Appendix 3: Base Model Verification

Table A3-1: Sites used for base model verification

Receptor name	Coordinate X(m)	Coordinate Y(m)	Height Z(m)
Gillygate continuous monitor	460149.16	452343.50	2.50
Holgate continuous monitor	459512.53	451282.44	1.65
Nunnery Lane continuous monitor	460068.94	451199.06	1.65
A1	460088.06	452263.44	2.75
A11	459341.12	453042.50	2.82
A12	459250.88	453008.00	2.72
A17	458578.00	452472.00	2.72
A19	458713.25	452414.44	2.73
A19a	458713.25	452414.44	2.50
A19b	458713.25	452414.44	2.50
A20	458759.91	452403.53	2.68
A20a	458759.91	452403.53	2.50
A20b	458759.91	452403.53	2.50
A25	458706.50	452224.75	2.60
A27	458675.00	452363.00	2.64
A3	459821.94	452492.34	2.71
A41	458171.53	452108.50	2.82
A42	458222.00	452030.00	2.60
A43	458298.16	451972.50	2.71
A48	458666.00	451468.00	2.28
A49	458634.38	451510.28	2.46
A5	459594.34	452707.62	2.70
A52	458945.00	451254.00	2.92
A53	459066.00	451239.00	3.57
A54	459255.00	451222.91	2.50
A55	459351.00	451221.00	2.94
A57	459533.41	451280.41	2.77
A6	459535.94	452810.97	2.70
A64	460029.53	452326.78	2.73

A7	459440.97	452891.78	2.70
A87	459323.94	453047.62	2.24
A9	459294.72	453067.03	2.70
A90	459238.44	453157.41	2.50
A91	458666.75	452246.31	2.49
A94	458651.25	452426.06	2.50
A95	458366.53	451891.88	2.50
A96	459037.97	452850.41	2.50
A97	457431.03	452616.94	2.50
C21	459409.59	451040.44	2.73
C23	459552.91	451251.84	2.78
C26	459639.22	451334.16	2.70
C27	459717.16	451432.91	2.78
C56	459483.62	451140.75	2.73
C62	459579.41	451250.84	2.50
16	460159.88	451151.56	2.65
17	459645.91	451500.06	2.12
6	459777.16	451405.84	2.81
D13	460270.72	451358.12	2.86
D19	460037.91	451626.12	2.78
D20	460322.88	451684.56	2.80
D22	460035.28	452009.53	2.97
D25	459692.94	451750.00	2.48
D32	460257.88	451207.91	2.77
D33	460075.41	451174.06	2.85
D35	460133.81	451169.50	3.49
D36	460134.56	450883.81	2.71
D37	460157.22	450987.50	2.68
D38	460087.59	450929.03	2.66
D39	460185.19	451055.34	2.59
D40	460068.56	451195.94	2.84
D41	460285.66	452486.50	2.55
D43	459920.50	451834.34	2.50

D46	460103.31	452098.50	2.50
D48	460102.91	452179.88	2.70
D53	460115.31	451146.09	2.50
D54	460146.25	451116.47	2.50
D55	460087.91	452065.41	2.77
102	458702.59	452428.91	2.50
103	458702.59	452428.94	2.50
104	458702.59	452428.91	2.50
105	459750.88	451551.94	2.50
108	458813.78	452373.06	2.50
110	459984.81	451727.50	2.50
111	459917.00	451727.72	2.50
112	459873.38	451683.75	2.50
113	459812.38	451648.22	2.50
114	459980.91	451777.81	2.50
115	459961.81	451771.44	2.50
116	458212.03	452036.53	2.50
118	459329.81	452956.94	2.50
123	459865.94	453155.12	2.50
128	458686.59	452369.41	2.50
13	460175.72	452377.03	2.48
14	460166.97	452347.16	2.43
35	457602.91	451491.78	2.83
37	459522.00	451187.09	2.85
40	459051.06	452106.22	2.68
45	460318.81	452753.56	2.78
68	459407.34	453089.97	2.76
69	458285.75	451409.16	2.70
7	460217.47	452421.00	2.53
78	460149.41	452342.44	2.50
79	460149.41	452342.44	2.50
80	460149.41	452342.44	2.50

Table A3-2: Derivation of correction factor for sites which exhibited a difference of greater than +/-25%

Receptor name	Modelled Road NO_x contribution ($\mu g/m^3$)	2014 Background NO_x ($\mu g/m^3$)	2014 Background NO_2 ($\mu g/m3$)	2014 Monitored NO_2 ($\mu g/m3$)	2014 Monitored Road NO_x ($\mu g/m^3$)	% Difference Monitored vs Modelled NO_2	Ratio between modelled and monitored Road NO_x	Corrected Modelled Road NO_x contribution ($\mu g/m^3$)	Modelled Total NO2 ($\mu g/m^3$) from NO_x-NO_2 calculator	Modelled Road NO_2 ($\mu g/m^3$) from NO_x-NO_2 calculator
A1	39.898	26.80	18.75	52.35	80.61	-28.98	2.02	91.76	56.02	37.27
A5	22.239	26.80	18.75	40.92	49.18	-27.86	2.21	51.15	41.69	22.94
A57	34.030	26.80	18.75	49.18	71.41	-29.42	2.10	78.27	51.55	32.8
D19	43.584	26.80	18.75	54.75	87.83	-29.33	2.02	100.24	58.71	39.96
D35	19.346	26.80	18.75	42.00	51.96	-32.89	2.69	44.50	39.05	20.3
D36	14.551	26.80	18.75	37.52	40.74	-30.87	2.80	33.47	34.47	15.72
D41	22.367	26.80	18.75	41.08	49.58	-28.01	2.22	51.44	41.8	23.05
D46	26.814	26.80	18.75	42.62	53.55	-25.92	2.00	61.67	45.67	26.92
14	39.512	26.80	18.75	52.17	80.09	-29.04	2.03	90.88	55.74	36.99
7	30.431	26.80	18.75	55.16	89.1	-39.89	2.93	69.99	48.68	29.93
					Average ratio		**2.30**			

Table A3-3: Final verification results

Receptor name	Modelled Road NO_x contribution ($\mu g/m^3$)	Factor used	Modelled Road NO_x contribution (corrected) ($\mu g/m^3$)	2014 Background NO_x ($\mu g/m^3$)	2014 Background NO_2 ($\mu g/m^3$)	Modelled Total NO_2 ($\mu g/m^3$) from NO_x-NO_2 calculator	2014 Monitored NO_2 ($\mu g/m^3$)	% Difference Monitored vs Modelled NO_2
Gillygate CM	30.71	1.0	30.71	26.80	18.75	33.28	34.65	-3.95
Holgate CM	34.12	1.0	34.12	26.80	18.75	34.75	32.50	6.92
Nunnery CM	28.23	1.0	28.23	26.80	18.75	32.20	34.11	-5.60
A1	39.90	2.3	91.77	26.80	18.75	56.02	52.35	7.01
A11	29.60	1.0	29.60	26.80	18.75	32.80	37.42	-12.36
A12	25.66	1.0	25.66	26.80	18.75	31.06	33.85	-8.24
A17	21.01	1.0	21.01	26.80	18.75	28.95	32.31	-10.39
A19	18.44	1.0	18.44	26.80	18.75	27.77	31.57	-12.02
A19a	19.67	1.0	19.67	26.80	18.75	28.34	30.92	-8.35
A19b	19.67	1.0	19.67	26.80	18.75	28.34	31.88	-11.11
A20	19.23	1.0	19.23	26.80	18.75	28.13	32.52	-13.49
A20a	20.54	1.0	20.54	26.80	18.75	28.74	35.63	-19.33
A20b	20.54	1.0	20.54	26.80	18.75	28.74	34.29	-16.19
A25	14.88	1.0	14.88	26.80	18.75	26.10	28.40	-8.09
A27	12.01	1.0	12.01	26.80	18.75	24.72	22.88	8.04
A3	18.62	1.0	18.62	26.80	18.75	27.85	34.43	-19.11
A41	14.84	1.0	14.84	26.80	18.75	26.08	25.95	0.48
A42	16.79	1.0	16.79	26.80	18.75	27.00	31.42	-14.07
A43	15.62	1.0	15.62	26.80	18.75	26.44	26.20	0.90
A48	14.81	1.0	14.81	26.80	18.75	26.06	26.88	-3.06
A49	13.63	1.0	13.63	26.80	18.75	25.50	26.58	-4.07

A5	22.24	2.3	51.15	26.80	18.75	41.69	40.92	1.88
A52	30.06	1.0	30.06	26.80	18.75	33.00	37.14	-11.15
A53	22.71	1.0	22.71	26.80	18.75	29.73	32.19	-7.64
A54	35.24	1.0	35.24	26.80	18.75	35.23	41.33	-14.76
A55	33.72	1.0	33.72	26.80	18.75	34.58	36.32	-4.79
A57	34.03	2.3	78.27	26.80	18.75	51.55	49.18	4.82
A6	17.98	1.0	17.98	26.80	18.75	27.55	28.81	-4.38
A64	33.74	1.0	33.74	26.80	18.75	34.59	35.05	-1.31
A7	22.14	1.0	22.14	26.80	18.75	29.47	29.31	0.54
A87	54.14	1.0	54.14	26.80	18.75	42.84	38.06	12.57
A9	34.21	1.0	34.21	26.80	18.75	34.79	34.41	1.10
A90	31.38	1.0	31.38	26.80	18.75	33.58	39.99	-16.03
A91	14.29	1.0	14.29	26.80	18.75	25.82	31.93	-19.13
A94	13.47	1.0	13.47	26.80	18.75	25.42	26.20	-2.99
A95	17.99	1.0	17.99	26.80	18.75	27.56	24.97	10.35
A96	18.87	1.0	18.87	26.80	18.75	27.97	34.38	-18.65
A97	12.64	1.0	12.64	26.80	18.75	25.03	22.04	13.56
C21	25.01	1.0	25.01	26.80	18.75	30.77	28.33	8.60
C23	40.47	1.0	40.47	26.80	18.75	37.41	42.85	-12.70
C26	59.78	1.0	59.78	26.80	18.75	44.97	42.13	6.74
C27	57.09	1.0	57.09	26.80	18.75	43.97	52.00	-15.44
C56	34.88	1.0	34.88	26.80	18.75	35.07	34.63	1.27
C62	35.75	1.0	35.75	26.80	18.75	35.44	30.69	15.49
16	24.51	1.0	24.51	26.80	18.75	30.54	37.39	-18.32
17	22.87	1.0	22.87	26.80	18.75	29.80	37.07	-19.61
6	26.31	1.0	26.31	26.80	18.75	31.35	39.03	-19.68

D13	11.61	1.0	11.61	26.80	18.75	24.53	27.82	-11.84
D19	43.58	2.3	100.24	26.80	18.75	58.71	54.75	7.24
D20	44.87	1.0	44.87	26.80	18.75	39.20	43.87	-10.65
D22	30.37	1.0	30.37	26.80	18.75	33.14	39.89	-16.92
D25	32.80	1.0	32.80	26.80	18.75	34.19	41.05	-16.70
D32	29.09	1.0	29.09	26.80	18.75	32.58	37.06	-12.10
D33	22.94	1.0	22.94	26.80	18.75	29.83	31.28	-4.63
D35	19.35	2.3	44.50	26.80	18.75	39.05	42.00	-7.03
D36	14.55	2.3	33.47	26.80	18.75	34.47	37.52	-8.14
D37	23.04	1.0	23.04	26.80	18.75	29.88	33.23	-10.09
D38	17.73	1.0	17.73	26.80	18.75	27.44	26.53	3.42
D39	27.11	1.0	27.11	26.80	18.75	31.71	34.03	-6.82
D40	25.05	1.0	25.05	26.80	18.75	30.79	31.55	-2.40
D41	22.37	2.3	51.44	26.80	18.75	41.80	41.08	1.76
D43	88.03	1.0	88.03	26.80	18.75	54.81	47.86	14.52
D46	26.81	2.3	61.67	26.80	18.75	45.67	42.62	7.16
D48	29.12	1.0	29.12	26.80	18.75	32.59	41.21	-20.91
D53	22.58	1.0	22.58	26.80	18.75	29.67	32.12	-7.64
D54	22.41	1.0	22.41	26.80	18.75	29.59	30.61	-3.32
D55	30.55	1.0	30.55	26.80	18.75	33.21	39.79	-16.54
102	23.20	1.0	23.20	26.80	18.75	29.95	34.46	-13.09
103	23.12	1.0	23.12	26.80	18.75	29.92	37.60	-20.42
104	23.20	1.0	23.20	26.80	18.75	29.95	36.88	-18.79
105	12.82	1.0	12.82	26.80	18.75	25.11	23.72	5.86
108	15.84	1.0	15.84	26.80	18.75	26.55	26.35	0.77
110	55.16	1.0	55.16	26.80	18.75	43.23	51.32	-15.77

111	17.83	1.0	17.83	26.80	18.75	27.48	31.94	-13.97
112	14.55	1.0	14.55	26.80	18.75	25.94	27.18	-4.56
113	12.54	1.0	12.54	26.80	18.75	24.98	23.89	4.54
114	55.82	1.0	55.82	26.80	18.75	43.48	41.47	4.85
115	47.79	1.0	47.79	26.80	18.75	40.37	48.41	-16.61
116	14.35	1.0	14.35	26.80	18.75	25.85	31.51	-17.96
118	15.83	1.0	15.83	26.80	18.75	26.54	25.21	5.28
123	10.65	1.0	10.65	26.80	18.75	24.07	23.51	2.38
128	15.80	1.0	15.80	26.80	18.75	26.53	22.47	18.09
13	41.06	1.0	41.06	26.80	18.75	37.66	48.26	-21.97
14	39.51	2.3	90.88	26.80	18.75	55.74	52.17	6.84
35	11.43	1.0	11.43	26.80	18.75	24.44	27.47	-11.03
37	28.73	1.0	28.73	26.80	18.75	32.42	37.47	-13.47
40	19.75	1.0	19.75	26.80	18.75	28.37	27.08	4.75
45	20.39	1.0	20.39	26.80	18.75	28.67	35.63	-19.52
68	17.85	1.0	17.85	26.80	18.75	27.49	29.35	-6.35
69	13.58	1.0	13.58	26.80	18.75	25.48	23.71	7.47
7	30.43	2.3	69.99	26.80	18.75	48.68	55.16	-11.75
78	32.13	1.0	32.13	26.80	18.75	33.90	32.11	5.57
79	32.13	1.0	32.13	26.80	18.75	33.90	35.21	-3.71
80	32.13	1.0	32.13	26.80	18.75	33.90	32.99	2.77

Figure A3-1: Modelled vs monitored nitrogen dioxide concentrations at 94 roadside locations within the study area