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3 November 2014

Braith Gilchrist
Lead, Planning & Assessment
SMEC Australia
Via email: Braith.Gilchrist@smec.com

RE: Response to EPA request for further data

Dear Braith,

It is understood that the NSW EPA seeks further information in regard to the M4 Widening Project. Essentially EPA seeks that the predicted ground level concentrations of principal air pollutants be provided at various distances from the M4 and Parramatta Road so that it can better assess the Project.

In regard to conducting an assessment of potential impacts, the Draft EIA Air Quality Impact Assessment (AQIA) report examines the nearest receptor location along both the M4 and Parramatta Road, using the highly conservative, worst-case calculations that would overstate the likely actual effects

For the entire length of the section of Parramatta Road near the Project, it would appear that there are approximately 3 or 4 potential residential receptor dwellings on Parramatta Road. All other properties on Parramatta Road appear to be commercial or industrial operations. There are many other residential receptors behind the first row of properties along Parramatta Road.

The data requested are provided in the tables and figures in the **Appendix** to this letter for the principal air pollutants for which there are criteria in the Approved Methods, i.e. PM_{10}, NO_2, CO.

All of the results are shown for various sections of the M4 and Parramatta Road as identified in **Figure A-1**. The sections of the M4 that were assessed are unchanged relative to the Draft EIA AQIA, and include Sections 6 and 7 which examine the cumulative effect of both the M4 and Parramatta Road which are close together for the eastern Parts of the Project.

Tables of results

The distance of the nearest corresponding residential receptor for each of the tables of results is provided in the title of the table (noting that in some cases there are no residential receptors in the vicinity of the road. Also, every prediction that may be above EPA criteria at the nearest receptor in any section is shaded in yellow highlighting).

Two sets of tables have been provided, the first is for receptors along the M4 and the second set of tables for receptors along Parramatta Road. There is also a summary table for each road included.

These tables show that there are few levels above criteria at the most affected receptors, and as discussed in detail below, it is clear that these effects are due to high background levels and conservative assumptions that overstate likely impacts. For the pollutants that may exceed EPA criteria, the assessment shows that pollutant levels would reduce by 2 to 11%.

As it is good practice and more relevant from a health perspective to consider the change that a project may produce in pollutant levels, the relative change due to the project is also provided in detailed tables for the principal air pollutants and $PM_{2.5}$. This relative change is the focus of the assessment, and it can be seen that the project will largely reduce emissions at most receptors, and at worst lead to a 4% increase at some receptors for annual average $PM_{2.5}$. However, given the inherent over prediction in the model, the actual increase is likely to be significantly less than 4%.

Results Figures

Figure A-2 and **Figure A-3** show the change in pollutant levels beside the roadway for Parramatta Road and are also provided, in the same format as the figures, showing the same information for the M4 Project Roadway, in the Draft EIS AQIA report that EPA has reviewed.

This letter also discusses the modelling approach and outlines the aspects of the modelling that result in over estimation of the pollutant concentration predictions.

Modelling approach

As the M4 widening project would make a change to an existing road, the approach taken in the assessment is to assess the change in the existing level of impacts along the roadway.

A feature of air dispersion models generally is that they are most powerful and useful in determining the relative differences between similar scenarios, in this case the existing case and future case scenario for the widening of a major roadway. Essentially most air dispersion models will determine the relative difference reliably. This is because when making a comparison, it is the factors that change between the two scenarios that affect the model outputs (all other variables being equal) and the aspects that change, are normally accurately known. Thus the inherent model accuracy, background levels and other such factors are the same for each scenario and do not affect the relative comparison to a great extent. In this case, it is the change in traffic numbers and the small spatial change in the road alignment that differs between the two scenarios.

For the same reasons, air dispersion models do not perform as accurately when used to predict absolute pollutant levels, (i.e. because a range of other less accurately definable data is used and the model algorithms also need to be accurate in absolute terms).

A general feature of screening models and regulatory models is that they are all designed to over predict actual impacts (or in other words to not under predict impacts). The level of accuracy, or the degree to which a model can be configured to produce results closer to the actual pollutant concentration levels that may occur, will be governed by the inherent modelling algorithms, the available data, the quality of that data and the settings selected by the modeller.

In this instance there is some limitation in the scope available to produce accurate cumulative predictions as there are no roadside data that can be used to determine the existing pollutant levels in the vicinity of the roadway. However, even if there were data available at some point nearby to the roadway, the actual

pollutant concentration levels along the length of the roadway can be expected to vary significantly in the same way that the background pollutant levels in Sydney vary at the different monitors or even at the same monitor over time.

Recently measured background pollutant concentrations for PM_{10} in Sydney are provided in **Table A-1**, and show that variations of 55% to 280% occur across the region in various years and that the variation in 24-hour average maximums can be approximately 500%. It is important to note that these data are from monitoring sites away from industry and roads and are likely to be representative of underlying baseline levels, and unlikely to fluctuate as much as the pollutant concentrations near industry or roads.

The question thus arises as to whether developing an accurate air dispersion model is necessary. An accurate air dispersion model would be warranted in cases where there is a real and major risk of significant impact occurring, where these impacts could otherwise be controlled through mitigation, and where it is possible/ practicable to develop such an accurate model. Noting that increased model accuracy/precision is needed where the change small (an otherwise inaccurate model in this case would mean that result is not reliable).

Thus a typical approach is to use a screening level model which will over estimate impacts. Where the impacts meet criteria, or where there is minimal change, it is not warranted to develop a more detailed and accurate model, nor will it be feasible or practical to do so.

For this project, a screening model developed specifically for NSW roadways was used.

The modelling results show that the maximum increase in pollutant concentrations for pollutants that may potentially be above EPA criteria would be up to approx. 4%. The results also show that in most cases there is a reduction in impacts along the M4 Motorway.

As it is reliably demonstrated that the worst case effect is small (up to a 4% increase in pollutant concentrations at some locations) and there is limited scope to produce reliably accurate absolute pollutant concentration predictions, further detailed model development for the purpose of comparison to criteria that do not apply to roads would not appear to be fruitful or warranted.

Inherent model over estimation

The TRAQ model used in this study is specifically designed for NSW roadways and is underpinned by the US EPA (CALINE) regulatory screening model. As such the model will inherently overestimate the likely emission concentrations at receptors, as follows:

- The TRAQ model identifies the meteorological condition which will result in the maximum impact from a road at any receptor. The worst case meteorological condition identified is generally a low wind speed blowing along the worst case wind direction with stable atmospheric conditions. Such conditions more commonly arise at night and near dawn. This is the only meteorological condition used in the model for each receptor.
- The model uses the worst case meteorological condition with the maximum predicted peak hour traffic numbers and associated emissions (even if such weather conditions never occur at peak traffic times).

- The model outputs 1-hour average results for the worst case meteorological condition at each receptor.
- The model converts the maximum 1-hour prediction to 24-hour average and annual average results using conversion factors of 0.5 and 0.2 respectively (whereas in reality 24-hour and annual average levels will be affected by the varying traffic profile and weather conditions over time). These conversion factors are likely to overestimate actual levels as they are unlikely to fully account for the natural variation of meteorology and the diurnal/ annual cycle of traffic and emissions.
- Where the M4 and Parramatta Road are adjacent (e.g. Section 6), TRAQ outputs for each road were combined. This is highly conservative as the results at a receptor are based on worst case wind directions which would be different at the same receptor for each of the M4 and Parramatta Roads. This means that results from two different runs with independent meteorological conditions were combined to give a single result (i.e. the modelling assumes the wind can blow along two different worst case directions simultaneously, which is of course impossible in reality, thus the results over estimate potential air pollutant concentrations for the two roads combined).
- The inherent model algorithms that calculate pollutant concentrations are designed to not under predict pollutant concentrations and thus there is inherent overestimation.
- All other input variables, such as the background concentration data, traffic numbers and the closest receptors were selected to present the maximum possible impact.

As a guide, in consideration of typical model performance, the actual pollutant levels from the roadway are likely to be two to five times lower than the incremental levels for the roadway used in the assessment.

For these reasons, the model predictions will be higher than may occur in practice and should not be compared with criteria. However it is noted that NSW EPA seeks that this be done, and the comparison is outlined below.

Comparison to EPA criteria

Table A-3 to **Table A-9** show predicted pollutant concentrations and percent change for PM_{10}, CO and NO_2.

1. For Section 1 – M4 - (refer to **Table A-3**) only 1-hour average NO_2 in the 2017 case could potentially exceed EPA criteria. Given that the receptor is 25m away from the roadway and the results at 20m are marginally higher than the criteria (246.7, vs. 246.0 µg/m^3), it is unlikely that there would be an impact.

   It is also noted that the background NO_2 level used is the maximum 1-hour level measured over a 4-year period at the three monitoring sites (i.e. 131.6µg/m^3). This is the highest 1-hour value out of (4 years x 3 sites x 365 days x 24 hours=) 105,120 hours of monitoring data in the area and is applied to all hours of the year in the assessment.

   It is more relevant to note that there is a 2% decrease in pollutant level in 2017 relative to the do nothing case at this receptor.

2. For Section 2, 3 and 4 – M4 - (refer to **Table A-4, Table A-5** and **Table A-6**) no impact is predicted at the nearest receptor.

3. For Section 5 – M4 - (refer to **Table A-7**) only 1-hour average NO_2 in the 2017 case could potentially exceed EPA criteria. Given that the receptor is 17m away from the roadway and the results are available at 20m from the road, the values at the receptor would be higher than at 20m by some degree. However it needs to be noted that the result assumes that the worst case 1-hour of meteorology, traffic volumes and background data all occur simultaneously for this result to arise, and in reality this is unlikely and the result is most likely to be much lower.

   What is most relevant in this case is that (refer to **Table A-15**) the project would result in an 11% decrease in 1-hour NO_2 emissions in the 2017 case (relative to not having the widened roadway in 2017).

4. For Section 6 and 7 – M4 - (refer to **Table A-8** and **Table A-9**) no impact is predicted at the nearest receptor. The results for these sections include conservative assumptions that add the two maximum impacts even though they occur at different times for different wind conditions to arrive at the cumulative maximum impacts shown from both the M4 and Parramatta roadways.

5. For Sections 8, 9 to 10 – Parra Rd - (refer to Table A-10**Table A-10** and **Table A-12**), there are no residential receptors in the vicinity of the roadway, or any impacts predicted.

6. For Section 11 – Parra Rd - (refer to Table A-10**Table A-13**), there are up to 4 potential residential receptors within 10 to 20 metres of the Roadway, however no impacts are predicted.

7. For Section 12 - Parra Rd - (refer to Table A-10**Table A-14**), there are no residential receptors in the vicinity of the roadway, or any impacts predicted.

It should be noted that throughout this letter, impacts refer to the effect at the most affected (closest) receptor in any section of the roadway, and all other receptors, being further away would experience less effect.

It can be seen that the conservatively predicted levels are not above EPA criteria at the most affected receptors in most cases, and where the levels are above criteria (highlighted in yellow shading in the tables) this is largely due to the high assumed background level and the over estimation inherent in the modelling.

As a guide, in consideration of typical model performance, the actual pollutant levels from the roadway are likely to be two to five times lower than the incremental levels for the roadway used in the assessment. This indicates that in reality it is unlikely that there would be any levels above EPA criteria, however this will largely depend on the prevailing background levels of pollutants.

Overall the results show that there is generally a small decrease in impacts at receptors along the M4 and generally a small net increase in impacts for receptors along Parramatta Road. The change in impacts is a small percentage of the existing impact levels.

Evaluation of $PM_{2.5}$ impacts

As there are no criteria for the assessment of $PM_{2.5}$ in NSW, the relative change in $PM_{2.5}$ levels is the focus of the assessment. The relative change has been considered where the results indicate that the cumulative $PM_{2.5}$ level, using background values of 6.5 and 7.5 $\mu g/m^3$ for the annual average and 24-hour average respectively, may be near to the NEPM reporting standards.

The worst case $PM_{2.5}$ levels that approach the NEPM reporting standards are highlighted in yellow shading in **Table A-15**. The results show that at worst there may be up to a 4% increase in annual average $PM_{2.5}$ levels at some of the most impacted receptors.

This 4% change is considered to be a small change that would not have any significant effect. For example the smallest change that occurs in annual average background levels was 16% across the Sydney Basin in 2010 (refer to **Table A-2**), and the minimum change at any one location occurs at the Chullora $PM_{2.5}$ monitor, which is the monitor nearest the roadway, and shows a variation of 46% in annual average $PM_{2.5}$ over time.

In this context, the project is not considered to have any significant impact.

Yours faithfully,

Todoroski Air Sciences

Aleks Todoroski

APPENDIX

Table A-1: NSW EPA PM_{10} monitoring data (2010 - 2013) ($\mu g/m^3$)

Year		Randwick	Rozelle	Lindfield	Liverpool	Bringelly	Chullora	Earlwood	Richmond	Bargo	St Marys	Vineyard	Macarthur	Oakdale	Prospect	Campbelltown West	Camden	Year Min	Year Max	Percent Variation
2010	Annual Ave	16.0	16.1	13.6	17.0	15.5	17.7	17.9	13.1	12.9	15.1	14.5	14.0	10.7	15.4	-	-	10.7	17.9	**66%**
	Max 24hr	42.7	37.6	48.2	41.1	41.1	42.1	47.8	37.0	34.9	52.1	39.7	58.7	33.3	40.1	-	-	33.3	58.7	**76%**
2011	Annual Ave	16.0	16.6	13.3	18.1	15.9	19.8	18.0	13.2	12.9	14.7	14.0	13.2	10.7	15.8	-	-	10.7	19.8	**85%**
	Max 24hr	40.1	39.4	35.7	68.8	86.0	65.2	124.9	46.2	89.7	73.9	32.7	38.1	54.7	41.5	-	-	32.7	124.9	**282%**
2012	Annual Ave	17.9	16.9	13.9	19.8	15.7	18.1	19.5	15.1	14.3	14.5	14.4	12.6	11.7	17.2	18.9	20.1	11.7	20.1	**72%**
	Max 24hr	43.7	40.7	34.5	42.5	40.1	52.4	44.2	99.2	45.2	34.3	34.3	33.9	38.9	38.7	39.3	35.6	33.9	99.2	**193%**
2013	Annual Ave	18.8	18.3	14.4	21.0	17.0	18.3	19.9	17.3	15.3	16.0	16.1	-	13.6	19.2	15.5	15.4	13.6	21.0	**55%**
	Max 24hr	55.3	58.5	63.4	98.5	97.2	69.4	63.1	104.6	208.9	93.0	67.8	-	99.0	81.8	56.9	97.5	55.3	208.9	**278%**
Max 24hr	Site Min	40.1	37.6	34.5	41.1	40.1	42.1	44.2	37.0	34.9	34.3	32.7	33.9	33.3	38.7	39.3	35.6			
Max 24hr	Site Max	55.3	58.5	63.4	98.5	97.2	69.4	124.9	104.6	208.9	93.0	67.8	58.7	99.0	81.8	56.9	97.5			
24 hr Percent Variation		**38%**	**56%**	**84%**	**140%**	**142%**	**65%**	**183%**	**183%**	**499%**	**171%**	**107%**	**73%**	**197%**	**111%**	**45%**	**174%**			
AA	Site Min	16.0	16.1	13.3	17.0	15.5	17.7	17.9	13.1	12.9	14.5	14.0	12.6	10.7	15.4	15.5	15.4			
AA	Site Max	18.8	18.3	14.4	21.0	17.0	19.8	19.9	17.3	15.3	16.0	16.1	14.0	13.6	19.2	18.9	20.1			
AA Percent Variation		**18%**	**13%**	**8%**	**24%**	**10%**	**12%**	**11%**	**32%**	**19%**	**11%**	**15%**	**10%**	**27%**	**25%**	**22%**	**31%**			

Table A-2: NSW EPA $PM_{2.5}$ monitoring data (2010 - 2013) ($\mu g/m^3$)

Year		Liverpool	Chullora	Earlwood	Richmond	Year Min	Year Max	Percent Variation
2010	Annual Ave	6.3	5.7	5.7	4.2	4.2	6.3	51%
	Max 24hr	21.8	24.2	22.5	20.8	20.8	24.2	16%
2011	Annual Ave	5.9	5.9	5.4	4.7	4.7	5.9	27%
	Max 24hr	38.0	23.9	23.6	42.9	23.6	42.9	82%
2012	Annual Ave	8.5	6.1	5.6	5.3	5.3	8.5	60%
	Max 24hr	24.9	23.7	20.7	116.7	20.7	116.7	464%
2013	Annual Ave	9.4	8.4	7.9	8.3	7.9	9.4	19%
	Max 24hr	73.8	49.1	37.3	68.0	37.3	73.8	98%
Max 24hr	Site Min	21.8	23.7	20.7	20.8			
Max 24hr	Site Max	73.8	49.1	37.3	116.7			
24hr Percent Variation		239%	107%	80%	461%			
AA	Site Min	5.9	5.7	5.4	4.2			
AA	Site Max	9.4	8.4	7.9	8.3			
AA Percent Variation		59%	46%	46%	98%			

Table A-3: Predicted pollutant concentrations – Section 1 (M4) (nearest receptor distance: 25m)

	Pollutant	Particulate matter ≤10µm (PM_{10})		Nitrogen Dioxide (NO_2)		Carbon Monoxide (CO)	
	Averaging Period	24 hour	Annual	1 hour	Annual	1 hour	8 hours
	Criterion	50	30	246	62	30	10
	Units	µg/m^3				mg/m^3	
20m from road	Without (2017)	41.6	26.2	252.2	46.2	6.6	3.5
	Worst Case With (2017)	40.5	25.7	246.7	45.1	6.6	3.5
	Without (2027)	37.2	24.4	198.5	35.5	6.2	3.2
	Worst Case With (2027)	38.5	24.9	212.3	38.2	6.0	3.1
	Change due to Project (2017)	-1.1	-0.5	-5.5	-1.1	0.0	0.0
	Change due to Project (2027)	1.3	0.5	13.8	2.7	-0.2	-0.1
	Percent Change (2017)	-3%	-2%	-2%	-2%	0%	0%
	Percent Change (2027)	3%	2%	7%	8%	-3%	-3%
50m from road	Without (2017)	34.8	23.4	214.7	38.7	6.3	3.3
	Worst Case With (2017)	34.0	23.1	211.1	38.0	6.4	3.3
	Without (2027)	31.8	22.2	177.8	31.3	6.1	3.1
	Worst Case With (2027)	32.7	22.6	187.1	33.2	5.9	3.0
	Change due to Project (2017)	-0.8	-0.3	-3.6	-0.7	0.1	0.0
	Change due to Project (2027)	0.9	0.4	9.3	1.9	-0.2	-0.1
	Percent Change (2017)	-2%	-1%	-2%	-2%	2%	0%
	Percent Change (2027)	3%	2%	5%	6%	-3%	-3%
100m from road	Without (2017)	30.7	21.8	192.1	34.2	6.2	3.2
	Worst Case With (2017)	30.0	21.5	188.7	33.5	6.2	3.2
	Without (2027)	28.5	20.9	165.5	28.9	6.0	3.0
	Worst Case With (2027)	29.2	21.2	172.4	30.3	5.9	3.0
	Change due to Project (2017)	-0.7	-0.3	-3.4	-0.7	0.0	0.0
	Change due to Project (2027)	0.7	0.3	6.9	1.4	-0.1	0.0
	Percent Change (2017)	-2%	-1%	-2%	-2%	0%	0%
	Percent Change (2027)	2%	1%	4%	5%	-2%	0%

Table A-4: Predicted pollutant concentrations – Section 2 (M4) (nearest receptor distance: 20m)

	Pollutant	Particulate matter ≤10µm (PM_{10})		Nitrogen Dioxide (NO_2)		Carbon Monoxide (CO)	
	Averaging Period	24 hour	Annual	1 hour	Annual	1 hour	8 hours
	Criterion	50	30	246	62	30	10
	Units	µg/m^3				mg/m^3	
20m from road	Without (2017)	38.2	24.8	234.0	42.6	6.4	3.3
	Worst Case With (2017)	35.9	23.9	224.1	40.6	6.6	3.5
	Without (2027)	34.9	23.5	202.0	36.2	6.1	3.1
	Worst Case With (2027)	34.3	23.3	186.4	33.1	6.6	3.5
	Change due to Project (2017)	-2.3	-0.8	-9.9	-2.0	0.3	0.2
	Change due to Project (2027)	-0.6	-0.3	-15.5	-3.1	0.5	0.4
	Percent Change (2017)	-6%	-3%	-4%	-5%	4%	6%
	Percent Change (2027)	-2%	-1%	-8%	-9%	8%	12%
50m from road	Without (2017)	32.4	22.4	201.8	36.1	6.2	3.2
	Worst Case With (2017)	31.1	21.9	196.5	35.1	6.4	3.3
	Without (2027)	30.2	21.6	179.5	31.7	6.0	3.0
	Worst Case With (2027)	30.0	21.5	170.4	29.8	6.3	3.3
	Change due to Project (2017)	-1.3	-0.5	-5.3	-1.0	0.2	0.1
	Change due to Project (2027)	-0.1	0.0	-9.1	-1.9	0.3	0.3
	Percent Change (2017)	-4%	-2%	-3%	-3%	3%	3%
	Percent Change (2027)	0%	0%	-5%	-6%	5%	10%
100m from road	Without (2017)	28.9	21.1	182.4	32.3	6.1	3.1
	Worst Case With (2017)	27.9	20.7	178.1	31.4	6.2	3.2
	Without (2027)	27.3	20.4	166.6	29.1	5.9	3.0
	Worst Case With (2027)	27.1	20.4	159.4	27.6	6.2	3.2
	Change due to Project (2017)	-1.1	-0.4	-4.2	-0.9	0.1	0.1
	Change due to Project (2027)	-0.2	0.0	-7.2	-1.5	0.3	0.2
	Percent Change (2017)	-4%	-2%	-2%	-3%	2%	3%
	Percent Change (2027)	-1%	0%	-4%	-5%	5%	6%

Table A-5: Predicted pollutant concentrations – Section 3 (M4) (nearest receptor distance: 10m (from off-ramp))

	Pollutant	Particulate matter ≤10µm (PM_{10})		Nitrogen Dioxide (NO_2)		Carbon Monoxide (CO)	
	Averaging Period	24 hour	Annual	1 hour	Annual	1 hour	8 hours
	Criterion	50	30	246	62	30	10
	Units	µg/m^3				mg/m^3	
20m from road	Without (2017)	38.3	24.9	234.8	42.8	6.4	3.3
	Worst Case With (2017)	35.6	23.8	216.6	39.1	6.6	3.5
	Without (2027)	35.0	23.5	202.5	36.3	6.1	3.1
	Worst Case With (2027)	34.1	23.1	181.5	32.0	6.5	3.4
	Change due to Project (2017)	-2.7	-1.1	-18.2	-3.7	0.2	0.2
	Change due to Project (2027)	-0.9	-0.4	-21.0	-4.2	0.4	0.3
	Percent Change (2017)	-7%	-4%	-8%	-9%	3%	6%
	Percent Change (2027)	-3%	-2%	-10%	-12%	6%	9%
50m from road	Without (2017)	32.4	22.4	202.1	36.2	6.2	3.2
	Worst Case With (2017)	30.7	21.8	190.4	33.9	6.4	3.3
	Without (2027)	30.2	21.6	179.8	31.8	6.0	3.0
	Worst Case With (2027)	29.9	21.4	166.6	29.1	6.3	3.3
	Change due to Project (2017)	-1.6	-0.6	-11.6	-2.3	0.2	0.1
	Change due to Project (2027)	-0.3	-0.1	-13.2	-2.7	0.3	0.3
	Percent Change (2017)	-5%	-3%	-6%	-6%	3%	3%
	Percent Change (2027)	-1%	-1%	-7%	-8%	5%	10%
100m from road	Without (2017)	28.9	21.1	182.4	32.3	6.1	3.1
	Worst Case With (2017)	27.7	20.6	173.8	30.6	6.2	3.2
	Without (2027)	27.3	20.4	166.6	29.1	5.9	3.0
	Worst Case With (2027)	27.1	20.3	156.8	27.2	6.2	3.2
	Change due to Project (2017)	-1.3	-0.5	-8.6	-1.7	0.1	0.1
	Change due to Project (2027)	-0.2	-0.1	-9.9	-1.9	0.3	0.2
	Percent Change (2017)	-4%	-2%	-5%	-5%	2%	3%
	Percent Change (2027)	-1%	0%	-6%	-7%	5%	6%

Table A-6: Predicted pollutant concentrations – Section 4 (M4) (nearest receptor distance: 45m)

	Pollutant	Particulate matter ≤10µm (PM_{10})		Nitrogen Dioxide (NO_2)		Carbon Monoxide (CO)	
	Averaging Period	24 hour	Annual	1 hour	Annual	1 hour	8 hours
	Criterion	50	30	246	62	30	10
	Units	µg/m^3				mg/m^3	
20m from road	Without (2017)	43.8	27.0	272.8	50.3	6.9	3.7
	Worst Case With (2017)	37.5	24.5	233.2	42.4	6.7	3.5
	Without (2027)	38.6	25.0	217.5	39.3	6.4	3.3
	Worst Case With (2027)	36.8	24.3	198.5	35.5	6.4	3.3
	Change due to Project (2017)	-6.3	-2.5	-39.6	-7.9	-0.2	-0.2
	Change due to Project (2027)	-1.8	-0.7	-19.0	-3.8	0.0	0.0
	Percent Change (2017)	-14%	-9%	-15%	-16%	-3%	-5%
	Percent Change (2027)	-5%	-3%	-9%	-10%	0%	0%
50m from road	Without (2017)	35.8	23.8	225.6	40.9	6.5	3.4
	Worst Case With (2017)	31.9	22.3	201.0	36.0	6.4	3.3
	Without (2027)	32.4	22.5	188.5	33.5	6.2	3.2
	Worst Case With (2027)	31.5	22.1	177.9	31.4	6.2	3.2
	Change due to Project (2017)	-3.9	-1.5	-24.6	-4.9	-0.1	-0.1
	Change due to Project (2027)	-0.9	-0.4	-10.6	-2.1	0.0	0.0
	Percent Change (2017)	-11%	-6%	-11%	-12%	-2%	-3%
	Percent Change (2027)	-3%	-2%	-6%	-6%	0%	0%
100m from road	Without (2017)	31.3	22.0	199.2	35.6	6.3	3.3
	Worst Case With (2017)	28.4	20.9	181.0	32.0	6.2	3.2
	Without (2027)	28.9	21.1	172.5	30.3	6.1	3.1
	Worst Case With (2027)	28.3	20.8	165.2	28.8	6.1	3.1
	Change due to Project (2017)	-2.9	-1.1	-18.2	-3.6	-0.1	-0.1
	Change due to Project (2027)	-0.6	-0.3	-7.3	-1.5	0.0	0.0
	Percent Change (2017)	-9%	-5%	-9%	-10%	-2%	-3%
	Percent Change (2027)	-2%	-1%	-4%	-5%	0%	0%

Table A-7: Predicted pollutant concentrations – Section 5 (M4) (nearest receptor distance: 17m (from off-ramp))

	Pollutant	Particulate matter ≤10µm (PM_{10})		Nitrogen Dioxide (NO_2)		Carbon Monoxide (CO)	
	Averaging Period	24 hour	Annual	1 hour	Annual	1 hour	8 hours
	Criterion	50	30	246	62	30	10
	Units	µg/m^3				mg/m^3	
20m from M4	Without (2017)	43.7	27.0	281.9	52.2	7.1	3.8
	Worst Case With (2017)	39.3	25.2	252.0	46.2	6.8	3.6
	Without (2027)	38.6	25.0	217.2	39.2	6.6	3.5
	Worst Case With (2027)	39.9	25.5	226.2	41.0	6.2	3.2
	Change due to Project (2017)	-4.4	-1.8	-29.9	-6.0	-0.3	-0.2
	Change due to Project (2027)	1.3	0.5	9.0	1.8	-0.4	-0.3
	Percent Change (2017)	-10%	-7%	-11%	-11%	-4%	-5%
	Percent Change (2027)	3%	2%	4%	5%	-6%	-9%
50m from M4	Without (2017)	36.2	24.0	233.7	42.5	6.7	3.5
	Worst Case With (2017)	33.2	22.8	213.7	38.5	6.5	3.4
	Without (2027)	32.7	22.6	189.6	33.7	6.3	3.3
	Worst Case With (2027)	33.5	22.9	196.2	35.0	6.1	3.1
	Change due to Project (2017)	-3.0	-1.2	-20.0	-4.0	-0.2	-0.1
	Change due to Project (2027)	0.8	0.3	6.6	1.3	-0.2	-0.2
	Percent Change (2017)	-8%	-5%	-9%	-9%	-3%	-3%
	Percent Change (2027)	2%	1%	3%	4%	-3%	-6%
100m from M4	Without (2017)	31.6	22.2	204.8	36.7	6.4	3.3
	Worst Case With (2017)	29.4	21.3	190.1	33.8	6.3	3.2
	Without (2027)	29.1	21.2	173.2	30.4	6.2	3.2
	Worst Case With (2027)	29.7	21.4	178.1	31.4	6.0	3.0
	Change due to Project (2017)	-2.2	-0.9	-14.7	-2.9	-0.1	-0.1
	Change due to Project (2027)	0.6	0.2	4.9	1.0	-0.2	-0.2
	Percent Change (2017)	-7%	-4%	-7%	-8%	-2%	-3%
	Percent Change (2027)	2%	1%	3%	3%	-3%	-6%

Table A-8: Predicted pollutant concentrations – Section 6 (M4 & Parramatta Road) (nearest receptor distance: 90m)

	Pollutant	Particulate matter ≤10µm (PM_{10})		Nitrogen Dioxide (NO_2)		Carbon Monoxide (CO)	
	Averaging Period	24 hour	Annual	1 hour	Annual	1 hour	8 hours
	Criterion	50	30	246	62	30	10
	Units	µg/m^3				mg/m^3	
20m from M4	Without (2017)	61.6	34.2	282.1	52.2	7.5	4.1
	Worst Case With (2017)	63.7	35.0	285.9	53.0	7.8	4.3
	Without (2027)	58.3	32.8	221.5	40.0	6.8	3.6
	Worst Case With (2027)	63.7	35.0	239.8	43.8	7.6	4.1
	Change due to Project (2017)	2.1	0.8	3.8	0.8	0.3	0.2
	Change due to Project (2027)	5.4	2.2	18.3	3.8	0.8	0.5
	Percent Change (2017)	3%	2%	1%	2%	4%	5%
	Percent Change (2027)	9%	7%	8%	9%	12%	14%
50m from M4	Without (2017)	40.1	25.5	234.0	42.6	6.6	3.5
	Worst Case With (2017)	40.9	25.8	238.0	43.3	6.8	3.6
	Without (2027)	37.9	24.7	192.9	34.4	6.4	3.2
	Worst Case With (2027)	40.7	25.8	205.1	36.8	6.7	3.5
	Change due to Project (2017)	0.8	0.3	4.0	0.7	0.2	0.1
	Change due to Project (2027)	2.8	1.1	12.2	2.4	0.3	0.3
	Percent Change (2017)	2%	1%	2%	2%	3%	3%
	Percent Change (2027)	7%	4%	6%	7%	5%	9%
100m from M4	Without (2017)	32.9	22.7	199.6	35.7	6.4	3.3
	Worst Case With (2017)	33.0	22.8	200.3	35.8	6.4	3.3
	Without (2027)	31.4	22.1	171.7	30.1	6.2	3.2
	Worst Case With (2027)	33.3	22.8	179.7	31.7	6.3	3.3
	Change due to Project (2017)	0.1	0.1	0.7	0.1	0.0	0.0
	Change due to Project (2027)	1.9	0.7	8.0	1.6	0.1	0.1
	Percent Change (2017)	0%	0%	0%	0%	0%	0%
	Percent Change (2027)	6%	3%	5%	5%	2%	3%

Table A-9: Predicted pollutant concentrations – Section 7 (M4 & Parramatta Road) (nearest receptor distance: 50m)

	Pollutant	Particulate matter ≤10µm (PM_{10})		Nitrogen Dioxide (NO_2)		Carbon Monoxide (CO)	
	Averaging Period	24 hour	Annual	1 hour	Annual	1 hour	8 hours
	Criterion	50	30	246	62	30	10
	Units	µg/m^3				mg/m^3	
20m from M4	Without (2017)	32.8	22.6	204.7	36.7	6.4	3.3
	Worst Case With (2017)	32.1	22.4	202.3	36.2	6.4	3.3
	Without (2027)	30.9	21.9	176.3	31.0	6.1	3.1
	Worst Case With (2027)	30.4	21.7	173.1	30.4	6.1	3.1
	Change due to Project (2017)	-0.7	-0.2	-2.4	-0.5	0.0	0.0
	Change due to Project (2027)	-0.5	-0.2	-3.2	-0.6	0.0	0.0
	Percent Change (2017)	-2%	-1%	-1%	-1%	0%	0%
	Percent Change (2027)	-2%	-1%	-2%	-2%	0%	0%
50m from M4	Without (2017)	28.2	20.8	179.2	31.6	6.2	3.2
	Worst Case With (2017)	27.8	20.6	177.7	31.3	6.2	3.2
	Without (2027)	26.9	20.3	160.5	27.9	6.0	3.0
	Worst Case With (2027)	26.7	20.2	158.5	27.5	6.0	3.1
	Change due to Project (2017)	-0.4	-0.2	-1.5	-0.3	0.0	0.0
	Change due to Project (2027)	-0.2	-0.1	-2.0	-0.4	0.0	0.1
	Percent Change (2017)	-1%	-1%	-1%	-1%	0%	0%
	Percent Change (2027)	-1%	0%	-1%	-1%	0%	3%
100m from M4	Without (2017)	25.8	19.8	165.4	28.9	6.1	3.1
	Worst Case With (2017)	25.5	19.7	164.4	28.7	6.1	3.1
	Without (2027)	24.9	19.5	152.2	26.2	6.0	3.0
	Worst Case With (2027)	24.7	19.4	150.8	25.9	6.0	3.0
	Change due to Project (2017)	-0.3	-0.1	-1.0	-0.2	0.0	0.0
	Change due to Project (2027)	-0.2	-0.1	-1.4	-0.3	0.0	0.0
	Percent Change (2017)	-1%	-1%	-1%	-1%	0%	0%
	Percent Change (2027)	-1%	-1%	-1%	-1%	0%	0%

Table A-10: Predicted pollutant concentrations – Section 8 (Parramatta Road) (nearest receptor distance: 40m)

	Pollutant	Particulate matter ≤10µm (PM_{10})		Nitrogen Dioxide (NO_2)		Carbon Monoxide (CO)	
	Averaging Period	24 hour	Annual	1 hour	Annual	1 hour	8 hours
	Criterion	50	30	246	62	30	10
	Units	µg/m^3				mg/m^3	
20m from road	Without (2017)	25.7	19.8	157.5	27.3	6.1	3.1
	Worst Case With (2017)	26.8	20.3	167.6	29.3	6.4	3.3
	Without (2027)	25.4	19.7	150.4	25.9	6.0	3.0
	Worst Case With (2027)	26.0	19.9	155.2	26.8	6.1	3.1
	Change due to Project (2017)	1.1	0.5	10.1	2.0	0.3	0.2
	Change due to Project (2027)	0.6	0.2	4.8	0.9	0.1	0.1
	Percent Change (2017)	4%	3%	6%	7%	5%	6%
	Percent Change (2027)	2%	1%	3%	3%	2%	3%
50m from road	Without (2017)	23.6	19.0	148.4	25.5	6.0	3.0
	Worst Case With (2017)	24.3	19.2	154.7	26.7	6.2	3.2
	Without (2027)	23.4	18.9	143.7	24.5	5.9	3.0
	Worst Case With (2027)	23.8	19.0	146.7	25.1	6.0	3.0
	Change due to Project (2017)	0.7	0.2	6.3	1.2	0.2	0.2
	Change due to Project (2027)	0.4	0.1	3.0	0.6	0.1	0.0
	Percent Change (2017)	3%	1%	4%	5%	3%	7%
	Percent Change (2027)	2%	1%	2%	2%	2%	0%
100m from road	Without (2017)	22.4	18.5	143.1	24.4	5.9	3.0
	Worst Case With (2017)	22.9	18.7	147.5	25.3	6.0	3.1
	Without (2027)	22.3	18.4	140.0	23.8	5.9	3.0
	Worst Case With (2027)	22.5	18.5	142.0	24.2	5.9	3.0
	Change due to Project (2017)	0.5	0.2	4.4	0.9	0.1	0.1
	Change due to Project (2027)	0.2	0.1	2.0	0.4	0.0	0.0
	Percent Change (2017)	2%	1%	3%	4%	2%	3%
	Percent Change (2027)	1%	1%	1%	2%	0%	0%

Table A-11: Predicted pollutant concentrations – Section 9 (Parramatta Road) (nearest receptor distance: 45m)

	Pollutant	Particulate matter ≤10µm (PM_{10})		Nitrogen Dioxide (NO_2)		Carbon Monoxide (CO)	
	Averaging Period	24 hour	Annual	1 hour	Annual	1 hour	8 hours
	Criterion	50	30	246	62	30	10
	Units	µg/m^3				mg/m^3	
20m from road	Without (2017)	27.0	20.3	167.4	29.3	6.3	3.3
	Worst Case With (2017)	27.7	20.6	172.1	30.2	6.4	3.3
	Without (2027)	26.3	20.0	154.1	26.6	6.1	3.1
	Worst Case With (2027)	26.7	20.2	155.7	26.9	6.1	3.1
	Change due to Project (2017)	0.7	0.3	4.7	0.9	0.1	0.0
	Change due to Project (2027)	0.4	0.2	1.6	0.3	0.0	0.0
	Percent Change (2017)	3%	1%	3%	3%	2%	0%
	Percent Change (2027)	2%	1%	1%	1%	0%	0%
50m from road	Without (2017)	24.4	19.3	154.6	26.7	6.1	3.1
	Worst Case With (2017)	24.9	19.5	157.6	27.3	6.2	3.2
	Without (2027)	24.0	19.1	146.0	25.0	6.0	3.0
	Worst Case With (2027)	24.2	19.2	147.1	25.2	6.0	3.0
	Change due to Project (2017)	0.5	0.2	3.0	0.6	0.1	0.1
	Change due to Project (2027)	0.2	0.1	1.1	0.2	0.0	0.0
	Percent Change (2017)	2%	1%	2%	2%	2%	3%
	Percent Change (2027)	1%	1%	1%	1%	0%	0%
100m from road	Without (2017)	22.9	18.7	147.4	25.3	6.0	3.1
	Worst Case With (2017)	23.3	18.8	149.5	25.7	6.1	3.1
	Without (2027)	22.6	18.6	141.5	24.1	5.9	3.0
	Worst Case With (2027)	22.8	18.6	142.3	24.2	5.9	3.0
	Change due to Project (2017)	0.4	0.1	2.1	0.4	0.1	0.0
	Change due to Project (2027)	0.2	0.0	0.8	0.1	0.0	0.0
	Percent Change (2017)	2%	1%	1%	2%	2%	0%
	Percent Change (2027)	1%	0%	1%	0%	0%	0%

Table A-12: Predicted pollutant concentrations – Section 10 (Parramatta Road) (nearest receptor distance: N/A)

	Pollutant	Particulate matter ≤10µm (PM_{10})		Nitrogen Dioxide (NO_2)		Carbon Monoxide (CO)	
	Averaging Period	24 hour	Annual	1 hour	Annual	1 hour	8 hours
	Criterion	50	30	246	62	30	10
	Units	µg/m^3				mg/m^3	
20m from road	Without (2017)	27.2	20.4	167.2	29.2	6.3	3.3
	Worst Case With (2017)	29.2	21.2	192.9	34.4	6.8	3.6
	Without (2027)	27.6	20.6	164.5	28.7	6.2	3.2
	Worst Case With (2027)	28.3	20.8	171.3	30.0	6.3	3.2
	Change due to Project (2017)	2.0	0.8	25.7	5.2	0.5	0.3
	Change due to Project (2027)	0.7	0.2	6.8	1.3	0.1	0.0
	Percent Change (2017)	7%	4%	15%	18%	8%	9%
	Percent Change (2027)	3%	1%	4%	5%	2%	0%
50m from road	Without (2017)	24.6	19.3	154.6	26.7	6.1	3.1
	Worst Case With (2017)	25.8	19.9	170.7	29.9	6.4	3.3
	Without (2027)	24.8	19.4	152.6	26.3	6.1	3.1
	Worst Case With (2027)	25.3	19.6	156.8	27.1	6.1	3.1
	Change due to Project (2017)	1.2	0.6	16.1	3.2	0.3	0.2
	Change due to Project (2027)	0.5	0.2	4.2	0.8	0.0	0.0
	Percent Change (2017)	5%	3%	10%	12%	5%	6%
	Percent Change (2027)	2%	1%	3%	3%	0%	0%
100m from road	Without (2017)	23.1	18.7	147.5	25.3	6.0	3.1
	Worst Case With (2017)	24.0	19.1	158.5	27.5	6.2	3.2
	Without (2027)	23.3	18.8	146.1	25.0	6.0	3.0
	Worst Case With (2027)	23.6	19.0	149.0	25.6	6.0	3.0
	Change due to Project (2017)	0.9	0.4	11.0	2.2	0.2	0.1
	Change due to Project (2027)	0.3	0.2	2.9	0.6	0.0	0.0
	Percent Change (2017)	4%	2%	7%	9%	3%	3%
	Percent Change (2027)	1%	1%	2%	2%	0%	0%

Table A-13: Predicted pollutant concentrations – Section 11 (Parramatta Road) (nearest receptor distance: 10m)

	Pollutant	Particulate matter ≤10µm (PM_{10})		Nitrogen Dioxide (NO_2)		Carbon Monoxide (CO)	
	Averaging Period	24 hour	Annual	1 hour	Annual	1 hour	8 hours
	Criterion	50	30	246	62	30	10
	Units	µg/m^3				mg/m^3	
10m from road	Without (2017)	24.9	19.5	147.7	25.3	6.0	3.0
	Worst Case With (2017)	28.0	20.7	158.5	27.5	6.3	3.2
	Without (2027)	25.4	19.7	143.9	24.6	5.9	3.0
	Worst Case With (2027)	27.8	20.6	153.8	26.5	6.2	3.1
	Change due to Project (2017)	3.1	1.2	10.8	2.2	0.3	0.2
	Change due to Project (2027)	2.4	0.9	9.9	1.9	0.3	0.1
	Percent Change (2017)	12%	6%	7%	9%	5%	7%
	Percent Change (2027)	9%	5%	7%	8%	5%	3%
20m from road	Without (2017)	23.5	18.9	147.5	25.3	5.9	3.0
	Worst Case With (2017)	25.9	19.9	158.2	27.4	6.1	3.1
	Without (2027)	24.0	19.1	143.9	24.6	5.9	3.0
	Worst Case With (2027)	25.7	19.8	153.3	26.4	6.1	3.1
	Change due to Project (2017)	2.4	1.0	10.7	2.1	0.2	0.1
	Change due to Project (2027)	1.7	0.7	9.4	1.8	0.2	0.1
	Percent Change (2017)	10%	5%	7%	8%	3%	3%
	Percent Change (2027)	7%	4%	7%	7%	3%	3%
50m from road	Without (2017)	22.2	18.4	141.8	24.1	5.9	3.0
	Worst Case With (2017)	23.7	19.0	148.9	25.6	6.0	3.0
	Without (2027)	22.5	18.5	139.6	23.7	5.9	2.9
	Worst Case With (2027)	23.6	19.0	145.5	24.9	6.0	3.0
	Change due to Project (2017)	1.5	0.6	7.1	1.5	0.1	0.0
	Change due to Project (2027)	1.1	0.5	5.9	1.2	0.1	0.1
	Percent Change (2017)	7%	3%	5%	6%	2%	0%
	Percent Change (2027)	5%	3%	4%	5%	2%	3%
100m from road	Without (2017)	21.4	18.1	138.6	23.5	5.9	2.9
	Worst Case With (2017)	22.5	18.5	143.6	24.5	5.9	3.0
	Without (2027)	21.6	18.2	137.1	23.2	5.8	2.9
	Worst Case With (2027)	22.4	18.5	141.2	24.0	5.9	3.0
	Change due to Project (2017)	1.1	0.4	5.0	1.0	0.0	0.1
	Change due to Project (2027)	0.8	0.3	4.1	0.8	0.1	0.1
	Percent Change (2017)	5%	2%	4%	4%	0%	3%
	Percent Change (2027)	4%	2%	3%	3%	2%	3%

Table A-14: Predicted pollutant concentrations – Section 12 (Parramatta Road) (nearest receptor distance: N/A)

	Pollutant	Particulate matter ≤10µm (PM_{10})		Nitrogen Dioxide (NO_2)		Carbon Monoxide (CO)	
	Averaging Period	24 hour	Annual	1 hour	Annual	1 hour	8 hours
	Criterion	50	30	246	62	30	10
	Units	µg/m^3				mg/m^3	
20m from road	Without (2017)	25.2	19.6	156.3	27.0	6.1	3.1
	Worst Case With (2017)	27.3	20.4	174.8	30.7	6.5	3.4
	Without (2027)	24.8	19.4	150.5	25.9	6.0	3.1
	Worst Case With (2027)	26.4	20.1	161.1	28.0	6.2	3.2
	Change due to Project (2017)	2.1	0.8	18.5	3.7	0.4	0.3
	Change due to Project (2027)	1.6	0.7	10.6	2.1	0.2	0.1
	Percent Change (2017)	8%	4%	12%	14%	7%	10%
	Percent Change (2027)	6%	4%	7%	8%	3%	3%
50m from road	Without (2017)	23.2	18.8	147.4	25.3	6.0	3.0
	Worst Case With (2017)	24.6	19.4	159.2	27.6	6.2	3.2
	Without (2027)	23.0	18.7	143.5	24.5	5.9	3.0
	Worst Case With (2027)	24.0	19.1	150.3	25.8	6.0	3.1
	Change due to Project (2017)	1.4	0.6	11.8	2.3	0.2	0.2
	Change due to Project (2027)	1.0	0.4	6.8	1.3	0.1	0.1
	Percent Change (2017)	6%	3%	8%	9%	3%	7%
	Percent Change (2027)	4%	2%	5%	5%	2%	3%
100m from road	Without (2017)	22.1	18.4	142.4	24.3	5.9	3.0
	Worst Case With (2017)	23.1	18.8	150.6	25.9	6.1	3.1
	Without (2027)	21.9	18.3	139.7	23.7	5.9	3.0
	Worst Case With (2027)	22.7	18.6	144.4	24.7	6.0	3.0
	Change due to Project (2017)	1.0	0.4	8.2	1.6	0.2	0.1
	Change due to Project (2027)	0.8	0.3	4.7	1.0	0.1	0.0
	Percent Change (2017)	5%	2%	6%	7%	3%	3%
	Percent Change (2027)	4%	2%	3%	4%	2%	0%

Table A-15: Predicted pollutant concentrations – percent change

Section	Distance from road	Pollutant	Particulate matter ≤10µm (PM_{10})		Particulate matter ≤2.5µm ($PM_{2.5}$)		Nitrogen Dioxide (NO_2)		Carbon Monoxide (CO)	
		Averaging Period	24 hour	Annual	24 hours	Annual	1 hour	Annual	1 hour	8 hours
		Criterion	50	30	25	8	246	62	30	10
		Units	µg/m^3						mg/m^3	
Section 1	20m	Change due to Project (2017)	-1.1	-0.5	-0.6	-0.3	-5.5	-1.1	0.0	0.0
		Change due to Project (2027)	1.3	0.5	0.7	0.3	13.8	2.7	-0.2	-0.1
		Percent Change (2017)	-3%	-2%	-3%	-2%	-2%	-2%	0%	0%
		Percent Change (2027)	3%	2%	4%	3%	7%	8%	-3%	-3%
	50m	Change due to Project (2017)	-0.8	-0.3	-0.4	-0.2	-3.6	-0.7	0.1	0.0
		Change due to Project (2027)	0.9	0.4	0.5	0.2	9.3	1.9	-0.2	-0.1
		Percent Change (2017)	-2%	-1%	-3%	-2%	-2%	-2%	2%	0%
		Percent Change (2027)	3%	2%	4%	2%	5%	6%	-3%	-3%
	100m	Change due to Project (2017)	-0.7	-0.3	-0.4	-0.2	-3.4	-0.7	0.0	0.0
		Change due to Project (2027)	0.7	0.3	0.4	0.2	6.9	1.4	-0.1	0.0
		Percent Change (2017)	-2%	-1%	-3%	-2%	-2%	-2%	0%	0%
		Percent Change (2027)	2%	1%	3%	2%	4%	5%	-2%	0%
Section 2	20m	Change due to Project (2017)	-2.3	-0.8	-1.1	-0.4	-9.9	-2.0	0.3	0.2
		Change due to Project (2027)	-0.6	-0.3	-0.3	-0.2	-15.5	-3.1	0.5	0.4
		Percent Change (2017)	-6%	-3%	-7%	-4%	-4%	-5%	4%	6%
		Percent Change (2027)	-2%	-1%	-2%	-2%	-8%	-9%	8%	12%
	50m	Change due to Project (2017)	-1.3	-0.5	-0.7	-0.3	-5.3	-1.0	0.2	0.1
		Change due to Project (2027)	-0.1	0.0	-0.1	0.0	-9.1	-1.9	0.3	0.3
		Percent Change (2017)	-4%	-2%	-5%	-3%	-3%	-3%	3%	3%
		Percent Change (2027)	0%	0%	-1%	0%	-5%	-6%	5%	10%
	100m	Change due to Project (2017)	-1.1	-0.4	-0.5	-0.2	-4.2	-0.9	0.1	0.1
		Change due to Project (2027)	-0.2	0.0	-0.1	0.0	-7.2	-1.5	0.3	0.2
		Percent Change (2017)	-4%	-2%	-4%	-2%	-2%	-3%	2%	3%
		Percent Change (2027)	-1%	0%	-1%	0%	-4%	-5%	5%	6%
Section 3	20m	Change due to Project (2017)	-2.7	-1.1	-1.4	-0.5	-18.2	-3.7	0.2	0.2
		Change due to Project (2027)	-0.9	-0.4	-0.5	-0.2	-21.0	-4.2	0.4	0.3
		Percent Change (2017)	-7%	-4%	-8%	-5%	-8%	-9%	3%	6%
		Percent Change (2027)	-3%	-2%	-3%	-2%	-10%	-12%	6%	9%
	50m	Change due to Project (2017)	-1.6	-0.6	-0.8	-0.3	-11.6	-2.3	0.2	0.1

Section	Distance from road	Pollutant	Particulate matter ≤10µm (PM_{10})		Particulate matter ≤2.5µm ($PM_{2.5}$)		Nitrogen Dioxide (NO_2)		Carbon Monoxide (CO)	
		Averaging Period	24 hour	Annual	24 hours	Annual	1 hour	Annual	1 hour	8 hours
		Criterion	50	30	25	8	246	62	30	10
		Units	µg/m^3						mg/m^3	
		Change due to Project (2027)	-0.3	-0.1	-0.2	-0.1	-13.2	-2.7	0.3	0.3
		Percent Change (2017)	-5%	-3%	-6%	-3%	-6%	-6%	3%	3%
		Percent Change (2027)	-1%	-1%	-1%	-1%	-7%	-8%	5%	10%
	100m	Change due to Project (2017)	-1.3	-0.5	-0.6	-0.2	-8.6	-1.7	0.1	0.1
		Change due to Project (2027)	-0.2	-0.1	-0.1	-0.1	-9.9	-1.9	0.3	0.2
		Percent Change (2017)	-4%	-2%	-5%	-3%	-5%	-5%	2%	3%
		Percent Change (2027)	-1%	0%	-1%	-1%	-6%	-7%	5%	6%
Section 4	20m	Change due to Project (2017)	-6.3	-2.5	-3.2	-1.3	-39.6	-7.9	-0.2	-0.2
		Change due to Project (2027)	-1.8	-0.7	-1.0	-0.4	-19.0	-3.8	0.0	0.0
		Percent Change (2017)	-14%	-9%	-16%	-11%	-15%	-16%	-3%	-5%
		Percent Change (2027)	-5%	-3%	-6%	-4%	-9%	-10%	0%	0%
	50m	Change due to Project (2017)	-3.9	-1.5	-2.0	-0.8	-24.6	-4.9	-0.1	-0.1
		Change due to Project (2027)	-0.9	-0.4	-0.5	-0.2	-10.6	-2.1	0.0	0.0
		Percent Change (2017)	-11%	-6%	-13%	-8%	-11%	-12%	-2%	-3%
		Percent Change (2027)	-3%	-2%	-3%	-2%	-6%	-6%	0%	0%
	100m	Change due to Project (2017)	-2.9	-1.1	-1.5	-0.6	-18.2	-3.6	-0.1	-0.1
		Change due to Project (2027)	-0.6	-0.3	-0.3	-0.2	-7.3	-1.5	0.0	0.0
		Percent Change (2017)	-9%	-5%	-11%	-6%	-9%	-10%	-2%	-3%
		Percent Change (2027)	-2%	-1%	-3%	-2%	-4%	-5%	0%	0%
Section 5	20m	Change due to Project (2017)	-4.4	-1.8	-2.2	-0.9	-29.9	-6.0	-0.3	-0.2
		Change due to Project (2027)	1.3	0.5	0.7	0.3	9.0	1.8	-0.4	-0.3
		Percent Change (2017)	-10%	-7%	-11%	-8%	-11%	-11%	-4%	-5%
		Percent Change (2027)	3%	2%	4%	3%	4%	5%	-6%	-9%
	50m	Change due to Project (2017)	-3.0	-1.2	-1.5	-0.6	-20.0	-4.0	-0.2	-0.1
		Change due to Project (2027)	0.8	0.3	0.4	0.2	6.6	1.3	-0.2	-0.2
		Percent Change (2017)	-8%	-5%	-10%	-6%	-9%	-9%	-3%	-3%
		Percent Change (2027)	2%	1%	3%	2%	3%	4%	-3%	-6%
	100m	Change due to Project (2017)	-2.2	-0.9	-1.1	-0.5	-14.7	-2.9	-0.1	-0.1
		Change due to Project (2027)	0.6	0.2	0.3	0.1	4.9	1.0	-0.2	-0.2
		Percent Change (2017)	-7%	-4%	-8%	-5%	-7%	-8%	-2%	-3%

Section	Distance from road	Pollutant	Particulate matter ≤10µm (PM_{10})		Particulate matter ≤2.5µm ($PM_{2.5}$)		Nitrogen Dioxide (NO_2)		Carbon Monoxide (CO)	
		Averaging Period	24 hour	Annual	24 hours	Annual	1 hour	Annual	1 hour	8 hours
		Criterion	50	30	25	8	246	62	30	10
		Units	µg/m^3						mg/m^3	
		Percent Change (2027)	2%	1%	3%	1%	3%	3%	-3%	-6%
Section 6	20m	Change due to Project (2017)	2.1	0.8	1.1	0.4	3.8	0.8	0.3	0.2
		Change due to Project (2027)	5.4	2.2	3.1	1.3	18.3	3.8	0.8	0.5
		Percent Change (2017)	3%	2%	4%	3%	1%	2%	4%	5%
		Percent Change (2027)	9%	7%	10%	8%	8%	9%	12%	14%
	50m	Change due to Project (2017)	0.8	0.3	0.4	0.2	4.0	0.7	0.2	0.1
		Change due to Project (2027)	2.8	1.1	1.6	0.6	12.2	2.4	0.3	0.3
		Percent Change (2017)	2%	1%	2%	2%	2%	2%	3%	3%
		Percent Change (2027)	7%	4%	9%	6%	6%	7%	5%	9%
	100m	Change due to Project (2017)	0.1	0.1	0.1	0.1	0.7	0.1	0.0	0.0
		Change due to Project (2027)	1.9	0.7	1.1	0.4	8.0	1.6	0.1	0.1
		Percent Change (2017)	0%	0%	0%	1%	0%	0%	0%	0%
		Percent Change (2027)	6%	3%	8%	4%	5%	5%	2%	3%
Section 7	20m	Change due to Project (2017)	-0.7	-0.2	-0.4	-0.1	-2.4	-0.5	0.0	0.0
		Change due to Project (2027)	-0.5	-0.2	-0.3	-0.1	-3.2	-0.6	0.0	0.0
		Percent Change (2017)	-2%	-1%	-3%	-1%	-1%	-1%	0%	0%
		Percent Change (2027)	-2%	-1%	-2%	-1%	-2%	-2%	0%	0%
	50m	Change due to Project (2017)	-0.4	-0.2	-0.2	-0.1	-1.5	-0.3	0.0	0.0
		Change due to Project (2027)	-0.2	-0.1	-0.1	-0.1	-2.0	-0.4	0.0	0.1
		Percent Change (2017)	-1%	-1%	-2%	-1%	-1%	-1%	0%	0%
		Percent Change (2027)	-1%	0%	-1%	-1%	-1%	-1%	0%	3%
	100m	Change due to Project (2017)	-0.3	-0.1	-0.2	-0.1	-1.0	-0.2	0.0	0.0
		Change due to Project (2027)	-0.2	-0.1	-0.1	-0.1	-1.4	-0.3	0.0	0.0
		Percent Change (2017)	-1%	-1%	-1%	-1%	-1%	-1%	0%	0%
		Percent Change (2027)	-1%	-1%	-1%	-1%	-1%	-1%	0%	0%
Section 8	20m	Change due to Project (2017)	1.1	0.5	0.6	0.3	10.1	2.0	0.3	0.2
		Change due to Project (2027)	0.6	0.2	0.3	0.1	4.8	0.9	0.1	0.1
		Percent Change (2017)	4%	3%	5%	3%	6%	7%	5%	6%
		Percent Change (2027)	2%	1%	3%	1%	3%	3%	2%	3%
	50m	Change due to Project (2017)	0.7	0.2	0.4	0.1	6.3	1.2	0.2	0.2

Section	Distance from road	Pollutant	Particulate matter ≤10µm (PM_{10})		Particulate matter ≤2.5µm ($PM_{2.5}$)		Nitrogen Dioxide (NO_2)		Carbon Monoxide (CO)	
		Averaging Period	24 hour	Annual	24 hours	Annual	1 hour	Annual	1 hour	8 hours
		Criterion	50	30	25	8	246	62	30	10
		Units	µg/m^3						mg/m^3	
		Change due to Project (2027)	0.4	0.1	0.2	0.1	3.0	0.6	0.1	0.0
		Percent Change (2017)	3%	1%	4%	1%	4%	5%	3%	7%
		Percent Change (2027)	2%	1%	2%	1%	2%	2%	2%	0%
	100m	Change due to Project (2017)	0.5	0.2	0.3	0.1	4.4	0.9	0.1	0.1
		Change due to Project (2027)	0.2	0.1	0.1	0.1	2.0	0.4	0.0	0.0
		Percent Change (2017)	2%	1%	3%	1%	3%	4%	2%	3%
		Percent Change (2027)	1%	1%	1%	1%	1%	2%	0%	0%
Section 9	20m	Change due to Project (2017)	0.7	0.3	0.4	0.2	4.7	0.9	0.1	0.0
		Change due to Project (2027)	0.4	0.2	0.2	0.1	1.6	0.3	0.0	0.0
		Percent Change (2017)	3%	1%	3%	2%	3%	3%	2%	0%
		Percent Change (2027)	2%	1%	2%	1%	1%	1%	0%	0%
	50m	Change due to Project (2017)	0.5	0.2	0.3	0.1	3.0	0.6	0.1	0.1
		Change due to Project (2027)	0.2	0.1	0.1	0.1	1.1	0.2	0.0	0.0
		Percent Change (2017)	2%	1%	3%	1%	2%	2%	2%	3%
		Percent Change (2027)	1%	1%	1%	1%	1%	1%	0%	0%
	100m	Change due to Project (2017)	0.4	0.1	0.2	0.1	2.1	0.4	0.1	0.0
		Change due to Project (2027)	0.2	0.0	0.1	0.0	0.8	0.1	0.0	0.0
		Percent Change (2017)	2%	1%	2%	1%	1%	2%	2%	0%
		Percent Change (2027)	1%	0%	1%	0%	1%	0%	0%	0%
Section 10	20m	Change due to Project (2017)	2.0	0.8	1.0	0.4	25.7	5.2	0.5	0.3
		Change due to Project (2027)	0.7	0.2	0.4	0.1	6.8	1.3	0.1	0.0
		Percent Change (2017)	7%	4%	9%	5%	15%	18%	8%	9%
		Percent Change (2027)	3%	1%	3%	1%	4%	5%	2%	0%
	50m	Change due to Project (2017)	1.2	0.6	0.6	0.3	16.1	3.2	0.3	0.2
		Change due to Project (2027)	0.5	0.2	0.3	0.1	4.2	0.8	0.0	0.0
		Percent Change (2017)	5%	3%	6%	4%	10%	12%	5%	6%
		Percent Change (2027)	2%	1%	3%	1%	3%	3%	0%	0%
	100m	Change due to Project (2017)	0.9	0.4	0.5	0.2	11.0	2.2	0.2	0.1
		Change due to Project (2027)	0.3	0.2	0.2	0.1	2.9	0.6	0.0	0.0
		Percent Change (2017)	4%	2%	5%	3%	7%	9%	3%	3%

Section	Distance from road	Pollutant	Particulate matter ≤10µm (PM_{10})		Particulate matter ≤2.5µm ($PM_{2.5}$)		Nitrogen Dioxide (NO_2)		Carbon Monoxide (CO)	
		Averaging Period	24 hour	Annual	24 hours	Annual	1 hour	Annual	1 hour	8 hours
		Criterion	50	30	25	8	246	62	30	10
		Units	µg/m³						mg/m³	
		Percent Change (2027)	1%	1%	2%	2%	2%	2%	0%	0%
Section 11	10m	Change due to Project (2017)	3.1	1.2	1.6	0.6	10.8	2.2	0.3	0.2
		Change due to Project (2027)	2.4	0.9	1.3	0.5	9.9	1.9	0.3	0.1
		Percent Change (2017)	12%	6%	16%	8%	7%	9%	5%	7%
		Percent Change (2027)	9%	5%	13%	6%	7%	8%	5%	3%
	20m	Change due to Project (2017)	2.4	1.0	1.2	0.5	10.7	2.1	0.2	0.1
		Change due to Project (2027)	1.7	0.7	1.0	0.4	9.4	1.8	0.2	0.1
		Percent Change (2017)	10%	5%	13%	7%	7%	8%	3%	3%
		Percent Change (2027)	7%	4%	10%	5%	7%	7%	3%	3%
	50m	Change due to Project (2017)	1.5	0.6	0.8	0.3	7.1	1.5	0.1	0.0
		Change due to Project (2027)	1.1	0.5	0.6	0.3	5.9	1.2	0.1	0.1
		Percent Change (2017)	7%	3%	9%	4%	5%	6%	2%	0%
		Percent Change (2027)	5%	3%	7%	4%	4%	5%	2%	3%
	100m	Change due to Project (2017)	1.1	0.4	0.6	0.2	5.0	1.0	0.0	0.1
		Change due to Project (2027)	0.8	0.3	0.4	0.2	4.1	0.8	0.1	0.1
		Percent Change (2017)	5%	2%	7%	3%	4%	4%	0%	3%
		Percent Change (2027)	4%	2%	5%	2%	3%	3%	2%	3%
Section 12	20m	Change due to Project (2017)	2.1	0.8	1.1	0.4	18.5	3.7	0.4	0.3
		Change due to Project (2027)	1.6	0.7	0.9	0.4	10.6	2.1	0.2	0.1
		Percent Change (2017)	8%	4%	10%	5%	12%	14%	7%	10%
		Percent Change (2027)	6%	4%	9%	5%	7%	8%	3%	3%
	50m	Change due to Project (2017)	1.4	0.6	0.7	0.3	11.8	2.3	0.2	0.2
		Change due to Project (2027)	1.0	0.4	0.6	0.2	6.8	1.3	0.1	0.1
		Percent Change (2017)	6%	3%	8%	4%	8%	9%	3%	7%
		Percent Change (2027)	4%	2%	6%	3%	5%	5%	2%	3%
	100m	Change due to Project (2017)	1.0	0.4	0.5	0.2	8.2	1.6	0.2	0.1
		Change due to Project (2027)	0.8	0.3	0.4	0.2	4.7	1.0	0.1	0.0
		Percent Change (2017)	5%	2%	6%	3%	6%	7%	3%	3%
		Percent Change (2027)	4%	2%	5%	2%	3%	4%	2%	0%

Figure A-1: Modelled Road Sections

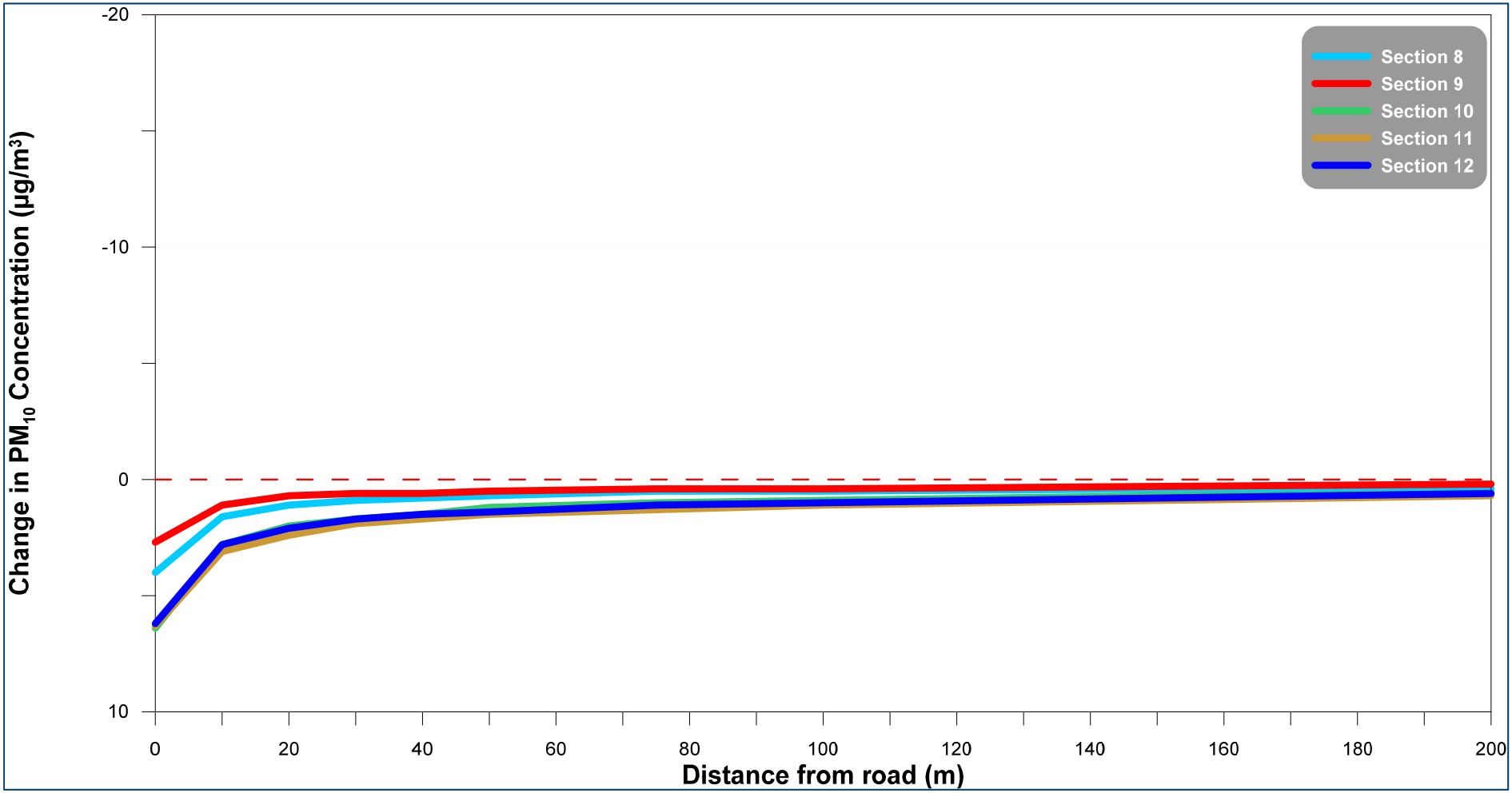

Figure A-2: Predicted change in pollutant concentrations 2017 (Parramatta Road)

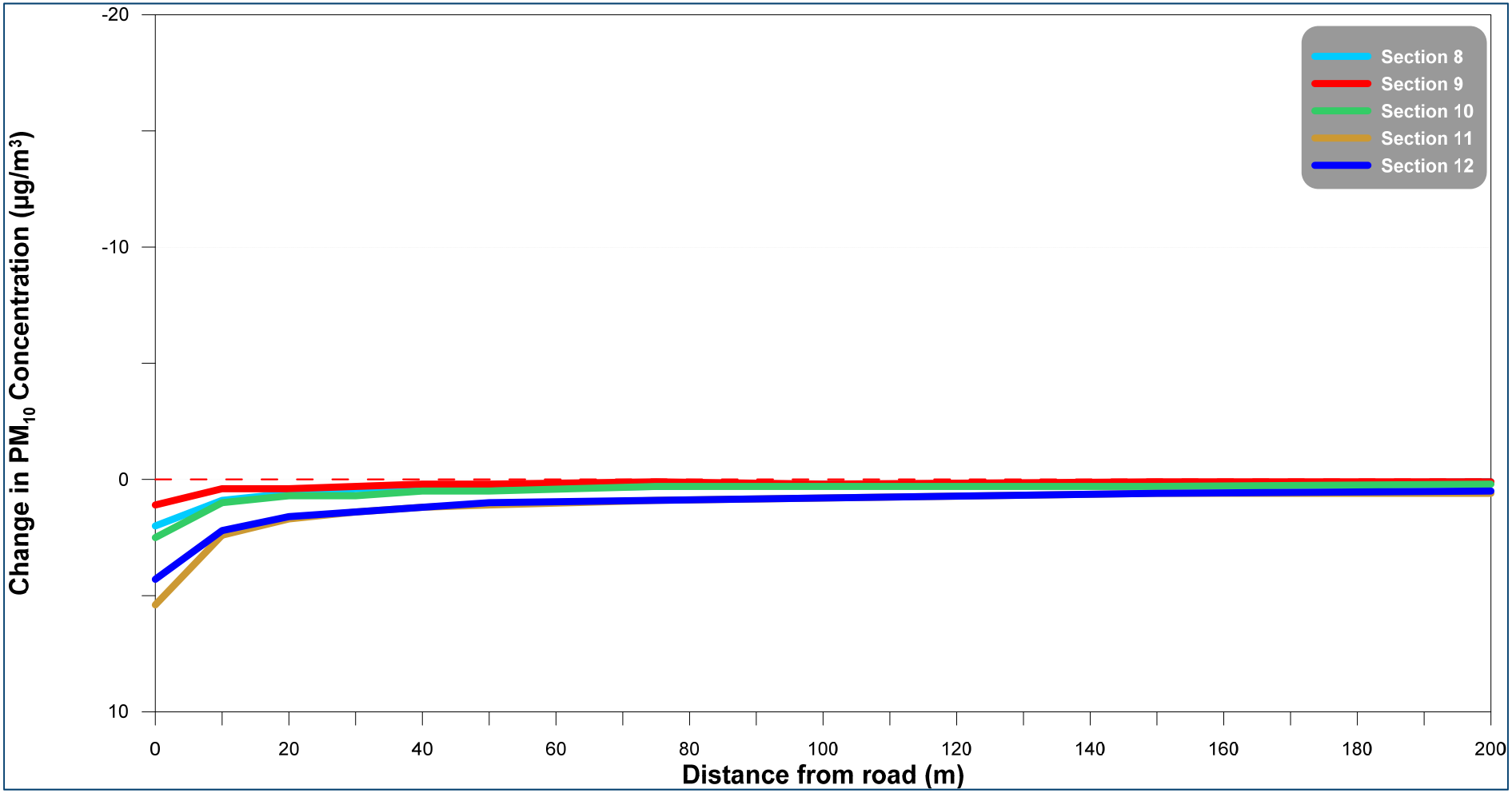

Figure A-3: Predicted change in pollutant concentrations 2027 (Parramatta Road)