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Cambridge Environmental Research Consultants

Chelmsford Local Plan – Review of the Air Quality Impact Assessment following proposed changes to the Local Plan

Final report

Prepared for
Chelmsford City Council

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CERC

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1 Introduction

In 2024, CERC carried out an assessment of the air quality impact of Chelmsford City Council's Local Plan. The conclusion of the assessment was that the impact of the Local Plan on air quality was considered ***Negligible***.

Since the close of the Pre-Submission (Regulation 19) Local Plan consultation in February-March 2025, the A12 DCO improvement scheme has had its funding withdrawn by central government. In addition, a couple of large housing sites are likely to be delayed, meaning that Chelmsford does not currently have a sufficient 5 Year Housing Supply. The Council has identified further development sites to fill this shortfall. These 'Additional Sites' comprise 11 new housing sites, three expanded housing sites and one expanded employment site.

In this report, we assess the likely impact of these changes on air quality and consider whether or not they are likely to alter the conclusions of the original assessment.

2 The 2024 air quality assessment

The 2024 air quality assessment used modelled road traffic data to model concentrations of nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$) throughout Chelmsford for a 2023 baseline and for 2041 with and without Local Plan scenarios.

The modelled concentrations were compared with the UK air quality limit values for NO_2, PM_{10} and $PM_{2.5}$, as shown in Table 2.1.

Table 2.1: Air quality limit values

	Value ($\mu g/m^3$)	Description of standard
NO_2	200	Hourly mean not to be exceeded more than 18 times a calendar year (modelled as 99.79th percentile)
	40	Annual average
PM_{10}	50	24-hour mean not to be exceeded more than 35 times a calendar year (modelled as 90.41st percentile)
	40	Annual average
$PM_{2.5}$	20	Annual average

The air quality impact was assessed by comparing the total concentrations and the change in concentrations due to the Local Plan with the Institute of Air Quality Management impact descriptors, as shown in Table 2.2.

Table 2.2: IAQM impact descriptors[1]

Long-term average concentration at receptor in assessment year	% change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

[1] *Land-use planning & development control: planning for air quality*, IAQM 2017
http://www.iaqm.co.uk/text/guidance/iaqm-planning-development.pdf

For the 2023 baseline scenario, there were no modelled exceedences of any of the air quality limit values. By 2041, vehicle exhaust emissions of NO_x, PM_{10} and $PM_{2.5}$ are predicted to decrease significantly. However, PM_{10} and $PM_{2.5}$ emissions also include contributions from non-exhaust emissions, i.e. road, brake and tyre wear, which are expected to increase in proportion to traffic levels.

There were no modelled exceedences of any of the air quality limit values for either 2041 scenario and, using the IAQM significance criteria, the impact of the Local Plan on air quality was considered ***Negligible***.

3 Assessing the impact of changes

Discontinuing the A12 improvements and the introduction of new development sites could both have an impact on air quality. The A12 changes have the potential to affect the total modelled concentrations and the new developments could affect both the total concentrations and the modelled change in concentrations due to the Local Plan.

3.1 Discontinuing the A12 improvements

The 2024 air quality assessment was based on traffic data which included the A12 DCO improvements for the 2041 with and without Local Plan scenarios.

The significance of discontinuing the A12 improvements was assessed using air quality modelling data produced for the A12 DCO Environmental Statement[2]. Appendix 6.5[3] of the Environmental Statement presents modelled NO_2, PM_{10} and $PM_{2.5}$ concentrations for 2027 with and without the scheme in place for a selection of receptors with potential human exposure. The selection of the modelled receptors is explained in an extract from the Environmental Statement reproduced in Box 3.1 below.

> *6.8.23 A total of 267 human health receptor locations were modelled, selected as those most likely to experience the highest pollutant concentrations or largest changes in air pollutant concentrations as a result of the proposed scheme. Of these receptors, 159 were assessed owing to their proximity to the construction traffic ARN [Affected Road Network], whilst 260 were assessed owing to their proximity to the operational traffic ARN. Note, the construction ARN extended beyond the operational ARN and so seven receptors were affected by construction only.*
>
> *6.8.24 The placement of human health receptors was focused on areas near the ARN, where traffic modelling indicated that emissions were likely to increase or where the highest concentrations were expected to occur (i.e. at the nearest façade of the building to the road). Equally, receptors were selected to indicate where air quality is likely to improve as a result of the proposed scheme. Of the total receptors (267) modelled, 25 receptors representing 39 consented mixed use developmental planning applications within 200m of the ARN, were included (see Table 1.3 of Appendix 6.3 [TR010060/APP/6.3]). The planning application receptors were modelled at the nearest point of the planning application boundary to the ARN unless information was made available as to the actual location and use of buildings.*

Box 3.1: Extract from Environmental Statement Chapter 6 Air Quality3

[2] https://national-infrastructure-consenting.planninginspectorate.gov.uk/projects/TR010060/documents

[3] *A12 Chelmsford to A1120 widening scheme TR010060; 6.3 Environmental Statement; Appendix 6.5 Air quality modelling results*, National Highways August 2022 https://nsip-documents.planninginspectorate.gov.uk/published-documents/TR010060-000125-HE551497-JAC-LDC-SCHW-RP-LA-0005.pdf

Figure 3.1 shows the locations of the modelled receptors within Chelmsford. Table 3.1 shows the modelled NO_2, PM_{10} and $PM_{2.5}$ concentrations at these receptors for the with (DS) and without (DM) widening scheme and the modelled change in concentrations (DS-DM).

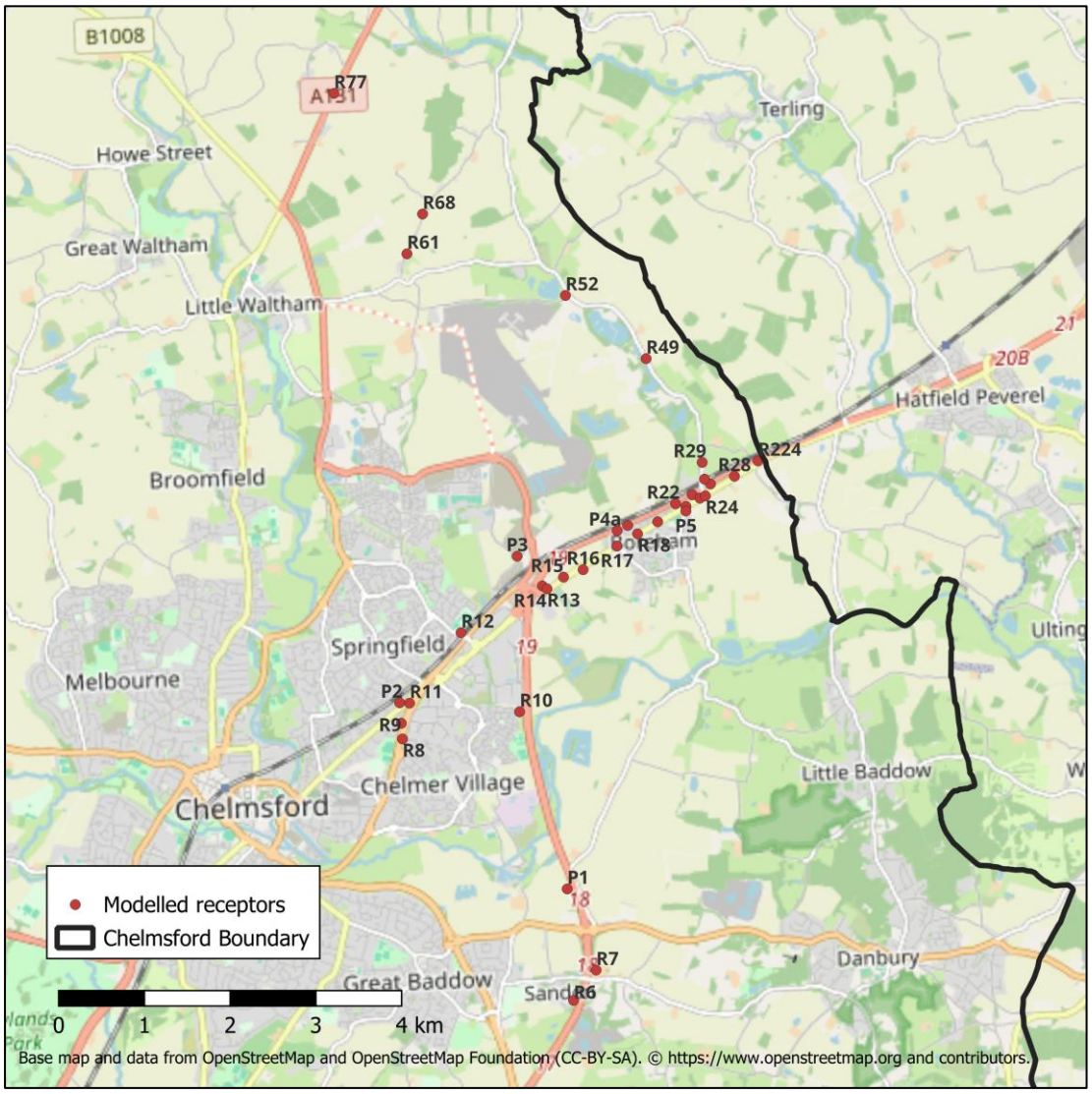

Figure 3.1: Modelled human health receptors from A12 Environmental Assessment

Positive values of DS-DM indicate locations where concentrations with the A12 improvements are greater than those without the improvements. At these locations, the modelled concentrations presented in the Local Plan air quality assessment are conservative, i.e. modelling the same scenario but without the A12 improvements would result in lower concentrations.

Negative values of DS-DM indicate locations where concentrations with the A12 improvements are less than those without the improvements. At these locations, the modelled concentrations presented in the Local Plan air quality assessment are lower than they would be if the A12 improvements were not included. This is only true for four receptors, shown in the table in **bold**: three on Waltham Road; and one on Leighs Road. The maximum change in concentrations at these receptors is 0.3 µg/m³ for NO_2 and 0.1 µg/m³ for PM_{10} and $PM_{2.5}$. By 2041, the modelled year for the Local Plan air quality assessment, NO_2 concentrations (and consequently the modelled change in concentrations due to the A12 improvements) are likely to have reduced significantly.

This shows that removing the A12 improvements from the modelling for the Local Plan scenarios would not have a significant impact on the total concentrations.

Table 3.1: Modelled concentrations for 2027 from A12 Environmental Statement

	NO_2			PM_{10}			$PM_{2.5}$		
	DM	DS	DS-DM	DM	DS	DS-DM	DM	DS	DS-DM
P1	18.6	18.7	0.1	19.8	19.8	0	12.2	12.2	0
P2	15.9	16	0.1	14.9	14.9	0	10.1	10.1	0
P3	16.9	16.9	0	16.2	16.2	0	10.1	10.1	0
P4a	27.5	29.4	1.9	18.4	18.5	0.1	11.7	11.8	0.1
P5	18.6	19.4	0.8	17.7	17.8	0.1	11	11.1	0.1
R10	18.9	19	0.1	15.8	15.8	0	10.2	10.3	0.1
R11	20.7	20.8	0.1	16	16	0	11.1	11.1	0
R12	21	21.1	0.1	16.5	16.6	0.1	10.9	11	0.1
R13	22	22.3	0.3	18.5	18.6	0.1	11.6	11.7	0.1
R14	26.6	26.7	0.1	19	19.1	0.1	12.2	12.2	0
R15	16.9	17.1	0.2	17.8	17.8	0	10.9	11	0.1
R16	15.4	15.5	0.1	17.5	17.6	0.1	10.6	10.7	0.1
R17	19.1	19.7	0.6	16.5	16.6	0.1	10.4	10.6	0.2
R18	17.4	18.2	0.8	17.5	17.6	0.1	10.8	10.9	0.1
R19	32.3	34.9	2.6	19.1	19.2	0.1	12.4	12.5	0.1
R20	18.1	19	0.9	17.5	17.6	0.1	10.8	10.9	0.1
R21	20.5	21.8	1.3	18	18.2	0.2	11.3	11.5	0.2
R22	27.9	30.5	2.6	18.5	18.6	0.1	11.8	11.9	0.1
R224	30.3	33.3	3	19.3	19.5	0.2	12.2	12.3	0.1
R23	20.4	21.7	1.3	18.3	18.6	0.3	11.2	11.5	0.3
R24	20.1	21.1	1	18.2	18.4	0.2	11.1	11.2	0.1
R25	28.3	30.9	2.6	18.9	19.1	0.2	11.8	12	0.2
R26	30.9	34	3.1	19.3	19.4	0.1	12.2	12.3	0.1
R27	23.2	24.8	1.6	18.3	18.4	0.1	11.2	11.3	0.1
R28	21.1	22.4	1.3	18.4	18.5	0.1	11.2	11.4	0.2
R29	18.7	18.6	**-0.1**	18	17.9	**-0.1**	10.9	10.8	**-0.1**
R49	12.8	12.5	**-0.3**	16	15.9	**-0.1**	9.4	9.4	0
R52	10.6	10.5	**-0.1**	15.5	15.5	0	9.1	9.1	0
R6	18.3	18.4	0.1	17.2	17.2	0	10.7	10.7	0
R61	9.4	9.4	0	15.4	15.4	0	9	8.9	**-0.1**
R68	9.4	9.4	0	15.4	15.4	0	8.9	8.9	0
R7	19.9	19.9	0	17.3	17.4	0.1	10.9	10.9	0
R77	14.3	14.4	0.1	15.6	15.6	0	9.5	9.5	0
R8	28.9	29.2	0.3	17.8	17.9	0.1	12.9	13	0.1
R9	20.6	20.8	0.2	15.8	15.8	0	10.9	10.9	0

3.2 Changes to development sites

Planning Policy DM31, in the Preferred Options Local Plan Consultation Document 2024, states that all new buildings must be designed and built to be Net Zero Carbon and fossil fuel free. In the 2024 air quality assessment, it was therefore assumed that no additional pollutant emissions would be generated by the proposed new developments. This means that, within the assessment, the only impact of the developments on air quality was assumed to be due to the generation of road traffic induced by the developments. Planning Policy DM31 is carried forward into the Pre-Submission (Regulation 19) Local Plan.

Table 3.2 gives a summary of the planned developments included in the 2024 air quality assessment and the new proposed developments (or Additional Sites), together with the change in number of homes and employment area. The sites with changes are shown in Figure 3.2. Note that the Danbury and North East Chelmsford developments are not shown, as the proposed increases are insignificant (1 extra dwelling in Danbury and ten extra dwellings in addition to the 5569 already planned for North East Chelmsford).

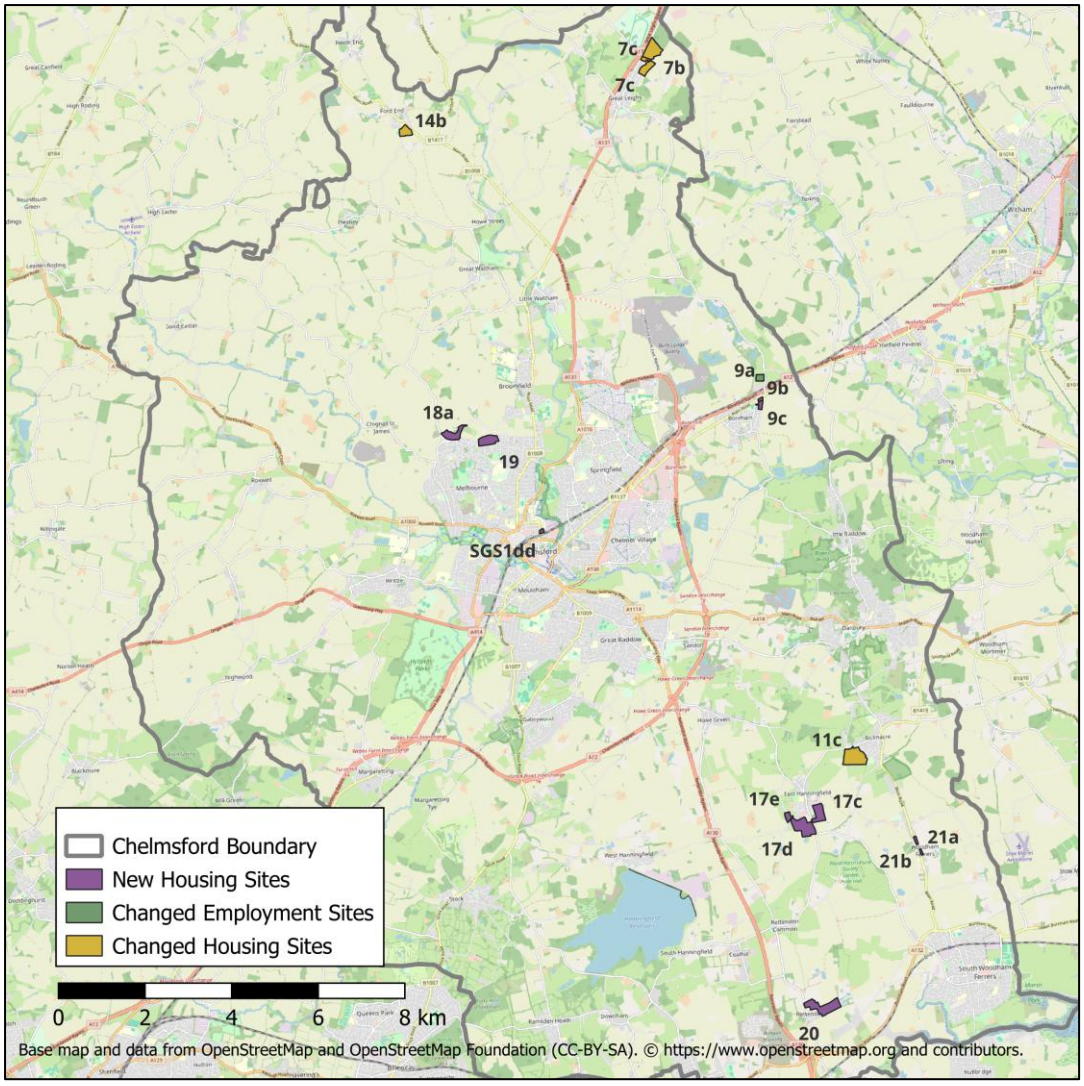

Figure 3.2: Map of proposed new developments (Additional Sites) and planned developments with an increase in the number of dwellings or employment area

Table 3.2: Summary of changes to the Local Plan (planned and proposed Additional Sites)

ID	Site description	Housing (dwellings)			Employment (sqm)		
		Original	New	Change	Original	New	Change
1	Previously developed sites in Chelmsford Urban Area	3013	2772	-241	4000	4000	-
2	West Chelmsford	880	880	-	-	-	-
3a	East of Chelmsford – Manor Farm	360	360	-	-	-	-
3b	East of Chelmsford - Land North of Maldon Road	-	-	-	5000	5000	-
3c	East of Chelmsford - Land South of Maldon Road	109	109	-	-	-	-
3d	East of Chelmsford - Land North of Maldon Road	65	65	-	-	-	-
4	Land North of Galleywood Reservoir	24	24	-	-	-	-
5	Land surrounding Telephone Exchange, Ongar Road, Writtle	25	25	-	-	-	-
6	North East Chelmsford (Chelmsford Garden Community)	5569	5579	+10	56946	56946	-
7a	Great Leighs – Land at Moulsham Hall	750	750	-	-	-	-
7b	Great Leighs – Land East of London Road	250	390	+140	-	-	-
7c	Great Leighs – Land North and South of Banters Lane	100	113	+13	-	-	-
8	North of Broomfield	512	512	-	-	-	-
9a	Waltham Road Employment Area	-	-	-	3500	14000	+10500
9b	Land to the East of 118 to 124 Plantation Road, Boreham	-	60	+60	-	-	-
9c	South of Main Road and Dukes Wood Close, Boreham	-	22	+22	-	-	-
10	North of South Woodham Ferrers	1220	1220	-	1200	1200	-
11b	Land at Kingsgate, Bicknacre	20	20	-	-	-	-
11c	Land west of Barbrook Way Bicknacre	20	250	+230	-	-	-
12	St Giles, Bicknacre	32	50	+18	-	-	-
13	Danbury	100	101	+1	-	-	-
14b	Land south of Ford End Primary School, Ford End	20	75	+55	-	-	-
15	Little Boyton Hall Farm Rural Employment Area	-	-	-	6000	6000	-
16a	East Chelmsford Garden Community (Hammonds Farm)	3000	3000	-	43000	43000	-
16b	Land adjacent to A12 Junction 18	-	-	-	43000	43000	-
17a	Land North of Abbey Fields, East Hanningfield	11	11	-	-	-	-
17b	Land east of Highfields, East Hanningfield	20	20	-	-	-	-
17c	Land South of Rough Hill Complex, East Hanningfield	-	115	+115	-	-	-
17d	Land South and South East of East Hanningfield Village	-	150	+150	-	-	-
17e	Land South of Windmill Farm, Back Lane, East Hanningfield	-	40	+40	-	-	-
18a	Land North West of Chelmsford (North of Hollow Lane)	-	100	+100	-	-	-
19	Land West of Patching Hall Lane	-	200	+200	-	-	-
20	Land to East and North of Rettendon Place	-	350	+350	-	-	-
21a	Land North of Old Rectory Lodge, Main Road, Woodham Ferrers	-	15	+15	-	-	-
21b	Land North of Congregational Church, Main Road, Woodham Ferrers	-	15	+15	-	-	-
	Total	16100	17393	+1293	162646	173146	+10500

The significance of the air quality impact of the developments was assessed using the IAQM impact descriptors given in Table 2.2.

Table 3.3 shows the maximum modelled total concentrations and changes in concentrations for 2041 for the whole of Chelmsford from the 2024 air quality assessment, expressed both in concentration units of µg/m³ and as a percentage of the air quality standard.

Table 3.3: Maximum total concentrations and changes in concentrations from the 2024 air quality assessment

	Air quality standard	Maximum total concentration		Maximum change in concentration	
	µg/m³	µg/m³	% of standard	µg/m³	% of standard
NO_2	40	24.7	62%	0.42	1.1%
PM_{10}	40	26.6	67%	0.15	0.4%
$PM_{2.5}$	20	13.9	70%	0.08	0.4%

The total concentrations for all pollutants are well below 75% of the air quality standards. The maximum changes in concentrations are 1.1% for NO_2 and 0.4% for both PM_{10} and $PM_{2.5}$.

Using the IAQM impact descriptors given in Table 2.2, for total concentrations less than 75% of the air quality standard, any increases in concentrations less than 5% of the standard are considered *negligible*. Note that, even with an increase of up to 5% of the standard, the total concentrations for all pollutants would remain below 75% of the air quality standard.

It would therefore require an increase of more than four times the change already modelled to result in an increase in concentrations of 5% of the air quality standard.

3.2.1 Potential impacts of new and amended development sites

The potential impact of the proposed additional new dwellings and additional employment area is discussed below. Where the traffic increases are likely to overlap, the new developments are grouped by area.

Chelmsford Urban Area
100 additional dwellings are planned for the former Kay Metzeler site in Chelmsford. The modelled concentrations in the 2024 air quality assessment included the impact of several other planned developments in central Chelmsford, including 141 dwellings at adjacent sites. Given that the maximum modelled change in concentrations in the 2024 assessment is only 1.1% of the air quality standard, it is very unlikely that including this new development would lead to a change in concentrations of 5% of the standard.

Great Leighs
153 additional dwellings are planned in Great Leighs in addition to the 1200 already taken into account in the 2024 assessment. Given that the maximum modelled change in concentrations in the 2024 assessment is only 1.1% of the air quality standard, it is very unlikely that including this new development would lead to a change in concentrations of 5% of the standard.

Boreham
82 new dwellings and an increase from 3,500 to 14,000 m^2 of employment area is planned east of Boreham, close to the A12. For the 2024 air quality assessment, the modelled change in concentrations in this area were well below 1% of the air quality standard. It is therefore very unlikely that these changes would lead to a change in concentrations of 5% of the standard.

Bicknacre
The number of dwellings planned for Bicknacre has increased by approximately 4.5 times. The maximum modelled change in concentrations in this area in the 2024 air quality assessment was approximately 0.5% of the air quality standard. It is therefore very unlikely that this change would lead to a change in concentrations of 5% of the standard.

Ford End
The number of dwellings is planned to increase from 20 to 75 in Ford End. It is very unlikely that this change would lead to a change in concentrations of 5% of the standard.

East Hanningfield
305 additional dwellings are planned for East Hanningfield. In the 2024 air quality assessment, no change in concentration was modelled here as there were no planned developments. However, at nearby South Woodham Ferrers, where over 1200 dwellings were planned, the modelled change in concentration was only 0.5% of the standard. It is therefore very unlikely that these new developments would lead to a change in concentrations of 5% of the standard.

Land North West of Chelmsford
300 additional dwellings are planned for the land west of Chelmsford. In the 2024 air quality assessment, a change in concentrations of 1.1% of the air quality standard was modelled resulting from the over 1000 planned dwellings at the nearby West Chelmsford and former St Peter's College sites. It is therefore very unlikely that these new developments would lead to a change in concentrations of 5% of the standard.

Land east and north of Rettendon Place
350 new dwellings are planned for land east and north of Rettendon Place. As above, given the changes in concentrations modelled for nearby South Woodham Ferrers, it is unlikely that these new dwellings would lead to a change in concentrations of 5% of the standard.

Woodham Ferrers
300 new dwellings are planned for Woodham Ferrers. As above, given the changes in concentrations modelled for South Woodham Ferrers, it is unlikely that these new dwellings would lead to a change in concentrations of 5% of the standard.

Other changes
One additional dwelling is planned in addition to the 100 planned for Danbury and the number of dwellings for the North East Chelmsford development is planned to increase from 5569 to 5579 dwellings. Both of these changes are insignificant increases.

4 Summary

In 2024, CERC carried out an assessment of the air quality impact of Chelmsford City Council's Local Plan. The conclusion of the assessment was that the impact of the Local Plan on air quality is considered ***Negligible***.

Since the close of the Pre-Submission (regulation 19) Local Plan consultation in February-March 2025, the A12 DCO improvement scheme has had its funding withdrawn by central government. In addition, a couple of large housing sites are likely to be delayed, meaning that Chelmsford does not currently have a sufficient 5 Year Housing Supply. The Council has identified further development sites to fill this shortfall.

We assessed the impact of discontinuing the A12 improvements on the total modelled concentrations presented in the 2024 air quality assessment using air quality modelling data published in the A12 Environmental Statement. We consider the impact to be negligible.

We assessed the impact of the traffic generated by the additional proposed developments by reviewing the changes in the numbers of dwellings and employment area, together with the modelled concentrations from the 2024 air quality assessment. Where the traffic impacts were likely to overlap, the developments were considered by area. In all cases, we consider that the changes are unlikely to alter the outcome of the air quality assessment; the impact of the Local Plan, including the additional developments, is considered to be ***Negligible.***