Appendix 5-B: Local Air Quality Assessment Results

Environmental Statement Volume II
Access to Witney

Oxfordshire County Council

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Delivering a better world

Appendix 5-B: Local Air Quality Assessment Results

Operation

Public Exposure Receptors

1.1 Table 1 present baseline annual mean PM_{10} and nitrogen dioxide (NO_2) concentrations and Table 2 presents predicted NO_2 concentrations in the opening year with (Do Something, DS) and without (Do Minimum, DM) the proposed development. The change in NO_2 concentration due to the proposed development in the opening year is also presented in Table 2.

1.2 Figure 5-4 presents the results of the operational assessment at each selected receptor, with modelled concentrations with the proposed development in sheets 1 and 2 and change in sheets 3 and 4.

Table 1: Predicted annual mean baseline PM_{10} and NO_2 concentrations at public exposure receptors

ID	2018 Base PM_{10} (µg/m^3)	2018 Base NO_2 (µg/m^3)	Verification Zone
R1	17.0	21.0	Affected Road Network (ARN)
R2	14.9	12.6	ARN
R3	16.8	15.2	ARN
R4	20.1	36.0	ARN
R5	16.5	17.8	ARN
R6	15.8	19.3	ARN
R7	16.5	19.2	ARN
R8	15.7	16.6	ARN
R9	15.0	10.5	ARN
R10	16.7	12.8	ARN
R11	18.4	**42.9**	Witney
R12	16.8	20.7	ARN
R13	15.9	10.7	ARN
R14	14.7	9.9	ARN
R15	19.0	**49.2**	Witney
R16	19.4	**52.0**	Witney
R17	14.8	10.1	ARN
R18	16.4	15.8	ARN
R19	15.5	16.8	ARN
R20	15.9	13.2	ARN
R21	17.1	25.5	ARN
R22	15.0	15.2	ARN

ID	2018 Base PM_{10} (µg/m^3)	2018 Base NO_2 (µg/m^3)	Verification Zone
R23	14.7	13.7	ARN
R24	17.3	26.6	ARN
R25	15.0	9.8	ARN
R26	16.9	17.9	ARN
R27	15.6	12.3	ARN
R28	16.4	19.4	ARN
R29	15.8	10.5	ARN
R30	15.9	18.2	ARN
R31	15.5	11.0	ARN
R32	16.0	14.4	ARN
R33	16.1	14.1	ARN
R34	16.0	13.7	ARN
R35	16.1	17.7	ARN
R36	15.4	10.4	ARN
R37	16.7	22.0	ARN
R38	15.7	14.1	ARN
R39	18.0	27.1	ARN
R40	16.6	19.0	ARN
R41	15.4	10.0	ARN
R42	16.0	17.4	ARN
R43	15.7	14.5	ARN
R44	15.9	16.4	ARN
R45	15.8	12.8	ARN
R46	14.9	9.3	ARN
R47	13.8	9.0	ARN
R48	15.6	14.8	ARN
R49	14.6	10.6	ARN
R50	16.4	22.4	ARN
R51	16.8	20.8	ARN
R52	15.4	12.8	ARN
R53	15.2	13.1	ARN
R54	15.8	14.0	ARN
R55	16.4	16.3	ARN
W1	19.4	37.9	ARN
W2	18.9	**40.8**	ARN
W3	18.4	**42.9**	Witney

ID	2018 Base PM_{10} (µg/m^3)	2018 Base NO_2 (µg/m^3)	Verification Zone
W4	17.2	31.5	Witney
W5	16.9	25.0	ARN
W6	17.7	31.1	ARN
W7	19.2	**50.4**	Witney
W8	19.3	**51.3**	Witney
W9	19.5	**52.7**	Witney
W10	19.5	**52.9**	Witney
W11	19.1	**49.6**	Witney
W12	17.7	37.2	Witney
W13	19.2	**50.4**	Witney
W14	19.1	**50.0**	Witney
W15	18.7	37.9	ARN
W16	18.8	35.7	ARN
W17	18.1	34.9	ARN
W18	16.6	22.2	ARN
W19	19.0	**49.0**	Witney
W20	16.8	23.5	ARN
W21	18.6	**45.0**	Witney
W22	18.9	**45.9**	Witney
W23	19.2	**50.2**	Witney
W24	18.0	40.0	Witney
W25	19.8	**47.2**	ARN
W26	16.8	24.2	ARN
W27	18.0	34.3	ARN
W28	19.2	**50.6**	Witney
W29	18.8	**46.5**	Witney
W30	16.5	22.7	ARN
W31	19.2	**50.2**	Witney
W32	16.7	23.6	ARN
W33	19.1	**49.7**	Witney
W34	19.0	**49.2**	Witney
W35	19.1	**49.5**	Witney
W36	18.3	36.9	ARN
W37	19.0	**49.1**	Witney
W38	18.1	34.6	ARN
W39	18.1	**40.3**	Witney

ID	2018 Base PM_{10} (µg/m^3)	2018 Base NO_2 (µg/m^3)	Verification Zone
W40	19.5	**48.1**	Witney
W41	18.9	**40.6**	ARN
W42	18.4	**43.4**	Witney
W43	18.9	**40.6**	ARN
W44	17.7	31.4	ARN
W45	18.4	**43.4**	Witney
W46	18.4	**42.9**	Witney
W47	19.8	**49.3**	ARN
W48	17.3	29.1	ARN
W49	19.3	**51.3**	Witney
W50	17.3	29.3	ARN
W51	16.7	23.6	ARN
W52	18.4	**42.4**	Witney
W53	18.6	38.2	ARN
W54	19.0	**49.0**	Witney
W55	18.7	**45.1**	Witney
W56	18.8	39.6	ARN
W57	17.3	31.9	Witney
W58	18.9	**40.2**	ARN
W59	18.7	**46.0**	Witney
W60	18.2	35.9	ARN
W61	19.0	**48.4**	Witney
W62	17.7	30.8	ARN
W63	17.6	30.3	ARN

Table 2: Predicted annual mean NO_2 concentrations and change at public exposure receptors during operation of the proposed development

ID	LTT_{E6} 2024 DM NO_2 (µg/m^3)	LTT_{E6} 2024 DS NO_2 (µg/m^3)	LTT_{E6} 2024 NO_2 Change (µg/m^3)	Verification Zone
R1	24.1	20.8	-3.3	ARN
R2	12.6	11.8	-0.8	ARN
R3	13.8	13.4	-0.4	ARN
R4	18.2	16.9	-1.3	ARN
R5	18.2	17.9	-0.3	ARN
R6	18.8	20.2	1.4	ARN
R7	18.0	18.4	0.4	ARN
R8	15.3	16.3	1.0	ARN

ID	LTT_{E6} 2024 DM NO_2 ($\mu g/m^3$)	LTT_{E6} 2024 DS NO_2 ($\mu g/m^3$)	LTT_{E6} 2024 NO_2 Change ($\mu g/m^3$)	Verification Zone
R9	9.2	9.4	0.2	ARN
R10	11.7	12.3	0.6	ARN
R11	36.6	34.5	-2.1	Witney
R12	17.3	17.5	0.2	ARN
R13	9.2	9.8	0.6	ARN
R14	9.2	9.3	0.1	ARN
R15	**41.8**	39.4	-2.5	Witney
R16	**44.2**	**41.6**	-2.6	Witney
R17	8.8	8.6	-0.2	ARN
R18	13.8	13.9	0.1	ARN
R19	15.6	14.6	-1.0	ARN
R20	12.2	11.7	-0.5	ARN
R21	24.7	26.6	1.9	ARN
R22	13.6	14.3	0.7	ARN
R23	12.2	12.7	0.5	ARN
R24	24.4	23.9	-0.5	ARN
R25	8.6	8.4	-0.2	ARN
R26	20.5	26.8	6.3	ARN
R27	10.7	11.5	0.8	ARN
R28	16.4	16.9	0.5	ARN
R29	9.0	9.5	0.5	ARN
R30	15.3	15.0	-0.4	ARN
R31	9.9	10.2	0.4	ARN
R32	13.9	14.9	1.1	ARN
R33	13.7	14.0	0.3	ARN
R34	13.1	13.2	0.1	ARN
R35	15.2	14.7	-0.4	ARN
R36	9.0	9.2	0.2	ARN
R37	18.3	17.5	-0.7	ARN
R38	13.5	15.4	1.9	ARN
R39	27.5	21.8	-5.7	ARN
R40	16.6	16.7	0.1	ARN
R41	8.5	8.8	0.3	ARN
R42	16.2	17.4	1.2	ARN
R43	12.0	11.7	-0.3	ARN

ID	LTT_{E6} 2024 DM NO_2 ($\mu g/m^3$)	LTT_{E6} 2024 DS NO_2 ($\mu g/m^3$)	LTT_{E6} 2024 NO_2 Change ($\mu g/m^3$)	Verification Zone
R44	13.7	13.4	-0.3	ARN
R45	10.8	10.7	-0.1	ARN
R46	8.1	8.0	-0.1	ARN
R47	7.7	7.9	0.1	ARN
R48	13.4	12.7	-0.8	ARN
R49	9.5	9.2	-0.4	ARN
R50	18.8	18.4	-0.4	ARN
R51	19.1	19.6	0.5	ARN
R52	11.8	12.0	0.2	ARN
R53	13.7	14.0	0.3	ARN
R54	12.2	12.4	0.1	ARN
R55	14.9	15.8	0.8	ARN
W1	37.2	30.5	-6.8	ARN
W2	35.6	33.8	-1.8	ARN
W3	36.6	34.5	-2.1	Witney
W4	26.9	25.5	-1.4	Witney
W5	21.9	21.1	-0.8	ARN
W6	27.2	25.9	-1.3	ARN
W7	**42.8**	**40.3**	-2.5	Witney
W8	**43.6**	**41.0**	-2.6	Witney
W9	**44.7**	**42.1**	-2.6	Witney
W10	**44.9**	**42.3**	-2.6	Witney
W11	**42.1**	39.6	-2.5	Witney
W12	31.7	29.9	-1.8	Witney
W13	**42.8**	**40.3**	-2.5	Witney
W14	**42.5**	**40.0**	-2.5	Witney
W15	33.0	32.7	-0.4	ARN
W16	34.1	28.9	-5.2	ARN
W17	30.6	29.0	-1.6	ARN
W18	19.3	18.7	-0.7	ARN
W19	**41.6**	39.2	-2.4	Witney
W20	20.8	19.5	-1.4	ARN
W21	38.3	36.2	-2.1	Witney
W22	39.3	37.0	-2.3	Witney
W23	**42.7**	**40.3**	-2.3	Witney

ID	LTT_{E6} 2024 DM NO_2 ($\mu g/m^3$)	LTT_{E6} 2024 DS NO_2 ($\mu g/m^3$)	LTT_{E6} 2024 NO_2 Change ($\mu g/m^3$)	Verification Zone
W24	34.0	32.1	-1.8	Witney
W25	**40.5**	39.6	-0.9	ARN
W26	21.3	20.6	-0.7	ARN
W27	30.0	28.5	-1.6	ARN
W28	**42.9**	**40.5**	-2.5	Witney
W29	39.6	37.4	-2.2	Witney
W30	19.5	19.0	-0.5	ARN
W31	**42.6**	**40.2**	-2.5	Witney
W32	20.8	20.2	-0.5	ARN
W33	**42.2**	39.8	-2.5	Witney
W34	**41.8**	39.4	-2.5	Witney
W35	**42.1**	39.6	-2.5	Witney
W36	32.2	32.1	-0.1	ARN
W37	**41.7**	39.3	-2.5	Witney
W38	29.0	28.6	-0.4	ARN
W39	34.3	32.3	-1.9	Witney
W40	**41.4**	38.8	-2.6	Witney
W41	35.6	33.4	-2.2	ARN
W42	37.0	34.9	-2.1	Witney
W43	35.5	33.6	-1.8	ARN
W44	27.5	26.2	-1.3	ARN
W45	36.9	34.8	-2.1	Witney
W46	36.5	34.5	-2.0	Witney
W47	**42.3**	**41.2**	-1.1	ARN
W48	24.6	24.0	-0.6	ARN
W49	**43.6**	**41.1**	-2.6	Witney
W50	26.0	25.4	-0.6	ARN
W51	20.8	20.2	-0.5	ARN
W52	36.3	34.2	-2.1	Witney
W53	33.4	31.7	-1.7	ARN
W54	**41.6**	39.2	-2.4	Witney
W55	38.5	36.3	-2.2	Witney
W56	34.0	33.5	-0.6	ARN
W57	27.3	25.8	-1.5	Witney
W58	35.1	33.3	-1.8	ARN

ID	LTT_{E6} 2024 DM NO_2 (µg/m³)	LTT_{E6} 2024 DS NO_2 (µg/m³)	LTT_{E6} 2024 NO_2 Change (µg/m³)	Verification Zone
W59	39.2	37.0	-2.2	Witney
W60	30.1	29.6	-0.5	ARN
W61	**41.1**	38.7	-2.3	Witney
W62	26.7	26.4	-0.3	ARN
W63	26.3	26.0	-0.3	ARN

1.3 Annual mean concentrations of PM_{10} are predicted to be below the annual mean objective at all receptors in the base year with a maximum concentration of 20.1 µg/m³ at R4, situated close to the A40. Therefore, following DMRB LA 105 Air quality (Ref 5.2.1), no further modelling of PM_{10} in the opening year has been undertaken as there is no risk of exceedance of the objective due to the proposed development. Based on the above results for PM_{10} concentrations, the $PM_{2.5}$ objective value of 25µg/m³ will also not be exceeded.

1.4 Annual mean concentrations of NO_2 are predicted to be below the 40µg/m³ annual mean NO_2 objective at all receptors in the 2018 base year and in the opening year, except on Bridge Street in the Witney AQMA. The highest concentration in the base year is predicted to be 52.9 µg/m³ at receptor W10.

1.5 Within the Witney AQMA, annual mean NO_2 concentrations are predicted to exceed the annual mean objective at numerous receptors, both with and without the proposed development. Under the 2024 DM scenario, 21 of the 63 additional receptors modelled within the Witney AQMA are anticipated to experience annual mean NO_2 concentrations in breach of the objective, bringing the total modelled exceedances in the 2024 DM scenario to 23 (including receptors R15 and R16). Comparatively, under the 2024 DS scenario, the number of additional Witney AQMA receptors predicted to exceed the NO_2 objective decreases to 11, and a combined total of 12 exceedances including R16. No receptors are expected to experience a new exceedance of the annual mean objective as a result of the proposed development.

1.6 In line with D*MRB LA 105 Air Quality* the significance of impact has been determined against the guideline bands. There are predicted small improvements in annual mean NO_2 concentrations at two receptors and medium improvements at 21 receptors exceeding the annual mean objective and of these, concentrations at 11 receptors are predicted to no longer exceed the objective with the proposed development. This is a beneficial improvement, but as the total number of receptors are not greater than the upper guideline band in the medium or small magnitude categories, this does not constitute a significant effect.

1.7 Outside the AQMA, in the wider area, increases in annual mean NO_2 concentrations as a result of the proposed development have been predicted at 31 public exposure receptors. These increases range from 0.1 µg/m³ to 6.3 µg/m³. The largest increase is predicted at receptor R26 (Clements Field Farm), which is located in close proximity to the Witney junction of the A40. Traffic flows are predicted to increase with the proposed development from around to 12,500 to 21,000 annual average daily traffic (AADT) flow.

1.8 Receptors situated along the A4095 / Witney Road extending northeast of Witney are predicted to experience increases in annual mean NO_2 concentrations of up to 1.9 µg/m³ as a result of the proposed development, attributable to increases in traffic volumes following anticipated re-routing, in addition to a greater proportion of the fleet utilising this route expected to be comprised by heavy duty vehicles (HDVs) in the 2024 DS scenario.

1.9 All receptors anticipated to experience increases in annual mean NO_2 as a result of the scheme are not expected to experience annual mean concentrations in excess of the objective value, with concentrations ranging from 7.9 µg/m³ to 26.8 µg/m³ under the 2024 DS scenario.

1.10 The largest reduction of -6.8 µg/m³ (from 37.2 µg/m³ to 30.5 µg/m³) is predicted at W1, located at the Mill Street junction with Bridge Street, located on the boundary of the Witney AQMA. The reason for this large decrease is due to a reduced volume of traffic and smoother traffic flows under the 2024 With Scheme scenario.

1.11 The conclusion of the local air quality assessment of operational impacts is that there are no significant effects.

Compliance Assessment

1.12 The results of the compliance risk assessment for pollution climate mapping (PCM) links within the ARN are shown in Table 3.

1.13 Predicted NO_2 concentrations at qualifying features and at the 4m validation point are higher than the PCM model. However, there are no predicted exceedances of the EU Limit Value and therefore there is no compliance risk.

Table 3: Compliance risk assessment results

Model ID	PCM Census Link ID	2024 PCM model NO_2 concentration ($\mu g/m^3$)	2024 DM NO_2 concentrations ($\mu g/m^3$) at qualifying features	2024 DS NO_2 concentrations ($\mu g/m^3$) at qualifying features	2024 NO_2 concentration change (%) at qualifying features
PCM1a_QF	802007878	13.7	33.7	33.2	-1.6%
PCM1b_4m	802007878	13.7	33.1	32.6	-1.5%
PCM2a_QF	802017037	9.9	35.8	33.8	-5.6%
PCM2b_4m	802017037	9.9	33.0	31.2	-5.4%
PCM3a_QF	802017037	9.9	37.6	35.5	-5.6%
PCM3b_4m	802017037	9.9	30.5	28.8	-5.3%
PCM4a_QF	802077524	14.5	27.8	27.5	-0.9%
PCM4b_4m	802077524	14.5	23.4	23.2	-1.1%
PCM5a_QF	802077524	14.5	30.2	29.9	-0.9%
PCM5b_4m	802077524	14.5	26.2	25.9	-0.9%
PCM6a_QF	802017037	9.9	29.5	23.3	-21.0%
PCM6b_4m	802017037	9.9	24.1	19.7	-18.3%
PCM7a_QF	802017037	9.9	24.9	20.2	-19.0%
PCM7b_4m	802017037	9.9	19.8	16.8	-15.2%
PCM8a_QF	802017037	9.9	22.4	21.3	-4.8%
PCM8b_4m	802017037	9.9	18.6	17.9	-4.1%
PCM9a_QF	802017037	9.9	21.3	20.3	-4.7%
PCM9b_4m	802017037	9.9	16.9	16.2	-3.7%
PCM10a_QF	802017037	9.9	18.7	17.8	-4.8%
PCM10b_4m	802017037	9.9	15.8	15.2	-4.0%
PCM11a_QF	802017037	9.9	16.0	15.3	-4.0%
PCM11b_4m	802017037	9.9	14.6	14.1	-3.6%
PCM12a_QF	802017037	9.9	19.5	18.6	-4.7%
PCM12b_4m	802017037	9.9	16.5	15.9	-4.0%
PCM13a_QF	802017037	9.9	19.1	18.2	-4.6%
PCM13b_4m	802017037	9.9	15.6	15.0	-3.6%
PCM14a_QF	802017037	9.9	19.3	18.4	-4.5%

Model ID	PCM Census Link ID	2024 PCM model NO_2 concentration ($\mu g/m^3$)	2024 DM NO_2 concentrations ($\mu g/m^3$) at qualifying features	2024 DS NO_2 concentrations ($\mu g/m^3$) at qualifying features	2024 NO_2 concentration change (%) at qualifying features
PCM14b_4m	802017037	9.9	16.4	15.8	-3.7%
PCM15a_QF	802017037	9.9	20.8	19.8	-4.8%
PCM15b_4m	802017037	9.9	17.1	16.5	-3.9%

Notes: QF = Qualifying Feature; 4m = 4m validation point

1.14 The results of the compliance risk assessment show that there is no risk to the reported date of compliance and no requirement for further assessment.

Designated Ecological Sites

1.15 Table 4 presents the predicted annual mean NO_X concentrations and predicted nitrogen deposition rates at all transect points and individual trees for designated ecological sites as part of the local air quality assessment for the operation of the proposed development.

Table 4: Predicted annual mean NOx and nitrogen deposition results for designated ecological receptors during operation of the proposed development

Transect ID	Distance to road edge (m)	2018 Base NO_X ($\mu g/m^3$)	LTT_{E6} 2024 DM NO_X ($\mu g/m^3$)	LTT_{E6} 2024 DS NO_X ($\mu g/m^3$)	LTT_{E6} 2024 NO_X Change ($\mu g/m^3$)	2024 DM N Dep (kg N/ha/yr)	2024 DS N Dep (kg N/ha/yr)	2024 Dep Change (kg N/ha/yr)
T1	195	14.2	11.4	11.6	0.1	16.0	16.0	<0.1
T2	165	14.4	11.6	11.8	0.1	29.3	29.4	<0.1
E1_8.5m	8.5	**54.9**	**136.6**	**88.9**	-47.7	47.1	41.4	-5.6
E1_10m	10	**52.2**	**125.7**	**82.3**	-43.4	45.9	40.6	-5.3
E1_20m	20	**40.6**	**83.7**	**56.7**	-27.0	40.8	37.1	-3.6
E1_30m	30	**34.3**	**63.8**	**44.5**	-19.3	38.1	35.4	-2.8
E1_40m	40	**30.3**	**52.1**	**37.3**	-14.9	36.5	34.3	-2.2
E1_50m	50	27.6	44.5	**32.5**	-12.0	35.4	33.6	-1.8
E1_60m	60	25.6	**39.1**	29.1	-10.0	34.5	33.0	-1.5
E1_70m	70	24.0	35.1	26.6	-8.5	33.9	32.6	-1.3
E1_80m	80	22.8	32.0	24.7	-7.3	33.5	32.3	-1.1
E1_90m	90	21.8	29.5	23.1	-6.4	33.1	32.1	-1.0
E1_100m	100	21.0	27.5	21.8	-5.7	32.8	31.9	-0.9
E1_110m	110	20.3	25.8	20.8	-5.1	32.5	31.7	-0.8
E1_120m	120	19.7	24.5	19.9	-4.6	32.3	31.5	-0.7
E1_130m	130	19.2	23.3	19.1	-4.1	32.1	31.4	-0.7
E1_140m	140	18.8	22.2	18.5	-3.8	31.9	31.3	-0.6
E1_150m	150	18.4	21.4	17.9	-3.4	31.8	31.2	-0.6
E1_160m	160	18.0	20.6	17.4	-3.2	31.7	31.1	-0.5
E1_170m	170	17.7	19.9	17.0	-2.9	31.5	31.1	-0.5

Transect ID	Distance to road edge (m)	2018 Base NO_X ($\mu g/m^3$)	LTT_{E6} 2024 DM NO_X ($\mu g/m^3$)	LTT_{E6} 2024 DS NO_X ($\mu g/m^3$)	LTT_{E6} 2024 NO_X Change ($\mu g/m^3$)	2024 DM N Dep (kg N/ha/yr)	2024 DS N Dep (kg N/ha/yr)	2024 Dep Change (kg N/ha/yr)
E1_180m	180	17.4	19.3	16.6	-2.7	31.4	31.0	-0.4
E1_190m	190	17.2	18.7	16.2	-2.5	31.3	30.9	-0.4
E1_200m	200	17.0	18.2	15.9	-2.4	31.3	30.9	-0.4
E2_197.8m	197.8	14.1	11.4	11.5	0.1	30.1	30.1	<0.1
E2_200m	200	14.1	11.4	11.5	0.1	30.1	30.1	<0.1
E3_189.05m	189.05	12.4	9.9	9.8	-0.1	29.9	29.9	<0.1
E3_190m	190	12.4	9.9	9.8	-0.1	29.9	29.9	<0.1
E3_200m	200	12.3	9.9	9.8	-0.1	29.9	29.9	<0.1
E4a_0m	0	**68.6**	**70.9**	**81.1**	10.2	20.2	20.9	0.6
E4a_10m	10	**39.6**	**38.8**	**43.6**	4.8	18.1	18.4	0.3
E4a_20m	20	**31.3**	29.7	**32.9**	3.2	17.4	17.6	0.2
E4a_30m	30	27.1	25.1	27.5	2.4	17.1	17.2	0.2
E4a_40m	40	24.6	22.3	24.2	1.9	16.8	17.0	0.1
E4a_50m	50	22.8	20.5	22.0	1.6	16.7	16.8	0.1
E4a_60m	60	21.6	19.1	20.5	1.3	16.6	16.7	0.1
E4a_70m	70	20.6	18.1	19.3	1.2	16.5	16.6	0.1
E4a_80m	80	19.9	17.3	18.4	1.0	16.4	16.5	0.1
E4a_90m	90	19.3	16.7	17.6	0.9	16.4	16.5	0.1
E4a_100m	100	18.8	16.2	17.0	0.8	16.4	16.4	0.1
E4a_110m	110	18.5	15.8	16.5	0.8	16.3	16.4	0.1
E4a_120m	120	18.1	15.4	16.1	0.7	16.3	16.3	0.1
E4a_130m	130	17.8	15.1	15.8	0.6	16.3	16.3	<0.1
E4a_140m	140	17.6	14.9	15.5	0.6	16.2	16.3	<0.1
E4a_150m	150	17.4	14.7	15.2	0.5	16.2	16.3	<0.1
E4a_160m	160	17.2	14.5	15.0	0.5	16.2	16.2	<0.1
E4a_170m	170	17.1	14.3	14.8	0.5	16.2	16.2	<0.1
E4a_180m	180	16.9	14.2	14.6	0.4	16.2	16.2	<0.1
E4a_190m	190	16.8	14.0	14.4	0.4	16.2	16.2	<0.1
E4a_200m	200	16.7	13.9	14.3	0.4	16.2	16.2	<0.1
E4b_8.5m	8.5	**39.7**	**37.7**	**42.4**	4.7	17.9	18.3	0.3
E4b_18.5m	18.5	**31.0**	28.4	31.2	2.8	17.2	17.5	0.2
E4b_28.5m	28.5	26.9	24.1	26.1	2.0	16.9	17.1	0.2
E4b_38.5m	38.5	24.5	21.6	23.2	1.5	16.7	16.8	0.1
E4b_48.5m	48.5	22.9	19.9	21.2	1.2	16.6	16.7	0.1

Transect ID	Distance to road edge (m)	2018 Base NO_X ($\mu g/m^3$)	LTT_{E6} 2024 DM NO_X ($\mu g/m^3$)	LTT_{E6} 2024 DS NO_X ($\mu g/m^3$)	LTT_{E6} 2024 NO_X Change ($\mu g/m^3$)	2024 DM N Dep (kg N/ha/yr)	2024 DS N Dep (kg N/ha/yr)	2024 Dep Change (kg N/ha/yr)
E4b_58.5m	58.5	21.7	18.7	19.8	1.0	16.5	16.6	0.1
E4b_68.5m	68.5	20.8	17.8	18.7	0.9	16.4	16.5	0.1
E4b_78.5m	78.5	20.1	17.1	17.9	0.8	16.4	16.4	0.1
E4b_88.5m	88.5	19.6	16.5	17.2	0.7	16.3	16.4	0.1
E4b_98.5m	98.5	19.1	16.1	16.7	0.6	16.3	16.3	<0.1
E4b_108.5m	108.5	18.7	15.7	16.2	0.5	16.2	16.3	<0.1
E4b_118.5m	118.5	18.4	15.3	15.8	0.5	16.2	16.3	<0.1
E4b_128.5m	128.5	18.1	15.0	15.5	0.5	16.2	16.2	<0.1
E4b_138.5m	138.5	17.8	14.8	15.2	0.4	16.2	16.2	<0.1
E4b_148.5m	148.5	17.6	14.5	14.9	0.4	16.1	16.2	<0.1
E4b_158.5m	158.5	17.4	14.3	14.7	0.4	16.1	16.2	<0.1
E4b_168.5m	168.5	17.2	14.1	14.5	0.3	16.1	16.1	<0.1
E4b_178.5m	178.5	17.0	14.0	14.3	0.3	16.1	16.1	<0.1
E4b_188.5m	188.5	16.9	13.8	14.1	0.3	16.1	16.1	<0.1
E4b_198.5m	198.5	16.7	13.7	14.0	0.3	16.1	16.1	<0.1
E5_0m	0	67.9	68.7	80.2	11.5	20.1	20.8	0.7
E5_10m	10	38.4	37.1	42.1	5.0	18.0	18.3	0.4
E5_20m	20	30.0	28.1	31.3	3.2	17.3	17.5	0.2
E5_30m	30	25.7	23.6	25.9	2.3	16.9	17.1	0.2
E5_40m	40	23.1	20.8	22.7	1.8	16.7	16.9	0.1
E5_50m	50	21.4	19.0	20.5	1.5	16.6	16.7	0.1
E5_60m	60	20.1	17.7	18.9	1.2	16.5	16.6	0.1
E5_70m	70	19.1	16.6	17.7	1.1	16.4	16.5	0.1
E5_80m	80	18.4	15.8	16.8	0.9	16.3	16.4	0.1
E5_90m	90	17.7	15.2	16.0	0.8	16.3	16.3	0.1
E5_100m	100	17.2	14.7	15.4	0.7	16.2	16.3	0.1
E5_110m	110	16.8	14.3	14.9	0.7	16.2	16.2	0.1
E5_120m	120	16.4	13.9	14.5	0.6	16.2	16.2	<0.1
E5_130m	130	16.1	13.6	14.1	0.5	16.1	16.2	<0.1
E5_140m	140	15.9	13.3	13.8	0.5	16.1	16.2	<0.1
E5_150m	150	15.6	13.0	13.5	0.5	16.1	16.1	<0.1
E5_160m	160	15.4	12.8	13.2	0.4	16.1	16.1	<0.1
E5_170m	170	15.2	12.6	13.0	0.4	16.1	16.1	<0.1
E5_180m	180	15.0	12.5	12.8	0.4	16.0	16.1	<0.1

Transect ID	Distance to road edge (m)	2018 Base NO_X ($\mu g/m^3$)	LTT_{E6} 2024 DM NO_X ($\mu g/m^3$)	LTT_{E6} 2024 DS NO_X ($\mu g/m^3$)	LTT_{E6} 2024 NO_X Change ($\mu g/m^3$)	2024 DM N Dep (kg N/ha/yr)	2024 DS N Dep (kg N/ha/yr)	2024 Dep Change (kg N/ha/yr)
E5_190m	190	14.9	12.3	12.6	0.3	16.0	16.1	<0.1
E5_200m	200	14.8	12.2	12.5	0.3	16.0	16.0	<0.1
E6_180.6m	180.6	12.8	10.2	10.3	0.1	30.2	30.2	<0.1
E6_190m	190	12.7	10.2	10.3	0.1	30.2	30.2	<0.1
E6_200m	200	12.6	10.1	10.2	0.1	30.1	30.2	<0.1
E7_9.6m	9.6	26.3	22.2	23.7	1.5	32.2	32.4	0.2
E7_10m	10	25.9	21.9	23.3	1.5	32.1	32.4	0.2
E7_20m	20	20.4	17.0	17.9	0.9	31.3	31.5	0.1
E7_30m	30	18.0	14.8	15.4	0.6	31.0	31.1	0.1
E7_40m	40	16.6	13.6	14.1	0.5	30.7	30.8	0.1
E7_50m	50	15.6	12.7	13.2	0.4	30.6	30.7	0.1
E7_60m	60	15.0	12.2	12.5	0.4	30.5	30.6	0.1
E7_70m	70	14.5	11.8	12.1	0.3	30.4	30.5	0.1
E7_80m	80	14.2	11.4	11.7	0.3	30.4	30.4	<0.1
E7_90m	90	13.9	11.2	11.4	0.2	30.3	30.4	<0.1
E7_100m	100	13.6	11.0	11.2	0.2	30.3	30.3	<0.1
E7_110m	110	13.4	10.8	11.0	0.2	30.3	30.3	<0.1
E7_120m	120	13.2	10.6	10.8	0.2	30.2	30.3	<0.1
E7_130m	130	13.1	10.5	10.7	0.2	30.2	30.3	<0.1
E7_140m	140	13.0	10.4	10.6	0.2	30.2	30.2	<0.1
E7_150m	150	12.9	10.3	10.5	0.2	30.2	30.2	<0.1
E7_160m	160	12.8	10.2	10.4	0.1	30.2	30.2	<0.1
E7_170m	170	12.7	10.1	10.3	0.1	30.2	30.2	<0.1
E7_180m	180	12.6	10.1	10.2	0.1	30.1	30.2	<0.1
E7_190m	190	12.5	10.0	10.1	0.1	30.1	30.2	<0.1
E7_200m	200	12.4	10.0	10.1	0.1	30.1	30.1	<0.1
E8_25m	25	26.1	20.7	20.0	-0.7	19.6	19.5	-0.1
E8_30m	30	24.9	19.8	19.2	-0.6	19.5	19.4	<0.1
E8_40m	40	23.3	18.5	18.1	-0.5	19.4	19.3	<0.1
E8_50m	50	22.2	17.7	17.3	-0.4	19.3	19.3	<0.1
E8_60m	60	21.4	17.0	16.7	-0.3	19.3	19.2	<0.1
E8_70m	70	20.7	16.5	16.2	-0.3	19.2	19.2	<0.1
E8_80m	80	20.2	16.1	15.9	-0.3	19.2	19.2	<0.1
E8_90m	90	19.8	15.8	15.6	-0.2	19.2	19.1	<0.1

Transect ID	Distance to road edge (m)	2018 Base NO_X ($\mu g/m^3$)	LTT_{E6} 2024 DM NO_X ($\mu g/m^3$)	LTT_{E6} 2024 DS NO_X ($\mu g/m^3$)	LTT_{E6} 2024 NO_X Change ($\mu g/m^3$)	2024 DM N Dep (kg N/ha/yr)	2024 DS N Dep (kg N/ha/yr)	2024 Dep Change (kg N/ha/yr)
E8_100m	100	19.5	15.5	15.3	-0.2	19.1	19.1	<0.1
E8_110m	110	19.2	15.3	15.1	-0.2	19.1	19.1	<0.1
E8_120m	120	19.0	15.1	14.9	-0.2	19.1	19.1	<0.1
E8_130m	130	17.9	14.3	14.1	-0.1	19.1	19.1	<0.1
E8_140m	140	17.7	14.1	14.0	-0.1	19.1	19.1	<0.1
E8_150m	150	17.6	14.0	13.9	-0.1	19.1	19.1	<0.1
E8_160m	160	17.4	13.9	13.8	-0.1	19.1	19.0	<0.1
E8_170m	170	17.3	13.8	13.7	-0.1	19.0	19.0	<0.1
E8_180m	180	17.2	13.7	13.6	-0.1	19.0	19.0	<0.1
E8_190m	190	17.1	13.6	13.5	-0.1	19.0	19.0	<0.1
E8_200m	200	17.0	13.5	13.4	-0.1	19.0	19.0	<0.1
E9_30m	30	24.2	21.1	18.4	-2.6	18.1	17.9	-0.2
E9_30m	30	24.2	21.1	18.4	-2.6	18.1	17.9	-0.2
E9_40m	40	22.4	19.1	17.1	-2.0	17.9	17.8	-0.2
E9_50m	50	21.1	17.8	16.3	-1.6	17.8	17.7	-0.1
E9_60m	60	20.2	16.9	15.6	-1.3	17.8	17.7	-0.1
E9_70m	70	19.6	16.2	15.2	-1.1	17.7	17.6	-0.1
E9_80m	80	19.1	15.7	14.8	-0.9	17.7	17.6	-0.1
E9_90m	90	18.6	15.3	14.5	-0.8	17.6	17.6	-0.1
E9_100m	100	18.3	15.0	14.2	-0.7	17.6	17.5	-0.1
E9_110m	110	18.0	14.7	14.0	-0.6	17.6	17.5	-0.1
E9_120m	120	17.8	14.4	13.9	-0.6	17.6	17.5	<0.1
E9_130m	130	17.6	14.2	13.7	-0.5	17.5	17.5	<0.1
E9_140m	140	17.4	14.1	13.6	-0.5	17.5	17.5	<0.1
E9_150m	150	17.3	13.9	13.5	-0.4	17.5	17.5	<0.1
E9_160m	160	17.2	13.8	13.4	-0.4	17.5	17.5	<0.1
E9_170m	170	17.1	13.7	13.4	-0.4	17.5	17.5	<0.1
E9_180m	180	17.0	13.6	13.3	-0.3	17.5	17.5	<0.1
E9_190m	190	16.9	13.6	13.3	-0.3	17.5	17.5	<0.1
E9_200m	200	16.9	13.5	13.2	-0.3	17.5	17.5	<0.1
E10_22m	22	25.4	20.0	19.3	-0.7	19.5	19.4	-0.1
E10_30m	30	23.7	18.7	18.1	-0.6	19.4	19.3	<0.1
E10_40m	40	22.3	17.6	17.2	-0.4	19.3	19.3	<0.1
E10_50m	50	21.4	16.9	16.6	-0.4	19.2	19.2	<0.1

Transect ID	Distance to road edge (m)	2018 Base NO_X ($\mu g/m^3$)	LTT_{E6} 2024 DM NO_X ($\mu g/m^3$)	LTT_{E6} 2024 DS NO_X ($\mu g/m^3$)	LTT_{E6} 2024 NO_X Change ($\mu g/m^3$)	2024 DM N Dep (kg N/ha/yr)	2024 DS N Dep (kg N/ha/yr)	2024 Dep Change (kg N/ha/yr)
E10_60m	60	20.8	16.4	16.1	-0.3	19.2	19.2	<0.1
E10_70m	70	20.3	16.1	15.8	-0.3	19.2	19.2	<0.1
E10_80m	80	19.9	15.8	15.5	-0.2	19.2	19.1	<0.1
E10_90m	90	19.6	15.5	15.3	-0.2	19.1	19.1	<0.1
E10_100m	100	19.3	15.3	15.1	-0.2	19.1	19.1	<0.1
E10_110m	110	19.1	15.1	15.0	-0.2	19.1	19.1	<0.1
E10_120m	120	18.9	15.0	14.8	-0.1	19.1	19.1	<0.1
E10_130m	130	18.7	14.8	14.7	-0.1	19.1	19.1	<0.1
E10_140m	140	18.6	14.7	14.6	-0.1	19.1	19.1	<0.1
E10_150m	150	18.4	14.6	14.5	-0.1	19.1	19.1	<0.1
E10_160m	160	18.3	14.5	14.4	-0.1	19.0	19.0	<0.1
E10_170m	170	18.2	14.4	14.3	-0.1	19.0	19.0	<0.1
E10_180m	180	18.1	14.3	14.3	-0.1	19.0	19.0	<0.1
E10_190m	190	17.1	13.6	13.5	-0.1	19.0	19.0	<0.1
E10_200m	200	17.0	13.5	13.5	-0.1	19.0	19.0	<0.1

Note 1. Values in bold exceed the annual mean NO_x objective of 30µg/m^3

1.16 The annual mean NOx objective value of 30 µg/m^3 is predicted to be exceeded in the opening year at E1 (Eynsham Wood Local Wildlife Site; LWS), E4a and E4b (Witney Lake and Meadows LWS) and E5 (Lower Windrush Valley LWS) with the proposed development in place.

1.17 The lower boundary of the relevant nitrogen deposition critical load is exceeded at all modelled ecological habitats across all transects, with and without the proposed development. There are reductions in nitrogen deposition rates of more than 1% of the critical load at sites E1 (Eynsham Wood LWS), E8 (Grimes Meadow and Little Grimes LWS), E9 (Langel Common (LWS) and E10 (Upper Windrush LWS) with increases above 1% of the critical load at E4a and b (Witney Lake and Meadows LWS), E5 (Lower Windrush Valley LWS) and E7 (Eynsham Hall Park Wychwood and Lower Evenlode Ancient Woodland and LWS). All other sites have changes of less than 1% of the critical load with the proposed development.

1.18 The largest decrease in annual mean NOx and nitrogen deposition is predicted at E1 (Eynsham Wood LWS) along the A40 at the junction with Freeland Road. This section of the A40 is predicted to have a reduction in traffic flow of up to around 1,000 AADT flows under the 2024 DS scenario, in addition to reduced congestion and therefore a smoother traffic flow, likely attributable to traffic re-routing as a result of the scheme. There is a reduction of -47.7 µg/m^3 in NOx and -5.6 kg N/ha/yr nitrogen deposition at 8.5m from the road.

1.19 The largest increase in annual mean NOx and nitrogen deposition is predicted at E5 (Lower Windrush Valley LWS) which is located along the A40 south of Witney. This road has an increase in traffic flow of around 5,000 AADT under the 2024 DS scenario, likely attributable to traffic re-routing as a result of the scheme. There is a predicted increase of 11.5 µg/m^3 NOx and 0.7 kg N/ha/yr nitrogen deposition at 0m from the road.

1.20 No significant effects are predicted at ecological sites. Further information on impacts at ecological sites are provided in *ES Volume I, Chapter 6: Biodiversity*.

References

Ref 5.2.1 Highways England, DMRB, Sustainability & Environment Appraisal, LA 105: Air quality, 2019.

Ref 5.2.2 Natural England. Approach to advising competent authorities on the assessment of road traffic emissions under the Habitats Regulations. June 2018.

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