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Consulting Engineers Limited



Stansted Logistics Facility



Wren Kitchens Ltd

Air Quality Addendum

Document approval

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1 Introduction

1.1 Background

Fichtner Consulting Engineers Ltd (Fichtner) has been engaged by Wren Kitchens Limited (the Client) to undertake an Air Quality Addendum to support the resubmission of the planning application for the development of a logistics facility at Land at Tilekiln Green (the Proposed Development), within the administrative area of Uttlesford District Council (UDC).

An Air Quality Assessment¹ (the original AQA) was prepared for a previous planning application (ref: UTT/22/0267/FUL). The application is being resubmitted under Section 62A of the Town and Country Planning Act 1990.

This Air Quality Addendum has been prepared to address relevant consultation responses to application UTT/22/0267/FUL, namely:

- To include two recently constructed residential receptors on Tilekiln Green (The Old Stables and Willow House); and
- To respond to queries raised by the National Trust regarding the impact on ecological features at the Hatfield Forest National Nature Reserve and Site of Special Scientific Interest (SSSI).

The location of the additional receptors is presented in bold in Table 1, which is an updated version of Table 7 of the Original AQA, and on Figure 1 of Appendix A.

Table 1: *Vehicle Emissions Sensitive Receptors*

ID	Description	X (m)	Y (m)	Height (m)
R1	Accuro Care Services	551807	221497	1.5
R2	The Old Elm 1	551847	221454	1.5
R3	The Old Elm 2	551856	221423	1.5
R4	Brookside Front	551898	221328	1.5
R5	Brookside Rear	551883	221327	1.5
R6	Willow House	551891	221391	1.5
R7	The Old Stables	551869	221414	1.5

All assessment methodologies are unchanged from those presented in the Original AQA.

¹ Fichtner ref: S3349-0030-0001 Air Quality Assessment_R1, 21 January 2022.

2 Impact at Additional Residential Receptors

2.1 Construction phase dust emissions

The assessment of the impact of dust emissions during the construction phase considers the sensitivity of the area around the Proposed Development to dust impacts from on-site activities (earthworks and construction) and off-site vehicle movements (trackout). The sensitivity of the area depends on the number of receptors within certain distance bands from the dust source.

When the additional receptors of the Old Stables and Willow House are included, the number of properties within 20 m of on-site dust generating areas remains less than 10, so the sensitivity of the area to dust soiling effects remains 'medium' and the sensitivity of the area to human health effects from dust remains 'low'.

The number of properties within 20 m of the routes used by construction vehicles on public highway up to 500 m from site entrance was already more than 10 in the Original AQA, resulting in the sensitivity of the area to trackout being 'high' either with or without the Old Stables and Willow House included. As such, their inclusion does not change the overall conclusion of the construction phase dust assessment, which is that the Proposed Development is 'high risk', for dust soiling effects from trackout, 'medium risk' for dust soiling effects from earthworks and construction, and 'low risk' for dust effects on human health and ecology.

As the inclusion of the Old Stables and Willow House as receptors does not change the conclusions of the construction phase dust assessment, no additional mitigation measures are recommended beyond those included in the Original AQA. As detailed in the Original AQA, the final mitigation measures to be implemented would be agreed between the construction contractor and UDC. These mitigation measures would be expected to give consideration to minimising dust impacts at specific receptors. With the implementation of these appropriate mitigation measures, the residual effect of construction phase dust emissions will remain 'not significant'.

2.2 Operational phase vehicle emissions

The ADMS-Roads dispersion model has been re-run with the additional receptors shown in Table 1. The results of the modelling are shown in Table 2 to Table 7. These compare the predicted pollutant concentrations with the Air Quality Assessment Levels (AQALs) and World Health Organisation Air Quality Guidelines (WHO-AQGs) detailed in the Original AQA. Any predicted exceedances of an AQAL or WHO-AQG are highlighted.

Table 2: Annual Mean Baseline Concentrations (2018)

Receptor	Nitrogen dioxide			PM ₁₀			PM _{2.5}				
	Bg (µg/m ³)	Baseline (µg/m ³)	Baseline (% AQAL)	Bg (µg/m ³)	Baseline (µg/m ³)	Baseline (% AQAL)	Bg (µg/m ³)	Baseline (µg/m ³)	Baseline (% AQAL)	Baseline (% 2005 WHO-AQG)	Baseline (% 2021 WHO-AQG)
R1	17.71	39.71	99.3%	17.40	20.17	50.4%	11.00	12.80	64.0%	128.0%	256.0%
R2	17.71	38.59	96.5%	17.40	20.05	50.1%	11.00	12.72	63.6%	127.2%	254.3%
R3	17.71	36.88	92.2%	17.40	19.69	49.2%	11.00	12.50	62.5%	125.0%	250.0%
R4	17.71	29.93	74.8%	17.40	18.85	47.1%	11.00	11.95	59.7%	119.5%	239.0%
R5	17.71	29.80	74.5%	17.40	18.81	47.0%	11.00	11.93	59.6%	119.3%	238.6%
R6	17.71	32.27	80.7%	17.40	19.16	47.9%	11.00	12.15	60.8%	121.5%	243.1%
R7	17.71	34.51	86.3%	17.40	19.44	48.6%	11.00	12.33	61.6%	123.3%	246.6%

Table 3: Annual Mean Nitrogen Dioxide

Receptor	Background	Do-minimum		Do-something		Impact		
	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	% AQAL	$\mu\text{g}/\text{m}^3$	% AQAL	$\mu\text{g}/\text{m}^3$	% AQAL	Impact Descriptor
2023 Opening Year								
R1	13.30	27.70	69.3%	27.90	69.8%	0.20	0.50%	Negligible
R2	13.30	26.78	67.0%	26.45	66.1%	0.22	-0.82%	Negligible
R3	13.30	25.57	63.9%	24.88	62.2%	-0.69	-1.73%	Negligible
R4	13.30	21.09	52.7%	21.31	53.3%	0.22	0.55%	Negligible
R5	13.30	21.01	52.5%	21.30	53.3%	0.29	0.72%	Negligible
R6	13.30	22.62	56.6%	22.80	57.0%	0.18	0.45%	Negligible*
R7	13.30	24.07	60.2%	23.97	59.9%	-0.10	-0.25%	Negligible*
2028 Future Year								
R1	10.93	19.72	49.3%	19.85	49.6%	0.13	0.33%	Negligible*
R2	10.93	19.16	47.9%	18.97	47.4%	-0.19	-0.48%	Negligible*
R3	10.93	18.43	46.1%	18.02	45.1%	-0.41	-1.03%	Negligible
R4	10.93	15.61	39.0%	15.80	39.5%	0.19	0.48%	Negligible*
R5	10.93	15.56	38.9%	15.81	39.5%	0.25	0.62%	Negligible
R6	10.93	16.55	41.4%	16.71	41.8%	0.16	0.40%	Negligible*
R7	10.93	17.46	43.7%	17.45	43.6%	-0.01	-0.03%	Negligible*
<i>Note:</i>								
<i>*Negligible irrespective of the total concentration</i>								

Table 4: Annual Mean PM₁₀

Receptor	Background	Do-minimum		Do-something		Impact		
	µg/m ³	µg/m ³	% AQAL	µg/m ³	% AQAL	µg/m ³	% AQAL	Impact Descriptor
2023 Opening Year								
R1	16.31	18.98	47.5%	19.02	47.6%	0.04	0.09%	Negligible*
R2	16.31	18.87	47.2%	18.81	47.0%	-0.05	-0.13%	Negligible*
R3	16.31	18.51	46.3%	18.40	46.0%	-0.11	-0.27%	Negligible*
R4	16.31	17.70	44.2%	17.73	44.3%	0.03	0.08%	Negligible*
R5	16.31	17.66	44.2%	17.70	44.3%	0.04	0.10%	Negligible*
R6	16.31	18.01	45.0%	18.03	45.1%	0.03	0.06%	Negligible*
R7	16.31	18.27	45.7%	18.25	45.6%	-0.02	-0.05%	Negligible*
2028 Future Year								
R1	15.98	18.70	46.7%	18.74	46.8%	0.04	0.09%	Negligible*
R2	15.98	18.58	46.5%	18.53	46.3%	-0.05	-0.14%	Negligible*
R3	15.98	18.21	45.5%	18.10	45.3%	-0.11	-0.28%	Negligible*
R4	15.98	17.39	43.5%	17.42	43.6%	0.03	0.08%	Negligible*
R5	15.98	17.35	43.4%	17.39	43.5%	0.04	0.10%	Negligible*
R6	15.98	17.71	44.3%	17.73	44.3%	0.02	0.06%	Negligible*
R7	15.98	17.97	44.9%	17.95	44.9%	-0.02	-0.06%	Negligible*
<i>Note:</i>								
<i>*Negligible irrespective of the total concentration</i>								

Table 5: Annual Mean PM_{2.5} – Assessment Against AQAL

Receptor	Background	Do-minimum		Do-something		Impact		
	µg/m ³	µg/m ³	% AQAL	µg/m ³	% AQAL	µg/m ³	% AQAL	Impact Descriptor
2023 Opening Year								
R1	10.13	11.74	58.7%	11.77	58.8%	0.02	0.12%	Negligible*
R2	10.13	11.67	58.3%	11.64	58.2%	-0.03	-0.15%	Negligible*
R3	10.13	11.46	57.3%	11.40	57.0%	-0.06	-0.32%	Negligible*
R4	10.13	10.97	54.8%	10.99	55.0%	0.03	0.13%	Negligible*
R5	10.13	10.95	54.7%	10.98	54.9%	0.03	0.16%	Negligible*
R6	10.13	11.15	55.8%	11.17	55.9%	0.02	0.10%	Negligible*
R7	10.13	11.31	56.6%	11.30	56.5%	-0.01	-0.05%	Negligible*
2028 Future Year								
R1	9.85	11.46	57.3%	11.49	57.4%	0.02	0.11%	Negligible*
R2	9.85	11.39	56.9%	11.36	56.8%	-0.03	-0.15%	Negligible*
R3	9.85	11.18	55.9%	11.12	55.6%	-0.06	-0.31%	Negligible*
R4	9.85	10.69	53.5%	10.72	53.6%	0.02	0.12%	Negligible*
R5	9.85	10.67	53.4%	10.70	53.5%	0.03	0.16%	Negligible*
R6	9.85	10.88	54.4%	10.90	54.5%	0.02	0.10%	Negligible*
R7	9.85	11.03	55.2%	11.02	55.1%	-0.01	-0.05%	Negligible*
<i>Note:</i>								
<i>*Negligible irrespective of the total concentration</i>								

Table 6: Annual Mean PM_{2.5} - Assessment against 2005 WHO Air Quality Guideline

Receptor	Background	Do-minimum		Do-something		Impact			
	µg/m ³	µg/m ³	% 2005 WHO-AQG	µg/m ³	% 2005 WHO-AQG	µg/m ³	% 2005 WHO-AQG	Impact Descriptor	
2023 Opening Year									
R1	10.13	11.74	117.4%	11.77	117.7%	0.02	0.23%	Negligible*	
R2	10.13	11.67	116.7%	11.64	116.4%	-0.03	-0.30%	Negligible*	
R3	10.13	11.46	114.6%	11.40	114.0%	-0.06	-0.63%	Moderate Beneficial	
R4	10.13	10.97	109.7%	10.99	109.9%	0.03	0.25%	Negligible*	
R5	10.13	10.95	109.5%	10.98	109.8%	0.03	0.33%	Negligible*	
R6	10.13	11.15	111.5%	11.17	111.7%	0.02	0.20%	Negligible*	
R7	10.13	11.31	113.1%	11.30	113.0%	-0.01	-0.09%	Negligible*	
2028 Future Year									
R1	9.85	11.46	114.6%	11.49	114.9%	0.02	0.23%	Negligible*	
R2	9.85	11.39	113.9%	11.36	113.6%	-0.03	-0.30%	Negligible*	
R3	9.85	11.18	111.8%	11.12	111.2%	-0.06	-0.63%	Moderate Beneficial	
R4	9.85	10.69	106.9%	10.72	107.2%	0.02	0.25%	Negligible*	
R5	9.85	10.67	106.7%	10.70	107.0%	0.03	0.32%	Negligible*	
R6	9.85	10.88	108.8%	10.90	109.0%	0.02	0.19%	Negligible*	
R7	9.85	11.03	110.3%	11.02	110.2%	-0.01	-0.10%	Negligible*	
<i>Note:</i>									
<i>*Negligible irrespective of the total concentration</i>									

Table 7: Annual Mean PM_{2.5} - Assessment against 2021 WHO Air Quality Guideline

Receptor	Background	Do-minimum		Do-something		Impact			
	µg/m ³	µg/m ³	% 2021 WHO-AQG	µg/m ³	% 2021 WHO-AQG	µg/m ³	% 2021 WHO-AQG	Impact Descriptor	
2023 Opening Year									
R1	10.13	11.74	234.9%	11.77	235.3%	0.02	0.46%	Negligible*	
R2	10.13	11.67	233.4%	11.64	232.8%	-0.03	-0.61%	Negligible*	
R3	10.13	11.46	229.2%	11.40	227.9%	-0.06	-1.27%	Moderate Beneficial	
R4	10.13	10.97	219.4%	10.99	219.9%	0.03	0.50%	Negligible*	
R5	10.13	10.95	219.0%	10.98	219.6%	0.03	0.66%	Negligible*	
R6	10.13	11.15	223.1%	11.17	223.5%	0.02	0.40%	Negligible*	
R7	10.13	11.31	226.2%	11.30	226.1%	-0.01	-0.19%	Negligible*	
2028 Future Year									
R1	9.85	11.46	229.2%	11.49	229.7%	0.02	0.46%	Negligible*	
R2	9.85	11.39	227.8%	11.36	227.2%	-0.03	-0.60%	Negligible*	
R3	9.85	11.18	223.6%	11.12	222.3%	-0.06	-1.26%	Moderate beneficial	
R4	9.85	10.69	213.8%	10.72	214.3%	0.02	0.49%	Negligible*	
R5	9.85	10.67	213.4%	10.70	214.1%	0.03	0.65%	Negligible*	
R6	9.85	10.88	217.5%	10.90	217.9%	0.02	0.39%	Negligible*	
R7	9.85	11.03	220.7%	11.02	220.5%	-0.01	-0.20%	Negligible*	
<i>Note:</i>									
<i>*Negligible irrespective of the total concentration</i>									

As shown, aside from impacts at R1 – R5 which are detailed in the Original AQA, the Proposed Development is predicted to result in a slight increase in concentrations at R6, and a slight reduction in concentrations at R7. The reduction at R7 is due to the proposed realignment of Tilekiln Green, which results in vehicle emissions from Tilekiln Green being moved further away from the receptor location. The slight increase at R6 is due mainly to emissions from vehicle movements within the Proposed Development, albeit offset by the realignment of Tilekiln Green.

When compared against the AQALs and the WHO-AQGs, in all scenarios the increase or reduction in concentrations for all pollutants at R6 and R7 is described as ‘negligible’ irrespective of the total concentration in accordance with the assessment criteria detailed in the Original AQA. The total concentration of PM_{2.5} is predicted to exceed both the 2005 and 2021 WHO-AQGs; however, this is due to the existing baseline concentrations, with the impact at R6 and R7 being described as ‘negligible’ irrespective of the total concentration.

With regard to short-term impacts, the maximum predicted concentrations at R6 and R7 are lower than the maximum at other receptors. The methodology in the Original AQA estimated the likelihood of exceeding the short-term AQALs based on the annual mean concentrations. As no exceedance of any short-term AQAL was predicted for R1 – R5, it follows that no exceedance will occur at R6 and R7.

As all impacts are described as ‘negligible’, the overall effect of the operation of the Proposed Development on human health remains ‘not significant’.

3 Impact at Hatfield Forest

The National Trust's consultation response to application UTT/22/0267/FUL stated:

"... the National Trust are concerned that there is evidence to suggest that the veteran trees and their resident species at Hatfield Forest National Nature Reserve and Site of Special Scientific Interest are sensitive to nutrient enrichment resulting from elevated NOx pollutants from both air and road traffic. Whilst Hatfield Forest is considered within the Ecological Assessment, the National Trust would request that the Local Planning Authority are satisfied that the conclusion that this proposal would not have a "significant adverse effect on the statutory site due to the nature of development (non-residential) and the intervening distances" is an appropriate conclusion, prior to the determination of this proposal."

Section 5.2 of Original AQA states the screening criteria for determining the requirement for an assessment of air quality effects on ecological sites. Only ecological sites within 200 m of a road affected by the Proposed Development require consideration. As shown on Figure 2 of Appendix A, the Hatfield Forest Nature Reserve and SSSI lies over 1 km from the Proposed Development. Although the Hatfield Forest Nature Reserve and SSSI lies within 200 m of the B1256 to the east of the Proposed Development (around 60 m at the closest point), the Proposed Development will result in only 13 daily car trips along this road, the effect of which was screened out of the assessment due to the very low number of vehicles.

Although the Hatfield Forest Nature Reserve and SSSI was not screened into the assessment, consideration has been given to the potential magnitude of the impact. The Flitch Way Local Nature Reserve (LNR) does lie within the screening distance of the Proposed Development, so was included in the Original AQA.

The LNR lies within 20 m of the Proposed Development boundary at the closest point. The Original AQA showed that the nutrient nitrogen deposition impact of the Proposed Development on the LNR was only just over the 1% screening threshold, at a maximum of 1.56% of the Critical Load for woodlands. Although this impact cannot be screened out as 'insignificant', the ecologist for the project assessed the significance of effect as 'not significant'. Given the very small impact on the LNR at a distance of 20 m, the impact on the Hatfield Forest Nature Reserve and SSSI at over 1 km distant from the Proposed Development, and 60 m distant from the very low level of additional traffic on the B1256, would be imperceptible. Therefore, the effect on ecological features will be 'not significant'.

4 Conclusions

This Air Quality Addendum has been prepared to provide additional information regarding the air quality impact of the Proposed Development at two new residential receptors located close to the site entrance, namely the Old Stables and Willow House, and to consider the potential impact at the Hatfield Forest Nature Reserve and SSSI.

The additional assessment work undertaken has shown that:

1. The residual effect of construction phase dust emissions will remain 'not significant';
2. The change in pollutant concentrations at the Old Stables and Willow House as a result of the operation of the Proposed Development will be 'negligible' irrespective of the total concentrations; and
3. The impact at the Hatfield Forest Nature Reserve and SSSI will be imperceptible, with no significant effects on ecological features predicted.

Overall, the conclusion of the Original AQA that the Proposed Development will not have a significant impact on local air quality remains unchanged.

Appendices

A Figures



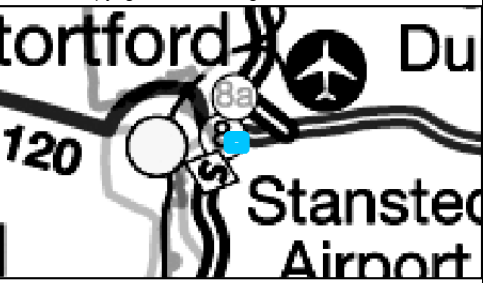
Legend

- Site boundary
- 10 kph
- 20 kph
- 40 kph
- 56 kph
- 69 kph
- 112 kph
- Car parking area
- Truck parking areas
- Flitch Way LNR
- Human receptors

Client:	Wren Kitchens
Site:	3349-03 Air Quality Addendum
Project:	Stansted Logistics Centre
Title:	

Figure 1: Modelled Sources and Human Sensitive Receptor Locations

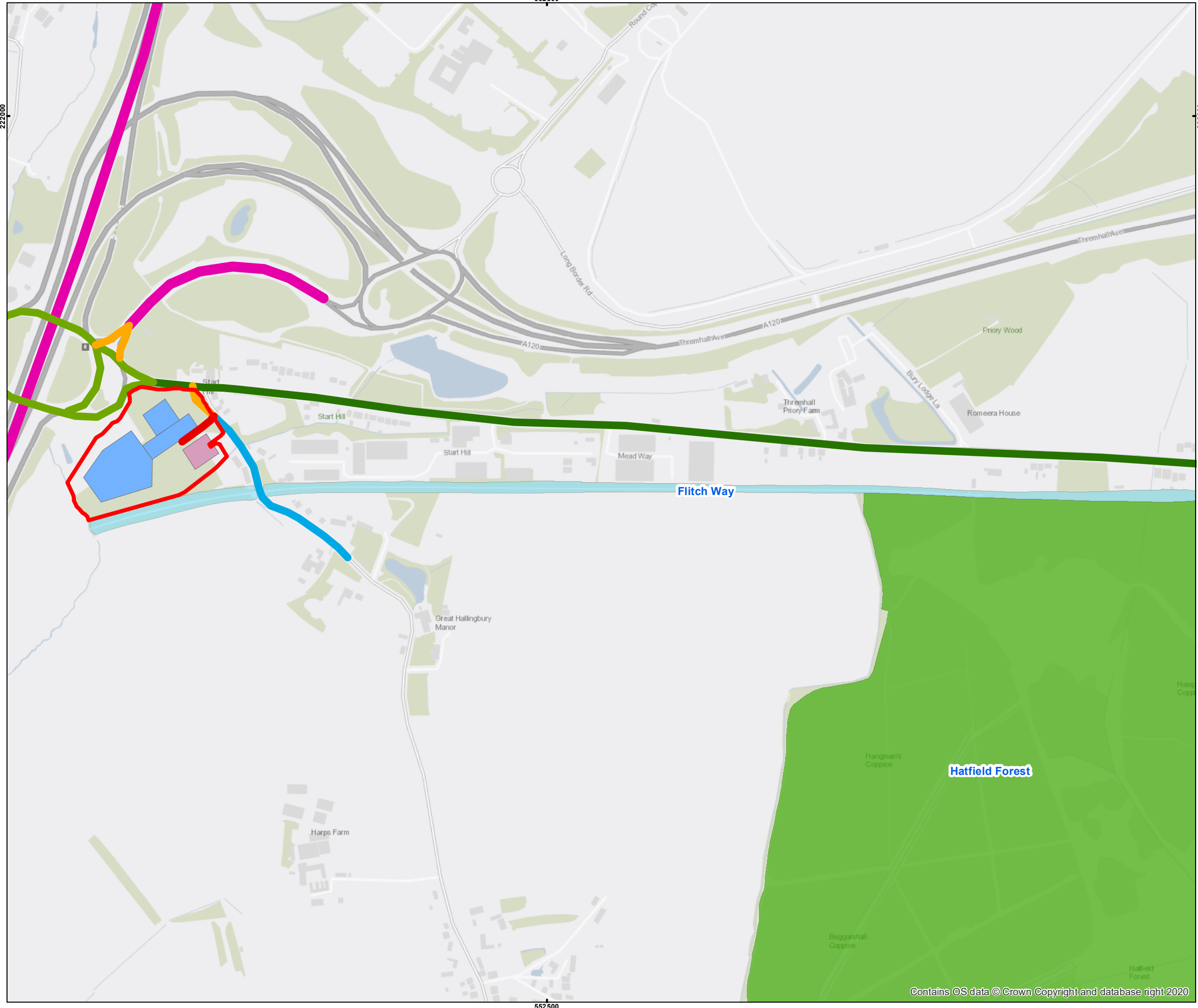
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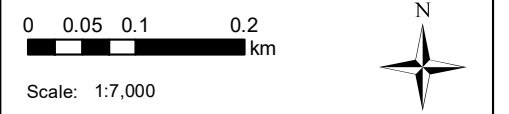
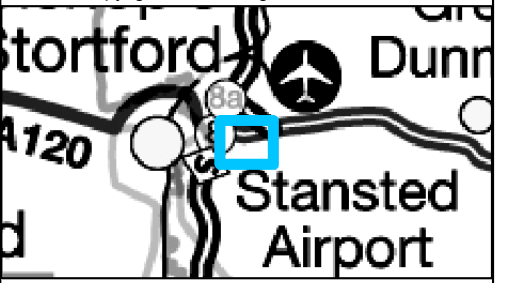
Legend

- Site boundary
- 10 kph
- 20 kph
- 40 kph
- 56 kph
- 69 kph
- 112 kph
- Fliitch Way LNR
- Hatfield Forest SSSI

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Figure 2: Hatfield Forest Nature Reserve and SSSI

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