.7 This report represents a Detailed Assessment following the findings of Medway Council's ASR published in 2016, which concluded that there were measured exceedences of the annual mean nitrogen dioxide objective at locations of relevant exposure (Medway Council, 2016). The diffusion tube NAS17 was set up in 2015, and measured an annual mean nitrogen dioxide concentration of 52 µg/m^3 during that year. As such, the ASR concluded that Medway Council would carry out a Detailed Assessment for the area surrounding that diffusion tube in order to determine the extent of the exceedences.

The Air Quality Objectives

1.8 The Government's Air Quality Strategy (Defra, 2007) provides air quality standards and objectives for key air pollutants, which are designed to protect human health and the environment. The 'standards' are set as concentrations below which health effects are unlikely even in sensitive population groups, or below which risks to public health would be exceedingly small. They are based purely upon the scientific and medical evidence of the effects of a particular pollutant. The 'objectives' set out the extent to which the Government expects the standards to be achieved by a certain date. They take account of the costs, benefits, feasibility and practicality of achieving the standards. It also sets out how the different sectors: industry, transport and local government, can contribute to achieving the air quality objectives. The objectives are prescribed within The Air Quality (England) Regulations 2000 (Stationery Office, 2000) and The Air Quality (England) (Amendment) Regulations 2002 (Stationery Office, 2002). Table 1 summarises the objectives which are relevant to this report. Appendix 1 provides a brief summary of the health effects of nitrogen dioxide.

Table 1: Air Quality Objectives for Nitrogen Dioxide

Pollutant	Time Period	Objective
Nitrogen Dioxide	1-hour mean	200 µg/m^3 not to be exceeded more than 18 times a year
	Annual mean	40 µg/m^3

1.9 The air quality objectives only apply where members of the public are likely to be regularly present for the averaging time of the objective (i.e. where people will be exposed to pollutants). For annual

mean objectives, relevant exposure is limited to residential properties, schools and hospitals. The 1-hour objective applies at these locations as well as at any outdoor location where a member of the public might reasonably be expected to stay for 1 hour or more, such as shopping streets, parks and sports grounds, as well as bus stations and railway stations that are not fully enclosed.

1.10 Measurements across the UK have shown that the 1-hour nitrogen dioxide objective is unlikely to be exceeded unless the annual mean nitrogen dioxide concentration is greater than 60 $\mu g/m^3$ (Defra, 2016a). Thus exceedences of 60 $\mu g/m^3$ as an annual mean nitrogen dioxide concentration are used as an indicator of potential exceedences of the 1-hour nitrogen dioxide objective.

2 Assessment Methodology

Monitoring

2.1 Medway Council operates two automatic sites measuring nitrogen dioxide, PM_{10} and $PM_{2.5}$ concentrations. The automatic monitor located in Rochester Stoke also measures concentrations of sulphur dioxide and ozone. These automatic monitors are not located within the study area. In addition, Medway Council monitors concentrations of nitrogen dioxide at 27 passive diffusion tubes sites. Two of these diffusion tubes are located along Four Elms Hill. The monitoring sites and study area are shown in Figure 1. Diffusion tubes were prepared and analysed by Environmental Services Group (ESG) using the 50% TEA in acetone method. It is necessary to adjust diffusion tube data to account for laboratory bias; for 2015, a bias adjustment factor of 0.81 was used (Medway Council, 2016).

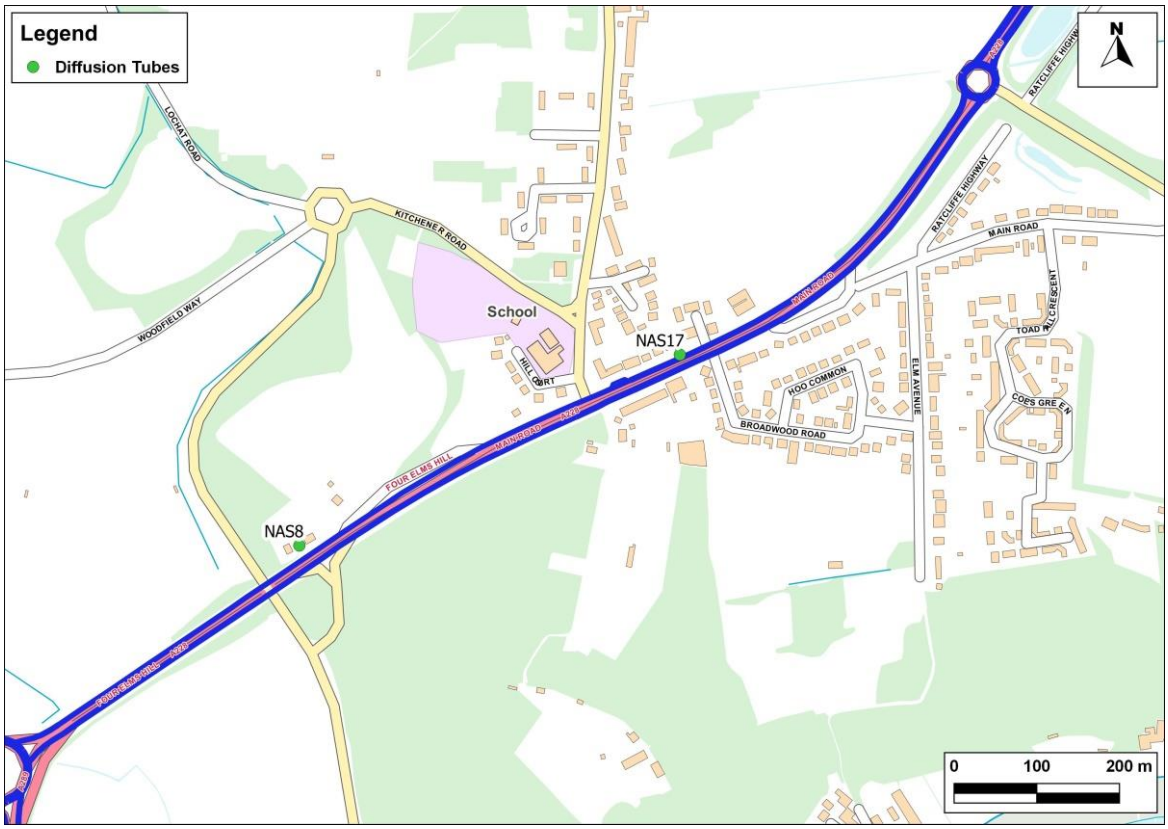

Figure 1 Detailed Assessment Study Area and Monitoring Locations. Roads explicitly included in the model shown in blue.

Modelling

2.2 Annual mean nitrogen dioxide concentrations have been predicted using detailed dispersion modelling (ADMS-Roads v4.1). The model outputs have been verified against the monitoring data described in paragraph 2.1. Details of the model inputs and the model verification are provided in Appendix A2, together with the method used to derive the current background nitrogen dioxide concentrations. Concentrations have been predicted for a grid of receptors across the study area to allow concentration isopleths to be plotted. In addition, concentrations have been predicted at a number of worst-case receptor locations (Figures 2, 3 and 4). The worst-case receptors have been modelled at ground floor level (1.5 m).

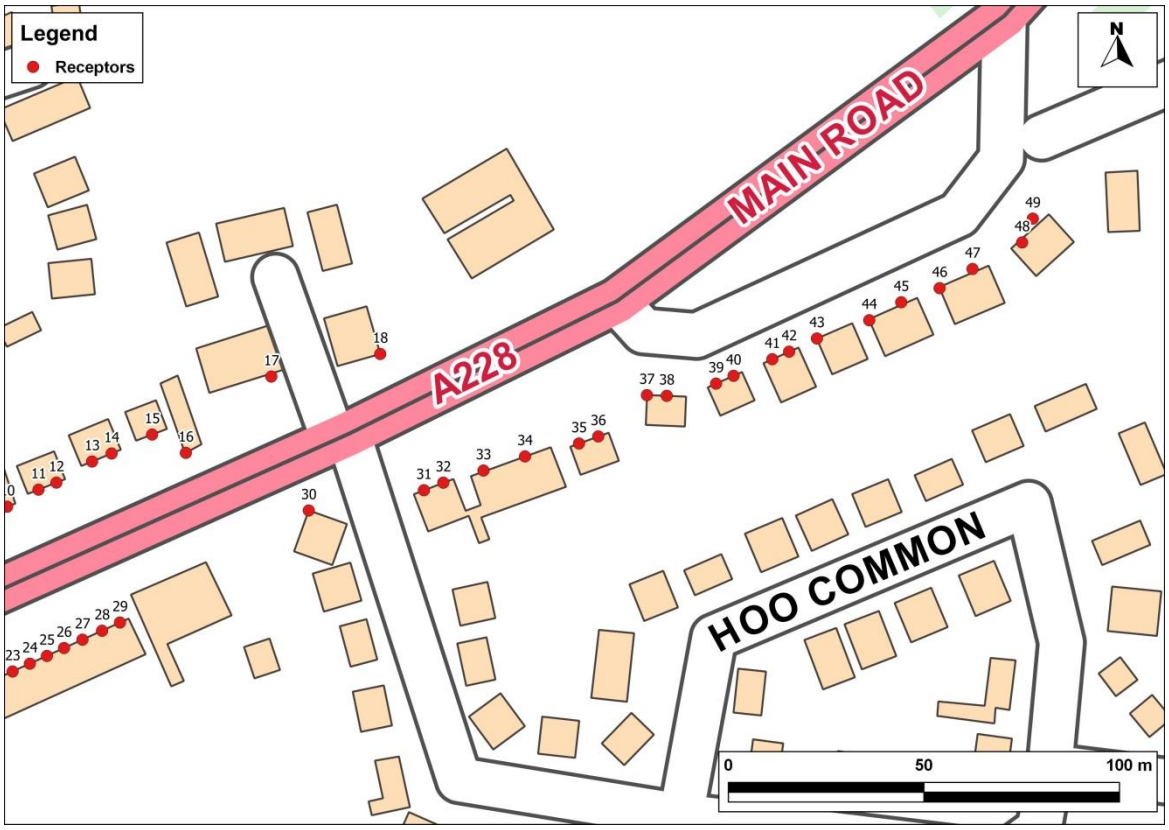

Figure 2 Specific Receptor Locations - East

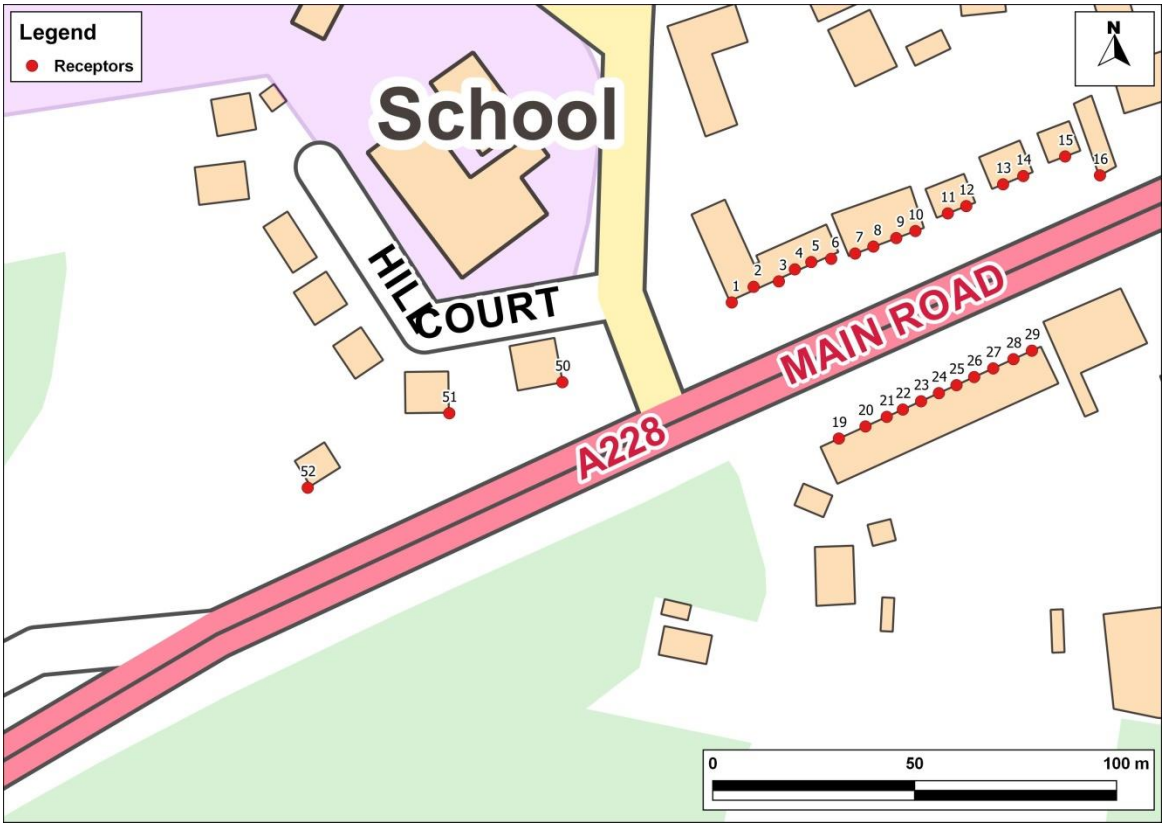

Figure 3 Specific Receptor Locations - Centre

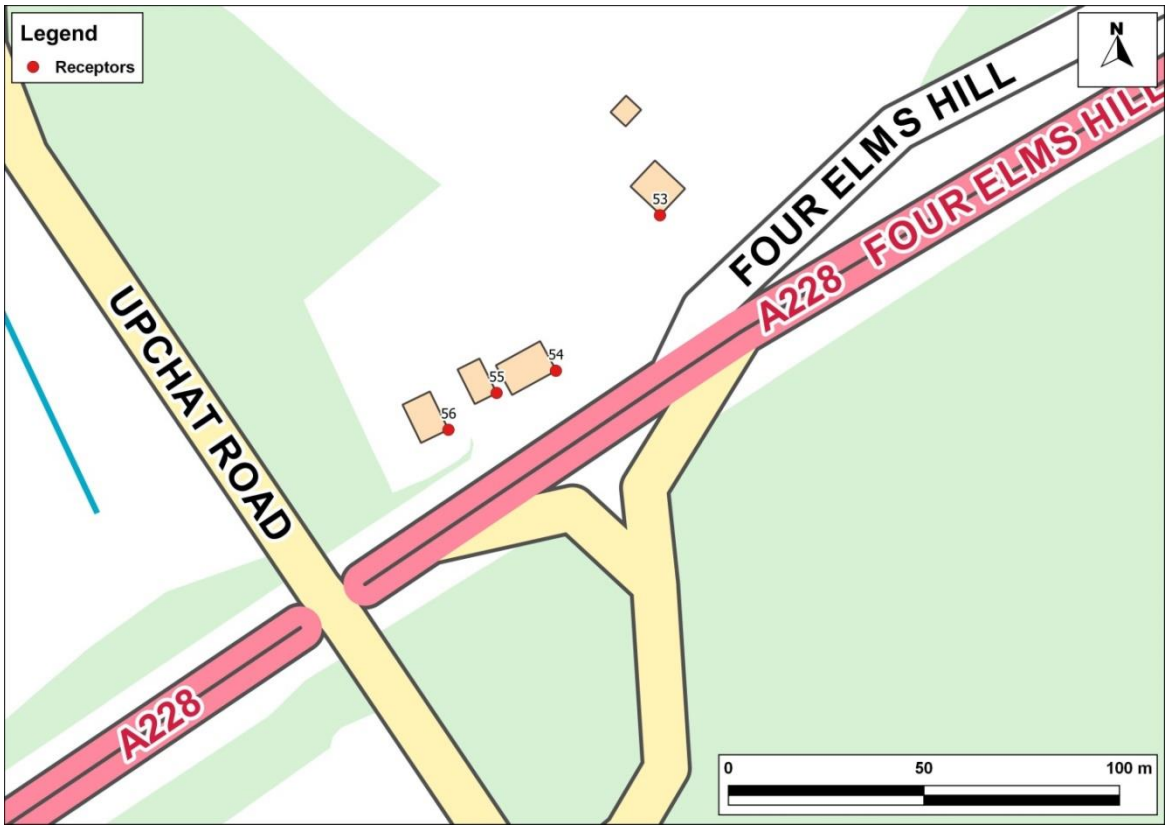

Figure 4 Specific Receptor Locations - West

Traffic Data

2.3 Traffic data for the assessment have been determined from the interactive web-based map provided by the Department for Transport (DfT, 2016). Further details of the traffic data used in this assessment are provided in Appendix A2.

Uncertainty

2.4 Uncertainty is inherent in all measured and modelled data. All values presented in this report are the best possible estimates, but uncertainties in the results might cause over- or under-predictions. All of the measured concentrations presented have an intrinsic margin of error. Defra (2016a) suggests that this is of the order of plus or minus 20% for diffusion tube data and plus or minus 10% for automatic measurements.

2.5 The model results rely on traffic data determined from the interactive web-based map provided by the Department for Transport (DfT, 2016), and any uncertainties inherent in these data will carry into this assessment. There will be additional uncertainties introduced because the modelling has simplified real-world processes into a series of algorithms. For example: it has been assumed that

wind conditions measured at Southend Airport during 2015 will have occurred throughout the study areas during 2015; and it has been assumed that the dispersion of emitted pollutants will conform to a Gaussian distribution over flat terrain.

2.6 An important step in the assessment is verifying the dispersion model against the measured data. By comparing the model results with measurements, and correcting for the apparent under-prediction of the model, the uncertainties can be reduced (see Appendix A2).

2.7 The limitations to the assessment should be borne in mind when considering the results set out in the following sections. Whilst the model should give an overall accurate picture, i.e. one without bias, there will be uncertainties for individual receptors. The results are 'best estimates' and have been treated as such in the outcomes that have been drawn.

3 Results

Monitoring

3.1 Monitoring data for the two diffusion tube sites within the study area (Figure 1) are summarised in Table 2. Monitoring at these two locations commenced in 2015, thus only one year of data is available to date.

Table 2: Annual Mean Nitrogen Dioxide Concentrations Measured in 2015 (µg/m^3)

Site	Site Type	Site Description	2015[a]
NAS8	Roadside	Joy Lodge, Four Elms Hill	31.0
NAS17	Kerbside	Lamp post Wainscott, Four Elms Hill	**52.0**
Objective			**40**

[a] As reported in Medway Council Annual Status Report (Medway Council, 2016). Data have been bias adjusted by the Council using the ESG, 50% TEA in acetone national factor (0.81).

3.2 The annual mean objective was exceeded at the monitoring location NAS17 in 2015. The majority of the diffusion tubes are attached to lamp posts or sign posts on the pavements and are therefore expected to measure higher concentrations than at the façades of the properties. There are no measured concentrations exceeding 60 µg/m^3, and thus exceedences of the 1-hour mean objective are unlikely.

Modelling

3.3 Predicted annual mean nitrogen dioxide concentrations in 2015 at each of the receptor locations shown in Figures 2, 3 and 4, are set out in Table A3-1 in Appendix A3 and shown on Figure 5. Predicted concentrations exceed the annual mean objective at Receptors 1 – 10, 16, 18 – 27, 30, 50 and 54. The receptors where no exceedences are predicted are located further away from the road. Details on the predicted concentrations at all receptor locations are presented in Appendix A3.

3.4 The highest modelled annual mean nitrogen dioxide concentration is 48.3 µg/m^3, predicted at Receptor 16 which is located at 1A Four Elms Hill, adjacent to diffusion tube NAS17 where the exceedance was measured in 2015. There are no predicted annual mean concentrations above 60 µg/m^3, and thus exceedences of the 1-hour mean objective are unlikely.

3.5 An isopleth map of the modelled annual mean nitrogen dioxide concentrations at ground-floor level is presented in Figure 6. This shows that the annual mean objective is likely to be exceeded alongside Four Elms Hill, at an approximate distance of up to 10 m from the roadside.

3.6 The isopleth shows the 40 µg/m^3 contour in red, as well as the 36 µg/m^3 contour in blue. There is some uncertainty surrounding both the measured and modelled concentrations. It is therefore recommended that an AQMA is declared to include, as a minimum, those residential properties which lie within the 36 µg/m^3 contour, in order to be precautionary.

3.7 No exceedences of 60 µg/m^3 as an annual mean nitrogen dioxide concentration have been identified at locations of relevant exposure, and thus exceedences of the 1-hour objective are unlikely.

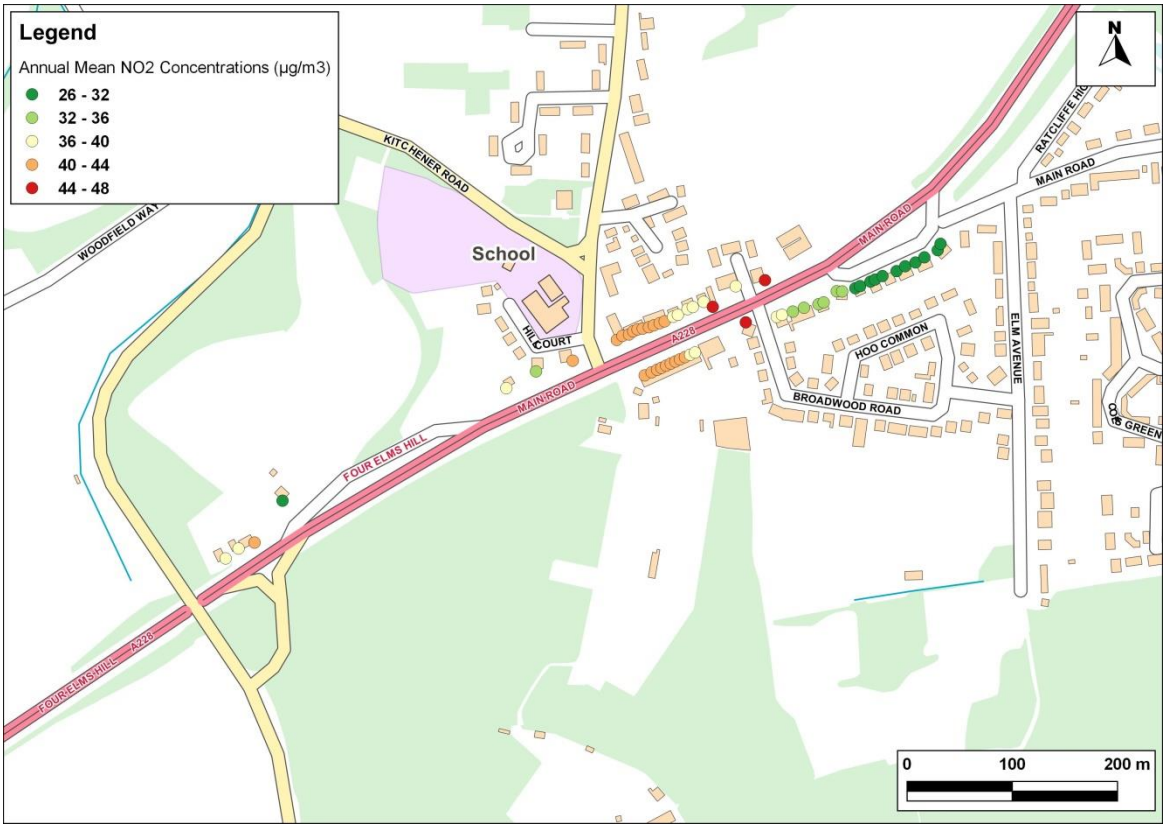

Figure 5 Annual Mean Nitrogen Dioxide Concentrations Modelled at Receptor Locations in 2015 (modelled at 1.5 m).

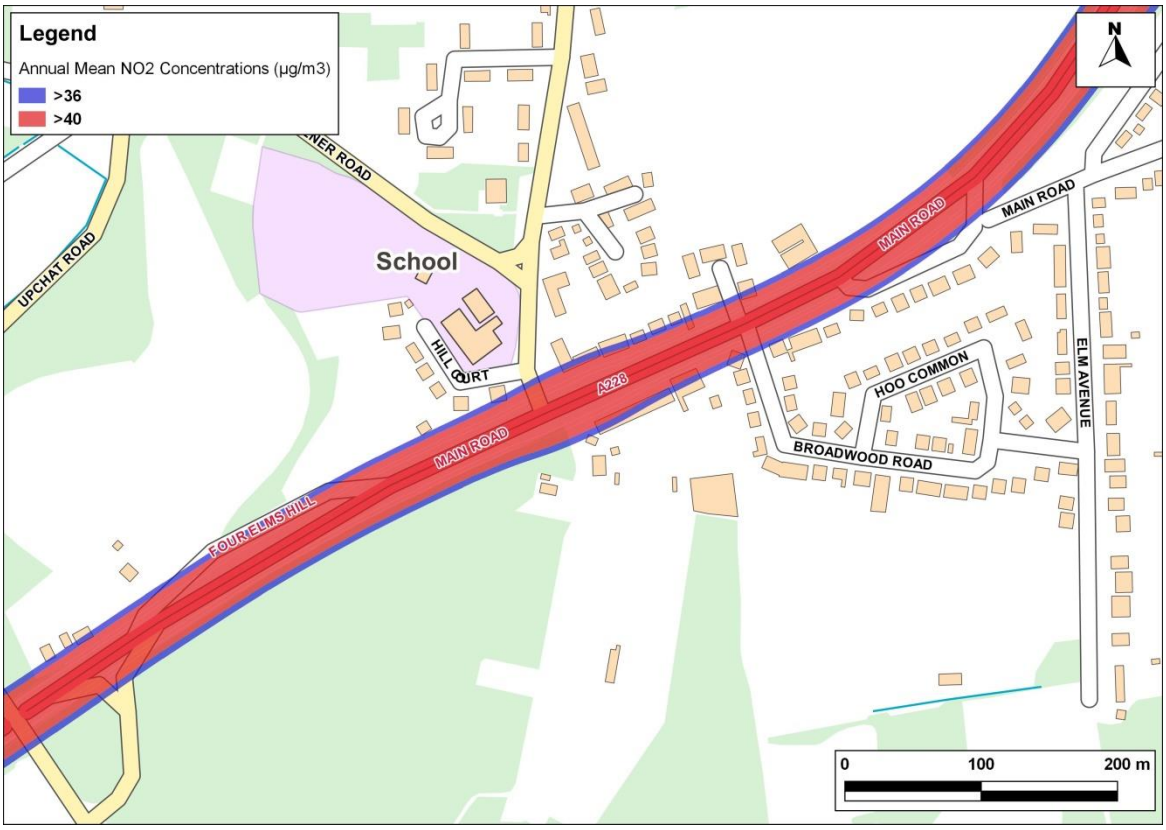

Figure 6 Extent of the Modelled 40µg/m^3 Contour (red) and 36 µg/m^3 Contour (blue) of Annual Mean Nitrogen Dioxide Concentrations in 2015 (modelled at 1.5 m).

Population Exposure

3.8 Objective exceedences are predicted at approximately 24 residential properties. Assuming that each property has on average two occupants, this equates to approximately 48 residents.

4 Source Apportionment

4.1 The traffic sources contributing to the objective exceedences have been identified. These data can be used to help develop an appropriate Action Plan and to inform future traffic management decisions. They have been calculated in line with guidance provided in LAQM.TG(16) (Defra, 2016a).

4.2 Figure 7 and Table A3-2 in Appendix A3 set out the relative contributions of traffic emissions. The following categories have been included in the source apportionment:

- Regional Background (Reg Bkgd);
- Local Background (Local Bkgd)
- Motorcycles (MCL);
- Cars;
- Light Goods Vehicles (LGV);
- Buses;
- Rigid Heavy Goods Vehicles (Rigid); and
- Articulated Heavy Good Vehicles (Artic).

4.3 The 56 receptor locations identified previously identified have been used to provide an overview of source contributions. Table A3-2 in Appendix A3 and Figure 7 show that the most significant component at all receptors is the regional and local (combined) ambient background concentration, followed by emissions from cars (although not shown, diesel cars will have a greater contribution than petrol cars).

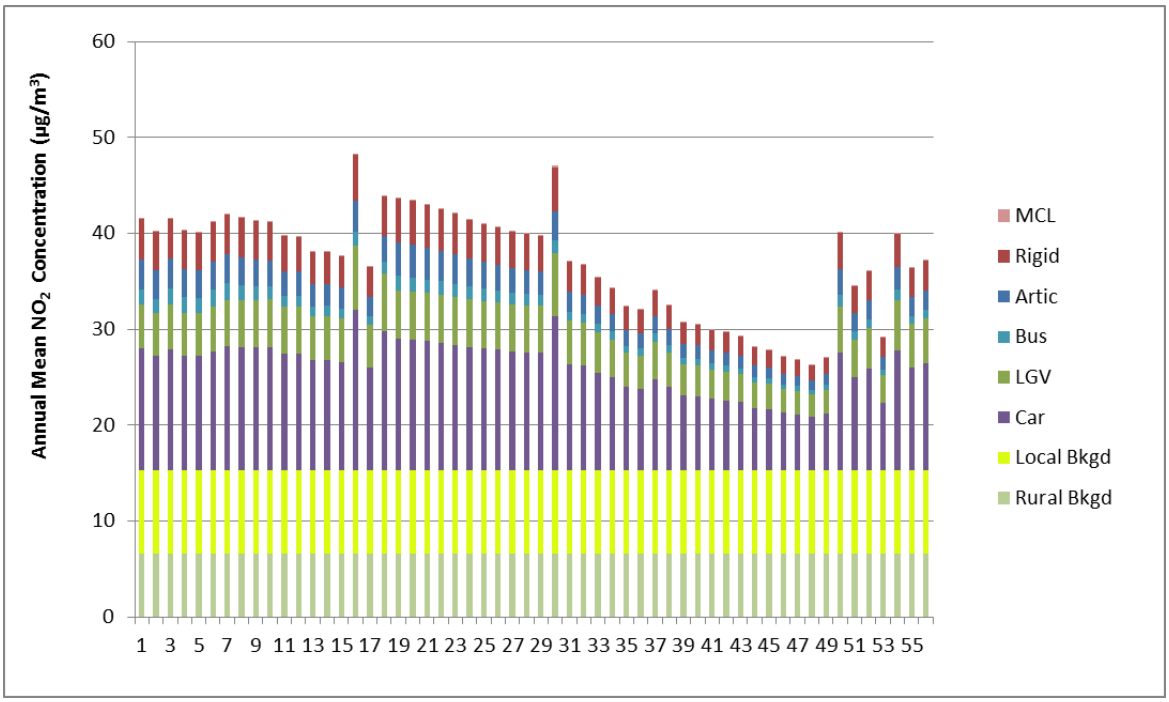

Figure 7: Relative Contribution of Each Source Type to the Total Predicted Annual Mean Nitrogen Dioxide Concentration at Receptor Locations (µg/m^3)

Air Quality Improvements Required

4.4 The degree of improvement needed in order for the annual mean nitrogen dioxide objective to be achieved is defined by the difference between the highest measured or predicted concentration and the objective level (40 µg/m^3). The highest nitrogen dioxide concentration was predicted at receptor R16 (48.3 µg/m^3), requiring a reduction of 8.3 µg/m^3 in order for the objective to be achieved.

4.5 In terms of describing the reduction in emissions required, it is more useful to consider nitrogen oxides (NOx). The required reduction in local nitrogen oxides emission has been calculated in line with guidance presented in LAQM.TG(16) (Defra, 2016a). Table 3 sets out the required reduction in local emissions of NOx that would be required at the seven receptor locations where the greatest exceedences are predicted, in order for the annual mean objective to be achieved.

3.15 Table 3 shows that at receptor 16, where the highest annual mean concentrations was predicted, a reduction of 28.7% in local road traffic emissions would be required in order to achieve the objective. This is followed by a required reduction of 25.2% in local road traffic at receptor 30, located on the other side of the road from receptor 16. These two locations are where the highest reduction is required in order to achieve the objective. At receptor locations 18 to 22, located along the southern side of Four Elms Hill, reductions ranging from 11.1 to 15.9% would be required to achieve the objective. At all other selected receptor locations in the study area where an

exceedance was predicted, a reduction of less than 10% in local road traffic would be required to achieve the objective.

Table 3: Improvement in Annual Mean Nitrogen Dioxide Concentrations and Nitrogen Oxides Concentration Required in 2015 to Meet the Objective

Receptor	Required reduction in annual mean nitrogen dioxide concentration (µg/m^3)	Required reduction in emissions of oxides of nitrogen from local roads (%)
16	8.3	28.7
30	7.0	25.2
18	4.0	15.9
19	3.8	15.0
20	3.5	14.0
21	3.1	12.6
22	2.7	11.1

5 Conclusions and Recommendations

5.1 A Detailed Assessment has been carried out for nitrogen dioxide along Four Elms Hill in Chattenden. This area was identified as being at risk of exceeding the annual mean air quality objective for nitrogen dioxide in Medway Council's 2016 ASR.

5.2 The Detailed Assessment has been carried out using a combination of monitoring data and modelled concentrations. Concentrations of nitrogen dioxide have been modelled for 2015 using the ADMS-Roads dispersion model. The model has been verified against measurements made at the two nitrogen dioxide diffusion tube monitoring locations which lie adjacent to the road network included in the model.

5.3 The assessment has identified that the annual mean nitrogen dioxide objective is being exceeded at a number of relevant locations alongside Four Elms Hill. No exceedences of 60 $\mu g/m^3$ as an annual mean nitrogen dioxide concentration have been identified at locations of relevant exposure, and thus exceedences of the 1-hour objective are unlikely.

5.4 There is some uncertainty surrounding both the measured and modelled concentrations. It is therefore recommended that an AQMA is declared to include, as a minimum, those residential properties that lie within the 36 $\mu g/m^3$ contour to be precautionary.

5.5 It is also recommended that Medway Council continues monitoring nitrogen dioxide at the existing monitoring locations, and expand the network where possible, in particular at locations of relevant exposure.

5.6 Source apportionment of the local traffic emissions has been undertaken. This shows that ambient background concentrations contribute the largest proportion to the overall concentration, followed by emissions from cars.

5.7 A reduction in traffic emissions along Four Elms Hill would result in a decrease in the concentrations of nitrogen dioxide. Reductions in vehicle emissions from local traffic of up to 28.7 % would be required to achieve the annual mean nitrogen dioxide objective where the highest concentrations are predicted to occur.

6 References

Defra, 2007. The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, July 2007.

Defra, 2016a. Local Air Quality Management: Technical Guidance LAQM.TG(16).

Defra, 2016b. LAQM Support Website Available at: http://laqm.defra.gov.uk/

DfT, 2016. Annual Average Daily Flows. Available at: http://www.dft.gov.uk/traffic-counts/cp.php

Medway Council, 2016. 2016 Annual Status Report.

Stationery Office, 2000. Air Quality Regulations, 2000, Statutory Instrument 928.

Stationery Office, 2002. Air Quality (England) (Amendment) Regulations, 2002, Statutory Instrument 3043.

7 Glossary

Standards	A nationally defined set of concentrations for nine pollutants below which health effects do not occur or are minimal.
Objectives	A nationally defined set of health-based concentrations for nine pollutants, seven of which are incorporated in Regulations, setting out the extent to which the standards should be achieved by a defined date, taking into account costs, benefits, feasibility and practicality. There are also vegetation-based objectives for sulphur dioxide and nitrogen oxides.
Exceedence	A period of time where the concentration of a pollutant is greater than the appropriate air quality objective.
AQMA	Air Quality Management Area
ADMS Roads	Atmospheric Dispersion Modelling System for Roads.
NO_X	Nitrogen oxides (taken as NO + NO_2)
NO	Nitric Oxide
NO_2	Nitrogen dioxide.
$\mu g/m^3$	Microgrammes per cubic metre.
Roadside	A site sampling between 1 m of the kerbside of a busy road and the back of the pavement. Typically this will be within 5 m of the road, but could be up to 15 m (Defra, 2009).
HDV	Heavy Duty Vehicle
LDV	Light Duty Vehicle
MCL	Motorcycles
AADT	Annual Average Daily Traffic flows

A1 Appendix 1 – Summary of Health Effects of Nitrogen Dioxide

Table A1.1: Summary of Health Effects of Nitrogen Dioxide

Pollutant	Main Health Effects
Nitrogen Dioxide	Short-term exposure to high concentrations may cause inflammation of respiratory airways. Long term exposure may affect lung function and enhance responses to allergens in sensitised individuals. Asthmatics will be particularly at risk (Defra, 2007).

A2 Appendix 2 – Dispersion Modelling Methodology

Meteorological Data

A2.1 The model has been run using a full year of meteorological data for 2015 from the meteorological station near Southend Airport.

Background Concentrations:

A2.2 Background concentrations of nitrogen dioxide have been taken from the national maps of background concentrations published by Defra (Defra, 2016b). The background concentrations used in the modelling are presented in Table A2.1.

Table A2.1: Background Concentrations (µg/m^3)

	NOx	NO_2
2015	21.7	15.3

Traffic Data

A2.3 The ADMS Roads model requires the user to provide various input data, including the Annual Average Daily Traffic (AADT) flow, the proportion of heavy duty vehicles (HDVs), road characteristics (including road width and street canyon height, where applicable), and the vehicle speed.

A2.4 Annual Average Daily Traffic (AADT) flows, and the flows split into a number of vehicle classes, have been sourced from the Department for Transport traffic counts (DfT, 2016). Traffic speeds have been estimated from local speed restrictions and take account of the proximity to junctions. The traffic data used in this Detailed Assessment are presented in Table A2.2.

Table A2.2: Summary of AADT Flows (2015)

	MCL	Cars	LGV	BUS	HGV	Total
Four Elms Hill (Count Point 56827)	412	26110	4146	184	1751	32419
A289 Hasted Road (Count Point 70381)	376	35861	7042	60	3312	46591
A289 Wulfure Way (Count Point 70385)	384	31991	6153	161	2314	40842

Model Verification

A2.5 Most nitrogen dioxide (NO_2) is produced in the atmosphere by reaction of nitric oxide (NO) with ozone. It is therefore most appropriate to verify the model in terms of primary pollutant emissions of nitrogen oxides (NO_X = NO + NO_2). The model has been run to predict the annual mean road-NO_X concentration during 2015 at the two diffusion tube monitoring sites described in Table 2, which lie alongside Four Elms Hill.

A2.6 The model output of road-NO_X (i.e. the component of total NO_X coming from road traffic) has been compared with the 'measured' road-NO_X. Measured road-NO_X for the diffusion tube sites was calculated from the measured NO_2 concentration and the predicted background NO_2 concentration using the NO_X from NO_2 calculator available on the LAQM Support website (Defra, 2016b).

A2.7 An adjustment factor was determined as the slope of the best fit line between the 'measured' road contribution and the model derived road contribution, forced through zero (Figure A2.1). This factor was then applied to the modelled road-NO_X concentration for each receptor to provide adjusted modelled road-NO_X concentrations. The total nitrogen dioxide concentrations were then determined by combining the adjusted modelled road-NO_X concentrations with the predicted background NO_2 concentration within the NO_X from NO_2 calculator.

A2.8 An adjustment factor of 5.6747 has been applied to all modelled nitrogen dioxide data.

A2.9 The results imply that the model was under-predicting the road-NO_X contribution. This is a common experience with this and most other models.

A2.10 Figure A2.2 compares adjusted modelled total NO_2 at each of the monitoring sites, to measured total NO_2, and shows a relationship close to 1:1.

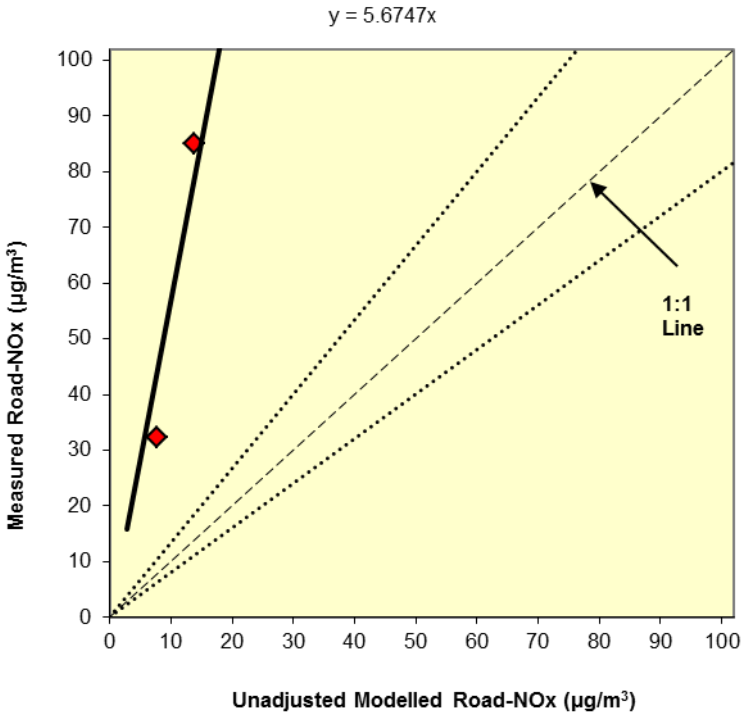

Figure A2.1: Comparison of Measured Road-NO_X to Unadjusted Modelled Road NO_X Concentrations

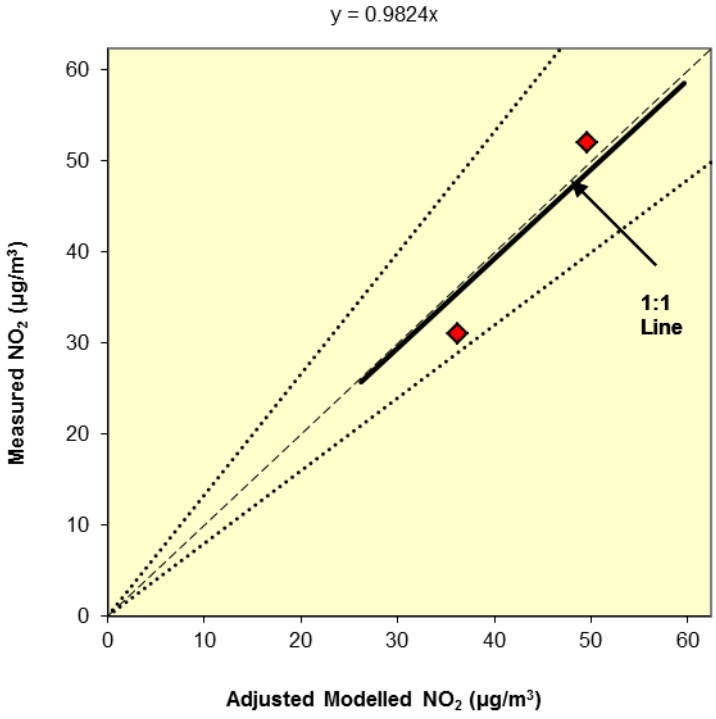

Figure A2.2: Comparison of Measured Total NO_2 to Adjusted Modelled Total NO_2 Concentrations

A3 Appendix 3 – Detailed modelling results

Table A3-1: Modelled Annual Mean Nitrogen Dioxide Concentrations at Specific Receptor Locations in 2015

Receptor	OS Grid coordinates		Height	2015 ($\mu g/m^3$)[a]
	X	Y		
1	575852	171816	1.5 m	**41.6**
2	575858	171820	1.5 m	**40.2**
3	575864	171822	1.5 m	**41.6**
4	575868	171825	1.5 m	**40.3**
5	575872	171826	1.5 m	**40.2**
6	575877	171827	1.5 m	**41.2**
7	575883	171829	1.5 m	**42.0**
8	575887	171830	1.5 m	**41.7**
9	575893	171832	1.5 m	**41.4**
10	575898	171834	1.5 m	**41.2**
11	575906	171839	1.5 m	39.8
12	575910	171840	1.5 m	39.8
13	575919	171846	1.5 m	38.2
14	575924	171848	1.5 m	38.2
15	575935	171853	1.5 m	37.8
16	575943	171848	1.5 m	**48.3**
17	575965	171867	1.5 m	36.6
18	575993	171873	1.5 m	**44.0**
19	575879	171783	1.5 m	**43.8**
20	575885	171786	1.5 m	**43.5**
21	575891	171788	1.5 m	**43.1**
22	575895	171790	1.5 m	**42.7**
23	575899	171792	1.5 m	**42.1**
24	575904	171794	1.5 m	**41.5**
25	575908	171796	1.5 m	**41.1**
26	575912	171798	1.5 m	**40.7**
27	575917	171800	1.5 m	**40.3**
28	575922	171802	1.5 m	**40.0**
29	575927	171805	1.5 m	39.8

Receptor	OS Grid coordinates		Height	2015 (µg/m^3)[a]
	X	Y		
30	575975	171833	1.5 m	**47.0**
31	576004	171838	1.5 m	37.2
32	576009	171840	1.5 m	36.8
33	576020	171843	1.5 m	35.5
34	576030	171847	1.5 m	34.4
35	576044	171850	1.5 m	32.4
36	576049	171852	1.5 m	32.1
37	576061	171863	1.5 m	34.1
38	576066	171863	1.5 m	32.5
39	576079	171866	1.5 m	30.8
40	576083	171868	1.5 m	30.6
41	576093	171872	1.5 m	30.0
42	576098	171874	1.5 m	29.7
43	576105	171877	1.5 m	29.3
44	576118	171882	1.5 m	28.2
45	576126	171887	1.5 m	27.9
46	576136	171890	1.5 m	27.1
47	576145	171895	1.5 m	26.9
48	576157	171902	1.5 m	26.3
49	576160	171908	1.5 m	27.0
50	575810	171797	1.5 m	**40.2**
51	575775	171787	1.5 m	34.6
52	575747	171771	1.5 m	36.2
53	575534	171664	1.5 m	29.2
54	575508	171624	1.5 m	**40.1**
55	575493	171618	1.5 m	36.5
56	575480	171609	1.5 m	37.3
Objective				**40**

[a] Values in bold are exceedences of the objective.

Table A3-2: Predicted Annual Mean Nitrogen Dioxide Concentrations (2015) and the Contribution of Each Source Type to the Total

Receptor	Annual Mean Concentration (µg/m^3)								
	Reg Bkgd	Local Bkgd	Car	LGV	MCL	Artic	Rigid	Bus	Total
1	6.6	8.7	12.7	4.7	0.1	3.2	4.2	1.5	26.4
2	6.6	8.7	12.0	4.4	0.1	3.0	4.0	1.5	25.0
3	6.6	8.7	12.6	4.7	0.1	3.1	4.2	1.7	26.4
4	6.6	8.7	12.0	4.5	0.1	2.9	3.9	1.6	25.1
5	6.6	8.7	11.9	4.5	0.1	2.9	3.9	1.6	24.9
6	6.6	8.7	12.5	4.7	0.1	3.0	4.1	1.7	26.0
7	6.6	8.7	12.9	4.9	0.1	3.0	4.2	1.7	26.8
8	6.6	8.7	12.9	4.9	0.1	2.9	4.1	1.6	26.4
9	6.6	8.7	12.8	5.0	0.1	2.8	4.0	1.4	26.1
10	6.6	8.7	12.8	5.0	0.1	2.8	3.9	1.3	26.0
11	6.6	8.7	12.2	4.8	0.1	2.5	3.7	1.2	24.6
12	6.6	8.7	12.2	4.9	0.1	2.5	3.6	1.2	24.5
13	6.6	8.7	11.5	4.6	0.1	2.3	3.4	1.1	22.9
14	6.6	8.7	11.5	4.6	0.1	2.3	3.4	1.0	22.9
15	6.6	8.7	11.3	4.6	0.1	2.2	3.3	1.0	22.5
16	6.6	8.7	16.7	6.8	0.2	3.2	4.8	1.4	33.1
17	6.6	8.7	10.8	4.4	0.1	2.0	3.1	0.9	21.3
18	6.6	8.7	14.6	5.9	0.1	2.7	4.1	1.2	28.8
19	6.6	8.7	13.8	5.0	0.1	3.5	4.6	1.5	28.5
20	6.6	8.7	13.6	5.0	0.1	3.4	4.6	1.5	28.2
21	6.6	8.7	13.5	5.0	0.1	3.3	4.5	1.4	27.8
22	6.6	8.7	13.3	5.0	0.1	3.2	4.4	1.4	27.4
23	6.6	8.7	13.1	5.0	0.1	3.1	4.2	1.4	26.9
24	6.6	8.7	12.9	5.0	0.1	2.9	4.1	1.3	26.3
25	6.6	8.7	12.7	4.9	0.1	2.8	3.9	1.3	25.8
26	6.6	8.7	12.6	4.9	0.1	2.7	3.8	1.2	25.4
27	6.6	8.7	12.5	4.9	0.1	2.6	3.8	1.2	25.0
28	6.6	8.7	12.4	4.9	0.1	2.5	3.7	1.2	24.7
29	6.6	8.7	12.3	4.9	0.1	2.5	3.6	1.1	24.5
30	6.6	8.7	16.1	6.5	0.2	3.0	4.6	1.4	31.8

31	6.6	8.7	11.1	4.5	0.1	2.1	3.2	0.9	21.9
32	6.6	8.7	10.9	4.5	0.1	2.1	3.1	0.9	21.6
33	6.6	8.7	10.2	4.2	0.1	1.9	2.9	0.9	20.2
34	6.6	8.7	9.7	4.0	0.1	1.8	2.7	0.8	19.1
35	6.6	8.7	8.7	3.6	0.1	1.6	2.5	0.7	17.2
36	6.6	8.7	8.5	3.5	0.1	1.6	2.4	0.7	16.8
37	6.6	8.7	9.6	3.9	0.1	1.8	2.7	0.8	18.8
38	6.6	8.7	8.8	3.6	0.1	1.6	2.5	0.7	17.3
39	6.6	8.7	7.9	3.2	0.1	1.5	2.2	0.7	15.6
40	6.6	8.7	7.8	3.2	0.1	1.4	2.2	0.6	15.3
41	6.6	8.7	7.5	3.1	0.1	1.4	2.1	0.6	14.7
42	6.6	8.7	7.3	3.0	0.1	1.4	2.1	0.6	14.5
43	6.6	8.7	7.1	2.9	0.1	1.3	2.0	0.6	14.1
44	6.6	8.7	6.5	2.7	0.1	1.2	1.8	0.5	12.9
45	6.6	8.7	6.4	2.6	0.1	1.2	1.8	0.5	12.6
46	6.6	8.7	6.0	2.5	0.1	1.1	1.7	0.5	11.9
47	6.6	8.7	5.9	2.4	0.1	1.1	1.7	0.5	11.6
48	6.6	8.7	5.6	2.3	0.1	1.0	1.6	0.5	11.1
49	6.6	8.7	6.0	2.5	0.1	1.1	1.7	0.5	11.8
50	6.6	8.7	12.3	4.8	0.1	2.7	3.8	1.2	24.9
51	6.6	8.7	9.7	3.9	0.1	1.9	2.8	0.8	19.3
52	6.6	8.7	10.6	4.3	0.1	2.0	3.0	0.9	20.9
53	6.6	8.7	7.0	3.0	0.1	1.3	2.0	0.6	13.9
54	6.6	8.7	12.6	5.2	0.1	2.3	3.5	1.0	24.8
55	6.6	8.7	10.8	4.5	0.1	2.0	3.0	0.9	21.3
56	6.6	8.7	11.2	4.7	0.1	2.1	3.1	0.9	22.1
Receptor	**% Contribution to Total**								
	Reg Bkgd	**Local Bkgd**	**Car**	**LGV**	**MCL**	**Artic**	**Rigid**	**Bus**	**Total**
1	15.8	20.9	30.5	11.2	0.2	7.6	10.2	3.6	100
2	16.3	21.6	29.9	11.0	0.2	7.4	9.9	3.7	100
3	15.8	20.9	30.3	11.2	0.2	7.5	10.0	4.1	100
4	16.3	21.5	29.8	11.1	0.2	7.3	9.8	4.1	100
5	16.4	21.6	29.7	11.1	0.2	7.2	9.7	4.1	100

6	15.9	21.1	30.2	11.3	0.2	7.2	9.8	4.2	100
7	15.6	20.7	30.8	11.6	0.2	7.2	9.9	4.0	100
8	15.8	20.8	30.9	11.8	0.2	7.1	9.8	3.7	100
9	15.9	21.0	31.0	12.0	0.2	6.8	9.6	3.4	100
10	15.9	21.1	31.1	12.1	0.3	6.7	9.5	3.3	100
11	16.5	21.8	30.7	12.1	0.3	6.4	9.2	3.0	100
12	16.5	21.9	30.8	12.2	0.3	6.3	9.1	2.9	100
13	17.2	22.8	30.1	12.0	0.3	6.0	8.8	2.8	100
14	17.2	22.8	30.2	12.1	0.3	6.0	8.8	2.7	100
15	17.4	23.0	30.0	12.1	0.3	5.9	8.7	2.7	100
16	13.6	18.0	34.6	14.0	0.3	6.6	9.9	3.0	100
17	18.0	23.8	29.5	12.0	0.3	5.6	8.4	2.5	100
18	14.9	19.7	33.1	13.5	0.3	6.2	9.4	2.8	100
19	15.0	19.9	31.4	11.5	0.2	8.0	10.6	3.4	100
20	15.1	20.0	31.4	11.6	0.2	7.9	10.5	3.4	100
21	15.3	20.2	31.3	11.6	0.2	7.7	10.4	3.3	100
22	15.4	20.4	31.2	11.7	0.2	7.5	10.2	3.3	100
23	15.6	20.6	31.2	11.8	0.2	7.3	10.0	3.2	100
24	15.8	20.9	31.1	11.9	0.2	7.0	9.8	3.1	100
25	16.0	21.2	31.0	12.0	0.3	6.8	9.6	3.1	100
26	16.2	21.4	31.0	12.1	0.3	6.6	9.5	3.0	100
27	16.3	21.6	30.9	12.2	0.3	6.5	9.3	2.9	100
28	16.4	21.7	30.9	12.3	0.3	6.4	9.2	2.9	100
29	16.5	21.8	30.9	12.3	0.3	6.3	9.1	2.8	100
30	14.0	18.5	34.2	13.9	0.3	6.4	9.7	2.9	100
31	17.7	23.4	29.9	12.2	0.3	5.6	8.5	2.5	100
32	17.8	23.6	29.7	12.1	0.3	5.6	8.4	2.5	100
33	18.5	24.5	28.9	11.8	0.3	5.4	8.2	2.4	100
34	19.1	25.3	28.2	11.5	0.3	5.3	8.0	2.4	100
35	20.3	26.8	26.8	11.0	0.3	5.0	7.6	2.3	100
36	20.5	27.1	26.6	10.9	0.3	5.0	7.5	2.2	100
37	19.3	25.5	28.0	11.5	0.3	5.2	7.9	2.3	100
38	20.2	26.7	26.9	11.0	0.3	5.0	7.6	2.3	100
39	21.3	28.2	25.6	10.5	0.2	4.8	7.2	2.1	100

40	21.5	28.4	25.4	10.4	0.2	4.7	7.2	2.1	100
41	21.9	29.0	24.9	10.2	0.2	4.6	7.0	2.1	100
42	22.1	29.3	24.7	10.1	0.2	4.6	6.9	2.1	100
43	22.4	29.6	24.3	10.0	0.2	4.5	6.9	2.0	100
44	23.3	30.9	23.2	9.6	0.2	4.3	6.5	1.9	100
45	23.6	31.2	23.0	9.4	0.2	4.3	6.5	1.9	100
46	24.2	32.0	22.2	9.1	0.2	4.1	6.2	1.8	100
47	24.5	32.4	21.9	9.0	0.2	4.1	6.2	1.8	100
48	25.0	33.0	21.3	8.8	0.2	4.0	6.0	1.8	100
49	24.3	32.2	22.1	9.1	0.2	4.1	6.2	1.8	100
50	16.3	21.6	30.7	12.0	0.2	6.7	9.5	2.9	100
51	19.0	25.1	28.1	11.4	0.3	5.5	8.1	2.4	100
52	18.2	24.0	29.3	12.0	0.3	5.6	8.3	2.5	100
53	22.5	29.8	24.1	10.2	0.2	4.6	6.7	1.9	100
54	16.4	21.7	31.4	13.1	0.3	5.9	8.8	2.5	100
55	18.0	23.8	29.5	12.3	0.3	5.5	8.2	2.4	100
56	17.6	23.3	29.9	12.5	0.3	5.6	8.4	2.4	100

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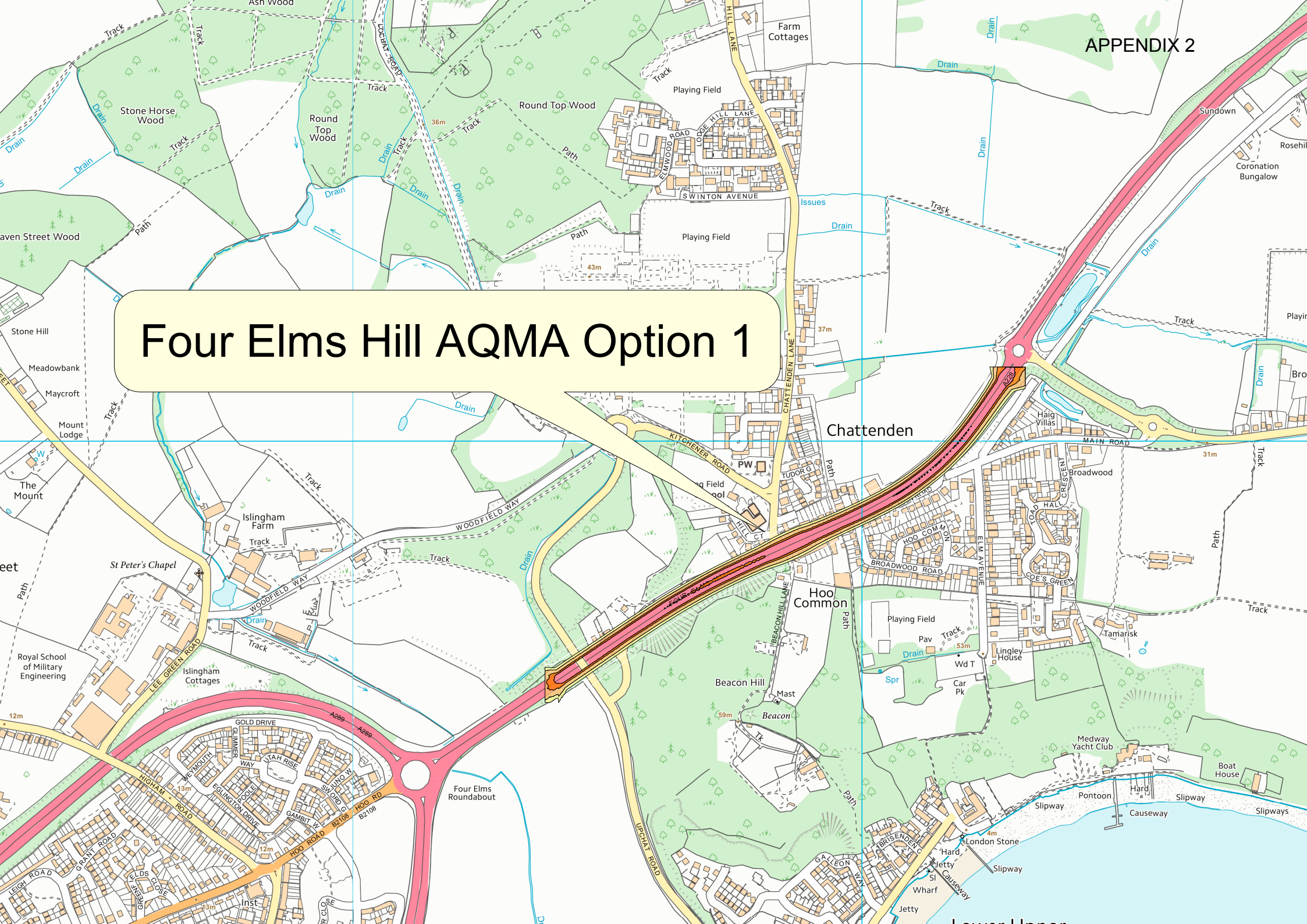
APPENDIX 2

Four Elms Hill AQMA Option 1



APPENDIX 3


Four Elms Hill AQMA Option 1
Central Medway AQMA
Pier Road AQMA
Chattenden
Lower Upnor
Upper Upnor
Wainscott
Frindsbury
Strood
ROCHESTER
Broad Street
Hoo St Werburgh
Hoo Salt Marsh
Hoo Ness
St Mary's Island
Marina
Dickens World
Historic Dockyard
Medway Tunnel
Gillingham Reach
Short Reach
Upnor Reach
Chatham Reach
Limehouse Reach
Saxon Shore Way
A 228
A 289
A 231
B 2108

Diversity Impact Assessment

APPENDIX 4

TITLE *Name/description of the issue being assessed*	**Declaration of Four Elms Hill Air Quality Management Area**
DATE *Date the DIA is completed*	**14 March 2017**
LEAD OFFICER *Name of person responsible for carrying out the DIA*.	**Lucy Kirk**

1 Summary description of the proposed change

- *What is the change to policy/service/new project that is being proposed?*
- *How does it compare with the current situation?*

Local authorities have a duty under the Environmental Act 1995 to declare an Air Quality Management Area (AQMA) where the air quality objectives are not being met. Monitoring and modelling has been undertaken in the area of Four Elms Hill. This has shown that annual average levels of nitrogen dioxide are above the Government's limits. The area must therefore be declared as an AQMA.

The council is required to undertake a statutory consultation on the AQMA declaration prior to the formal declaration of the AQMA by legal order. Schedule 11 of the Environment Act 1995 lists the statutory consultees on AQMA declarations.

Medway currently has three AQMAs. The current Air Quality Action Plan will subsequently be updated to include measures for the new area. If measured levels of nitrogen dioxide remain below the objective level for three consecutive years, the Council can revoke the AQMA.

The European Commission has commenced proceedings against the UK for breach of nitrogen dioxide limit values under the EU Air Quality Directive and was issued a final warning in February 2017. If fines are imposed, the Government proposes to pass these on to local authorities. If the council does not undertake its statutory air quality duties, it will not be able to show that it is working to improve the air quality within the area and could be liable for these fines.

The pollutant of concern in Medway is nitrogen dioxide. Nitrogen dioxide is known to cause inflammation of the airways, reduce lung function and exacerbate asthma.

2 Summary of evidence used to support this assessment

- *Eg: Feedback from consultation, performance information, service user records etc.*
- *Eg: Comparison of service user profile with Medway Community Profile*

The Environment Act 1995 requires all local authorities to review air quality within their area. If any air quality "Objective" prescribed by regulations and in the National Air Quality Strategy is not likely to be achieved, then the local authority must designate the affected areas as AQMAs. The Act then requires an action plan to be produced for these designated areas, setting out the actions that the council intends to take to achieve the National Air Quality Strategy.

Air quality monitoring and modelling carried out by the council indicates that despite good air quality within most of the Medway Council area, the air quality objectives for nitrogen dioxide in some areas were not met, including that of Four Elms Hill.

In 2004 Medway Council declared six AQMAs and then in August 2010, following further consideration of air quality results, the Council consolidated the existing AQMAs along with newly identified areas into three AQMAs, These areas were designated as Central Medway AQMA, Pier Road, Gillingham AQMA and High Street, Rainham AQMA. The monitoring and modelling which has been undertaken in the area of Four Elms Hill, has shown that annual average levels of nitrogen dioxide are above the Government's limits. The air quality objective for nitrogen dioxide is an annual average of 40µg/m3. The area must therefore be declared as an AQMA. There are approximately 24 properties within the new AQMA that are affected by poor air quality.

The council is required to undertake a statutory consultation on the AQMA declaration prior to the formal declaration of the AQMA by legal order. Schedule 11 of the Environment Act 1995 lists the statutory consultees on AQMA declarations. The consultation will include members of the public living within the properties identified in the assessment and any other relevant local groups (including MASH (Medway Asthma Self Help) and the Rural Liaison Committee) and will be undertaken for a period of 6 weeks. The consultation will include the extent of the AQMA which is to be declared.

Diversity Impact Assessment

3 What is the likely impact of the proposed change?

Is it likely to :

- *Adversely impact on one or more of the protected characteristic groups?*
- *Advance equality of opportunity for one or more of the protected characteristic groups?*
- *Foster good relations between people who share a protected characteristic and those who don't?*

(insert ✓ in one or more boxes)

Protected characteristic groups	Adverse impact	Advance equality	Foster good relations
Age		✓	
Disabilty		✓	
Gender reassignment			
Marriage/civil partnership			
Pregnancy/maternity		✓	
Race			
Religion/belief			
Sex			
Sexual orientation			
Other (eg low income groups)		✓	

4 Summary of the likely impacts

- *Who will be affected?*
- *How will they be affected?*

Local residents, including those within affected properties on Four Elm Hills, and local businesses will be impacted by the declaration of the AQMA. Moving to declare this AQMA is a constructive move for Medway Council as it identifies the need to improve air quality in respect of nitrogen dioxide and enables development of an Action Plan to work towards improving the air quality within the area, which will have a positive impact on residents' health and improve air quality within Medway. In particular, the young, elderly and all others that suffer from respiratory conditions will benefit as the air quality improves over time

Diversity Impact Assessment

5 What actions can be taken to mitigate likely adverse impacts, improve equality of opportunity or foster good relations?

- *Are there alternative providers?*
- *What alternative ways can the Council provide the service?*
- *Can demand for services be managed differently?*

As part of the consultation/engagement exercise we will ensure that all statutory stakeholders and members of the public have the relevant information and are well informed. Overall responsibility for reducing the pollutant levels lies, ultimately with the council. Once the AQMA has been formally declared and the action plan measures have been formulated, the council will consult externally on the action plan to ensure that there are no negative impacts on any of the protected groups.

6 Action plan

- *Actions to mitigate adverse impact, improve equality of opportunity or foster good relations and/or obtain new evidence*

Action	Lead	Deadline or review date
Consultation on declaration of AQMA at Four Elms Hill	**LAK/ SS**	**July 17**
Formal declaration of AQMA at Four Elms Hill	**LAK/ SS**	**September 17**
Review current AQMA and see if measures are relevant to new AQMA at Four Elms Hill.	**LAK/ SS**	**November 17**
Amend AQAP to accommodate new AQMA and any new measures	**LAK/ SS**	**November 17**
Consult on AQAP internally and externally in order to seek their views on the plan and obtain any suggestions they have which can be included into the Plan.	**LAK/ SS**	**January 18**
Review the DIA taking into consideration feedback from external consultation.	**LAK/ SS**	**March 18**

7 Recommendation

The recommendation by the lead officer should be stated below. This may be:

- *to proceed with the change implementing action plan if appropriate*
- *consider alternatives*
- *gather further evidence*

If the recommendation is to proceed with the change and there are no actions that can be taken to mitigate likely adverse impact, it is important to state why.

The Council is required to undertake a statutory consultation on the AQMA declaration prior to the formal declaration of the AQMA by legal order. I would recommend that this matter is considered by Cabinet.

Diversity Impact Assessment

8 Authorisation

The authorising officer is consenting that:

- *the recommendation can be implemented*
- *sufficient evidence has been obtained and appropriate mitigation is planned*
- *the Action Plan will be incorporated into service plan and monitored*

Assistant Director	
Date	

Contact your Performance and Intelligence hub for advice on completing this assessment

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Send completed assessment to the Corporate Performance & Intelligence Hub (CPI) for web publication