

**Tillbridge Solar Project
EN010142**

**Volume 6
Environmental Statement
Appendix 6-3 Air Quality Modelling
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1. Air Quality Model

1.1 Introduction

1.1.1 This appendix outlines the details of the dispersion model carried out for the Tillbridge Solar Project (hereafter referred to as ‘the Scheme’) Air Quality Assessment. The impact of peak construction traffic is modelled at several sensitive receptors in the vicinity of the Scheme for the main assessment scenario and a cumulative scenario.

1.2 Traffic Data

1.2.1 The traffic data was collected via an Automatic Traffic Count (ATC) survey by AECOM in 2022 and subsequently modelled for the assessment years. The data is in the form of Annual Average Daily Total (AADT) traffic flows. The percentage of Heavy Duty Vehicles (HDVs) was also surveyed. Speeds were surveyed and adjusted to reflect slower flow at junctions. The traffic data for the main scenario is presented in **Table 1** below.

Table 1: Modelled Traffic Data: Main Scenario

Road ID	Speed (kph)	Base 2022		Without Scheme traffic 2026		With Scheme traffic 2026	
		AADT	% HDV	AADT	% HDV	AADT	% HDV
Rd_2	101.8	1082	9.8	1109	9.8	1823	35.8
Rd_3	101.8	1082	9.8	1109	9.8	1823	35.8
Rd_4	58.5	175	14.7	179	14.7	542	57.6
Rd_6	98.6	5080	7.5	5205	7.5	5937	15.7
Rd_6_j	20.0	5080	7.5	5205	7.5	5937	15.7
Rd_7_j	20.0	4115	7.3	4216	7.3	5045	16.9
Rd_7	97.8	4115	7.3	4216	7.3	5045	16.9
Rd_11_j	20.0	3699	6.8	3790	6.8	3790	6.8
Rd_11_1	59.4	3699	6.8	3790	6.8	3790	6.8
Rd_11_2	59.4	3699	6.8	3790	6.8	3790	6.8
Rd_12	98.7	2524	7.0	2585	7.0	3071	18.9

Road ID	Speed (kph)	Base 2022		Without Scheme traffic 2026		With Scheme traffic 2026	
Rd_14	53.5	3424	5.7	3508	5.7	4222	17.6
Rd_14_J	20.0	3424	5.7	3508	5.7	4222	17.6
Rd_15_j	20.0	169	10.7	173	10.7	659	63.7
Rd_15	71.7	169	10.7	173	10.7	659	63.7
Rd_16	54.7	2592	9.0	2655	9.0	3141	20.4
Rd_17	71.7	169	10.7	173	10.7	659	63.7
Rd_18	47.9	382	6.4	392	6.4	392	6.4
Rd_19	75.1	2826	6.9	2895	6.9	2895	6.9
Rd_20_j2	20.0	7341	19.6	7520	19.6	7781	21.0
Rd_20	85.3	14682	19.6	15040	19.6	15562	21.0
Rd_20_j	20.0	7341	19.6	7520	19.6	7781	21.0
Rd_21_j	20.0	14682	19.6	15040	19.6	15562	21.0
Rd_21	85.3	14682	19.6	15040	19.6	15562	21.0
Rd_22	85.3	14682	19.6	15040	19.6	15562	21.0
Rd_22_j	20.0	14682	19.6	15040	19.6	15562	21.0
Rd_23	20.0	19471	17.3	19947	17.3	21273	19.8
Rd_24	20.0	19471	17.3	19947	17.3	21273	19.8
Rd_25j2	85.2	2834	12.1	2904	12.1	2984	11.8
Rd_25	85.2	5669	12.1	5807	12.1	5968	11.8
Rd_25j	85.2	2834	12.1	2904	12.1	2984	11.8
Rd_26	20.0	19471	17.3	19947	17.3	21273	19.8
Rd_27	81.2	13236	24.3	13559	24.3	14229	25.8
Rd_27j_2	20.0	6618	24.3	6780	24.3	7115	25.8
Rd_27j	20.0	6618	24.3	6780	24.3	7115	25.8

Road ID	Speed (kph)	Base 2022		Without Scheme traffic 2026		With Scheme traffic 2026	
Rd_28_j	20.0	728	5.6	745	5.6	921	18.6
Rd_28	89.3	728	5.6	745	5.6	921	18.6
Rd_29	89.3	728	5.6	745	5.6	921	18.6
Rd_30	70.5	191	9.8	196	9.8	196	9.8
Rd_31	70.5	191	9.8	196	9.8	196	9.8
Rd_32	75.8	83	5.8	85	5.8	85	5.8
Rd_33	80.9	89	9.4	91	9.4	267	51.6
Rd_40_2	59.1	88	15.0	90	15.0	90	15.0
Rd_40_1	59.1	88	15.0	90	15.0	90	15.0
Rd_41	59.1	88	15.0	90	15.0	90	15.0
Rd_42_2	82.2	103	18.6	106	18.6	106	18.6
Rd_42_1	82.2	103	18.6	106	18.6	106	18.6
Rd_43_j	20.0	3072	7.1	3147	7.1	3718	11.4
Rd_43	97.8	3072	7.1	3147	7.1	3718	11.4
Rd_44	97.8	3072	7.1	3147	7.1	3718	11.4
Rd_44_j	20.0	3072	7.1	3147	7.1	3718	11.4
Rd_45	97.8	3072	7.1	3147	7.1	3718	11.4
Rd_46	97.8	3072	7.1	3147	7.1	3718	11.4
Rd_47	97.8	3072	7.1	3147	7.1	3718	11.4
Rd_48	97.8	3072	7.1	3147	7.1	3718	11.4
Rd_49	97.8	3072	7.1	3147	7.1	3718	11.4
Rd_50	102.1	3395	10.6	3478	10.6	3613	10.2
Rd_50_j	20.0	3395	10.6	3478	10.6	3613	10.2
Rd_51	94.4	6472	11.0	6630	11.0	7312	13.6

Road ID	Speed (kph)	Base 2022		Without Scheme traffic 2026		With Scheme traffic 2026	
Rd_52	90.8	6527	11.0	6687	11.0	7772	15.2
Rd_53	78.9	6581	11.1	6742	11.1	8041	17.9
Rd_53_j	20.0	6581	11.1	6742	11.1	8041	17.9
Rd_54	84.6	5357	13.1	5488	13.1	6786	20.8
Rd_54_j	20.0	2678	13.1	2744	13.1	3393	20.8
Rd_54_j_2	20.0	2678	13.1	2744	13.1	3393	20.8
Rd_55	85.5	6417	11.7	6574	11.7	7935	15.8
Rd_56_j	20.0	6581	11.1	6742	11.1	8041	17.9
Rd_56	78.9	6581	11.1	6742	11.1	8041	17.9
Rd_57	81.7	5825	9.3	5967	9.3	6541	14.9
Rd_58_j	20.0	5825	9.3	5967	9.3	6541	14.9
Rd_57_j	20.0	5825	9.3	5967	9.3	6541	14.9
Rd_58	81.7	5825	9.3	5967	9.3	6541	14.9
Rd_59	81.7	5825	9.3	5967	9.3	6541	14.9
Rd_60	81.7	5825	9.3	5967	9.3	6541	14.9
Rd_61	81.7	5825	9.3	5967	9.3	6541	14.9
Rd_62	81.7	5825	9.3	5967	9.3	6541	14.9
Rd_63	81.7	5825	9.3	5967	9.3	6541	14.9
Rd_64	81.7	5825	9.3	5967	9.3	6541	14.9
Rd_65	81.7	5825	9.3	5967	9.3	6541	14.9
Rd_66	69.5	8379	8.7	8584	8.7	8965	9.0
Rd_68	69.5	8379	8.7	8584	8.7	8965	9.0
Rd_69	81.7	5825	9.3	5967	9.3	6541	14.9
Rd_70	81.7	5825	9.3	5967	9.3	6541	14.9

Road ID	Speed (kph)	Base 2022		Without Scheme traffic 2026		With Scheme traffic 2026	
		AADT	% HDV	AADT	% HDV	AADT	% HDV
Rd_71	81.7	5825	9.3	5967	9.3	6541	14.9
Rd_72	81.7	5825	9.3	5967	9.3	6541	14.9
Rd_73	76.6	43	8.4	44	8.4	152	49.8
Rd_74	20.0	9303	10.0	9530	10.0	11086	14.4
Rd_77	60.2	7502	11.0	7685	11.0	8425	10.8
Rd_78	60.2	7502	11.0	7685	11.0	8425	10.8
Rd_80	60.2	3751	11.0	3843	11.0	4212	10.8
Rd_81	60.2	3751	11.0	3843	11.0	4212	10.8
Rd_70	101.8	1082	9.8	1109	9.8	1823	35.8
Rd_71	101.8	1082	9.8	1109	9.8	1823	35.8
Rd_72	58.5	175	14.7	179	14.7	542	57.6
Rd_73	98.6	5080	7.5	5205	7.5	5937	15.7
Rd_74	20.0	5080	7.5	5205	7.5	5937	15.7
Rd_77	20.0	4115	7.3	4216	7.3	5045	16.9
Rd_78	97.8	4115	7.3	4216	7.3	5045	16.9
Rd_80	20.0	3699	6.8	3790	6.8	3790	6.8
Rd_81	59.4	3699	6.8	3790	6.8	3790	6.8

1.2.2 The traffic data for the cumulative scenario is presented in **Table 2** below.

Table 2: Modelled Traffic Data: Cumulative Scenario

Road ID	Speed (kph)	Base 2026		Cumulative traffic 2026	
		AADT	% HDV	AADT	% HDV
Rd_2	101.8	1109	9.8	2169	9.8
Rd_3	101.8	1109	9.8	2169	9.8

Road ID	Speed (kph)	Base 2026		Cumulative traffic 2026	
Rd_4	58.5	179	14.7	888	14.7
Rd_6	98.6	5269	7.5	5937	7.5
Rd_6_j	20.0	5269	7.5	5937	7.5
Rd_7_j	20.0	4216	7.3	5877	7.3
Rd_7	97.8	4216	7.3	5877	7.3
Rd_11_j	20.0	3836	6.8	3790	6.8
Rd_11_1	59.4	3836	6.8	3790	6.8
Rd_11_2	59.4	3836	6.8	3790	6.8
Rd_12	98.7	2585	7.0	3215	7.0
Rd_14	53.5	3551	5.7	4222	5.7
Rd_14_J	20.0	3551	5.7	4222	5.7
Rd_15_j	20.0	173	10.7	803	10.7
Rd_15	71.7	173	10.7	803	10.7
Rd_16	54.7	2688	9.0	3141	9.0
Rd_17	71.7	173	10.7	803	10.7
Rd_18	47.9	397	6.4	392	6.4
Rd_19	75.1	2931	6.9	2895	6.9
Rd_20_j2	20.0	7613	19.6	7781	19.6
Rd_20	85.3	15225	19.6	15562	19.6
Rd_20_j	20.0	7613	19.6	7781	19.6
Rd_21_j	20.0	15225	19.6	15562	19.6
Rd_21	85.3	15225	19.6	15562	19.6
Rd_22	85.3	15225	19.6	15562	19.6
Rd_22_j	20.0	15225	19.6	15562	19.6

Road ID	Speed (kph)	Base 2026		Cumulative traffic 2026	
Rd_23	20.0	20193	17.3	21273	17.3
Rd_24	20.0	20193	17.3	21273	17.3
Rd_25j2	85.2	2939	12.1	2984	12.1
Rd_25	85.2	5879	12.1	5968	12.1
Rd_25j	85.2	2939	12.1	2984	12.1
Rd_26	20.0	20193	17.3	21273	17.3
Rd_27	81.2	13559	24.3	15689	24.3
Rd_27j_2	20.0	13559	24.3	15689	24.3
Rd_27j	20.0	13559	24.3	15689	24.3
Rd_28_j	20.0	755	5.6	921	5.6
Rd_28	89.3	755	5.6	921	5.6
Rd_29	89.3	755	5.6	921	5.6
Rd_30	70.5	198	9.8	196	9.8
Rd_31	70.5	198	9.8	196	9.8
Rd_32	75.8	86	5.8	85	5.8
Rd_33	80.9	91	9.4	411	9.4
Rd_40_2	59.1	91	15.0	90	15.0
Rd_40_1	59.1	91	15.0	90	15.0
Rd_41	59.1	91	15.0	90	15.0
Rd_42_2	82.2	107	18.6	106	18.6
Rd_42_1	82.2	107	18.6	106	18.6
Rd_43_j	20.0	3147	7.1	4062	7.1
Rd_43	97.8	3147	7.1	4062	7.1
Rd_44	97.8	3147	7.1	4062	7.1

Road ID	Speed (kph)	Base 2026		Cumulative traffic 2026	
Rd_44_j	20.0	3147	7.1	4062	7.1
Rd_45	97.8	3147	7.1	4062	7.1
Rd_46	97.8	3147	7.1	4062	7.1
Rd_47	97.8	3147	7.1	4062	7.1
Rd_48	97.8	3147	7.1	4062	7.1
Rd_49	97.8	3147	7.1	4062	7.1
Rd_50	102.1	3521	10.6	3613	10.6
Rd_50_j	20.0	3521	10.6	3613	10.6
Rd_51	94.4	6712	11.0	7312	11.0
Rd_52	90.8	6769	11.0	7772	11.0
Rd_53	78.9	6825	11.1	8041	11.1
Rd_53_j	20.0	6825	11.1	8041	11.1
Rd_54	84.6	5488	13.1	7332	13.1
Rd_54_j	20.0	5488	13.1	7332	13.1
Rd_54_j_2	20.0	5488	13.1	7332	13.1
Rd_55	85.5	6655	11.7	7935	11.7
Rd_56_j	20.0	6825	11.1	8041	11.1
Rd_56	78.9	6825	11.1	8041	11.1
Rd_57	81.7	5967	9.3	7205	9.3
Rd_58_j	20.0	5967	9.3	7205	9.3
Rd_57_j	20.0	5967	9.3	7205	9.3
Rd_58	81.7	5967	9.3	7205	9.3
Rd_59	81.7	5967	9.3	7205	9.3
Rd_60	81.7	5967	9.3	7205	9.3

Road ID	Speed (kph)	Base 2026		Cumulative traffic 2026	
Rd_61	81.7	5967	9.3	7205	9.3
Rd_62	81.7	5967	9.3	7205	9.3
Rd_63	81.7	5967	9.3	7205	9.3
Rd_64	81.7	5967	9.3	7205	9.3
Rd_65	81.7	5967	9.3	7205	9.3
Rd_66	69.5	8689	8.7	8965	8.7
Rd_68	69.5	8689	8.7	8965	8.7
Rd_69	81.7	5967	9.3	7205	9.3
Rd_70	81.7	5967	9.3	7205	9.3
Rd_71	81.7	5967	9.3	7205	9.3
Rd_72	81.7	5967	9.3	7205	9.3
Rd_73	76.6	44	8.4	224	8.4
Rd_74	20.0	9647	10.0	11086	10.0
Rd_77	60.2	7780	11.0	8425	11.0
Rd_78	60.2	7780	11.0	8425	11.0
Rd_80	60.2	3890	11.0	4212	11.0
Rd_81	60.2	3890	11.0	4212	11.0
Rd_70	101.8	1109	9.8	2169	9.8
Rd_71	101.8	1109	9.8	2169	9.8
Rd_72	58.5	179	14.7	888	14.7
Rd_73	98.6	5269	7.5	5937	7.5
Rd_74	20.0	5269	7.5	5937	7.5
Rd_77	20.0	4216	7.3	5877	7.3
Rd_78	97.8	4216	7.3	5877	7.3

Road ID	Speed (kph)	Base 2026		Cumulative traffic 2026	
Rd_80	20.0	3836	6.8	3790	6.8
Rd_81	59.4	3836	6.8	3790	6.8

1.3 Receptors

- 1.3.1 NO₂, PM₁₀ and PM_{2.5} concentrations have been predicted at 94 receptor locations representing the closest sensitive buildings to the local road network affected by the Scheme, shown in **Figure 6-1: Air Quality Baseline Monitoring Locations and Receptors [EN010142/APP/6.3]**. The receptors have been selected from aerial photography and publicly available mapping. Each of the receptors chosen represents the maximum level of exposure that could be experienced within each area. Receptor locations listed in **Table 3** below.
- 1.3.2 All receptors were modelled at ground floor level, at a height of 1.5 metres, which represents the typical breathing zone height of an average person.
- 1.3.3 Commercial properties are not considered sensitive to changes in ambient pollutant concentrations and are legislated separately as part of occupational health and safety regulations. These are, therefore, not included in the assessment which focuses on residential buildings and sensitive receptors such as schools and nursing homes.

Table 3: Modelled Receptors

Receptor ID	Description	X	Y	Height (m)
R3	Buchanan Road	494879.5	389726.1	1.5
R6	28 Canberra Crescent	495772.1	389544.7	1.5
R7	Heritage Farms	493479.7	390086.7	1.5
R8	16 Harpswell Lane	492971.8	390178.3	1.5
R9	Grange Farm	491327.3	390473.3	1.5
R10	Harpswell Lane	490888.6	390709.4	1.5
R11	15 High Street	486758.0	391041.9	1.5

Receptor ID	Description	X	Y	Height (m)
R14	Woodhouse Farm	484634.1	390624.8	1.5
R16	17 Apley Close	482911.7	389312.0	1.5
R17	The Drive	482522.8	389292.8	1.5
R18	3 St Johns Terrace	481718.8	389056.2	1.5
R21	64A Wintern Close	481742.1	388710.5	1.5
R23	Winter Micheal farm	487635.2	389803.5	1.5
R29	Sunflower Smile Nursery	489482.4	376148.9	1.5
R33	Newton on Trent Church of England	483259.7	374405.0	1.5
R36	Rectory Farm	487568.2	388355.7	1.5
R38	269 Lea Road	482251.4	387826.2	1.5
R40	71 Gainsborough Road	482637.4	387137.6	1.5
R41	Redcote Homes Assisted Living	482780.6	386848.8	1.5
R42	3A Anderson Way	483002.3	386641.6	1.5
R43	Knaith Hill	482955.4	384754.0	1.5
R44	2 Gainsborough Way	483038.2	384474.1	1.5
R45	33 High Street	484001.7	381870.3	1.5
R46	63 High Street	484164.1	381208.8	1.5

Receptor ID	Description	X	Y	Height (m)
R47	8 Main Street	483722.2	379026.5	1.5
R50	The Elms Retirement Village	483820.7	378197.0	1.5
R52	3 A1133	483637.9	375721.2	1.5
R53	Vulcan Drive	497287.6	378688.0	1.5
R54	2 Hillside Road	494726.6	388388.8	1.5
R55	4 B1398	495249.2	387607.6	1.5
R56	The Mill House	495725.3	383174.8	1.5
R57	100 Lincoln Road	494881.9	382843.9	1.5
R59	Common Lane	493483.6	389723.0	1.5
R60	Common Lane	492124.5	388995.1	1.5
R61	Elwess Farm	491144.6	388347.2	1.5
R62	Common Lane	489127.0	388390.3	1.5
R63	The Poplars	488167.1	388364.8	1.5
R64	1 Hawthorne Close	494478.7	387817.0	1.5
R66	Orchard House	492013.5	387100.1	1.5
R67	Kexby Road	490541.2	386929.5	1.5
R68	Cow Lane	488890.7	387300.3	1.5
R69	Glenworth Road	489049.6	386098.6	1.5
R70	2 Lodge Lane	487041.7	386937.9	1.5
R72	41 High Street	486918.7	386396.8	1.5

Receptor ID	Description	X	Y	Height (m)
R74	47 B1241	484068.4	385796.0	1.5
R77	Hill Top Farm	485847.6	385569.5	1.5
R78	Kexby Lane	486358.9	385645.9	1.5
R79	Tennyson House	487153.0	385694.3	1.5
R80	Borewood	487196.2	385004.4	1.5
R81	19 B1241	487549.5	384387.9	1.5
R83	Nursery House	486083.2	382964.7	1.5
R84	Gainsborough Road	483825.7	382540.0	1.5
R85	B1241	487738.6	383808.6	1.5
R86	2 Normanby Road	488211.9	383059.4	1.5
R88	8A Sturton Road	488256.0	381860.8	1.5
R89	54 Stow Road	488851.6	381179.0	1.5
R91	21 A1500	489203.9	380310.7	1.5
R93	Gables Manor Care Home	489260.3	377860.7	1.5
R95	Sharp Tillbridge Lane House	493096.8	378897.0	1.5
R102	Highfield	478677.1	379331.5	1.5
R104	1-4 Cottam Lane	478985.6	379486.4	1.5
R106	6 Cottam Road	481485.1	379782.1	1.5
R107	Floss Lane	481676.3	379774.0	1.5
R110	Willow Farm	481847.4	379856.9	1.5
R113	Wells Lane Cottage	481897.6	380252.5	1.5

Receptor ID	Description	X	Y	Height (m)
R115	Riseholme College	496944.3	378095.5	1.5
R117	2 Brigg Road	497432.0	377255.4	1.5
R118	2 Riseholme Lane	497550.1	375146.8	1.5
R122	Lyndarlea Lodge	496647.4	389358.2	1.5
R124	The Cottage	496624.8	390258.8	1.5
R125	Slates Farm	497295.1	389639.2	1.5
R128	33 High Street	495451.0	379187.6	1.5
R130	10 High Street	494871.5	379338.4	1.5
R131	Parsonage Lodge	494944.4	379649.1	1.5
R136	Gate Lodge	494839.7	380848.5	1.5
R141	Groom's Cottage	494821.5	382121.6	1.5
R145	Shephard's Cottage	495493.2	385673.7	1.5
R147	The Old rectory	494826.8	385867.8	1.5
R151	20 Willingham Road	494599.7	385689.9	1.5
R152	Turpin Bungalow	491062.3	385281.0	1.5
R153	Ivy Cottage Fillingham Lane	490173.9	385127.8	1.5
R154	Moor House	489825.5	385062.1	1.5
R155	Slate House Farm	489268.9	384919.3	1.5

Receptor ID	Description	X	Y	Height (m)
R156	Upper Hill Farm	488725.9	384761.8	1.5
R158	26 High Street	487757.3	384584.4	1.5
R167	The Gobles	487233.3	384076.0	1.5
R168	Sandebus Farm	486419.8	383011.2	1.5
R174	9 Stow Park Road	484149.6	382009.6	1.5
R177	50 Stow Park Road	484462.1	381849.0	1.5
R178	Marton Grange	485144.8	381655.8	1.5
R181	White House	486684.9	381148.6	1.5
R183	Gallows Dale Farm	487433.2	380909.0	1.5
R186	29 Hill House	488777.8	380427.9	1.5
R192	67 Saxilby Road	489141.0	379719.5	1.5

1.4 Dispersion Model Input Data and Conditions

1.4.1 Details of general model conditions set up in ADMS-Roads are summarized in **Table 4**.

Table 4: ADMS-Roads Model Conditions

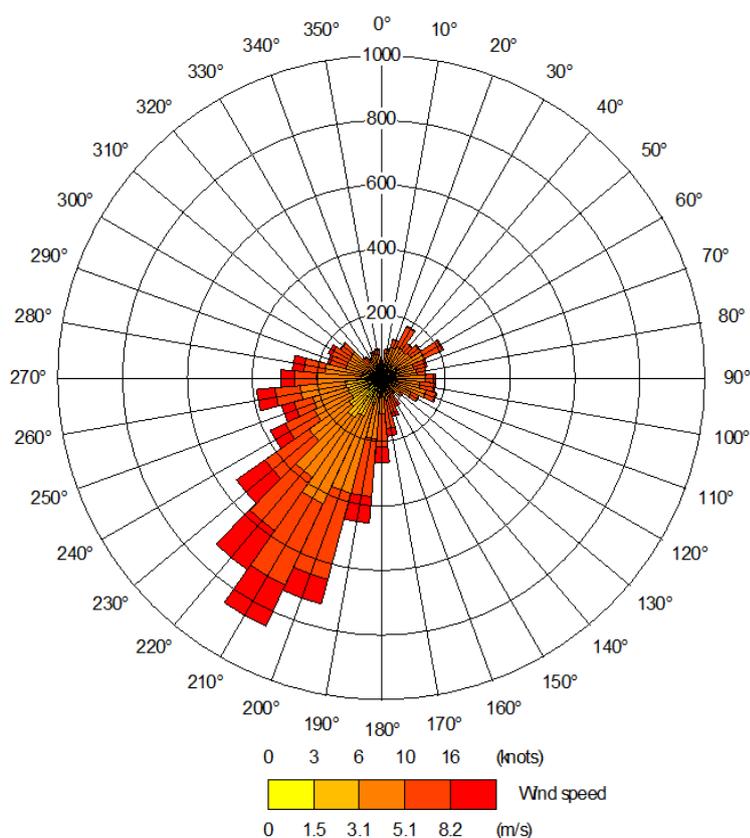
Variables	Model Inputs
Surface roughness at source	0.2m
Surface roughness at Meteorological Site	0.2m
Minimum Monin-Obukhov length for stable conditions	10m
Terrain types	Flat

Variables	Model Inputs
Receptor locations	x, y coordinates determined by GIS, z = various.
Emissions	NO _x , PM ₁₀ , PM _{2.5}
Emission factors	Defra EFT Version 11, rural (not London) traffic.
Meteorological data	1 year (2022) hourly sequential data.
Receptors	Facades of selected receptors only.
Model output	Long-term (annual) mean NO _x concentrations. NO _x to NO ₂ conversion discussed later in assessment.

1.5 Meteorological Data

- 1.5.1 One year (2022) of hourly sequential observation data from Humberside meteorological station has been used in the dispersion modelling assessment. Humberside is located approximately 2.5km north-east of the Scheme and experiences meteorological conditions that are representative of those experienced within the Study Area. A windrose representation of the meteorological data is presented in and illustrated in **Plate 1**, and shows that the dominant direction of wind is from the south-west, as is typical for the UK. The wind speed ranges from 0-16 knots (0- ~8.2m/s).

Plate 1: Windrose of 2022 Meteorological data from Humberside Met Stations



1.6 Model Verification

1.6.1 The model performance has been calibrated (verified) against the site-specific diffusion tube monitoring undertaken by AECOM in 2022 following the methodology set out in LAQM.TG(22). The verification adjustment factor given was considered representative and used for the adjustment of the model. **Table 5** presents a summary of the model performance prior to the bias adjustment and shows that without adjustment the model under predicted annual mean NO₂ concentrations at all modelled receptors.

Table 5: Model Performance Prior to Bias Adjustment

Roadside Monitoring Location	Background NO ₂ (2022)	Measured NO ₂ (µg/m ³)	Modelled NO ₂ (µg/m ³)	% Difference (Modelled – Measured / Measured)
M1	6.9	11.9	9.2	-23.2
M2	6.6	9.9	8.6	-12.8
M3	6.7	15.4	10.4	-32.4

Roadside Monitoring Location	Background NO ₂ (2022)	Measured NO ₂ (µg/m ³)	Modelled NO ₂ (µg/m ³)	% Difference (Modelled – Measured / Measured)
M4	7.1	27.8	16.8	-39.3
A14	6.7	8.8	6.8	-22.1
A15	6.9	19.3	8.6	-55.4
A16	7.0	11.2	7.9	-28.9
A17	7.0	8.5	7.2	-14.7
A18	7.1	11.6	8.2	-29.8

1.6.2 An adjustment factor of 2.38 was applied to the modelled road NO_x concentrations to adjust for model bias. The comparison of modelled with measured values was then repeated. The results are shown in **Table 6**.

Table 6: Model Performance After Bias Adjustment

Roadside Monitoring Location	Background NO ₂ (2022)	Measured NO ₂ (µg/m ³)	Modelled NO ₂ (µg/m ³)	% Difference (Modelled – Measured / Measured)
M1	6.9	11.9	12.2	2.5
M2	6.6	9.9	11.3	14.3
M3	6.7	15.4	15.3	-0.6
M4	7.1	27.8	29.1	4.8
A14	6.7	8.8	7.1	-19.3
A15	6.9	19.3	10.8	-43.7
A16	7.0	11.2	9.3	-17.1
A17	7.0	8.5	7.5	-11.2
A18	7.1	11.6	9.6	-17.2

1.6.3 The accuracy of the adjusted model was also considered via the calculation of the Root Mean Square Error (RMSE) and fractional bias. With the unadjusted model results, the RMSE was $5.7\mu\text{g}/\text{m}^3$. This was reduced with the adjusted model results to $3.1\mu\text{g}/\text{m}^3$. The adjustment lowered the average error or uncertainty in the model results. The fractional bias was 0.4 with the unadjusted model, which indicated model underprediction. The adjusted model shows a fractional bias of 0.1 which shows good model agreement.

1.7 Model Results Main Assessment

NO₂ Results Main Assessment

- 1.7.1 Predicted annual mean NO₂ concentrations are presented in **Table 7**. Predicted annual mean NO₂ concentrations 'With' the Scheme are predicted to be significantly below the applicable objective at all modelled receptor locations. The predicted change in annual mean NO₂ concentrations due to operational traffic is $\leq 0.5\mu\text{g}/\text{m}^3$ at all receptors. In accordance with the IAQM / EPUK significance criteria this change is considered negligible at all modelled receptor locations.
- 1.7.2 The predicted annual mean concentration at all receptors in both the Without and With scenarios are well below $60\mu\text{g}/\text{m}^3$, which suggests that the short-term NO₂ objective is unlikely to be exceeded at any receptor in the peak construction year (2026).

Table 7: Annual Mean NO₂ Concentrations ($\mu\text{g}/\text{m}^3$) Modelled in 2026

Receptor	Without Development ($\mu\text{g}/\text{m}^3$)	With Development ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	Impact
R3	7.8	8.1	0.4	Negligible
R6	7.3	7.5	0.2	Negligible
R7	7.9	8.3	0.4	Negligible
R8	8.7	9.2	0.5	Negligible
R9	6.4	6.5	0.1	Negligible
R10	7.6	7.9	0.3	Negligible
R11	7.6	7.7	0.1	Negligible
R14	8.5	8.7	0.2	Negligible
R16	9.1	9.2	0.1	Negligible

Receptor	Without Development ($\mu\text{g}/\text{m}^3$)	With Development ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	Impact
R17	8.8	8.8	0.1	Negligible
R18	11.1	11.4	0.3	Negligible
R21	9.4	9.6	0.2	Negligible
R23	6.2	6.3	0.1	Negligible
R29	6.8	6.8	<0.1	Negligible
R33	6.8	6.8	<0.1	Negligible
R36	6.2	6.2	<0.1	Negligible
R38	8.7	8.9	0.3	Negligible
R40	7.9	8.0	0.1	Negligible
R41	6.9	7.0	0.1	Negligible
R42	7.1	7.2	0.1	Negligible
R43	8.0	8.2	0.2	Negligible
R44	8.4	8.7	0.3	Negligible
R45	10.5	10.8	0.2	Negligible
R46	8.3	8.6	0.3	Negligible
R47	7.5	7.6	0.1	Negligible
R50	7.3	7.5	0.1	Negligible
R52	8.3	8.5	0.2	Negligible
R53	8.5	8.6	0.1	Negligible
R54	6.5	6.6	<0.1	Negligible
R55	7.6	7.9	0.2	Negligible
R56	7.0	7.1	0.1	Negligible
R57	6.6	6.6	0.0	Negligible
R59	6.4	6.4	0.1	Negligible

Receptor	Without Development (µg/m³)	With Development (µg/m³)	Change (µg/m³)	Impact
R60	6.1	6.2	<0.1	Negligible
R61	6.1	6.1	<0.1	Negligible
R62	6.1	6.1	<0.1	Negligible
R63	6.1	6.1	<0.1	Negligible
R64	6.3	6.3	<0.1	Negligible
R66	6.2	6.2	<0.1	Negligible
R67	6.2	6.2	<0.1	Negligible
R68	6.1	6.1	0.1	Negligible
R69	6.1	6.1	<0.1	Negligible
R70	6.2	6.2	<0.1	Negligible
R72	6.3	6.3	<0.1	Negligible
R74	6.5	6.6	0.1	Negligible
R77	6.5	6.5	0.1	Negligible
R78	6.5	6.6	0.1	Negligible
R79	7.7	7.7	<0.1	Negligible
R80	6.7	6.7	<0.1	Negligible
R81	7.4	7.6	0.2	Negligible
R83	6.8	6.8	<0.1	Negligible
R84	7.7	7.8	0.2	Negligible
R85	6.9	7.1	0.1	Negligible
R86	7.2	7.4	0.2	Negligible
R88	7.1	7.4	0.2	Negligible
R89	7.5	7.9	0.4	Negligible
R91	8.5	8.8	0.3	Negligible

Receptor	Without Development (µg/m³)	With Development (µg/m³)	Change (µg/m³)	Impact
R93	7.0	7.0	<0.1	Negligible
R95	7.0	7.0	0.1	Negligible
R102	6.6	6.9	0.3	Negligible
R104	6.5	6.7	0.2	Negligible
R106	9.3	9.5	0.3	Negligible
R107	9.5	9.9	0.4	Negligible
R110	9.0	9.3	0.3	Negligible
R113	6.9	7.1	0.1	Negligible
R115	7.7	7.8	0.1	Negligible
R117	10.8	11.0	0.1	Negligible
R118	11.7	11.8	0.2	Negligible
R122	10.4	10.8	0.4	Negligible
R124	9.9	10.1	0.2	Negligible
R125	7.3	7.3	0.1	Negligible
R128	7.8	8.0	0.2	Negligible
R130	7.3	7.4	0.1	Negligible
R131	7.2	7.3	0.1	Negligible
R136	7.5	7.7	0.2	Negligible
R141	8.6	8.9	0.4	Negligible
R145	7.4	7.6	0.2	Negligible
R147	6.3	6.6	0.3	Negligible
R151	6.3	6.5	0.2	Negligible
R152	6.2	6.5	0.3	Negligible
R153	6.3	6.7	0.4	Negligible

Receptor	Without Development ($\mu\text{g}/\text{m}^3$)	With Development ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	Impact
R154	6.2	6.6	0.4	Negligible
R155	6.2	6.5	0.3	Negligible
R156	6.3	6.6	0.3	Negligible
R158	6.5	6.7	0.2	Negligible
R167	6.6	6.6	<0.1	Negligible
R168	6.6	6.6	<0.1	Negligible
R174	8.2	8.5	0.3	Negligible
R177	7.2	7.4	0.2	Negligible
R178	8.7	9.1	0.5	Negligible
R181	8.7	9.1	0.5	Negligible
R183	7.9	8.2	0.3	Negligible
R186	7.5	7.8	0.3	Negligible
R192	7.5	7.5	<0.1	Negligible

PM₁₀ Results Main Assessment

- 1.7.3 Predicted annual mean PM₁₀ concentrations are presented in **Table 8**. Predicted annual mean PM₁₀ concentrations 'With' the Scheme are predicted to be significantly below the applicable objective at all modelled receptor locations. The predicted change in annual mean PM₁₀ concentrations due to operational traffic is $\leq 0.2 \mu\text{g}/\text{m}^3$ at all receptors. In accordance with the IAQM / EPUK significance criteria this change is considered to be negligible at all modelled receptor locations.
- 1.7.4 Likewise, as annual mean PM₁₀ concentrations are predicted to be well below $32 \mu\text{g}/\text{m}^3$ the predicted short-term (24 hour) AQS objective is anticipated to be achieved in both the 'Without' and 'With' scenarios at all modelled receptors. The change in daily PM₁₀ concentrations as a result of the Scheme is also predicted to be negligible at all modelled receptor locations.

Table 8: Annual Mean PM₁₀ Concentrations (µg/m³) Modelled in 2026

Receptor	Without Development (µg/m³)	With Development (µg/m³)	Change (µg/m³)	Impact
R3	15.6	15.7	0.2	Negligible
R6	15.4	15.5	0.1	Negligible
R7	15.5	15.7	0.2	Negligible
R8	15.8	16.0	0.2	Negligible
R9	15.1	15.2	<0.1	Negligible
R10	15.4	15.5	0.1	Negligible
R11	15.6	15.7	<0.1	Negligible
R14	15.9	15.9	0.1	Negligible
R16	14.2	14.3	<0.1	Negligible
R17	14.1	14.1	<0.1	Negligible
R18	15.4	15.5	0.2	Negligible
R21	15.9	16.0	0.1	Negligible
R23	15.0	15.0	<0.1	Negligible
R29	15.4	15.4	<0.1	Negligible
R33	15.7	15.7	<0.1	Negligible
R36	14.9	14.9	<0.1	Negligible
R38	14.9	15.0	0.1	Negligible
R40	14.7	14.8	0.1	Negligible
R41	14.4	14.5	<0.1	Negligible
R42	13.8	13.9	0.1	Negligible
R43	15.4	15.5	0.1	Negligible
R44	14.9	15.1	0.2	Negligible
R45	16.4	16.5	0.1	Negligible

Receptor	Without Development (µg/m³)	With Development (µg/m³)	Change (µg/m³)	Impact
R46	15.5	15.6	0.1	Negligible
R47	15.4	15.5	0.1	Negligible
R50	14.6	14.7	0.1	Negligible
R52	16.1	16.3	0.1	Negligible
R53	16.2	16.2	<0.1	Negligible
R54	15.1	15.1	<0.1	Negligible
R55	15.2	15.3	0.1	Negligible
R56	15.1	15.1	<0.1	Negligible
R57	15.0	15.0	<0.1	Negligible
R59	15.0	15.0	<0.1	Negligible
R60	14.9	14.9	<0.1	Negligible
R61	14.9	14.9	<0.1	Negligible
R62	14.9	14.9	<0.1	Negligible
R63	14.9	14.9	<0.1	Negligible
R64	15.0	15.0	<0.1	Negligible
R66	14.9	14.9	<0.1	Negligible
R67	14.9	14.9	<0.1	Negligible
R68	14.9	14.9	<0.1	Negligible
R69	14.9	14.9	<0.1	Negligible
R70	14.9	14.9	<0.1	Negligible
R72	15.0	15.0	<0.1	Negligible
R74	15.0	15.0	<0.1	Negligible
R77	15.0	15.0	<0.1	Negligible
R78	15.0	15.1	<0.1	Negligible

Receptor	Without Development (µg/m³)	With Development (µg/m³)	Change (µg/m³)	Impact
R79	15.4	15.4	<0.1	Negligible
R80	15.1	15.1	<0.1	Negligible
R81	14.4	14.5	0.1	Negligible
R83	15.0	15.0	<0.1	Negligible
R84	15.5	15.5	0.1	Negligible
R85	15.0	15.1	0.1	Negligible
R86	15.1	15.2	0.1	Negligible
R88	15.3	15.4	0.1	Negligible
R89	15.4	15.6	0.2	Negligible
R91	15.5	15.7	0.1	Negligible
R93	15.4	15.4	<0.1	Negligible
R95	15.2	15.3	<0.1	Negligible
R102	15.0	15.1	0.1	Negligible
R104	15.0	15.1	0.1	Negligible
R106	14.6	14.8	0.1	Negligible
R107	14.7	14.9	0.2	Negligible
R110	14.6	14.7	0.1	Negligible
R113	15.1	15.2	0.1	Negligible
R115	15.4	15.5	0.1	Negligible
R117	17.0	17.1	0.1	Negligible
R118	17.4	17.5	0.1	Negligible
R122	16.8	16.9	0.1	Negligible
R124	16.8	16.9	0.1	Negligible
R125	15.4	15.4	<0.1	Negligible

Receptor	Without Development (µg/m³)	With Development (µg/m³)	Change (µg/m³)	Impact
R128	15.3	15.4	0.1	Negligible
R130	15.2	15.3	<0.1	Negligible
R131	15.2	15.2	<0.1	Negligible
R136	15.3	15.3	0.1	Negligible
R141	15.4	15.5	0.1	Negligible
R145	15.2	15.2	0.1	Negligible
R147	15.0	15.2	0.2	Negligible
R151	15.0	15.1	0.1	Negligible
R152	14.9	15.1	0.2	Negligible
R153	14.9	15.2	0.2	Negligible
R154	14.9	15.2	0.3	Negligible
R155	14.9	15.1	0.2	Negligible
R156	14.9	15.1	0.2	Negligible
R158	14.2	14.3	0.1	Negligible
R167	14.2	14.2	<0.1	Negligible
R168	15.0	15.0	<0.1	Negligible
R174	15.4	15.5	0.2	Negligible
R177	15.1	15.2	0.1	Negligible
R178	15.0	15.2	0.2	Negligible
R181	15.5	15.7	0.2	Negligible
R183	15.3	15.5	0.1	Negligible
R186	15.3	15.4	0.1	Negligible
R192	15.4	15.4	<0.1	Negligible

PM_{2.5} Results Main Assessment

- 1.7.5 Predicted annual mean PM_{2.5} concentrations (presented in **Table 9**) in the 'Without' and 'With' scenarios are well below the AQS objective of 20µg/m³ at all modelled receptor locations. The predicted change in annual mean PM_{2.5} as a result of the Scheme is predicted to be ≤0.1µg/m³ at all modelled receptor locations. This change is considered to be negligible (not significant) at all receptors in the future assessment year.

Table 9: Annual Mean PM_{2.5} Concentrations (µg/m³) Modelled in 2026

Receptor	Without Development (µg/m ³)	With Development (µg/m ³)	Change (µg/m ³)	Impact
R3	8.3	8.4	0.1	Negligible
R6	8.2	8.2	0.1	Negligible
R7	8.3	8.4	0.1	Negligible
R8	8.4	8.6	0.1	Negligible
R9	8.0	8.1	<0.1	Negligible
R10	8.2	8.3	0.1	Negligible
R11	8.3	8.3	<0.1	Negligible
R14	8.5	8.5	<0.1	Negligible
R16	8.4	8.4	<0.1	Negligible
R17	8.4	8.4	<0.1	Negligible
R18	8.9	9.0	0.1	Negligible
R21	8.7	8.8	0.1	Negligible
R23	8.0	8.0	<0.1	Negligible
R29	8.2	8.2	<0.1	Negligible
R33	8.2	8.2	<0.1	Negligible
R36	7.9	7.9	<0.1	Negligible
R38	8.3	8.3	0.1	Negligible
R40	8.1	8.2	<0.1	Negligible

Receptor	Without Development ($\mu\text{g}/\text{m}^3$)	With Development ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	Impact
R41	8.0	8.0	<0.1	Negligible
R42	7.8	7.8	<0.1	Negligible
R43	8.2	8.3	0.1	Negligible
R44	8.2	8.2	0.1	Negligible
R45	8.8	8.9	0.1	Negligible
R46	8.3	8.4	0.1	Negligible
R47	8.2	8.3	<0.1	Negligible
R50	8.0	8.1	<0.1	Negligible
R52	8.5	8.6	0.1	Negligible
R53	8.6	8.7	<0.1	Negligible
R54	8.0	8.0	<0.1	Negligible
R55	8.1	8.2	<0.1	Negligible
R56	8.0	8.1	<0.1	Negligible
R57	8.0	8.0	<0.1	Negligible
R59	8.0	8.0	<0.1	Negligible
R60	7.9	7.9	<0.1	Negligible
R61	7.9	7.9	<0.1	Negligible
R62	7.9	7.9	<0.1	Negligible
R63	7.9	7.9	<0.1	Negligible
R64	7.9	7.9	<0.1	Negligible
R66	7.9	7.9	<0.1	Negligible
R67	7.9	8.0	<0.1	Negligible
R68	7.9	7.9	<0.1	Negligible
R69	7.9	7.9	<0.1	Negligible

Receptor	Without Development ($\mu\text{g}/\text{m}^3$)	With Development ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	Impact
R70	8.0	8.0	<0.1	Negligible
R72	8.0	8.0	<0.1	Negligible
R74	8.0	8.0	<0.1	Negligible
R77	8.0	8.0	<0.1	Negligible
R78	8.0	8.0	<0.1	Negligible
R79	8.2	8.3	<0.1	Negligible
R80	8.1	8.1	<0.1	Negligible
R81	7.9	8.0	0.1	Negligible
R83	8.0	8.0	<0.1	Negligible
R84	8.3	8.3	0.1	Negligible
R85	8.0	8.1	0.0	Negligible
R86	8.0	8.1	0.1	Negligible
R88	8.1	8.2	0.1	Negligible
R89	8.2	8.3	0.1	Negligible
R91	8.3	8.4	0.1	Negligible
R93	8.1	8.1	<0.1	Negligible
R95	8.1	8.1	<0.1	Negligible
R102	8.0	8.1	0.1	Negligible
R104	8.0	8.1	0.1	Negligible
R106	8.2	8.3	0.1	Negligible
R107	8.3	8.4	0.1	Negligible
R110	8.2	8.3	0.1	Negligible
R113	8.1	8.1	<0.1	Negligible
R115	8.2	8.3	<0.1	Negligible

Receptor	Without Development ($\mu\text{g}/\text{m}^3$)	With Development ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	Impact
R117	9.1	9.2	<0.1	Negligible
R118	9.3	9.4	0.1	Negligible
R122	8.9	9.0	0.1	Negligible
R124	9.0	9.0	0.1	Negligible
R125	8.2	8.2	<0.1	Negligible
R128	8.2	8.2	<0.1	Negligible
R130	8.1	8.2	<0.1	Negligible
R131	8.1	8.1	<0.1	Negligible
R136	8.1	8.2	<0.1	Negligible
R141	8.2	8.3	0.1	Negligible
R145	8.1	8.1	<0.1	Negligible
R147	8.0	8.1	0.1	Negligible
R151	8.0	8.0	0.1	Negligible
R152	8.0	8.1	0.1	Negligible
R153	8.0	8.1	0.1	Negligible
R154	7.9	8.1	0.1	Negligible
R155	7.9	8.0	0.1	Negligible
R156	7.9	8.0	0.1	Negligible
R158	7.8	7.9	0.1	Negligible
R167	7.8	7.8	<0.1	Negligible
R168	8.0	8.0	<0.1	Negligible
R174	8.2	8.3	0.1	Negligible
R177	8.1	8.2	0.1	Negligible
R178	8.1	8.3	0.1	Negligible

Receptor	Without Development ($\mu\text{g}/\text{m}^3$)	With Development ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	Impact
R181	8.3	8.4	0.1	Negligible
R183	8.2	8.2	0.1	Negligible
R186	8.1	8.2	0.1	Negligible
R192	8.2	8.2	<0.1	Negligible

1.8 Model Results Cumulative Assessment

NO₂ Results Cumulative Assessment

- 1.8.1 Predicted annual mean NO₂ concentrations are presented in **Table 10**. Predicted annual mean NO₂ concentration for the cumulative scenario are predicted to be significantly below the applicable objective at all modelled receptor locations. The predicted change in annual mean NO₂ concentrations due to cumulative construction traffic is $\leq 0.4\mu\text{g}/\text{m}^3$ at all receptors. In accordance with the IAQM / EPUK significance criteria this change is considered negligible at all modelled receptor locations.
- 1.8.2 The predicted annual mean concentration at all receptors for the cumulative scenario are well below $60\mu\text{g}/\text{m}^3$, which suggests that the short-term NO₂ objective is unlikely to be exceeded at any receptor in the peak construction year (2026).

Table 10: Annual Mean NO₂ Concentrations ($\mu\text{g}/\text{m}^3$) Modelled in 2026

Receptor	Without Development ($\mu\text{g}/\text{m}^3$)	Cumulative ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	Impact
R3	7.8	8.1	0.2	Negligible
R6	7.3	7.6	0.1	Negligible
R7	7.9	8.3	0.2	Negligible
R8	8.7	9.2	0.2	Negligible
R9	6.4	6.5	<0.1	Negligible
R10	7.6	7.9	0.1	Negligible
R11	7.6	7.7	<0.1	Negligible

Receptor	Without Development ($\mu\text{g}/\text{m}^3$)	Cumulative ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	Impact
R14	8.5	8.7	0.1	Negligible
R16	8.3	8.3	<0.1	Negligible
R17	9.1	9.2	<0.1	Negligible
R18	8.8	8.9	<0.1	Negligible
R21	11.1	11.6	0.2	Negligible
R23	9.4	9.7	0.2	Negligible
R29	6.2	6.3	0.1	Negligible
R33	6.8	6.8	<0.1	Negligible
R36	6.8	6.9	<0.1	Negligible
R38	8.7	9.1	0.2	Negligible
R40	7.9	8.1	0.1	Negligible
R41	6.9	7.1	0.1	Negligible
R42	7.1	7.3	0.1	Negligible
R43	7.1	8.3	0.2	Negligible
R44	8.4	8.9	0.2	Negligible
R45	10.6	10.8	0.1	Negligible
R46	8.4	8.8	0.2	Negligible
R47	7.5	7.7	0.1	Negligible
R50	7.4	7.6	0.1	Negligible
R52	8.3	8.6	0.2	Negligible
R53	8.5	8.6	<0.1	Negligible
R54	6.5	6.6	<0.1	Negligible
R55	7.6	8.0	0.1	Negligible
R56	7.0	7.1	0.0	Negligible

Receptor	Without Development ($\mu\text{g}/\text{m}^3$)	Cumulative ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	Impact
R57	6.6	6.7	<0.1	Negligible
R59	6.4	6.4	<0.1	Negligible
R60	6.1	6.2	<0.1	Negligible
R61	6.1	6.1	<0.1	Negligible
R62	6.1	6.1	<0.1	Negligible
R63	6.1	6.1	<0.1	Negligible
R64	6.3	6.3	<0.1	Negligible
R66	6.2	6.2	<0.1	Negligible
R67	6.2	6.3	<0.1	Negligible
R68	6.1	6.2	<0.1	Negligible
R69	6.2	6.2	<0.1	Negligible
R70	6.3	6.3	<0.1	Negligible
R72	6.6	6.6	<0.1	Negligible
R74	6.5	6.6	<0.1	Negligible
R77	6.5	6.6	0.1	Negligible
R78	7.7	7.7	<0.1	Negligible
R79	6.7	6.7	<0.1	Negligible
R80	7.4	7.7	0.1	Negligible
R81	6.8	6.8	<0.1	Negligible
R83	7.7	8.0	0.1	Negligible
R84	6.9	7.1	0.1	Negligible
R85	7.2	7.5	0.1	Negligible
R86	7.1	7.4	0.1	Negligible
R88	7.5	7.9	0.2	Negligible

Receptor	Without Development ($\mu\text{g}/\text{m}^3$)	Cumulative ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	Impact
R89	7.2	7.5	0.1	Negligible
R91	8.5	8.8	0.1	Negligible
R93	7.0	7.0	<0.1	Negligible
R95	7.0	7.1	<0.1	Negligible
R102	6.6	7.0	0.2	Negligible
R104	6.5	6.8	0.1	Negligible
R106	9.3	9.7	0.2	Negligible
R107	9.5	10.1	0.3	Negligible
R110	9.0	9.5	0.2	Negligible
R113	6.9	7.2	0.1	Negligible
R115	7.7	7.8	0.1	Negligible
R117	10.9	11.0	0.1	Negligible
R118	11.7	11.8	0.1	Negligible
R122	10.5	11.2	0.2	Negligible
R124	9.9	10.5	0.2	Negligible
R125	7.3	7.4	<0.1	Negligible
R128	7.8	8.1	0.1	Negligible
R130	7.3	7.5	0.1	Negligible
R131	7.2	7.3	<0.1	Negligible
R136	7.5	7.8	0.1	Negligible
R141	8.6	9.2	0.2	Negligible
R145	7.4	7.7	0.1	Negligible
R147	6.3	6.7	0.2	Negligible
R151	6.3	6.5	0.1	Negligible

Receptor	Without Development ($\mu\text{g}/\text{m}^3$)	Cumulative ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	Impact
R152	6.2	6.6	0.2	Negligible
R153	6.3	6.8	0.3	Negligible
R154	6.2	6.7	0.3	Negligible
R155	6.2	6.6	0.2	Negligible
R156	6.3	6.7	0.2	Negligible
R158	6.5	6.8	0.1	Negligible
R167	6.6	6.6	<0.1	Negligible
R168	6.6	6.6	<0.1	Negligible
R174	8.2	8.8	0.2	Negligible
R177	7.2	7.5	0.1	Negligible
R178	8.7	9.5	0.3	Negligible
R181	8.7	9.5	0.3	Negligible
R183	7.9	8.4	0.2	Negligible
R186	7.5	8.0	0.2	Negligible
R192	7.5	7.5	<0.1	Negligible

PM₁₀ Results Cumulative Assessment

- 1.8.3 Predicted annual mean PM₁₀ concentrations are presented in **Table 11**. Predicted annual mean PM₁₀ concentrations for the cumulative scenario are predicted to be significantly below the applicable objective at all modelled receptor locations. The predicted change in annual mean PM₁₀ concentrations due to cumulative construction traffic is $\leq 0.2\mu\text{g}/\text{m}^3$ at all receptors. In accordance with the IAQM / EPUK significance criteria this change is considered to be negligible at all modelled receptor locations.
- 1.8.4 Likewise, as annual mean PM₁₀ concentrations are predicted to be well below $32\mu\text{g}/\text{m}^3$ the predicted short-term (24 hour) AQS objective is anticipated to be achieved in the cumulative scenario at all modelled receptors. The change in daily PM₁₀ concentrations as a result of the Scheme is also predicted to be negligible at all modelled receptor locations.

Table 11: Annual Mean PM₁₀ Concentrations (µg/m³) Modelled in 2026

Receptor	Without Development (µg/m³)	Cumulative (µg/m³)	Change (µg/m³)	Impact
R3	15.6	15.7	0.1	Negligible
R6	15.4	15.5	0.1	Negligible
R7	15.6	15.7	0.1	Negligible
R8	15.8	16.0	0.1	Negligible
R9	15.1	15.2	<0.1	Negligible
R10	15.4	15.5	0.1	Negligible
R11	15.6	15.7	<0.1	Negligible
R14	15.9	15.9	<0.1	Negligible
R16	13.9	13.9	<0.1	Negligible
R17	14.2	14.3	<0.1	Negligible
R18	14.1	14.1	<0.1	Negligible
R21	15.4	15.6	0.1	Negligible
R23	15.9	16.1	0.1	Negligible
R29	15.0	15.0	<0.1	Negligible
R33	15.4	15.4	<0.1	Negligible
R36	15.7	15.7	<0.1	Negligible
R38	14.9	15.1	0.1	Negligible
R40	14.7	14.8	0.1	Negligible
R41	14.4	14.5	<0.1	Negligible
R42	13.8	13.9	<0.1	Negligible
R43	15.4	15.5	0.1	Negligible
R44	14.9	15.1	0.1	Negligible

Receptor	Without Development ($\mu\text{g}/\text{m}^3$)	Cumulative ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	Impact
R45	16.4	16.5	0.1	Negligible
R46	15.5	15.7	0.1	Negligible
R47	15.4	15.5	0.1	Negligible
R50	14.7	14.7	0.1	Negligible
R52	16.1	16.3	0.1	Negligible
R53	16.2	16.2	<0.1	Negligible
R54	15.1	15.1	<0.1	Negligible
R55	15.2	15.3	0.1	Negligible
R56	15.1	15.1	<0.1	Negligible
R57	15.0	15.0	<0.1	Negligible
R59	15.0	15.0	<0.1	Negligible
R60	14.9	14.9	<0.1	Negligible
R61	14.9	14.9	<0.1	Negligible
R62	14.9	14.9	<0.1	Negligible
R63	14.9	14.9	<0.1	Negligible
R64	15.0	15.0	<0.1	Negligible
R66	14.9	14.9	<0.1	Negligible
R67	14.9	14.9	<0.1	Negligible
R68	14.9	14.9	<0.1	Negligible
R69	14.9	14.9	<0.1	Negligible
R70	15.0	15.0	<0.1	Negligible
R72	15.0	15.0	<0.1	Negligible
R74	15.0	15.0	<0.1	Negligible
R77	15.0	15.1	<0.1	Negligible

Receptor	Without Development ($\mu\text{g}/\text{m}^3$)	Cumulative ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	Impact
R78	15.4	15.4	<0.1	Negligible
R79	15.1	15.1	<0.1	Negligible
R80	14.4	14.5	0.1	Negligible
R81	15.0	15.0	<0.1	Negligible
R83	15.5	15.6	0.1	Negligible
R84	15.0	15.1	<0.1	Negligible
R85	15.1	15.2	0.1	Negligible
R86	15.3	15.4	0.1	Negligible
R88	15.4	15.6	0.1	Negligible
R89	15.3	15.4	0.1	Negligible
R91	15.5	15.7	0.1	Negligible
R93	15.4	15.4	<0.1	Negligible
R95	15.2	15.3	<0.1	Negligible
R102	15.0	15.2	0.1	Negligible
R104	15.0	15.1	0.1	Negligible
R106	14.6	14.8	0.1	Negligible
R107	14.7	15.0	0.2	Negligible
R110	14.6	14.8	0.1	Negligible
R113	15.1	15.2	0.1	Negligible
R115	15.4	15.5	<0.1	Negligible
R117	17.0	17.1	<0.1	Negligible
R118	17.4	17.5	<0.1	Negligible
R122	16.8	17.0	0.1	Negligible
R124	16.8	17.0	0.1	Negligible

Receptor	Without Development ($\mu\text{g}/\text{m}^3$)	Cumulative ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	Impact
R125	15.4	15.4	<0.1	Negligible
R128	15.3	15.4	0.1	Negligible
R130	15.2	15.3	<0.1	Negligible
R131	15.2	15.2	<0.1	Negligible
R136	15.3	15.3	0.1	Negligible
R141	15.4	15.6	0.1	Negligible
R145	15.2	15.3	0.1	Negligible
R147	15.0	15.2	0.1	Negligible
R151	15.0	15.1	0.1	Negligible
R152	14.9	15.2	0.1	Negligible
R153	14.9	15.2	0.2	Negligible
R154	14.9	15.2	0.2	Negligible
R155	14.9	15.1	0.1	Negligible
R156	14.9	15.1	0.1	Negligible
R158	14.2	14.3	0.1	Negligible
R167	14.2	14.2	<0.1	Negligible
R168	15.0	15.0	<0.1	Negligible
R174	15.4	15.6	0.1	Negligible
R177	15.1	15.2	0.1	Negligible
R178	15.0	15.3	0.2	Negligible
R181	15.5	15.8	0.2	Negligible
R183	15.3	15.5	0.1	Negligible
R186	15.3	15.5	0.1	Negligible
R192	15.4	15.4	<0.1	Negligible

PM_{2.5} Results Cumulative Assessment

- 1.8.5 Predicted annual mean PM_{2.5} concentrations (presented in **Table 12**) Cumulative scenario are well below the AQS objective of 20µg/m³ at all modelled receptor locations. The predicted change in annual mean PM_{2.5} as a result of the Scheme is predicted to be ≤0.2µg/m³ at all modelled receptor locations. This change is considered to be negligible (not significant) at all receptors in the future assessment year.

Table 12: Annual Mean PM_{2.5} Concentrations (µg/m³) Modelled in 2026

Receptor	Without Development (µg/m ³)	Cumulative (µg/m ³)	Change (µg/m ³)	Impact
R3	8.3	8.4	0.1	Negligible
R6	8.2	8.3	0.1	Negligible
R7	8.3	8.4	0.1	Negligible
R8	8.4	8.6	0.1	Negligible
R9	8.0	8.1	<0.1	Negligible
R10	8.2	8.3	0.1	Negligible
R11	8.3	8.3	<0.1	Negligible
R14	8.5	8.5	<0.1	Negligible
R16	8.3	8.3	<0.1	Negligible
R17	8.4	8.4	<0.1	Negligible
R18	8.4	8.4	<0.1	Negligible
R21	8.9	9.1	0.1	Negligible
R23	8.7	8.8	0.1	Negligible
R29	8.0	8.0	<0.1	Negligible
R33	8.2	8.2	<0.1	Negligible
R36	8.2	8.2	<0.1	Negligible
R38	8.3	8.4	0.1	Negligible
R40	8.1	8.2	0.1	Negligible
R41	8.0	8.0	<0.1	Negligible

Receptor	Without Development ($\mu\text{g}/\text{m}^3$)	Cumulative ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	Impact
R42	7.8	7.8	<0.1	Negligible
R43	8.2	8.3	0.1	Negligible
R44	8.2	8.3	0.1	Negligible
R45	8.8	8.9	0.1	Negligible
R46	8.3	8.5	0.1	Negligible
R47	8.2	8.3	0.1	Negligible
R50	8.0	8.1	0.1	Negligible
R52	8.5	8.6	0.1	Negligible
R53	8.7	8.7	<0.1	Negligible
R54	8.0	8.0	<0.1	Negligible
R55	8.1	8.2	0.1	Negligible
R56	8.0	8.1	<0.1	Negligible
R57	8.0	8.0	<0.1	Negligible
R59	8.0	8.0	<0.1	Negligible
R60	7.9	7.9	<0.1	Negligible
R61	7.9	7.9	<0.1	Negligible
R62	7.9	7.9	<0.1	Negligible
R63	7.9	7.9	<0.1	Negligible
R64	7.9	7.9	<0.1	Negligible
R66	7.9	7.9	<0.1	Negligible
R67	7.9	8.0	<0.1	Negligible
R68	7.9	8.0	<0.1	Negligible
R69	8.0	8.0	<0.1	Negligible
R70	8.0	8.0	<0.1	Negligible

Receptor	Without Development ($\mu\text{g}/\text{m}^3$)	Cumulative ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	Impact
R72	8.0	8.0	<0.1	Negligible
R74	8.0	8.0	<0.1	Negligible
R77	8.0	8.0	<0.1	Negligible
R78	8.2	8.3	<0.1	Negligible
R79	8.1	8.1	<0.1	Negligible
R80	7.9	8.0	0.1	Negligible
R81	8.0	8.0	<0.1	Negligible
R83	8.3	8.3	0.1	Negligible
R84	8.0	8.1	<0.1	Negligible
R85	8.0	8.1	0.1	Negligible
R86	8.1	8.2	0.1	Negligible
R88	8.2	8.3	0.1	Negligible
R89	8.1	8.2	0.1	Negligible
R91	8.3	8.4	0.1	Negligible
R93	8.1	8.1	<0.1	Negligible
R95	8.1	8.1	<0.1	Negligible
R102	8.0	8.1	0.1	Negligible
R104	8.0	8.1	0.1	Negligible
R106	8.2	8.3	0.1	Negligible
R107	8.3	8.4	0.2	Negligible
R110	8.2	8.4	0.1	Negligible
R113	8.1	8.1	0.1	Negligible
R115	8.2	8.3	<0.1	Negligible
R117	9.1	9.2	<0.1	Negligible

Receptor	Without Development ($\mu\text{g}/\text{m}^3$)	Cumulative ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	Impact
R118	9.3	9.4	<0.1	Negligible
R122	8.9	9.0	0.1	Negligible
R124	9.0	9.1	0.1	Negligible
R125	8.2	8.2	<0.1	Negligible
R128	8.2	8.2	0.1	Negligible
R130	8.1	8.2	<0.1	Negligible
R131	8.1	8.2	<0.1	Negligible
R136	8.1	8.2	0.1	Negligible
R141	8.2	8.4	0.1	Negligible
R145	8.1	8.1	0.1	Negligible
R147	8.0	8.1	0.1	Negligible
R151	8.0	8.0	0.1	Negligible
R152	8.0	8.1	0.1	Negligible
R153	8.0	8.1	0.2	Negligible
R154	7.9	8.1	0.2	Negligible
R155	7.9	8.0	0.1	Negligible
R156	7.9	8.1	0.1	Negligible
R158	7.8	7.9	0.1	Negligible
R167	7.8	7.8	<0.1	Negligible
R168	8.0	8.0	<0.1	Negligible
R174	8.2	8.3	0.1	Negligible
R177	8.1	8.2	0.1	Negligible
R178	8.2	8.3	0.2	Negligible
R181	8.3	8.5	0.2	Negligible

Receptor	Without Development ($\mu\text{g}/\text{m}^3$)	Cumulative ($\mu\text{g}/\text{m}^3$)	Change ($\mu\text{g}/\text{m}^3$)	Impact
R183	8.2	8.3	0.1	Negligible
R186	8.1	8.2	0.1	Negligible
R192	8.2	8.2	<0.1	Negligible