



Appendix 6.5 – Operational Phase Road Traffic Impact Sensitivity Analysis

Crown Street Phase 3 and Plot D

Renaker Build Limited

MAN.779.003.AQ.R.001



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Operational Phase Road Traffic Impact Sensitivity Analysis

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Appendix 6.5 – Operational Phase Road Traffic Impact Sensitivity Analysis.

In order to provide an assessment scenario which considers future improvements to the national vehicle fleet resulting from legislation directed to increase the uptake low emission and electric vehicles, an additional scenario utilising 2032 operational traffic data and 2027 emissions was carried out. This is also considered a conservative case scenario which uses mid-year (2027) fleet improvements predicted by DEFRA with 2032 traffic data.

The following sections present the predicted NO₂, PM₁₀ and PM_{2.5} concentrations and associated impacts associated with the 2027 operational scenario. All impacts are defined as regional and permanent in nature.

Predicted Concentrations at Sensitive Human Receptors

Nitrogen Dioxide (NO₂)

Annual mean NO₂ concentrations are summarised in Table A6.5.1.

Table A6.5.1: Predicted Annual Mean NO₂ Concentrations

ID	Annual Mean Concentration (µg/m ³)			% Change in Concentration Relative to AQO	Long Term Average Concentration Relative to AQO	Impact Descriptor
	DM	DS	Change			
HR1	20.6	20.7	0.1	0.3	75% or Less	Negligible
HR2	19.8	19.9	0.1	0.3	75% or Less	Negligible
HR3	25.0	25.1	0.2	0.4	75% or Less	Negligible
HR4	25.2	25.4	0.3	0.6	75% or Less	Negligible
HR5	24.6	24.8	0.2	0.6	75% or Less	Negligible
HR6	34.0	34.5	0.4	1.0	76-94%	Negligible
HR7	30.7	31.1	0.4	0.9	76-94%	Negligible
HR8	26.4	26.7	0.3	0.7	75% or Less	Negligible
HR9	23.0	23.2	0.2	0.5	75% or Less	Negligible
HR10	33.9	34.3	0.4	1.1	76-94%	Negligible
HR11	32.1	32.3	0.2	0.4	76-94%	Negligible
HR12	22.6	22.7	0.1	0.3	75% or Less	Negligible
HR13	25.5	25.8	0.4	0.9	75% or Less	Negligible
HR14	24.7	25.5	0.8	2.0	75% or Less	Negligible
HR15	24.8	25.7	0.9	2.3	75% or Less	Negligible
HR16	22.3	22.7	0.4	1.0	75% or Less	Negligible
HR17	23.7	23.8	0.2	0.4	75% or Less	Negligible
HR18	22.5	22.6	0.1	0.2	75% or Less	Negligible
HR19	24.5	24.7	0.2	0.5	75% or Less	Negligible
HR20	21.9	21.9	0.1	0.1	75% or Less	Negligible
HR21	29.2	29.6	0.4	1.1	75% or Less	Negligible
HR22	26.5	26.8	0.3	0.8	75% or Less	Negligible
HR23	23.9	24.1	0.2	0.6	75% or Less	Negligible
HR24	22.6	22.8	0.2	0.5	75% or Less	Negligible

ID	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)			% Change in Concentration Relative to AQO	Long Term Average Concentration Relative to AQO	Impact Descriptor
	DM	DS	Change			
HR25	34.6	35.1	0.5	1.2	76-94%	Negligible
HR26	34.8	35.3	0.5	1.1	76-94%	Negligible
HR27	33.4	33.9	0.5	1.3	76-94%	Negligible
HR28	23.1	23.3	0.3	0.7	75% or Less	Negligible
HR29	22.9	23.1	0.2	0.5	75% or Less	Negligible
HR30	22.0	22.1	0.1	0.2	75% or Less	Negligible
HR31	24.7	24.8	0.1	0.3	75% or Less	Negligible
HR32	23.8	23.9	0.1	0.3	75% or Less	Negligible
HR33	25.0	25.1	0.1	0.3	75% or Less	Negligible
HR34	24.0	24.1	0.1	0.3	75% or Less	Negligible
HR35	22.5	22.7	0.1	0.3	75% or Less	Negligible
HR36	22.0	22.1	0.1	0.2	75% or Less	Negligible
HR37	28.4	28.6	0.2	0.5	75% or Less	Negligible
HR38	27.4	27.7	0.3	0.7	75% or Less	Negligible
HR39	28.8	29.1	0.3	0.8	75% or Less	Negligible
HR40	28.3	28.5	0.2	0.5	75% or Less	Negligible

As indicated in Table A6.5.1, annual mean NO₂ concentrations are below the AQO at all 40 sensitive receptor locations during the DM and DS scenarios. Impacts on annual mean NO₂ concentrations as a result of operational phase road vehicle exhaust emissions are predicted to be negligible on a permanent basis at all 40 sensitive receptor locations.

Particulate Matter (PM₁₀)

Annual mean PM₁₀ concentrations are summarised Table A6.5.2.

Table A6.5.2: Predicted Annual Mean PM₁₀ Concentrations

ID	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)			% Change in Concentration Relative to AQO	Long Term Average Concentration Relative to AQO	Impact Descriptor
	DM	DS	Change			
HR1	14.0	14.1	0.0	0.1	75% or Less	Negligible
HR2	13.7	13.7	0.0	0.1	75% or Less	Negligible
HR3	15.4	15.4	0.0	0.1	75% or Less	Negligible
HR4	15.2	15.3	0.1	0.2	75% or Less	Negligible
HR5	15.0	15.1	0.1	0.2	75% or Less	Negligible
HR6	17.2	17.3	0.1	0.3	75% or Less	Negligible
HR7	16.3	16.4	0.1	0.3	75% or Less	Negligible
HR8	15.0	15.1	0.1	0.2	75% or Less	Negligible
HR9	14.3	14.3	0.1	0.1	75% or Less	Negligible
HR10	18.7	18.9	0.2	0.4	75% or Less	Negligible
HR11	18.0	18.2	0.1	0.3	75% or Less	Negligible
HR12	13.6	13.7	0.0	0.1	75% or Less	Negligible
HR13	15.3	15.4	0.1	0.3	75% or Less	Negligible

ID	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)			% Change in Concentration Relative to AQO	Long Term Average Concentration Relative to AQO	Impact Descriptor
	DM	DS	Change			
HR14	14.7	15.0	0.3	0.8	75% or Less	Negligible
HR15	14.8	15.2	0.4	0.9	75% or Less	Negligible
HR16	14.0	14.2	0.2	0.4	75% or Less	Negligible
HR17	14.5	14.6	0.1	0.1	75% or Less	Negligible
HR18	14.1	14.1	0.0	0.1	75% or Less	Negligible
HR19	14.9	15.0	0.1	0.2	75% or Less	Negligible
HR20	14.0	14.0	0.0	0.0	75% or Less	Negligible
HR21	15.5	15.6	0.1	0.4	75% or Less	Negligible
HR22	14.9	15.0	0.1	0.3	75% or Less	Negligible
HR23	14.2	14.3	0.1	0.2	75% or Less	Negligible
HR24	13.8	13.9	0.1	0.2	75% or Less	Negligible
HR25	16.4	16.5	0.1	0.3	75% or Less	Negligible
HR26	16.3	16.5	0.1	0.3	75% or Less	Negligible
HR27	16.0	16.2	0.1	0.4	75% or Less	Negligible
HR28	13.9	14.0	0.1	0.2	75% or Less	Negligible
HR29	14.3	14.4	0.1	0.2	75% or Less	Negligible
HR30	13.5	13.5	0.0	0.1	75% or Less	Negligible
HR31	14.1	14.2	0.0	0.1	75% or Less	Negligible
HR32	13.9	14.0	0.0	0.1	75% or Less	Negligible
HR33	14.3	14.4	0.0	0.1	75% or Less	Negligible
HR34	14.1	14.1	0.0	0.1	75% or Less	Negligible
HR35	13.8	13.9	0.0	0.1	75% or Less	Negligible
HR36	13.6	13.6	0.0	0.1	75% or Less	Negligible
HR37	15.0	15.0	0.1	0.1	75% or Less	Negligible
HR38	15.4	15.5	0.1	0.2	75% or Less	Negligible
HR39	15.5	15.6	0.1	0.2	75% or Less	Negligible
HR40	14.9	14.9	0.1	0.1	75% or Less	Negligible

As indicated in Table A6.5.2 annual mean PM_{10} concentrations are below the AQO at all 40 receptor locations. Predicted impacts on annual mean PM_{10} concentrations as a result of road vehicle exhaust emissions associated with the development were predicted to be negligible on a permanent basis at all receptor locations.

Particulate Matter ($\text{PM}_{2.5}$)

Annual mean $\text{PM}_{2.5}$ concentrations are summarised Table A6.4.3.

Table A6.5.3: Predicted Annual Mean PM_{10} Concentrations

ID	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)			% Change in Concentration Relative to AQO	Long Term Average Concentration Relative to AQO	Impact Descriptor
	DM	DS	Change			
HR1	8.9	8.9	0.0	0.1	75% or Less	Negligible
HR2	8.7	8.8	0.0	0.1	75% or Less	Negligible

ID	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)			% Change in Concentration Relative to AQO	Long Term Average Concentration Relative to AQO	Impact Descriptor
	DM	DS	Change			
HR3	9.7	9.7	0.0	0.2	75% or Less	Negligible
HR4	9.6	9.7	0.0	0.2	75% or Less	Negligible
HR5	9.5	9.6	0.0	0.2	75% or Less	Negligible
HR6	10.9	10.9	0.1	0.3	75% or Less	Negligible
HR7	10.3	10.4	0.1	0.2	75% or Less	Negligible
HR8	9.6	9.6	0.0	0.2	75% or Less	Negligible
HR9	9.1	9.1	0.0	0.1	75% or Less	Negligible
HR10	11.6	11.7	0.1	0.4	75% or Less	Negligible
HR11	11.2	11.3	0.1	0.3	75% or Less	Negligible
HR12	8.7	8.7	0.0	0.0	75% or Less	Negligible
HR13	9.6	9.6	0.1	0.3	75% or Less	Negligible
HR14	9.3	9.4	0.2	0.7	75% or Less	Negligible
HR15	9.3	9.5	0.2	0.8	75% or Less	Negligible
HR16	8.9	9.0	0.1	0.4	75% or Less	Negligible
HR17	9.2	9.2	0.0	0.1	75% or Less	Negligible
HR18	8.9	8.9	0.0	0.0	75% or Less	Negligible
HR19	9.4	9.4	0.0	0.2	75% or Less	Negligible
HR20	8.8	8.8	0.0	0.0	75% or Less	Negligible
HR21	9.8	9.9	0.1	0.3	75% or Less	Negligible
HR22	9.4	9.5	0.1	0.2	75% or Less	Negligible
HR23	9.0	9.1	0.1	0.2	75% or Less	Negligible
HR24	8.8	8.8	0.0	0.2	75% or Less	Negligible
HR25	10.4	10.5	0.1	0.3	75% or Less	Negligible
HR26	10.4	10.5	0.1	0.3	75% or Less	Negligible
HR27	10.2	10.3	0.1	0.4	75% or Less	Negligible
HR28	8.9	8.9	0.1	0.2	75% or Less	Negligible
HR29	9.0	9.1	0.0	0.2	75% or Less	Negligible
HR30	8.6	8.6	0.0	0.1	75% or Less	Negligible
HR31	9.0	9.0	0.0	0.1	75% or Less	Negligible
HR32	8.9	8.9	0.0	0.0	75% or Less	Negligible
HR33	9.1	9.1	0.0	0.1	75% or Less	Negligible
HR34	8.9	9.0	0.0	0.0	75% or Less	Negligible
HR35	8.8	8.8	0.0	0.1	75% or Less	Negligible
HR36	8.7	8.7	0.0	0.0	75% or Less	Negligible
HR37	9.5	9.6	0.0	0.1	75% or Less	Negligible
HR38	9.7	9.8	0.1	0.2	75% or Less	Negligible
HR39	9.8	9.8	0.1	0.2	75% or Less	Negligible
HR40	9.5	9.5	0.0	0.1	75% or Less	Negligible

As indicated in Table A6.5.3. annual mean $PM_{2.5}$ concentrations are below the AQO at all 40 receptor locations. Predicted impacts on annual mean $PM_{2.5}$ concentrations as a result of road vehicle exhaust emissions associated with the development were predicted to be negligible on a permanent basis at all receptor locations.

Given negligible impacts over the study area, the overall significance was determined to be not significant.

A detailed discussion of the associated impact significance is provided within the Sections 6.142 to 6.145 of the main ES Chapter.