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TRANSFIELD SERVICES PTY. LTD.

# EastLink Ambient Air Quality Monitoring Report October-December 2009

**Submitted to:**  
Transfield Services Pty. Ltd.,  
EastLink Operations Centre,  
2 Hillcrest Avenue,  
Ringwood, 3134

REPORT



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# EASTLINK AMBIENT AIR QUALITY MONITORING REPORT OCTOBER-DECEMBER 2009

## Record of Issue

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Limitations



# EASTLINK AMBIENT AIR QUALITY MONITORING REPORT OCTOBER-DECEMBER 2009

## 1.0 INTRODUCTION

EastLink is a 39-kilometre motorway running between Donvale in Melbourne's north east to Frankston in Melbourne's south east with two tunnels under the Mullum Mullum Valley. Transfield Services, who are responsible for operation and maintenance of the road, commissioned Golder Associates Pty. Ltd. {trading as Golder AWN} to provide ambient air quality monitoring services for the EastLink Road project. The services provided include:

- Operational and maintenance services of the EastLink ambient air monitoring stations; and
- NATA endorsed ambient air quality monitoring reports.

Monitoring commenced on the 29th June 2008 with the opening of the EastLink motorway. Results for the monitoring period 1st October, 2009 to 31st December, 2009 inclusive are contained in the following report.

Your attention is drawn to the document - "Limitations", which is included in Attachment A of this report. The statements presented in this document are intended to advise you of what your realistic expectations of this report should be. The document is not intended to reduce the level of responsibility accepted by Golder, but rather to ensure that all parties who may rely on this report are aware of the responsibilities each assumes in so doing.



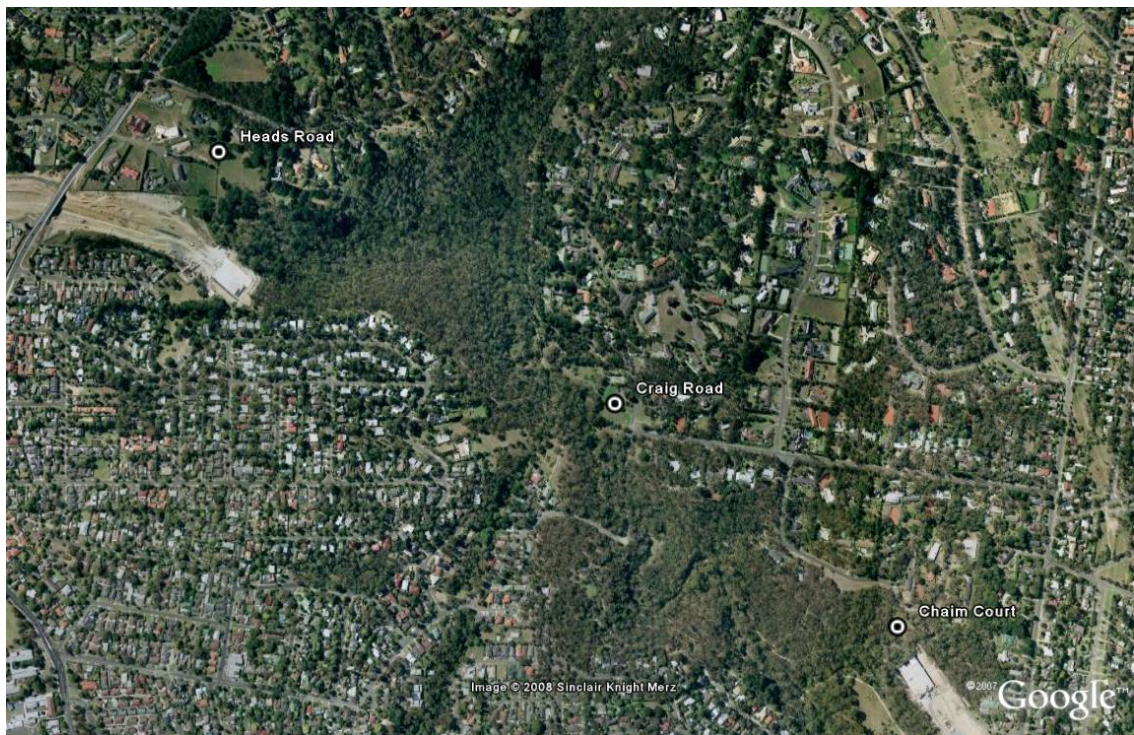


## 2.0 MONITORING LOCATIONS

Three ambient air quality monitoring stations (AAQMS) are located along the Mullum Mullum valley in close proximity to the tunnel portals and ventilation stacks. The locations are described in Table 1 and depicted in Figure 1.

**Table 1: Site Locations**

STATION NAME	LOCATION	GPS CO-ORDINATES (AMG)
Chaim Court	Chaim Court, Donvale	342532E, 5814022S
Craig Road	Corner Craig Rd. and Beckett Rd. Donvale	341971E, 5814450S
Heads Road	Hillcrest Reserve, Heads Road, Donvale	341195E, 5814923S



*Figure 1: Ambient Air Quality Monitoring Stations*



### **3.0 AMBIENT AIR QUALITY MONITORING PARAMETERS**

The following ambient air quality parameters are monitored continuously, with averages logged at 5 minute intervals:

- Particulate matter with an equivalent aerodynamic diameter less than 2.5 microns (PM<sub>2.5</sub>);
- Particulate matter with an equivalent aerodynamic diameter less than 10 microns (PM<sub>10</sub>);
- Total oxides of nitrogen (NO<sub>x</sub>);
- Nitric oxide (NO);
- Nitrogen dioxide (NO<sub>2</sub>);
- Carbon monoxide (CO);
- Wind speed;
- Wind direction;
- Relative humidity;
- Ambient temperature; and
- Total solar radiation.



## **4.0 METHODS**

### **4.1 PM<sub>2.5</sub>**

PM<sub>2.5</sub> concentration in ambient air was determined in real time using a Tapered Element Oscillating Microbalance (TEOM) analyser fitted with the Flow Dynamics Measurement System (TEOM-FDMS).

Ambient air was drawn through a PM<sub>2.5</sub> size selective inlet (PM<sub>10</sub> WINS head fitted with a PM<sub>2.5</sub> sharp cut cyclone (SSC)) at 1 m<sup>3</sup>/h). The PM<sub>2.5</sub> fraction passes through the FDMS unit which compensates for loss of volatile material from the TEOM filter. Measurements were made in real-time (2 s intervals) with the 5-minute averages logged. From the logged data 1-hour and 24-hour averages were then calculated.

### **4.2 PM<sub>10</sub>**

PM<sub>10</sub> concentration in ambient air was determined in real time using a Tapered Element Oscillating Microbalance (TEOM) analyser. Ambient air was drawn through a PM<sub>10</sub> WINS size selective inlet at 1 m<sup>3</sup>/h. Measurements were made in real-time (2 s intervals) with the 5-minute averages logged. From the logged data 1-hour and 24-hour averages were then calculated.

The sample stream is heated to 50°C to maintain a low and therefore relatively constant humidity.

PM<sub>10</sub> monitoring was conducted in accordance with Australian Standard AS 3580.9.8, "Methods for Sampling and Analysis of Ambient Air: Determination of Suspended Particulate Matter – PM<sub>10</sub> Continuous Direct Mass Method Using a Tapered Element Oscillating Microbalance Analyser".

### **4.3 Carbon Monoxide**

Carbon monoxide monitoring was conducted in accordance with Australian Standard AS 3580.7.1-1992, "Determination of Carbon Monoxide – Direct Reading Instrumental Method".

### **4.4 Oxides of Nitrogen**

Oxides of nitrogen (NO, NO<sub>2</sub> and NO<sub>x</sub>) monitoring was conducted in accordance with Australian Standard AS 3580.5.1, "Determination of Oxides of Nitrogen – Chemiluminescence Method".

## **4.5 Meteorological Parameters**

### **4.5.1 Wind Speed and Direction**

Wind speed and direction was measured by an ultrasonic anemometer located 10 m above ground level.

### **4.5.2 Temperature and Relative Humidity**

Temperature and relative humidity were measured by a combined temperature- humidity sensor.

The sensors comprise a platinum resistance thermometer (PRT) to measure temperature and a capacitive thin-film polymer sensor to measure humidity.



## **5.0 AIR QUALITY GOALS**

The Environment Protection Act of 1970 provides a legislative framework for the protection of the environment in Victoria. Section 16(1) details the provision for environment protection policies to stipulate environment protection for any element or segment of the environment. The State Environment Protection Policy (Air Quality Management) {SEPP (AQM)} is relevant to the ambient air quality objectives of the EastLink monitoring programme.

The intention of the SEPP (AQM) is to manage emissions to the air environment so that “beneficial uses of the air environment are protected, Victoria’s air quality goals and objectives are met”, with an overall emphasis on continual improvement, with regard to the economic and social development of the State.

The SEPP (AQM) provides the framework for this objective through the classification of air quality indicators and the stipulation of management strategies and criteria. Applicable to the EastLink ambient monitoring programme are the assessment criteria for local or neighbourhood air monitoring data contained within Schedule B. The criteria are listed as intervention levels which are used to determine whether the beneficial uses of the air environment are protected.

The Schedule B intervention levels for Class 1 indicators, carbon monoxide, nitrogen dioxide and PM<sub>10</sub> and Class 2 indicator, PM<sub>2.5</sub>, are displayed in Table 2.

**Table 2: SEPP (AQM) Schedule B Intervention Levels**

<b>Atmospheric Contaminant</b>		<b>Intervention Level</b>	<b>Units</b>
Carbon monoxide	1 hour	29	ppm
Nitrogen dioxide	1 hour	140	ppb
PM <sub>10</sub>	24 hour	60	µg/m <sup>3</sup>
PM <sub>2.5</sub>	24 hour	36	µg/m <sup>3</sup>



## 6.0 AMBIENT AIR QUALITY MONITORING PERIOD: 01/10/2009 – 31/10/2009

### 6.1 Data Capture

Data capture is defined as the number of valid data periods collected divided by the number of available data periods. Valid data excludes periods where the instrument is unavailable due to calibration and maintenance and excludes periods where the data has been rejected due to quality assurance procedures.

The data capture statistics for the reporting period 1st October to 31st October, 2009 are shown in Tables 3-5. Averages were only collected for those periods where the 5-minute data constituted 75% data capture.

Section 6.3 provides further information on the reasons for invalid data periods.

**Table 3: Data Capture Statistics - 1 Hour Averages**

Parameter	Station	Collected Periods	Available Periods	Data Capture
PM <sub>2.5</sub>	Chaim Cr.	715	744	96.1%
PM <sub>10</sub>	Chaim Cr.	742	744	99.7%
	Craig Rd.	728	744	97.8%
	Heads Rd.	739	744	99.3%
NO, NO <sub>2</sub>	Chaim Cr.	712	744	95.7%
	Craig Rd.	683	744	91.8%
	Heads Rd.	612	744	82.3%
CO	Chaim Cr.	712	744	95.7%
	Craig Rd.	705	744	94.8%
	Heads Rd.	708	744	95.2%

**Table 4: Data Capture Statistics - 8 Hour Rolling Averages**

Parameter	Station	Collected Periods	Available Periods	Data Capture
CO	Chaim Cr.	744	744	100.0%
	Craig Rd.	737	744	99.1%
	Heads Rd.	741	744	99.6%

**Table 5: Data Capture Statistics - 24 Hour Averages**

Parameter	Station	Collected Periods	Available Periods	Data Capture
PM <sub>2.5</sub>	Chaim Cr.	30	31	96.8%
PM <sub>10</sub>	Chaim Cr.	31	31	100.0%
	Craig Rd.	31	31	100.0%
	Heads Rd.	31	31	100.0%



## 6.2 Results

### 6.2.1 PM<sub>2.5</sub>

PM<sub>2.5</sub> was continuously monitored and 5-minute averages logged. The 5-minute average data was then transformed to 1-hour and 24-hour averages for reporting.

PM<sub>2.5</sub> (1-hour average) concentration statistics for the reporting period are given in Table 6. A plot of PM<sub>2.5</sub> (1-hour average) concentration for the reporting period is presented in Figure 2.

**Table 6: PM<sub>2.5</sub> Concentration Percentiles (1 Hour Average)**

Station	PM <sub>2.5</sub> Concentration (µg/m <sup>3</sup> ) (1-hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	32	29	27	23	20	16	14

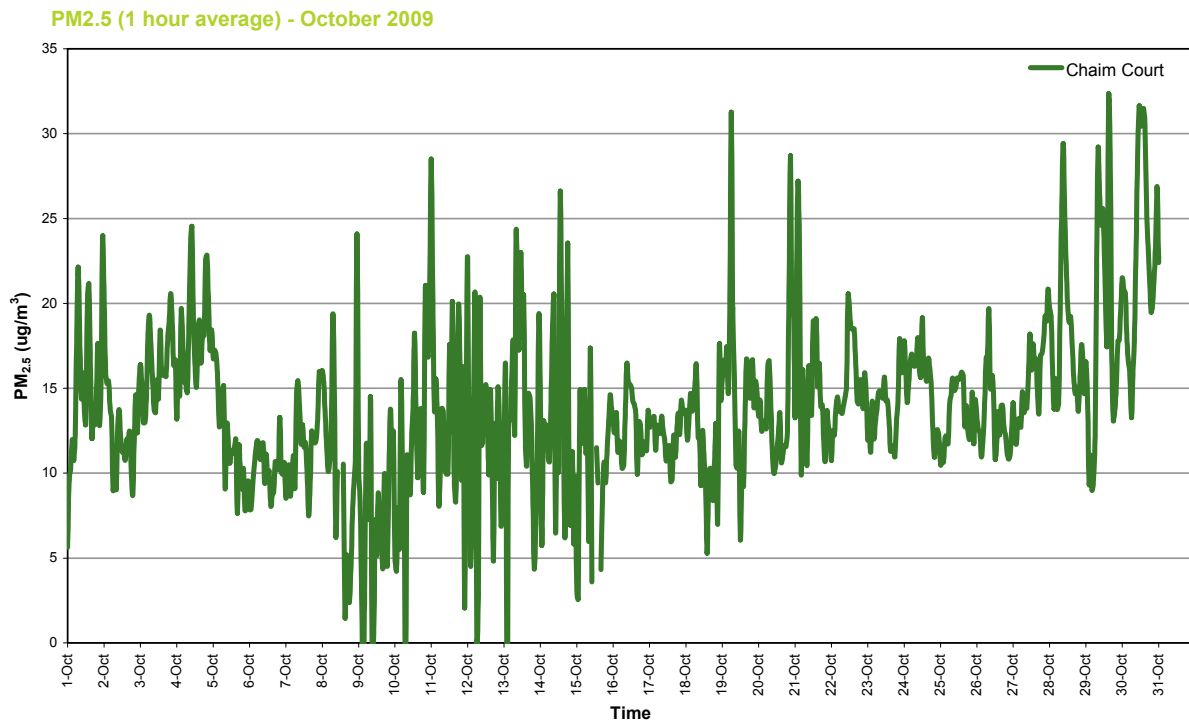


Figure 2: PM<sub>2.5</sub> Concentration (1 Hour Average)



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PM<sub>2.5</sub> (24-hour average) concentration statistics for the reporting period are given in Table 7. A plot of PM<sub>2.5</sub> (24-hour average) concentration for the reporting period is presented in Figure 3.

**Table 7: PM<sub>2.5</sub> Concentration Percentiles (24 Hour Average)**

Station	PM <sub>2.5</sub> Concentration (µg/m <sup>3</sup> ) (24-hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	23	22	20	18	18	15	14

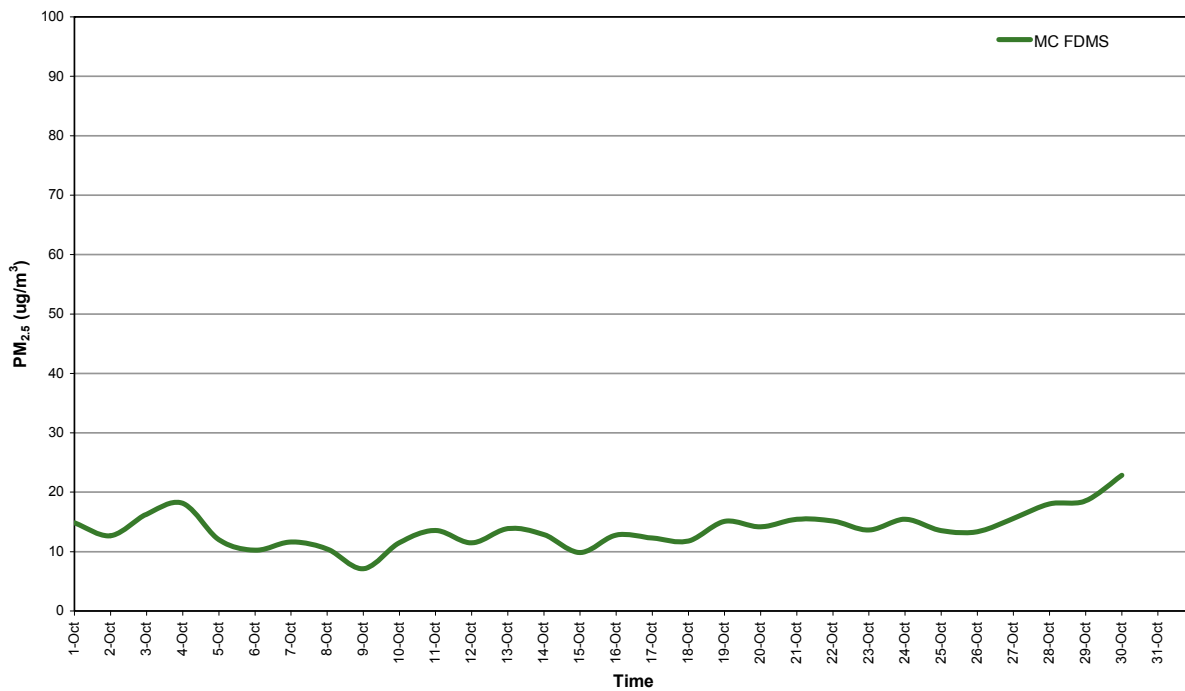


Figure 3: PM<sub>2.5</sub> Concentration (24 Hour Average)



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## 6.2.2 PM<sub>10</sub>

PM<sub>10</sub> was continuously monitored and 5-minute averages logged. The 5-minute average data was then transformed to 1-hour and 24-hour averages for reporting.

PM<sub>10</sub> (1-hour average) concentration statistics for the reporting period are given in Table 8. A plot of PM<sub>10</sub> (1-hour average) concentration for the reporting period is presented in Figure 4.

**Table 8: PM<sub>10</sub> Concentration Percentiles (1 Hour Average)**

Station	PM <sub>10</sub> Concentration (µg/m <sup>3</sup> ) (1-Hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	48	35	32	26	22	17	13
Craig Rd	75	34	31	27	23	17	12
Heads Rd	64	37	33	26	22	16	12

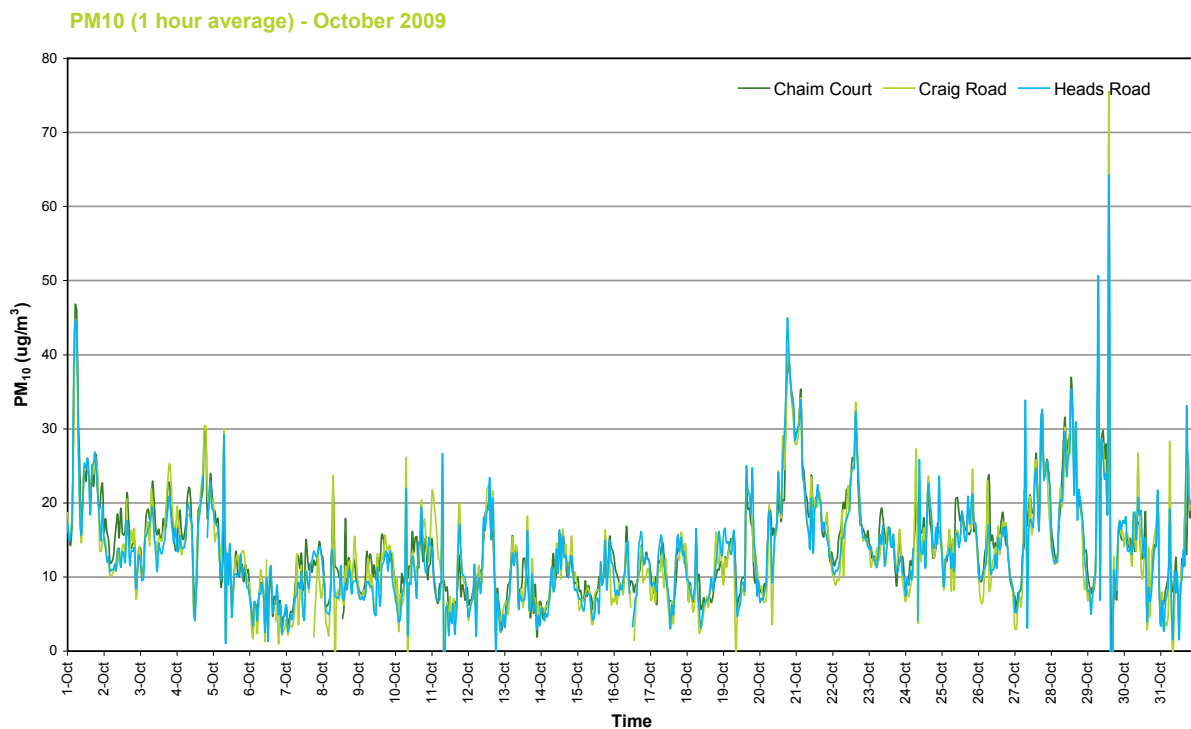


Figure 4: PM<sub>10</sub> Concentration (1 Hour Average)





# EASTLINK AMBIENT AIR QUALITY MONITORING REPORT OCTOBER-DECEMBER 2009

PM<sub>10</sub> (24-hour average) concentration statistics for the reporting period are given in Table 9. A plot of PM<sub>10</sub> (24-hour average) concentration for the reporting period is presented in Figure 5.

**Table 9: PM<sub>10</sub> Concentration Percentiles (24 Hour Average)**

Station	PM <sub>10</sub> Concentration (µg/m <sup>3</sup> ) (24-Hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	24	23	23	21	21	17	13
Craig Rd.	23	22	21	20	20	17	12
Heads Rd	24	23	22	21	20	16	12

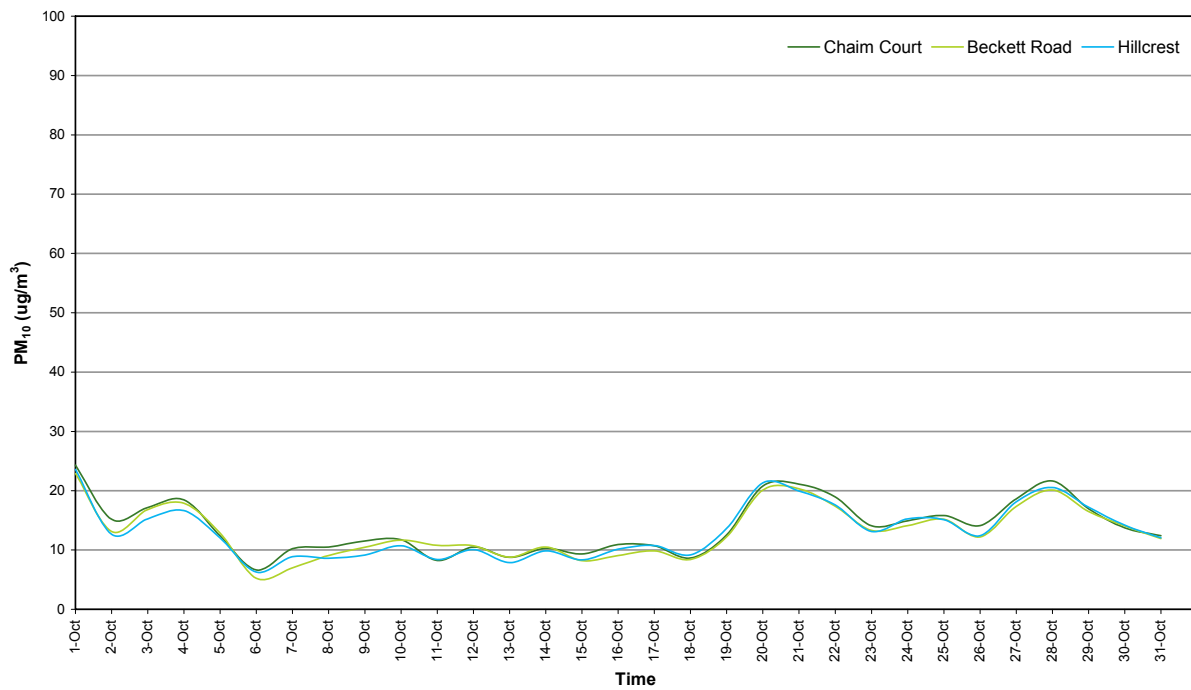


Figure 5: PM<sub>10</sub> Concentration (24 Hour Average)



### 6.2.3 Carbon Monoxide

#### 6.2.3.1 1-Hour Average

Carbon monoxide (1-hour average) concentration statistics for the reporting period are given in Table 10. A plot of carbon monoxide (1-hour average) concentration for the reporting period is presented in Figure 6.

**Table 10: Carbon Monoxide Concentration Percentiles (1 Hour Average)**

Station	Carbon Monoxide Concentration (ppm) (1-Hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	0.76	0.54	0.50	0.44	0.40	0.30	0.22
Craig Rd	0.91	0.59	0.46	0.39	0.33	0.22	0.15
Heads Rd	0.73	0.55	0.48	0.40	0.34	0.27	0.21

**Carbon Monoxide (1 hour average) - October 2009**

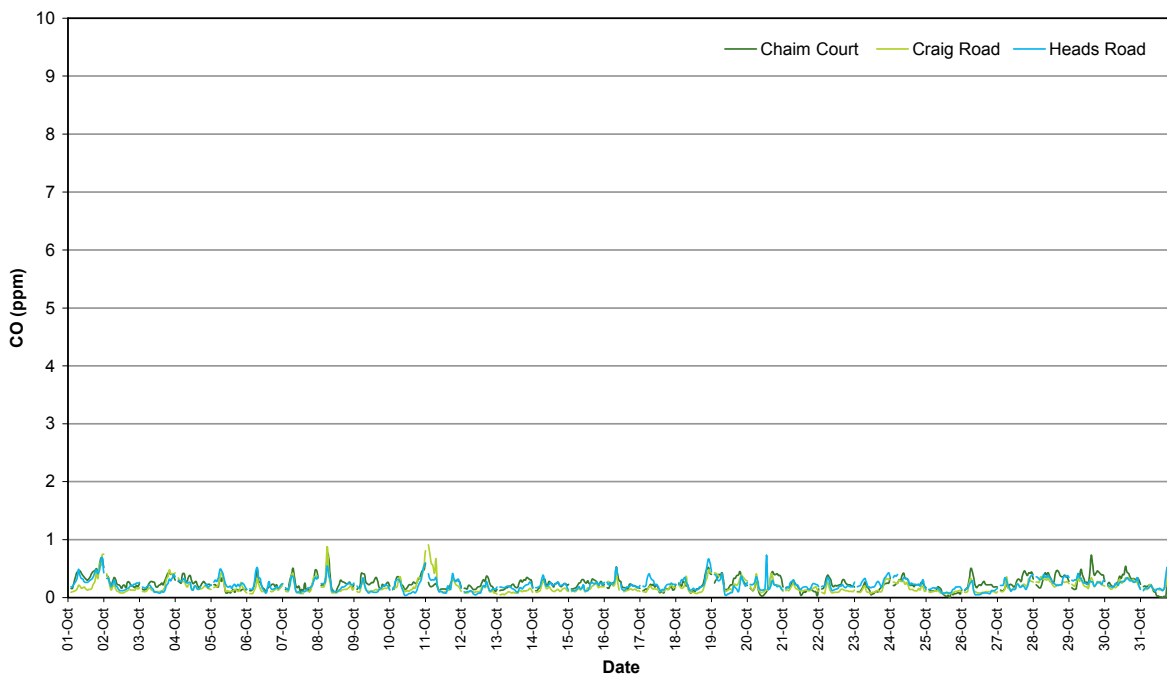


Figure 6: Carbon Monoxide Concentration (1 Hour Average)



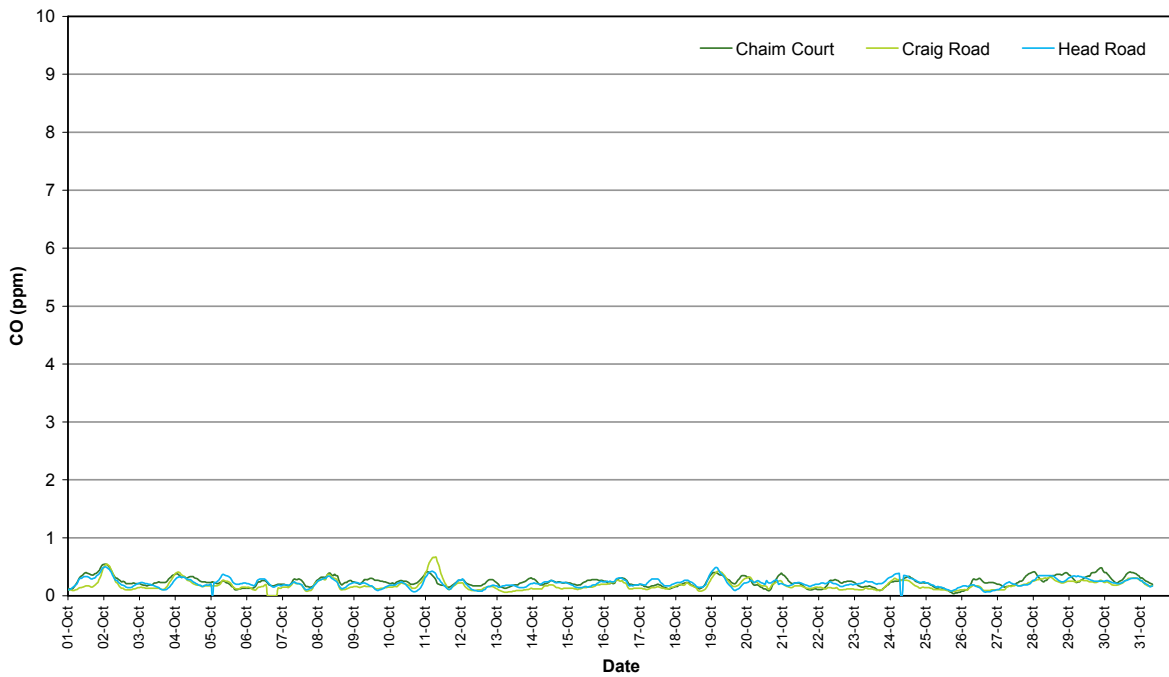
**6.2.3.2 8-Hour Rolling Average**

Carbon monoxide (8-hour rolling average) concentration statistics for the reporting period are given in Table 11. A plot of carbon monoxide (8-hour rolling average) concentration for the reporting period is presented in Figure 7.

**Table 11: Carbon Monoxide Concentration Percentiles (8 Hour Rolling Average)**

Station	Carbon Monoxide Concentration (ppm) (8-Hour Rolling Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	0.55	0.48	0.41	0.39	0.36	0.28	0.23
Craig Rd	0.67	0.53	0.43	0.34	0.29	0.23	0.16
Heads Rd	0.50	0.46	0.41	0.35	0.32	0.26	0.21

**Carbon Monoxide (8 hour average) - October 2009**



*Figure 7: Carbon Monoxide Concentration (8 Hour Rolling Average)*



**6.2.4 Oxides of Nitrogen**

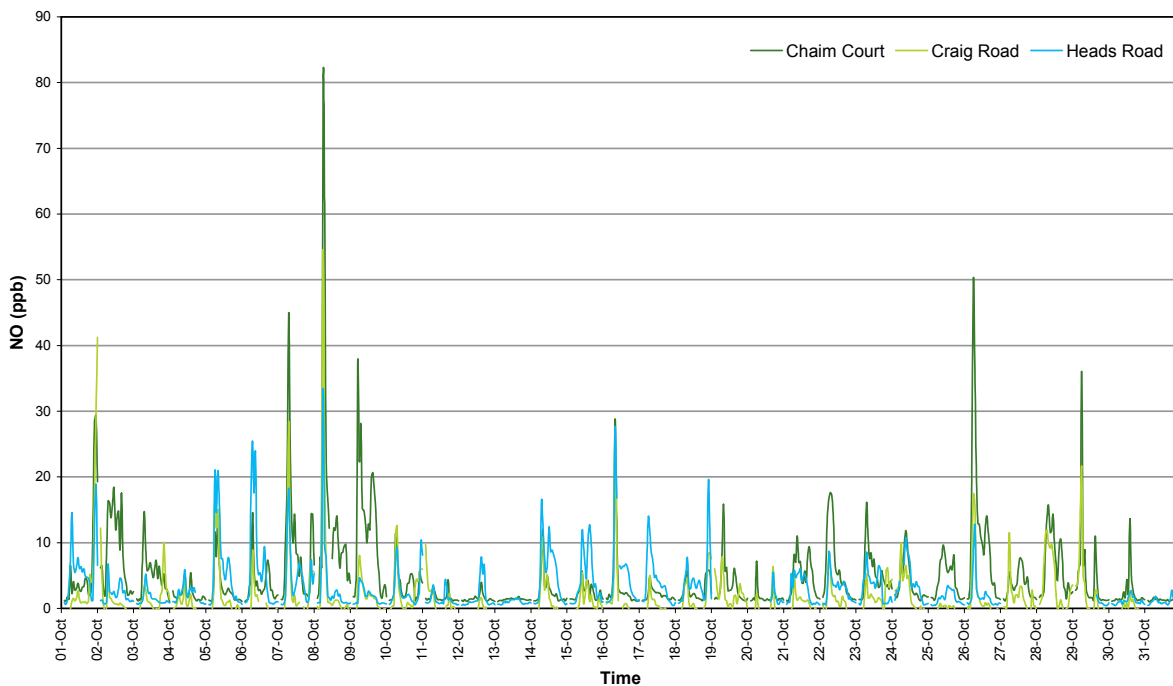
**6.2.4.1 Nitric Oxide**

Nitric oxide (1-hour average) concentration statistics for the reporting period are given in Table 12. A plot of nitric oxide (1-hour average) concentration for the reporting period is presented in Figure 8.

**Table 12: Nitric Oxide Concentration Percentiles (1 Hour Average)**

Station	Nitric Oxide Concentration (ppm) (1-Hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	80	29	21	15	11	5.5	2.3
Craig Rd	55	22	13	8.4	5.0	1.8	0.4
Heads Rd	33	19	17	10	7.0	3.9	1.6

**Nitric Oxide (1 hour average) - October 2009**



*Figure 8: Nitric Oxide Concentration (1 Hour Average)*



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## 6.2.4.2 Nitrogen Dioxide

Nitrogen dioxide (1-hour average) concentration statistics for the reporting period are given in Table 13. A plot of nitrogen dioxide (1-hour average) concentration for the reporting period is presented in Figure 9.

**Table 13: Nitrogen Dioxide Concentration Percentiles (1 Hour Average)**

Station	Nitrogen Dioxide Concentration (ppb) (1-Hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	24	20	19	17	15	10	6.3
Craig Rd	21	18	17	15	13	9.0	5.8
Heads Rd	24	20	18	15	12	8.6	5.7

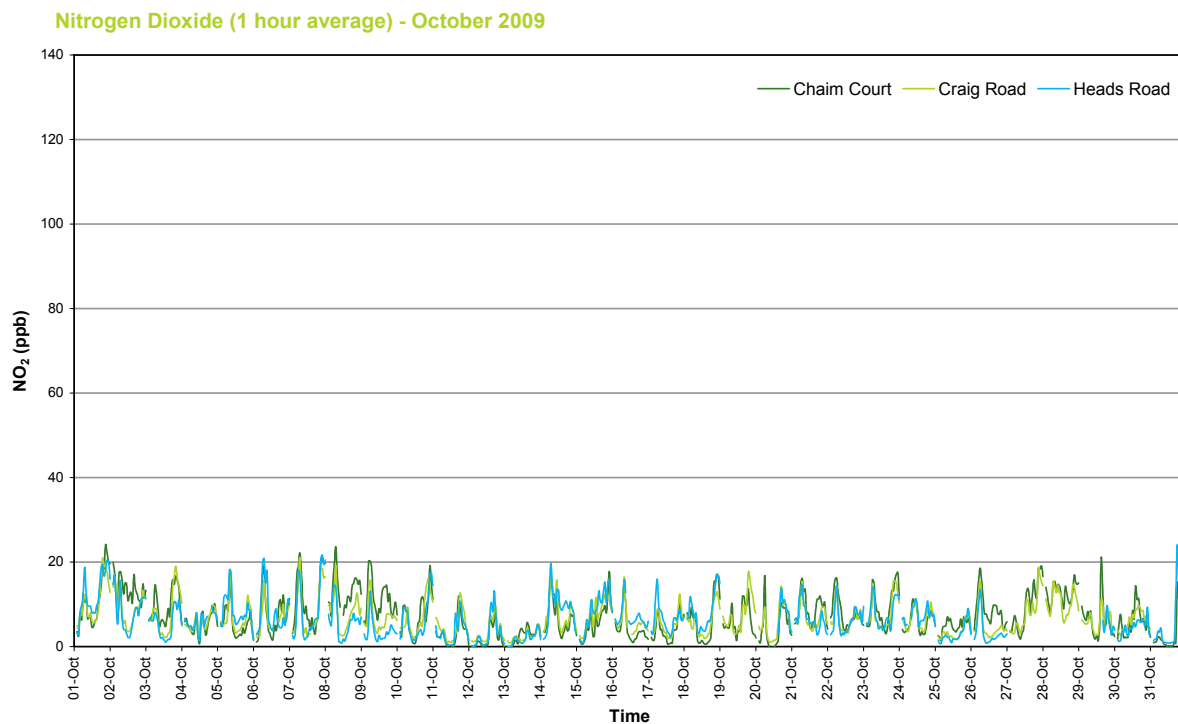


Figure 9: Nitrogen Dioxide Concentration (1 Hour Average)



## 6.2.5 Meteorological Data

Wind speed and direction for each of the monitoring stations are presented as wind roses in Figures 10 – 12.

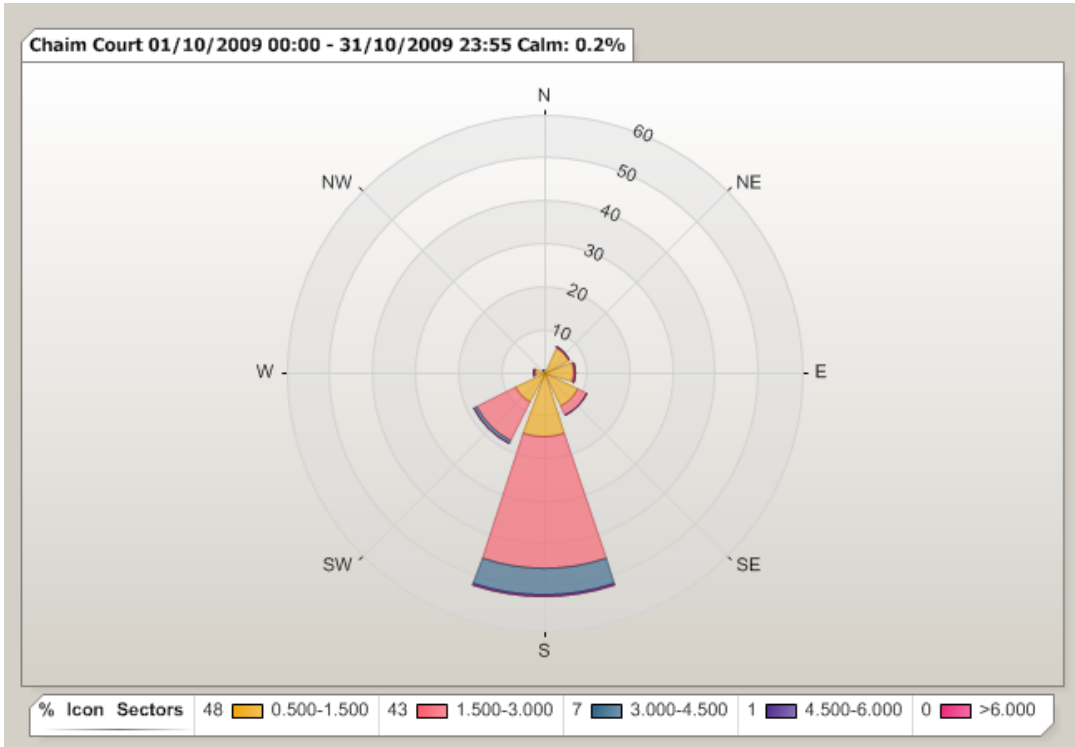


Figure 10: Chaim Court Wind Rose

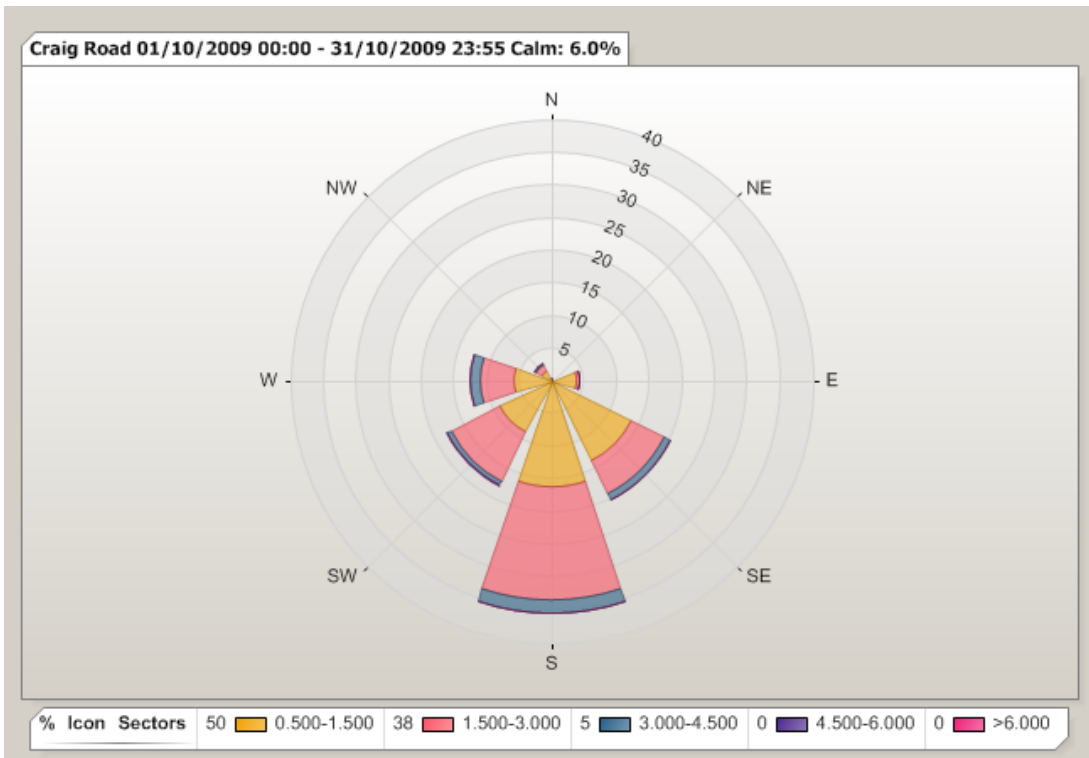


Figure 11: Craig Road Wind Rose



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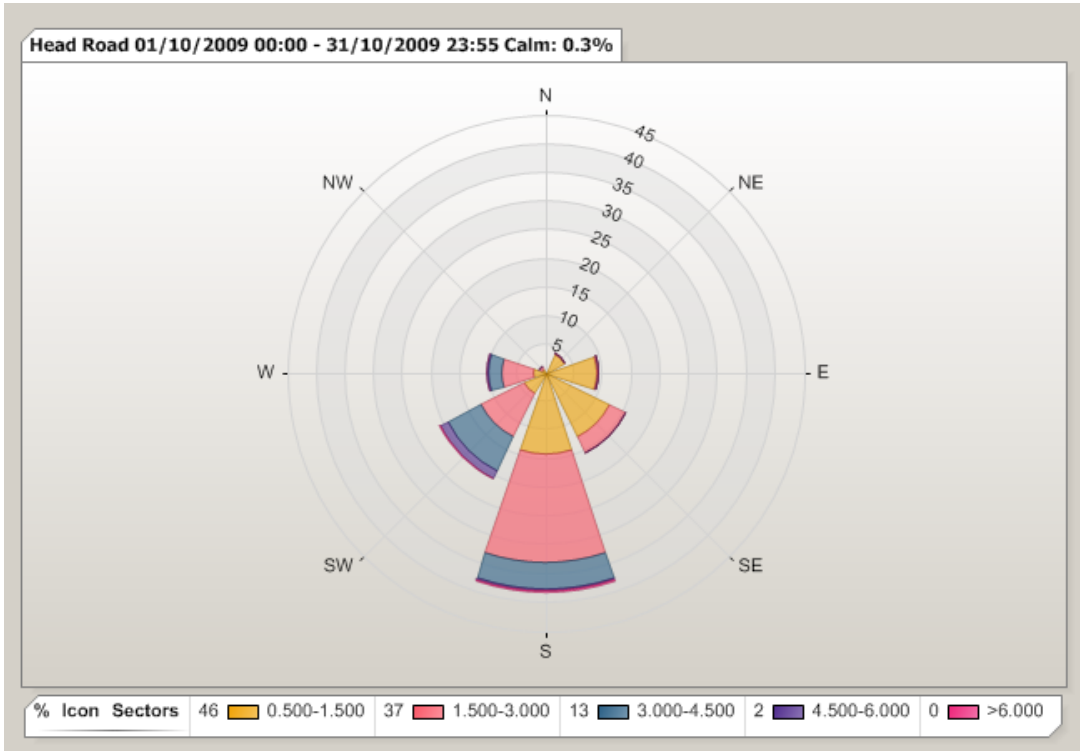


Figure 12: Heads Road Wind Rose



### 6.3 Data Validation and Exception

Data contained in the report has been validated against performance and calibration requirements for each instrument. Data during maintenance and calibration periods has been removed from the validated data sets. Tables 14 – 16 list the data exceptions for Chaim Court, Craig Road and Heads Road monitoring stations respectively. Data during automatic calibrations of the gaseous analysers has also been removed from the data sets.

**Table 14: Data Exceptions – Chaim Court**

Start	End	Parameter	Reason
7/10/2009 17:40	7/10/2009 17:50	NO, NO <sub>2</sub> , NO <sub>x</sub>	Maintenance/calibration
8/10/2009 11:05	8/10/2009 12:05	CO	Maintenance/calibration
8/10/2009 11:05	8/10/2009 12:05	NO, NO <sub>2</sub> , NO <sub>x</sub>	Maintenance/calibration
8/10/2009 11:30	8/10/2009 13:15	PM <sub>2.5</sub>	Maintenance/calibration
8/10/2009 11:45	8/10/2009 13:00	PM <sub>10</sub>	Maintenance/calibration
15/10/2009 11:15	15/10/2009 12:20	PM <sub>2.5</sub>	Maintenance/calibration
15/10/2009 15:00	15/10/2009 15:55	PM <sub>10</sub>	Maintenance/calibration
15/10/2009 15:00	15/10/2009 15:55	PM <sub>2.5</sub>	Maintenance/calibration
31/10/2009 1:35	31/10/2009 23:55	PM <sub>2.5</sub>	Invalid data <sup>1</sup>

**Note:**

- 1 In the opinion of the data reviewer.





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**Table 15: Data Exceptions – Craig Road**

Start	End	Parameter	Reason
1/10/2009 1:00	1/10/2009 1:50	PM <sub>10</sub>	Invalid data – electrical interference <sup>1</sup>
2/10/2009 1:00	2/10/2009 1:50	PM <sub>10</sub>	Invalid data – electrical interference <sup>1</sup>
2/10/2009 16:00	2/10/2009 16:40	PM <sub>10</sub>	Maintenance/calibration
3/10/2009 1:00	3/10/2009 1:50	PM <sub>10</sub>	Invalid data – electrical interference <sup>1</sup>
4/10/2009 1:00	4/10/2009 1:50	PM <sub>10</sub>	Invalid data – electrical interference <sup>1</sup>
5/10/2009 1:00	5/10/2009 1:50	PM <sub>10</sub>	Invalid data – electrical interference <sup>1</sup>
6/10/2009 1:00	6/10/2009 1:50	PM <sub>10</sub>	Invalid data – electrical interference <sup>1</sup>
6/10/2009 12:20	6/10/2009 15:25	CO	Maintenance/calibration
6/10/2009 12:20	6/10/2009 15:25	NO, NO <sub>2</sub> , NO <sub>x</sub>	Maintenance/calibration
6/10/2009 12:25	6/10/2009 12:30	WS ,WD, Temp, RH	Maintenance/calibration
6/10/2009 12:25	6/10/2009 16:20	PM <sub>10</sub>	Maintenance/calibration
6/10/2009 13:25	6/10/2009 13:25	WS ,WD, Temp, RH	Maintenance/calibration
6/10/2009 14:15	6/10/2009 14:15	WS ,WD, Temp, RH	Maintenance/calibration
6/10/2009 15:20	6/10/2009 15:20	WS ,WD, Temp, RH	Maintenance/calibration
7/10/2009 15:25	7/10/2009 16:45	CO	Maintenance/calibration
7/10/2009 15:25	7/10/2009 16:45	NO, NO <sub>2</sub> , NO <sub>x</sub>	Maintenance/calibration
7/10/2009 16:40	7/10/2009 18:05	PM <sub>10</sub>	Maintenance/calibration
8/10/2009 14:15	8/10/2009 14:15	All parameters	Communications fault
15/10/2009 15:00	15/10/2009 15:40	PM <sub>10</sub>	Maintenance/calibration
16/10/2009 11:35	16/10/2009 12:25	CO	Maintenance/calibration
16/10/2009 11:35	16/10/2009 12:25	NO, NO <sub>2</sub> , NO <sub>x</sub>	Maintenance/calibration
16/10/2009 11:55	16/10/2009 12:55	PM <sub>10</sub>	Maintenance/calibration
16/10/2009 12:20	16/10/2009 12:20	WS ,WD, Temp, RH	Maintenance/calibration
31/10/2009 1:40	31/10/2009 23:55	NO, NO <sub>2</sub> , NO <sub>x</sub>	Invalid data - span drift <sup>1</sup>

**Note:**

<sup>1</sup> In the opinion of the data reviewer.

**Table 16: Data Exceptions – Heads Road**

Start	End	Parameter	Reason
4/10/2009 18:35	4/10/2009 19:20	All parameters	Communications fault
16/10/2009 10:00	16/10/2009 10:40	CO	Maintenance/calibration
16/10/2009 10:00	16/10/2009 10:50	NO, NO <sub>2</sub> , NO <sub>x</sub>	Maintenance/calibration
16/10/2009 10:50	16/10/2009 11:45	PM <sub>10</sub>	Maintenance/calibration
19/10/2009 3:00	19/10/2009 23:55	NO, NO <sub>2</sub> , NO <sub>x</sub>	Invalid data - span drift <sup>1</sup>
20/10/2009 3:00	20/10/2009 14:15	NO, NO <sub>2</sub> , NO <sub>x</sub>	Invalid data - span drift <sup>1</sup>
20/10/2009 13:15	20/10/2009 13:20	CO	Maintenance/calibration
24/10/2009 6:40	24/10/2009 7:25	All parameters	Communications fault
27/10/2009 1:40	29/10/2009 15:50	NO, NO <sub>2</sub> , NO <sub>x</sub>	Invalid data - span drift <sup>1</sup>

**Note:**

<sup>1</sup> In the opinion of the data reviewer.



## 7.0 AMBIENT AIR QUALITY MONITORING PERIOD: 01/11/2009 – 30/11/2009

### 7.1 Data Capture

Data capture is defined as the number of valid data periods collected divided by the number of available data periods. Valid data excludes periods where the instrument is unavailable due to calibration and maintenance and excludes periods where the data has been rejected due to quality assurance procedures.

The data capture statistics for the reporting period 1st November to 30th November, 2009 are shown in Tables 17-19. Averages were only collected for those periods where the 5-minute data constituted 75% data capture.

Section 7.3 provides further information on the reasons for invalid data periods.

**Table 17: Data Capture Statistics – 1 Hour Averages**

Parameter	Station	Collected Periods	Available Periods	Data Capture
PM <sub>2.5</sub>	Chaim Crt.	690	720	95.8%
PM <sub>10</sub>	Chaim Crt	717	720	99.6%
	Craig Rd.	717	720	99.6%
	Heads Rd.	691	720	96.0%
NO, NO <sub>2</sub>	Chaim Crt	688	720	95.6%
	Craig Rd.	503	720	69.9%
	Heads Rd.	656	720	91.1%
CO	Chaim Crt	688	720	95.6%
	Craig Rd.	688	720	95.6%
	Heads Rd.	662	720	91.9%

**Table 18: Data Capture Statistics - 8 Hour Rolling Averages**

Parameter	Station	Collected Periods	Available Periods	Data Capture
CO	Chaim Crt	720	720	100.0%
	Craig Rd.	720	720	100.0%
	Heads Rd.	688	720	95.6%

**Table 19: Data Capture Statistics - 24 Hour Averages**

Parameter	Station	Collected Periods	Available Periods	Data Capture
PM <sub>2.5</sub>	Chaim Crt.	28	30	93.3%
PM <sub>10</sub>	Chaim Crt	30	30	100.0%
	Craig Rd.	30	30	100.0%
	Heads Rd.	28	30	93.3%



## 7.2 Results

### 7.2.1 PM<sub>2.5</sub>

PM<sub>2.5</sub> was continuously monitored and 5-minute averages logged. The 5-minute average data was then transformed to 1-hour and 24-hour averages for reporting.

PM<sub>2.5</sub> (1-hour average) concentration statistics for the reporting period are given in Table 20. A plot of PM<sub>2.5</sub> (1-hour average) concentration for the reporting period is presented in Figure 13.

**Table 20: PM<sub>2.5</sub> Concentration Percentiles (1 Hour Average)**

Station	PM <sub>2.5</sub> Concentration (µg/m <sup>3</sup> ) (1-hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	54	43	38	31	26	20	15

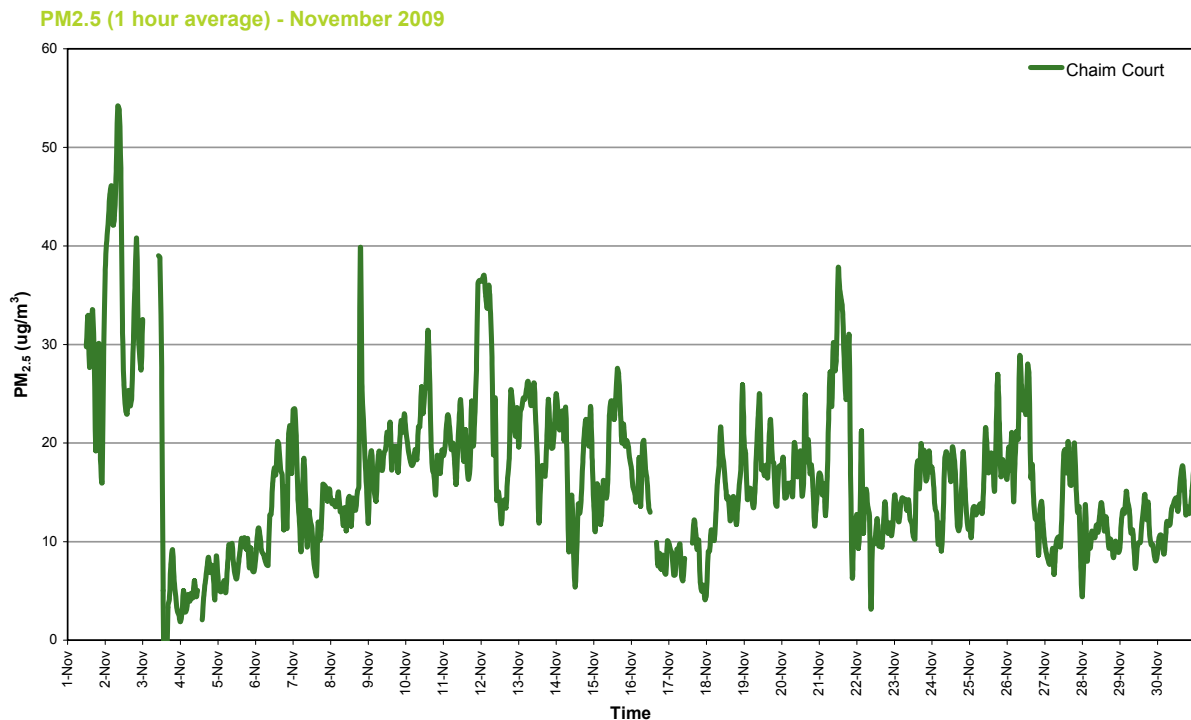


Figure 13: PM<sub>2.5</sub> Concentration (1 Hour Average)



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PM<sub>2.5</sub> (24-hour average) concentration statistics for the reporting period are given in Table 21. A plot of PM<sub>2.5</sub> (24-hour average) concentration for the reporting period is presented in Figure 14.

**Table 21: PM<sub>2.5</sub> Concentration Percentiles (24 Hour Average)**

Station	PM <sub>2.5</sub> Concentration (µg/m <sup>3</sup> ) (24-hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	36	33	30	23	22	19	15

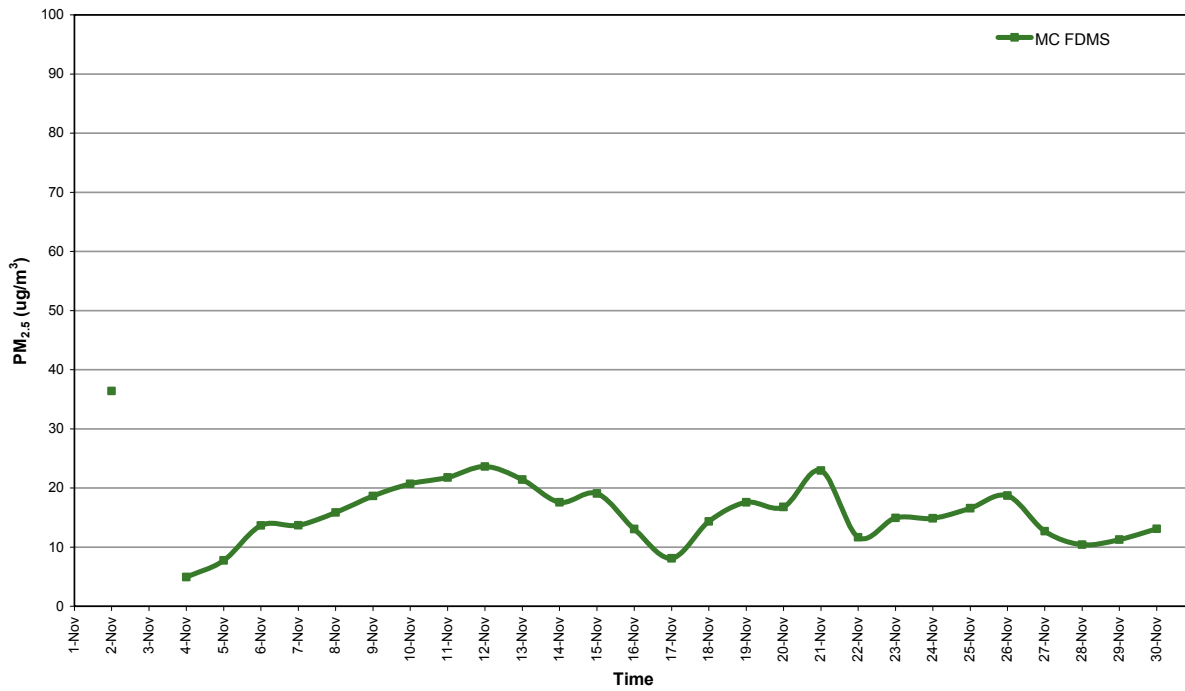


Figure 14: PM<sub>2.5</sub> Concentration (24 Hour Average)



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## 7.3 PM<sub>10</sub>

PM<sub>10</sub> was continuously monitored and 5-minute averages logged. The 5-minute average data was then transformed to 1-hour and 24-hour averages for reporting.

PM<sub>10</sub> (1-hour average) concentration statistics for the reporting period are given in Table 22. A plot of PM<sub>10</sub> (1-hour average) concentration for the reporting period is presented in Figure 15.

**Table 22: PM<sub>10</sub> Concentration Percentiles (1 Hour Average)**

Station	PM <sub>10</sub> Concentration (µg/m <sup>3</sup> ) (1-Hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	130	51	46	38	33	26	18
Craig Rd	170	54	49	42	34	25	16
Heads Rd	170	53	46	39	33	25	18

PM<sub>10</sub> (1 hour average) - November 2009

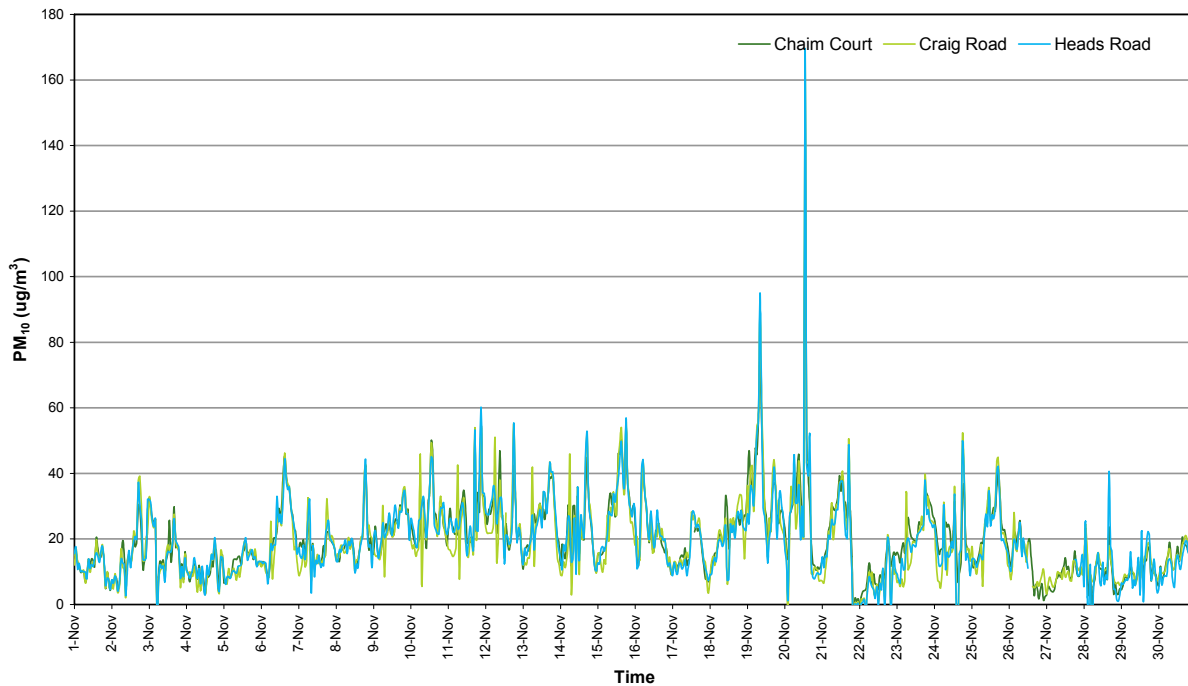


Figure 15: PM<sub>10</sub> Concentration (1 Hour Average)



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PM<sub>10</sub> (24-hour average) concentration statistics for the reporting period are given in Table 23. A plot of PM<sub>10</sub> (24-hour average) concentration for the reporting period is presented in Figure 16.

**Table 23: PM<sub>10</sub> Concentration Percentiles (24 Hour Average)**

Station	PM <sub>10</sub> Concentration (µg/m <sup>3</sup> ) (24-Hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	37	35	33	30	28	24	21
Craig Rd.	37	35	32	29	26	23	19
Heads Rd	35	34	32	30	28	25	19

**PM10 (24 hour average) - November 2009**

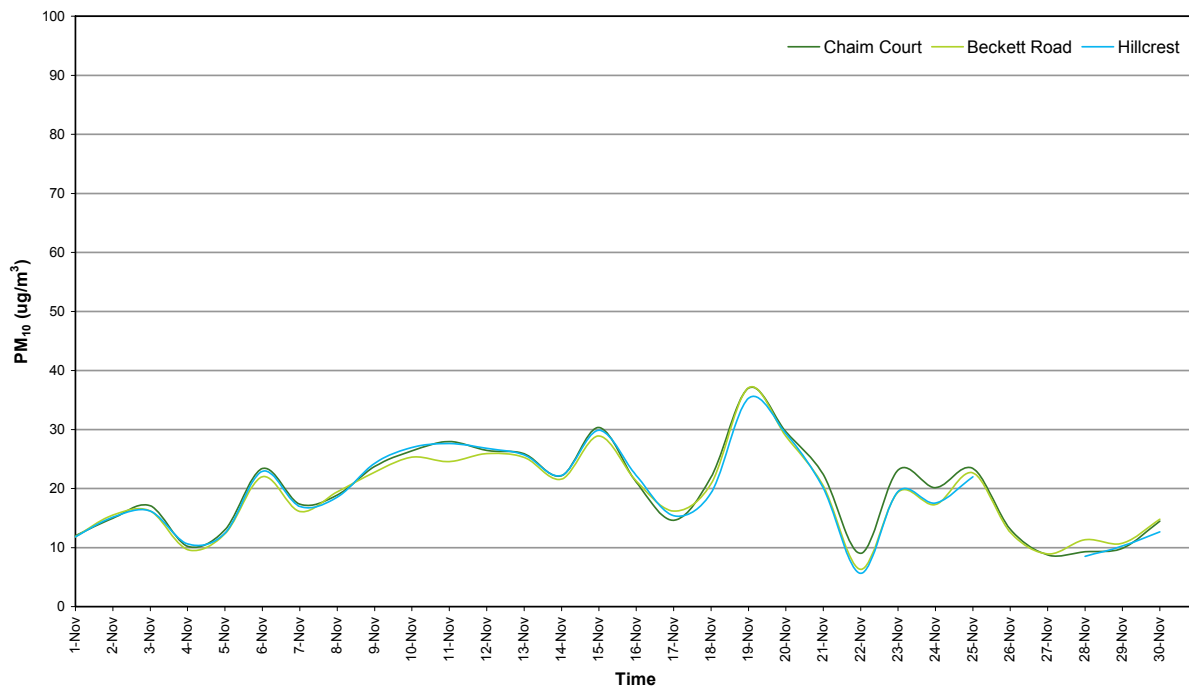


Figure 16: PM<sub>10</sub> Concentration (24 Hour Average)



# EASTLINK AMBIENT AIR QUALITY MONITORING REPORT OCTOBER-DECEMBER 2009

## 7.3.1 Carbon Monoxide

### 7.3.1.1 1-Hour Average

Carbon monoxide (1-hour average) concentration statistics for the reporting period are given in Table 24. A plot of carbon monoxide (1-hour average) concentration for the reporting period is presented in Figure 17.

**Table 24: Carbon Monoxide Concentration Percentiles (1 Hour Average)**

Station	Carbon Monoxide Concentration (ppm) (1-Hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	0.67	0.56	0.47	0.42	0.36	0.27	0.18
Craig Rd	0.56	0.48	0.41	0.33	0.28	0.21	0.14
Heads Rd	1.1	0.50	0.46	0.39	0.35	0.30	0.23

**Carbon Monoxide (1 hour average) - November 2009**

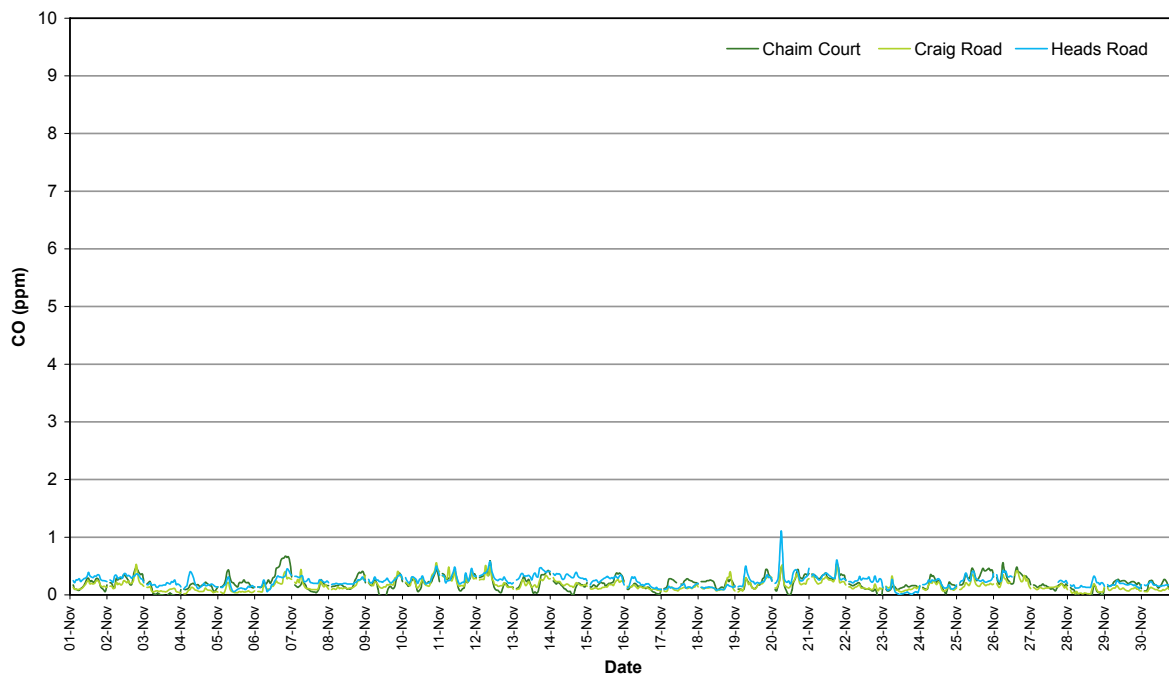


Figure 17 Carbon Monoxide Concentration (1 Hour Average)



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## 7.3.1.2 8-Hour Rolling Average

Carbon monoxide (8-hour rolling average) concentration statistics for the reporting period are given in Table 25. A plot of carbon monoxide (8-hour rolling average) concentration for the reporting period is presented in Figure 18.

**Table 25: Carbon Monoxide Concentration Percentiles (8 Hour Rolling Average)**

Station	Carbon Monoxide Concentration (ppm) (8-Hour Rolling Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	0.61	0.48	0.40	0.36	0.33	0.26	0.18
Craig Rd	0.41	0.35	0.32	0.30	0.27	0.22	0.15
Heads Rd	0.49	0.43	0.41	0.36	0.34	0.30	0.24

Carbon Monoxide (8 hour average) - November 2009

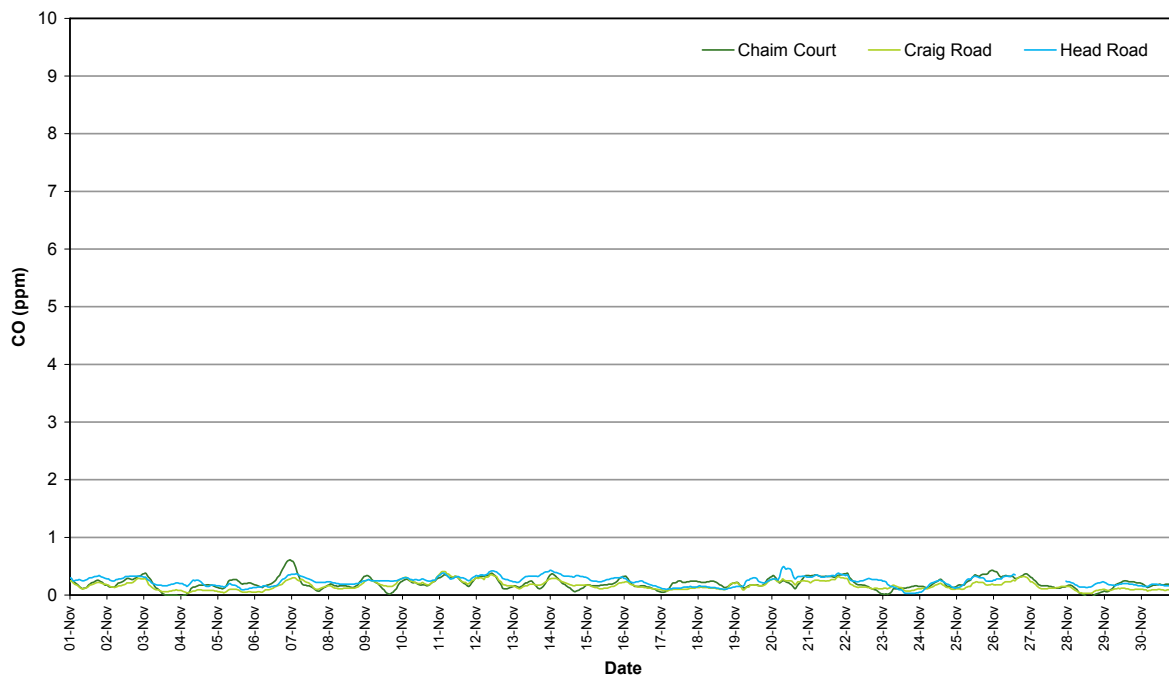


Figure 18: Carbon Monoxide Concentration (8 Hour Rolling Average)





**7.3.2 Oxides of Nitrogen**

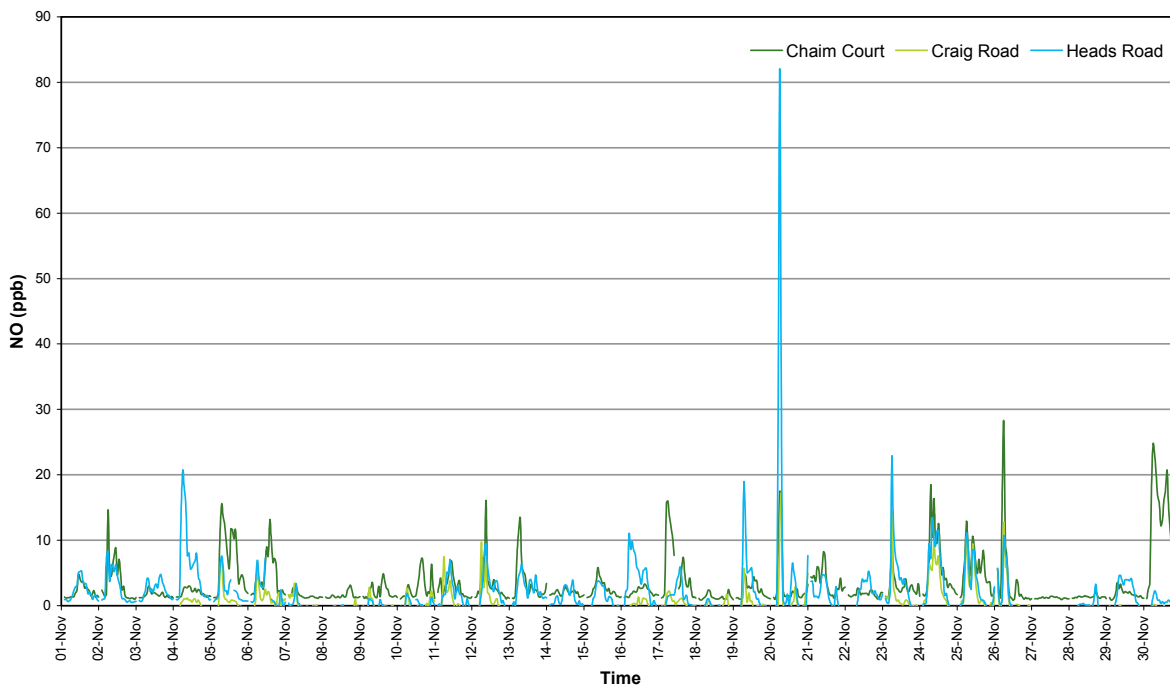
**7.3.2.1 Nitric Oxide**

Nitric oxide (1-hour average) concentration statistics for the reporting period are given in Table 26. A plot of nitric oxide (1-hour average) concentration for the reporting period is presented in Figure 19.

**Table 26: Nitric Oxide Concentration Percentiles (1 Hour Average)**

Station	Nitric Oxide Concentration (ppm) (1-Hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	28	18	16	11	7.3	3.3	2.0
Craig Rd	17	9.6	7.4	4.7	2.2	0.74	<0.2
Heads Rd	82	17	11	7.9	5.6	3.0	0.88

**Nitric Oxide (1 hour average) - November 2009**



*Figure 19: Nitric Oxide Concentration (1 Hour Average)*



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## 7.3.2.2 Nitrogen Dioxide

Nitrogen dioxide (1-hour average) concentration statistics for the reporting period are given in Table 27. A plot of nitrogen dioxide (1-hour average) concentration for the reporting period is presented in Figure 20.

**Table 27: Nitrogen Dioxide Concentration Percentiles (1 Hour Average)**

Station	Nitrogen Dioxide Concentration (ppb) (1-Hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	34	23	21	17	15	10	6.0
Craig Rd	28	24	21	17	14	8.4	6.3
Heads Rd	42	27	21	18	14	10	6.8

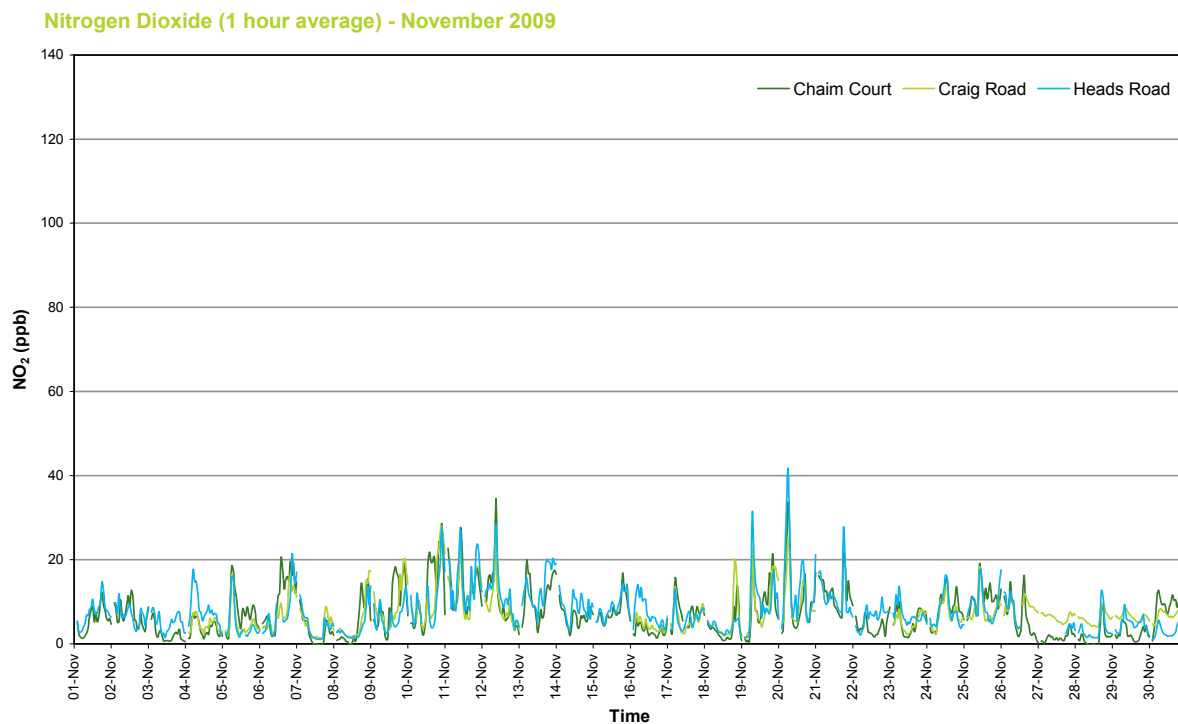


Figure 20: Nitrogen Dioxide Concentration (1 Hour Average)



**7.3.3 Meteorological Data**

Wind speed and direction for each of the monitoring stations are presented as wind roses in Figures 21 – 23.

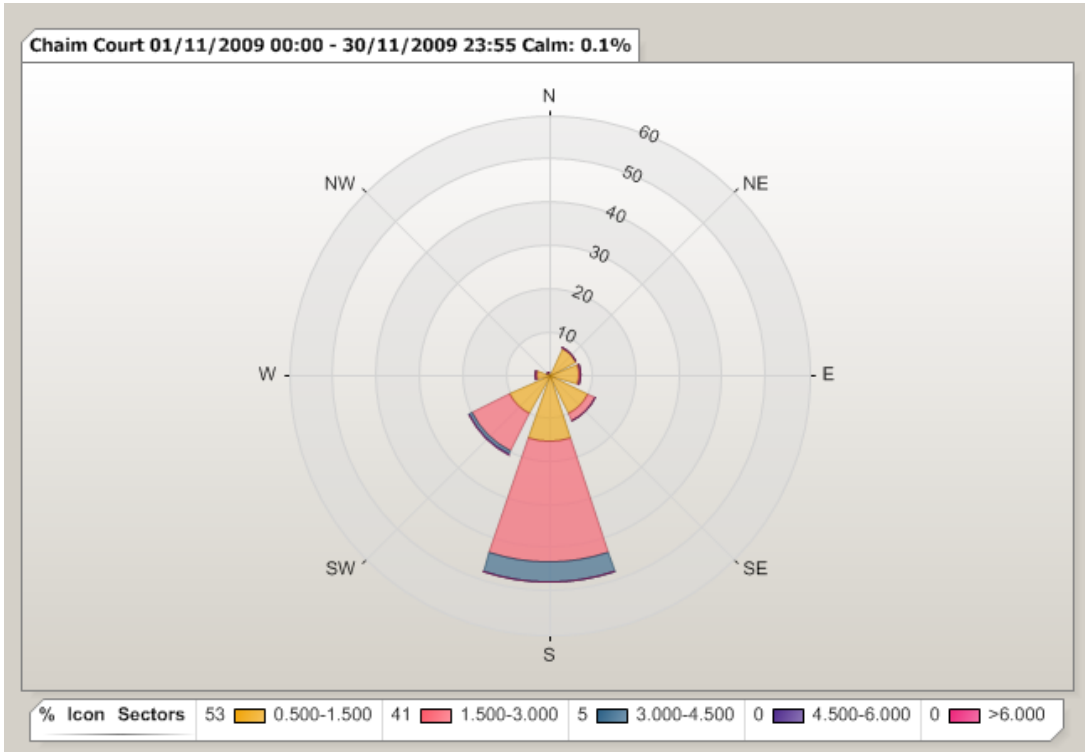


Figure 21: Chaim Court Wind Rose

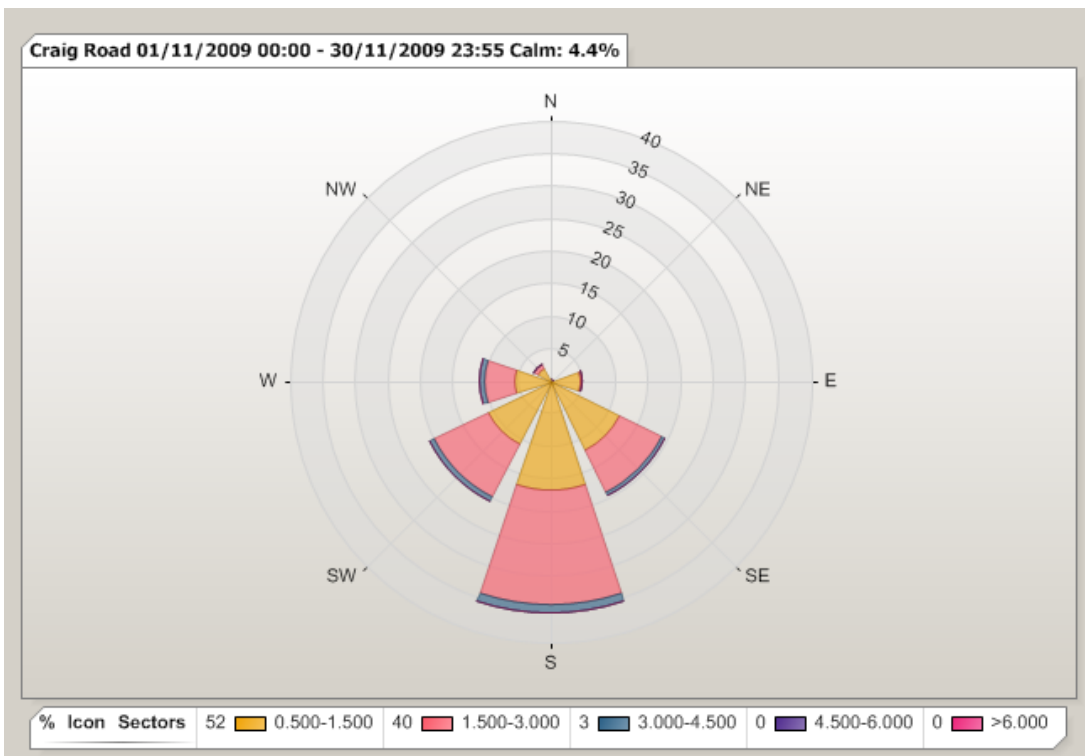


Figure 22: Craig Road Wind Rose



# EASTLINK AMBIENT AIR QUALITY MONITORING REPORT OCTOBER-DECEMBER 2009

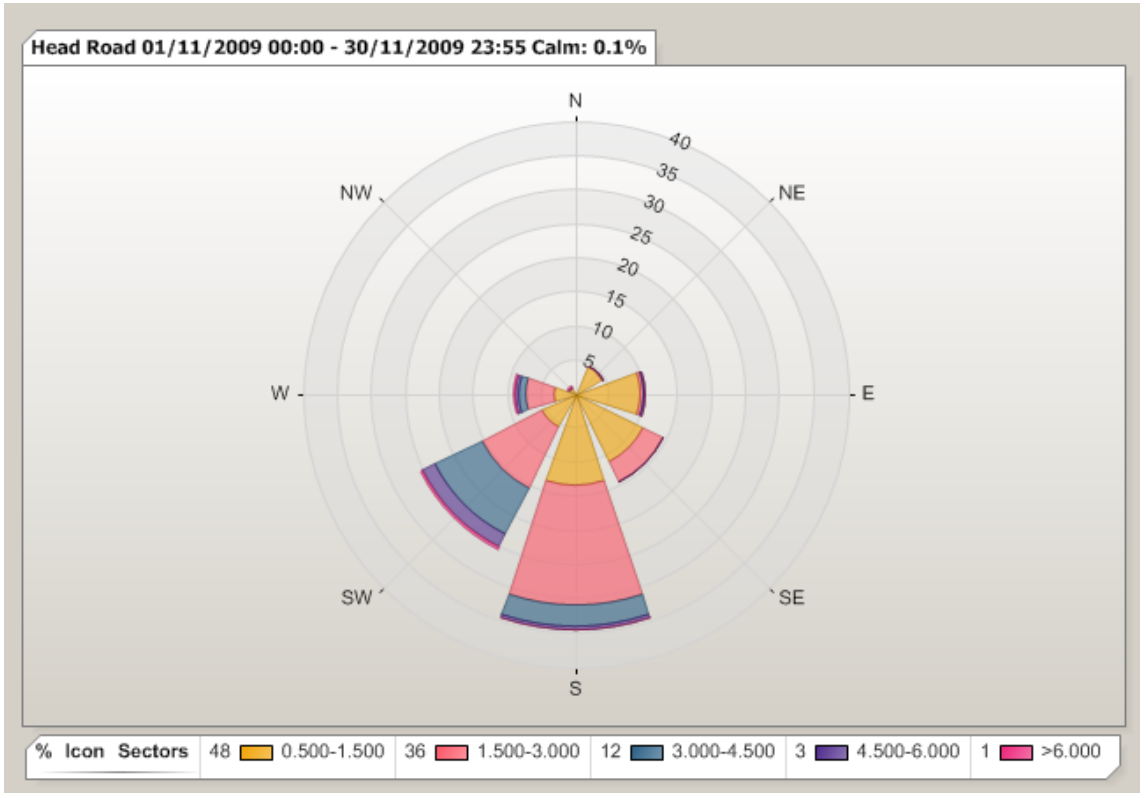


Figure 23: Heads Road Wind Rose



## 7.4 Data Validation and Exception

Data contained in the report has been validated against performance and calibration requirements for each instrument. Data during maintenance and calibration periods has been removed from the validated data sets. Tables 28 – 30 list the data exceptions for Chaim Court, Craig Road and Heads Road monitoring stations respectively. Data during automatic calibrations of the gaseous analysers has also been removed from the data sets.

**Table 28: Data Exceptions - Chaim Court**

Start	End	Parameter	Reason
1/11/2009 0:00	1/11/2009 12:00	PM <sub>2.5</sub>	Invalid data <sup>1</sup>
3/11/2009 1:00	3/11/2009 10:00	PM <sub>2.5</sub>	Invalid data <sup>1</sup>
4/11/2009 12:20	4/11/2009 13:25	PM <sub>2.5</sub>	Maintenance/calibration
16/11/2009 13:35	16/11/2009 15:25	PM <sub>2.5</sub>	Maintenance/calibration
17/11/2009 11:10	17/11/2009 12:35	CO	Maintenance/calibration
17/11/2009 11:10	17/11/2009 12:35	NO, NO <sub>2</sub> , NO <sub>x</sub>	Maintenance/calibration
17/11/2009 11:30	17/11/2009 14:35	PM <sub>2.5</sub>	Maintenance/calibration
17/11/2009 11:35	17/11/2009 13:05	PM <sub>10</sub>	Maintenance/calibration
17/11/2009 13:45	17/11/2009 13:45	All parameters	Maintenance/calibration
17/11/2009 13:55	17/11/2009 13:55	All parameters	Maintenance/calibration

**Note:**

1 In the opinion of the data reviewer.

**Table 29: Data Exceptions - Craig Road**

Start	End	Parameter	Reason
1/11/2009 3:00	4/11/2009 0:55	NO, NO <sub>2</sub> , NO <sub>x</sub>	Invalid data - span drift <sup>1</sup>
12/11/2009 14:20	12/11/2009 15:05	PM <sub>10</sub>	Maintenance/calibration
13/11/2009 1:40	16/11/2009 0:55	NO, NO <sub>2</sub> , NO <sub>x</sub>	Invalid data - span drift <sup>1</sup>
16/11/2009 14:35	16/11/2009 14:35	PM <sub>10</sub>	Communications fault
21/11/2009 1:40	23/11/2009 0:55	NO, NO <sub>2</sub> , NO <sub>x</sub>	Invalid data - span drift <sup>1</sup>
26/11/2009 12:40	26/11/2009 13:30	CO	Maintenance/calibration
26/11/2009 12:40	26/11/2009 13:30	NO, NO <sub>2</sub> , NO <sub>x</sub>	Maintenance/calibration
26/11/2009 12:45	26/11/2009 12:45	WS, WD, Temp, RH	Maintenance/calibration
26/11/2009 13:05	26/11/2009 14:35	PM <sub>10</sub>	Maintenance/calibration

**Note:**

1 In the opinion of the data reviewer.



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**Table 30: Data Exceptions - Heads Road**

Start	End	Parameter	Reason
5/11/2009 14:35	5/11/2009 15:05	NO, NO <sub>2</sub> , NO <sub>x</sub>	Maintenance/calibration
6/11/2009 12:35	6/11/2009 14:15	NO, NO <sub>2</sub> , NO <sub>x</sub>	Maintenance/calibration
6/11/2009 13:40	6/11/2009 13:40	All parameters	Communications fault
10/11/2009 10:05	10/11/2009 11:45	NO, NO <sub>2</sub> , NO <sub>x</sub>	Maintenance/calibration
26/11/2009 13:40	27/11/2009 17:55	All parameters	Communications fault



## 8.0 AMBIENT AIR QUALITY MONITORING PERIOD: 01/12/2009 – 31/12/2009

### 8.1 Data Capture

Data capture is defined as the number of valid data periods collected divided by the number of available data periods. Valid data excludes periods where the instrument is unavailable due to calibration and maintenance and excludes periods where the data has been rejected due to quality assurance procedures.

The data capture statistics for the reporting period 1st December to 31st December 2009 are shown in Tables 31-33. Averages were only collected for those periods where the 5-minute data constituted 75% data capture.

Section 8.3 provides further information on the reasons for invalid data periods.

**Table 31: Data Capture Statistics – 1 Hour Averages**

Parameter	Station	Collected Periods	Available Periods	Data Capture
PM <sub>2.5</sub>	Chaim Crt.	669	744	89.9%
PM <sub>10</sub>	Chaim Crt	721	744	96.9%
	Craig Rd.	741	744	99.6%
	Heads Rd.	734	744	98.7%
NO, NO <sub>2</sub>	Chaim Crt	687	744	92.3%
	Craig Rd.	710	744	95.4%
	Heads Rd.	694	744	93.3%
CO	Chaim Crt	668	744	89.8%
	Craig Rd.	711	744	95.6%
	Heads Rd.	700	744	94.1%

**Table 32: Data Capture Statistics - 8 Hour Rolling Averages**

Parameter	Station	Collected Periods	Available Periods	Data Capture
CO	Chaim Crt	689	744	92.6%
	Craig Rd.	744	744	100.0%
	Heads Rd.	744	744	100.0%

**Table 33: Data Capture Statistics – 24 Hour Averages**

Parameter	Station	Collected Periods	Available Periods	Data Capture
PM <sub>2.5</sub>	Chaim Crt.	27	31	87.1%
PM <sub>10</sub>	Chaim Crt	30	31	96.8%
	Craig Rd.	31	31	100.0%
	Heads Rd.	31	31	100.0%



## 8.2 Results

### 8.2.1 PM<sub>2.5</sub>

PM<sub>2.5</sub> was continuously monitored and 5-minute averages logged. The 5-minute average data was then transformed to 1-hour and 24-hour averages for reporting.

PM<sub>2.5</sub> (1-hour average) concentration statistics for the reporting period are given in Table 34. A plot of PM<sub>2.5</sub> (1-hour average) concentration for the reporting period is presented in Figure 24.

**Table 34: PM<sub>2.5</sub> Concentration Percentiles (1 Hour Average)**

Station	PM <sub>2.5</sub> Concentration (µg/m <sup>3</sup> ) (1-hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	20	19	16	15	12	8.4	4.4

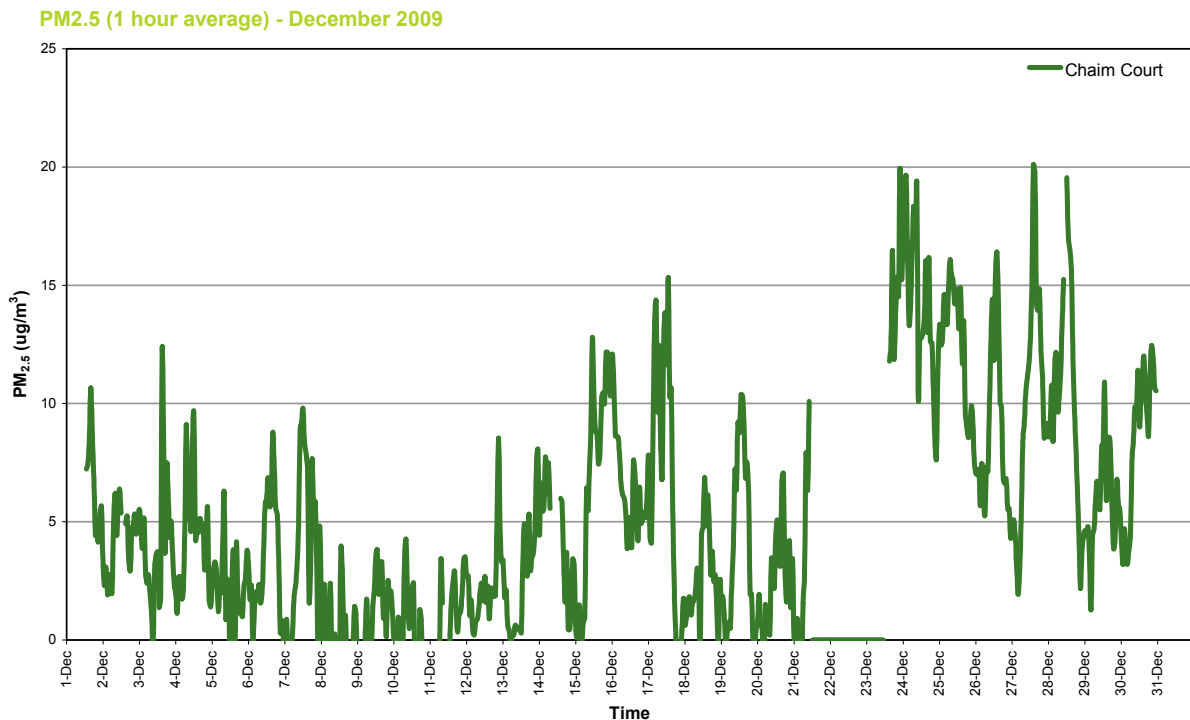


Figure 24: PM<sub>2.5</sub> Concentration (1 Hour Average)





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PM<sub>2.5</sub> (24-hour average) concentration statistics for the reporting period are given in Table 35. A plot of PM<sub>2.5</sub> (24-hour average) concentration for the reporting period is presented in Figure 25.

**Table 35: PM<sub>2.5</sub> Concentration Percentiles (24 Hour Average)**

Station	PM <sub>2.5</sub> Concentration (µg/m <sup>3</sup> ) (24-hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	14	14	13	12	10	7.0	4.2

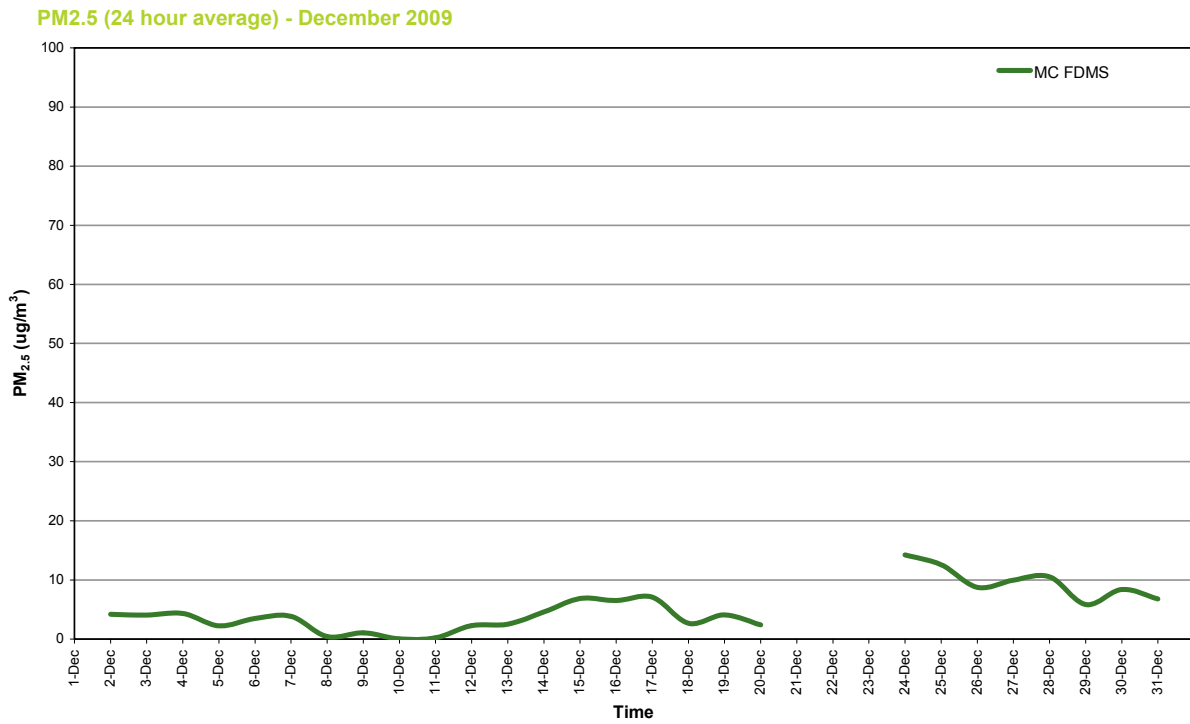


Figure 25: PM<sub>2.5</sub> Concentration (24 Hour Average)



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## 8.3 PM<sub>10</sub>

PM<sub>10</sub> was continuously monitored and 5-minute averages logged. The 5-minute average data was then transformed to 1-hour and 24-hour averages for reporting.

PM<sub>10</sub> (1-hour average) concentration statistics for the reporting period are given in Table 36. A plot of PM<sub>10</sub> (1-hour average) concentration for the reporting period is presented in Figure 26.

**Table 36: PM<sub>10</sub> Concentration Percentiles (1 Hour Average)**

Station	PM <sub>10</sub> Concentration (µg/m <sup>3</sup> ) (1-Hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	69	43	34	28	26	21	15
Craig Rd	72	41	37	29	25	20	15
Heads Rd	66	40	35	27	24	20	14

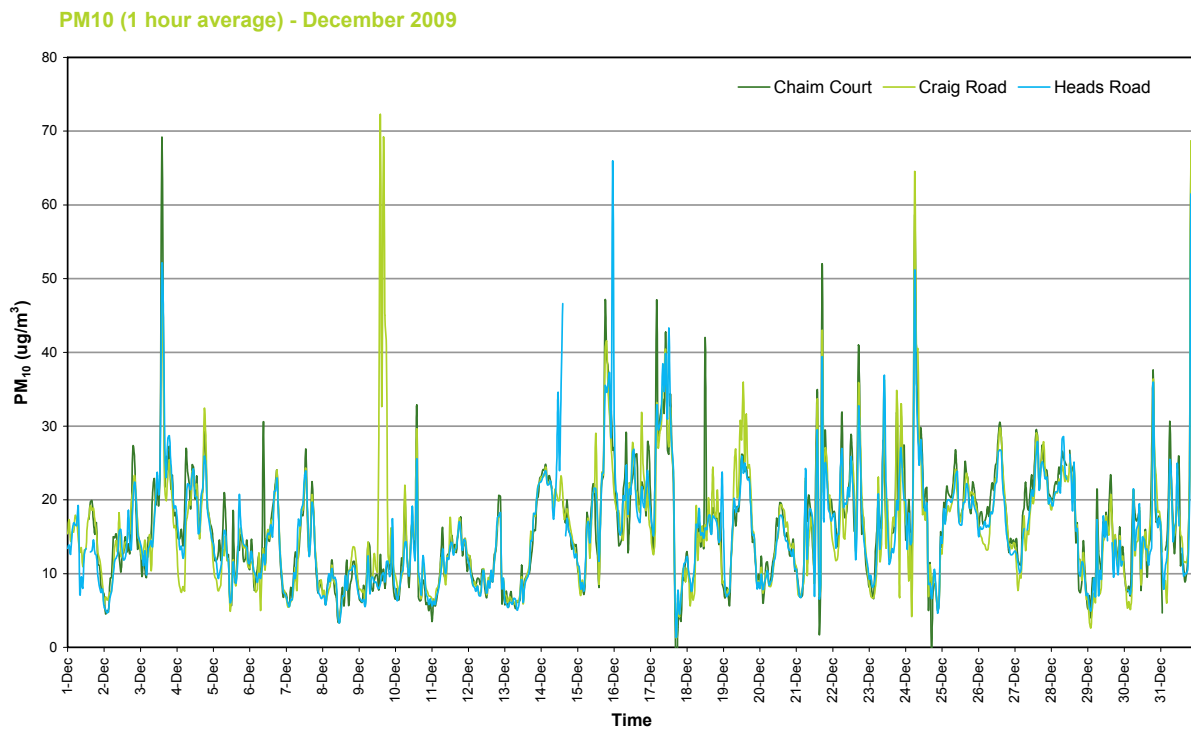


Figure 26: PM<sub>10</sub> Concentration (1 Hour Average)



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PM<sub>10</sub> (24-hour average) concentration statistics for the reporting period are given in Table 37. A plot of PM<sub>10</sub> (24-hour average) concentration for the reporting period is presented in Figure 27.

**Table 37: PM<sub>10</sub> Concentration Percentiles (24 Hour Average)**

Station	PM <sub>10</sub> Concentration (µg/m <sup>3</sup> ) (24-Hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	22	22	21	21	21	20	17
Craig Rd.	21	20	20	20	20	19	17
Heads Rd	22	22	22	22	21	19	16

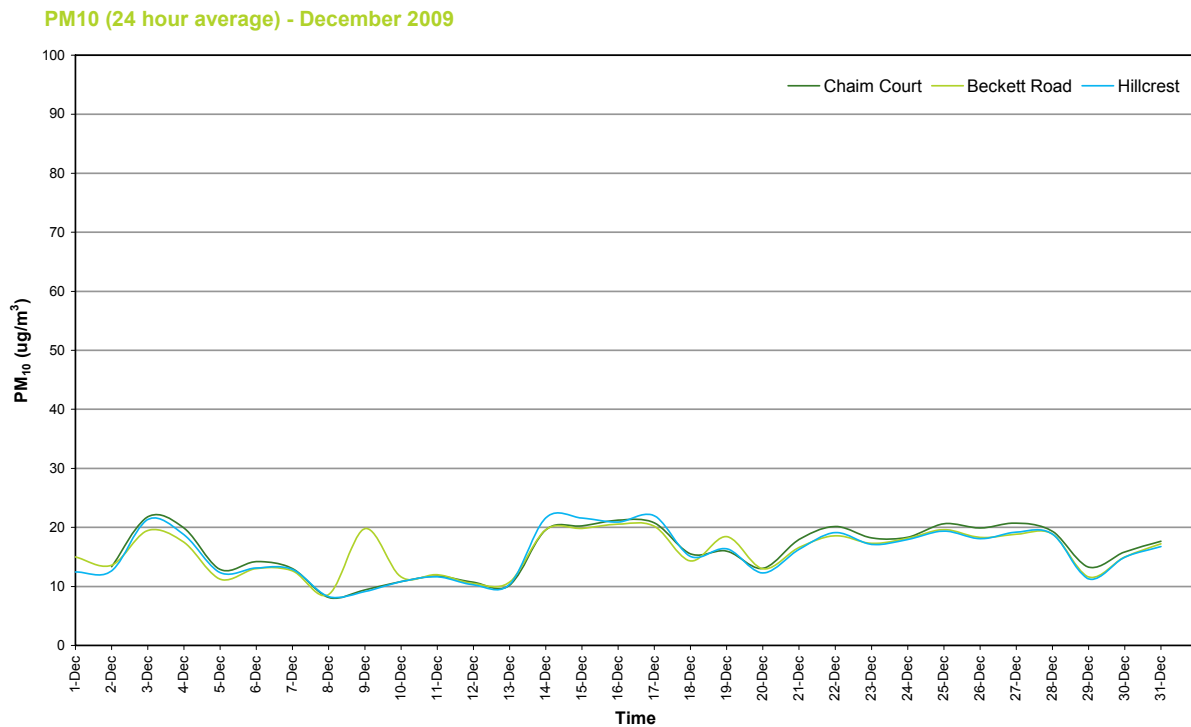


Figure 27: PM<sub>10</sub> Concentration (24 Hour Average)



# EASTLINK AMBIENT AIR QUALITY MONITORING REPORT OCTOBER-DECEMBER 2009

## 8.3.1 Carbon Monoxide

### 8.3.1.1 1-Hour Average

Carbon monoxide (1-hour average) concentration statistics for the reporting period are given in Table 38. A plot of carbon monoxide (1-hour average) concentration for the reporting period is presented in Figure 28.

**Table 38: Carbon Monoxide Concentration Percentiles (1 Hour Average)**

Station	Carbon Monoxide Concentration (ppm) (1-Hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	0.60	0.45	0.41	0.36	0.32	0.25	0.17
Craig Rd	0.47	0.37	0.34	0.26	0.22	0.16	0.11
Heads Rd	0.52	0.37	0.33	0.29	0.25	0.20	0.14

**Carbon Monoxide (1 hour average) - December 2009**

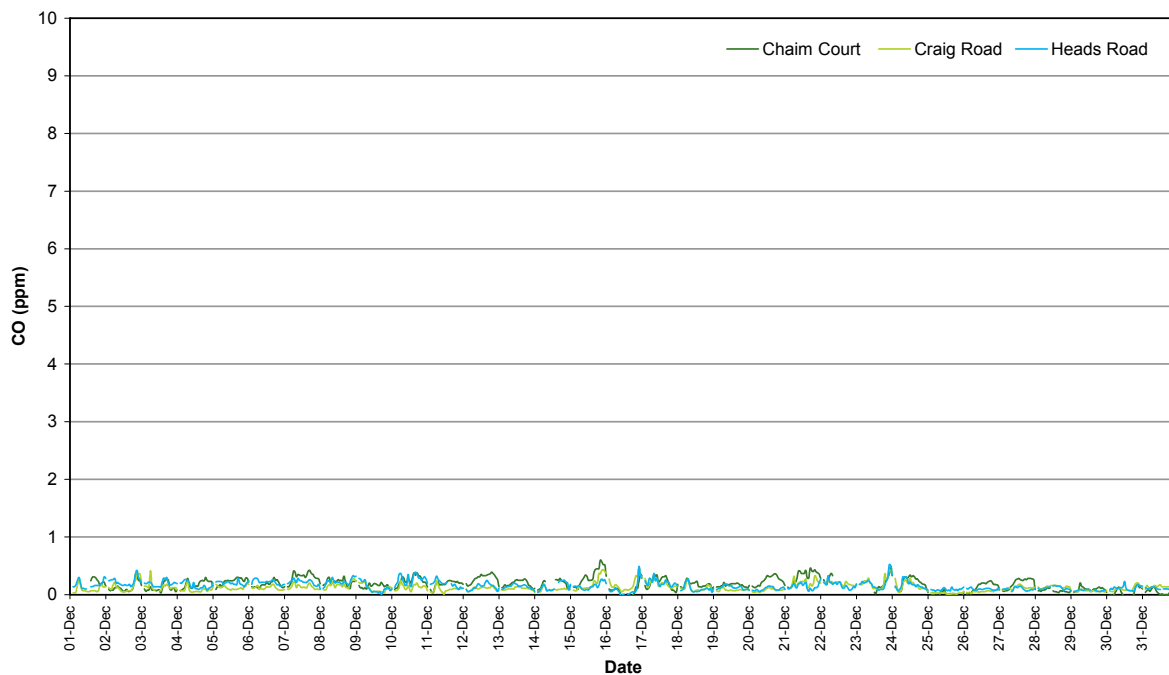


Figure 28: Carbon Monoxide Concentration (1 Hour Average)



**8.3.1.2 8-Hour Rolling Average**

Carbon monoxide (8-hour rolling average) concentration statistics for the reporting period are given in Table 39. A plot of carbon monoxide (8-hour rolling average) concentration for the reporting period is presented in Figure 29.

**Table 39: Carbon Monoxide Concentration Percentiles (8 Hour Rolling Average)**

Station	Carbon Monoxide Concentration (ppm) (8-Hour Rolling Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	0.49	0.39	0.38	0.34	0.30	0.24	0.17
Craig Rd	0.37	0.32	0.28	0.23	0.21	0.15	0.12
Heads Rd	0.32	0.29	0.28	0.25	0.23	0.20	0.15

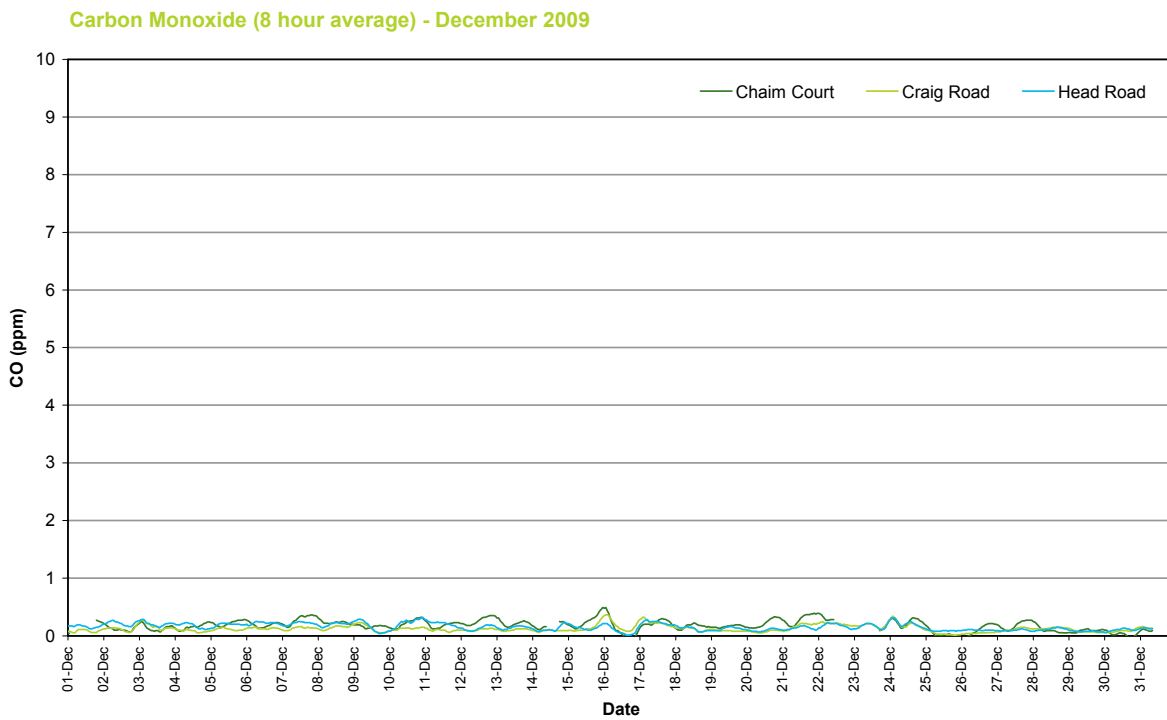


Figure 29: Carbon Monoxide Concentration (8 Hour Rolling Average)



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## 8.3.2 Oxides of Nitrogen

### 8.3.2.1 Nitric Oxide

Nitric oxide (1-hour average) concentration statistics for the reporting period are given in Table 40. A plot of nitric oxide (1-hour average) concentration for the reporting period is presented in Figure 30.

**Table 40: Nitric Oxide Concentration Percentiles (1 Hour Average)**

Station	Nitric Oxide Concentration (ppm) (1-Hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	27	17	13	8.5	5.6	3.1	1.8
Craig Rd	38	17	12	6.4	3.9	1.1	<0.04
Heads Rd	36	18	14	8.9	6.5	3.6	1.4

**Nitric Oxide (1 hour average) - December 2009**

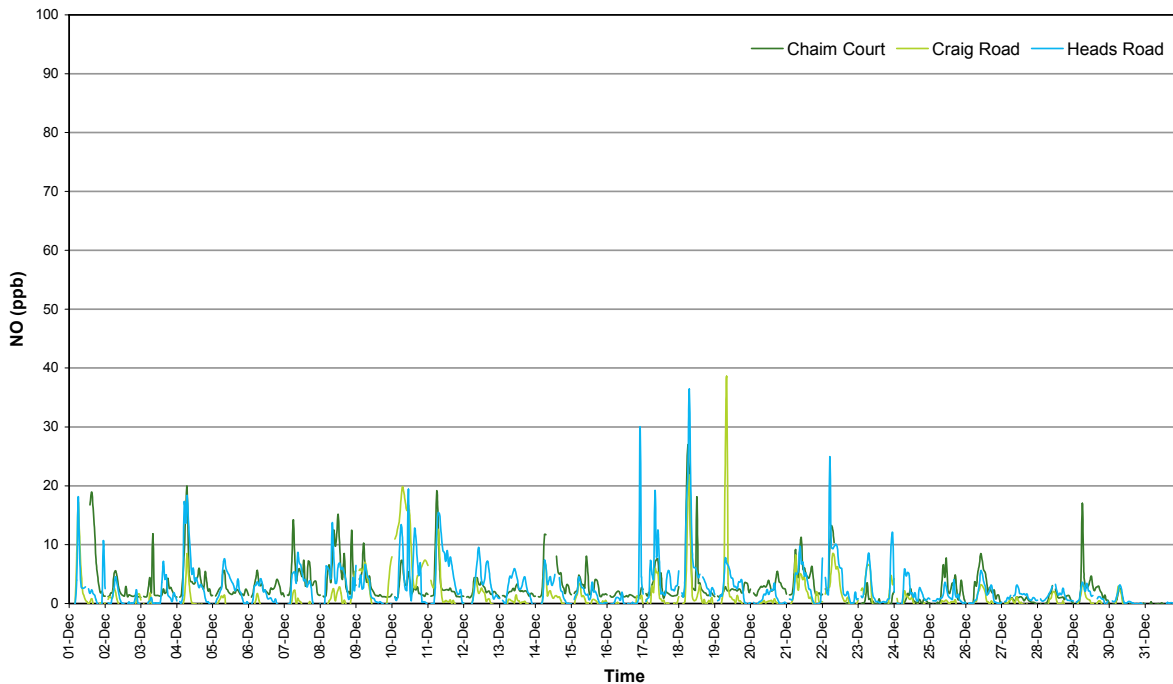


Figure 30: Nitric Oxide Concentration (1 Hour Average)



# EASTLINK AMBIENT AIR QUALITY MONITORING REPORT OCTOBER-DECEMBER 2009

## 8.3.2.2 Nitrogen Dioxide

Nitrogen dioxide (1-hour average) concentration statistics for the reporting period are given in Table 41. A plot of nitrogen dioxide (1-hour average) concentration for the reporting period is presented in Figure 31.

**Table 41: Nitrogen Dioxide Concentration Percentiles (1 Hour Average)**

Station	Nitrogen Dioxide Concentration (ppb) (1-Hour Average)						
	Maximum	99 <sup>th</sup>	98 <sup>th</sup>	95 <sup>th</sup>	90 <sup>th</sup>	75 <sup>th</sup>	50 <sup>th</sup>
Chaim Crt	25	21	18	14	11	7.2	4.7
Craig Rd	27	19	17	14	11	8.4	5.5
Heads Rd	37	23	20	14	12	8.0	5.3

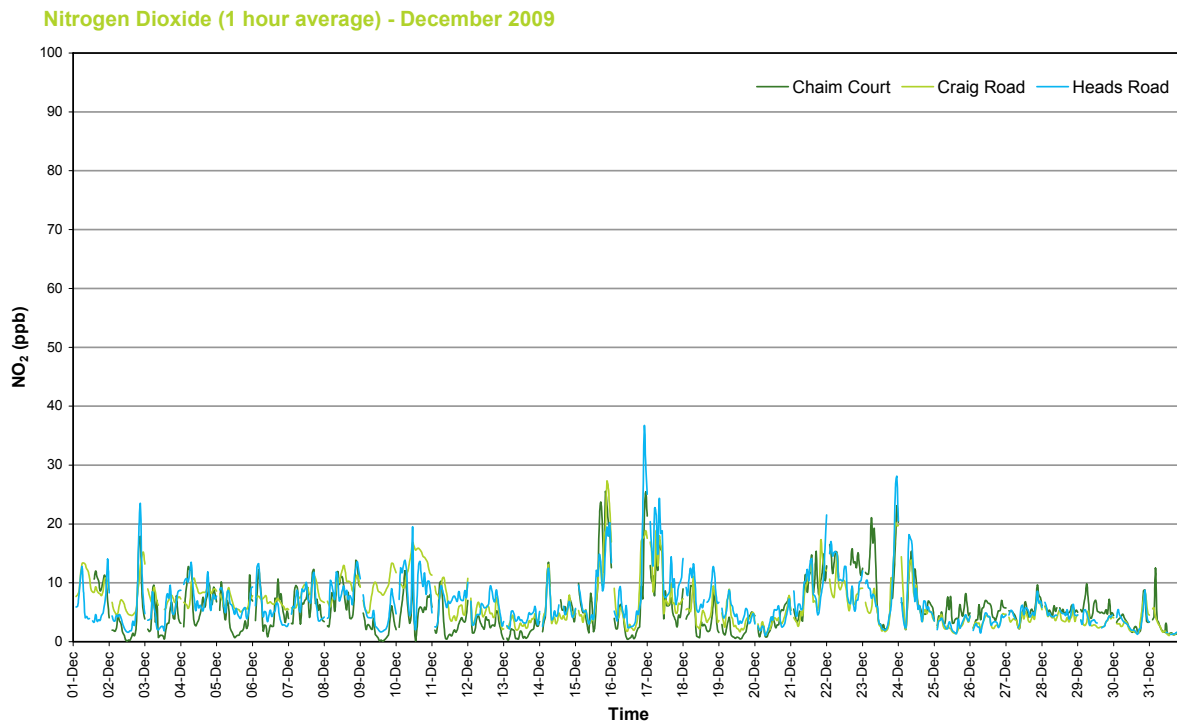


Figure 31: Nitrogen Dioxide Concentration (1 Hour Average)



### 8.4 Meteorological Data

Wind speed and direction for each of the monitoring stations are presented as wind roses in Figures 32 – 34.

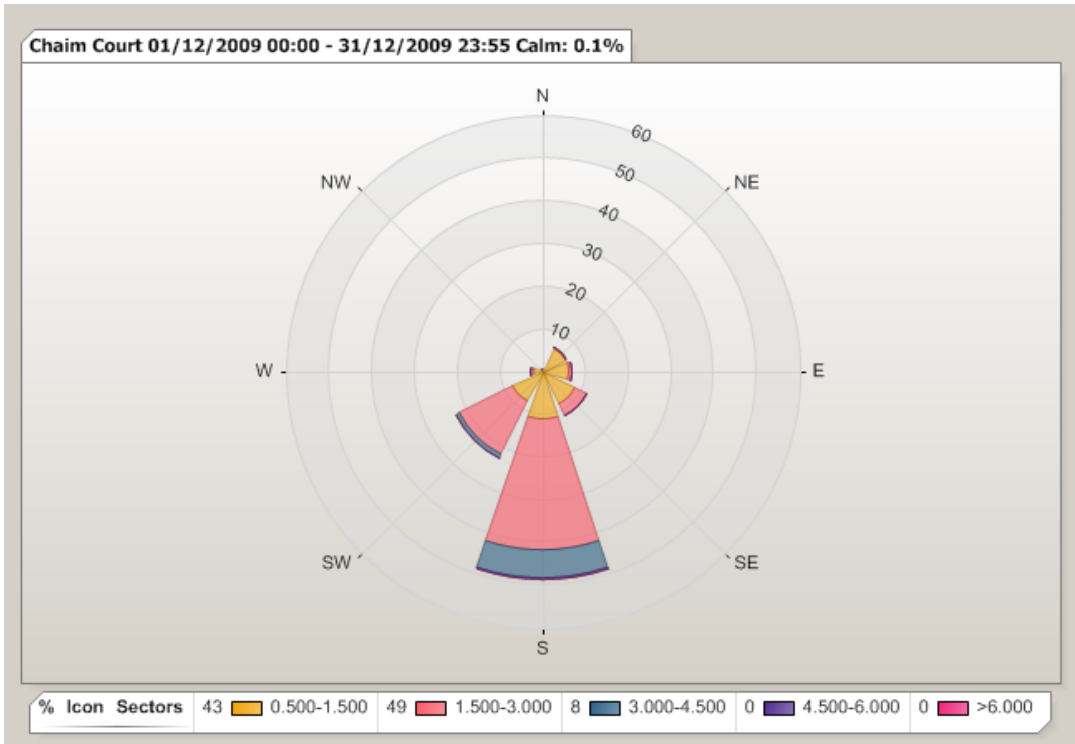


Figure 32: Chaim Court Wind Rose

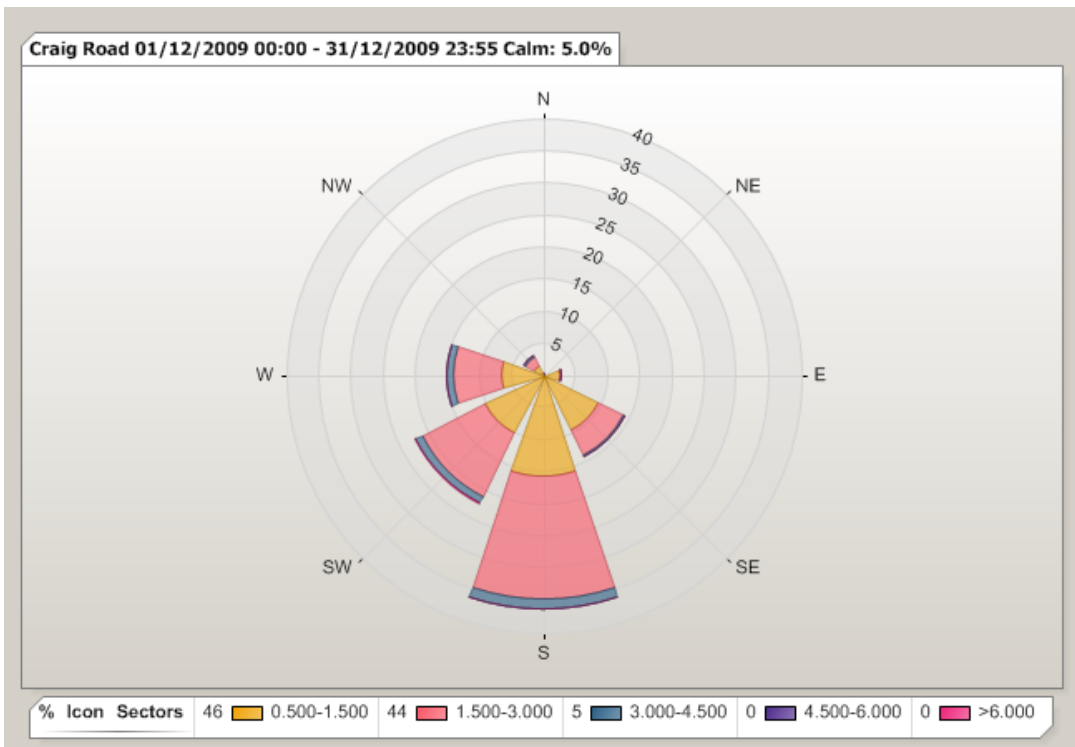


Figure 33: Craig Road Wind Rose





# EASTLINK AMBIENT AIR QUALITY MONITORING REPORT OCTOBER-DECEMBER 2009

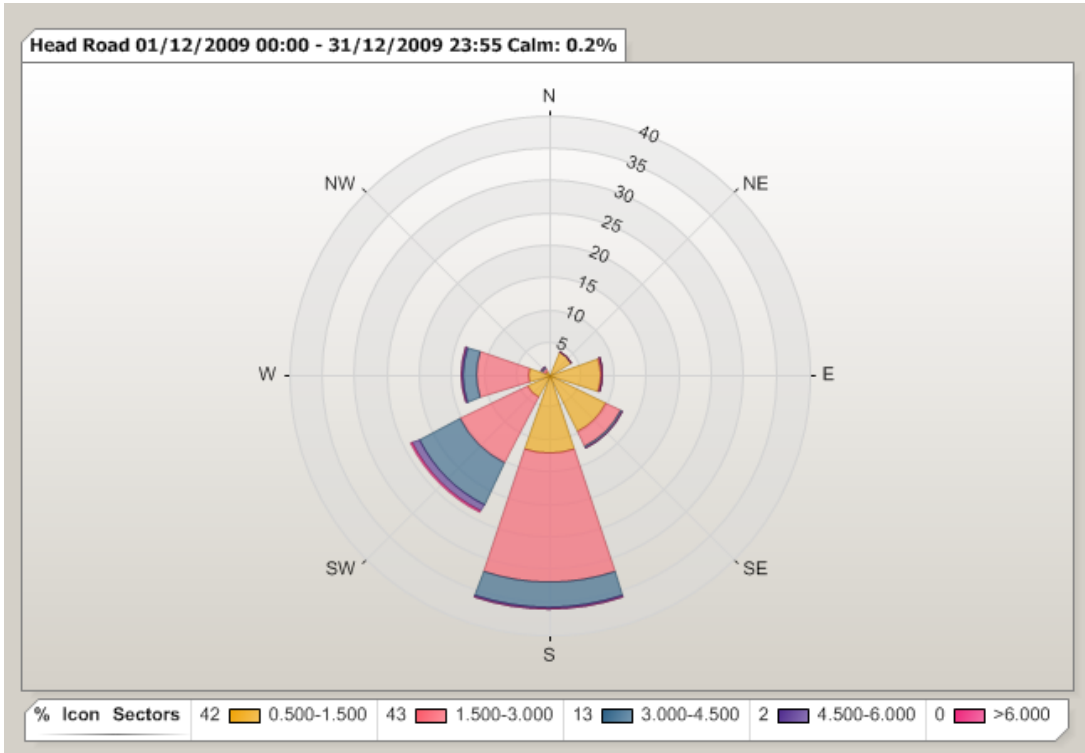


Figure 34: Heads Road Wind Rose



## 8.5 Data Validation and Exception

Data contained in the report has been validated against performance and calibration requirements for each instrument. Data during maintenance and calibration periods has been removed from the validated data sets. Tables 42 – 44 list the data exceptions for Chaim Court, Craig Road and Heads Road monitoring stations respectively. Data during automatic calibrations of the gaseous analysers has also been removed from the data sets.

**Table 42: Data Exceptions - Chaim Court**

Start	End	Parameter	Reason
1/12/2009 0:20	1/12/2009 11:45	All parameters	Power failure
1/12/2009 11:45	1/12/2009 13:15	CO,NO, NO <sub>2</sub> , NO <sub>x</sub> , PM <sub>10</sub>	Instrument stabilisation
1/12/2009 11:45	1/12/2009 12:50	PM <sub>2.5</sub>	Instrument stabilisation
2/12/2009 13:30	2/12/2009 14:20	PM <sub>2.5</sub>	Maintenance/calibration
11/12/2009 8:50	11/12/2009 10:00	PM <sub>2.5</sub>	Maintenance/calibration
14/12/2009 8:00	14/12/2009 8:45	All parameters	Communications fault
14/12/2009 9:40	14/12/2009 10:25	All parameters	Communications fault
14/12/2009 11:20	14/12/2009 12:05	All parameters	Communications fault
14/12/2009 13:00	14/12/2009 13:45	All parameters	Communications fault
21/12/2009 10:50	23/12/2009 14:50	PM <sub>2.5</sub>	Invalid data <sup>1</sup>
22/12/2009 9:25	22/12/2009 15:40	CO	Maintenance/calibration
22/12/2009 9:25	22/12/2009 15:40	NO, NO <sub>2</sub> , NO <sub>x</sub>	Maintenance/calibration
22/12/2009 14:30	22/12/2009 14:30	PM <sub>10</sub>	Maintenance/calibration
22/12/2009 15:40	23/12/2009 11:10	CO	Invalid data - span drift <sup>1</sup>
23/12/2009 11:10	23/12/2009 12:00	CO	Maintenance/calibration
23/12/2009 12:15	23/12/2009 12:15	All parameters	Maintenance/calibration
23/12/2009 13:15	23/12/2009 15:00	PM <sub>10</sub>	Maintenance/calibration
28/12/2009 10:55	28/12/2009 11:40	All parameters	Communications fault

**Note:**

1 In the opinion of the data reviewer.

**Table 43: Data Exceptions - Craig Road**

Start	End	Parameter	Reason
3/12/2009 10:25	3/12/2009 11:40	CO	Maintenance/calibration
3/12/2009 10:25	3/12/2009 12:20	NO, NO <sub>2</sub> , NO <sub>x</sub>	Maintenance/calibration
3/12/2009 12:00	3/12/2009 13:25	PM <sub>10</sub>	Maintenance/calibration
11/12/2009 11:20	11/12/2009 11:20	CO	Maintenance/calibration
11/12/2009 11:20	11/12/2009 11:20	NO, NO <sub>2</sub> , NO <sub>x</sub>	Maintenance/calibration



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**Table 44: Data Exceptions - Heads Road**

Start	End	Parameter	Reason
1/12/2009 12:25	1/12/2009 13:25	CO	Maintenance/calibration
1/12/2009 12:25	1/12/2009 13:00	NO, NO <sub>2</sub> , NO <sub>x</sub>	Maintenance/calibration
1/12/2009 13:10	1/12/2009 14:15	PM <sub>10</sub>	Maintenance/calibration
11/12/2009 14:05	11/12/2009 15:40	CO	Maintenance/calibration
14/12/2009 14:05	14/12/2009 14:25	CO	Maintenance/calibration
14/12/2009 14:05	14/12/2009 15:50	NO, NO <sub>2</sub> , NO <sub>x</sub>	Maintenance/calibration
14/12/2009 14:40	14/12/2009 15:15	CO	Maintenance/calibration
14/12/2009 14:55	14/12/2009 16:10	PM <sub>10</sub>	Maintenance/calibration
16/12/2009 13:00	16/12/2009 13:15	CO	Maintenance/calibration
18/12/2009 15:30	18/12/2009 15:50	NO, NO <sub>2</sub> , NO <sub>x</sub>	Maintenance/calibration
27/12/2009 7:15	27/12/2009 8:00	All parameters	Communications fault
28/12/2009 11:15	28/12/2009 12:00	All parameters	Communications fault
29/12/2009 13:45	29/12/2009 14:30	All parameters	Communications fault
29/12/2009 15:25	29/12/2009 16:10	All parameters	Communications fault
31/12/2009 1:40	31/12/2009 9:55	NO, NO <sub>2</sub> , NO <sub>x</sub>	Invalid data - span drift <sup>1</sup>
31/12/2009 9:55	31/12/2009 9:55	CO	Maintenance/calibration
31/12/2009 10:05	31/12/2009 10:35	NO, NO <sub>2</sub> , NO <sub>x</sub>	Maintenance/calibration
31/12/2009 10:35	31/12/2009 10:35	All parameters	Communications fault
31/12/2009 13:15	31/12/2009 14:00	All parameters	Communications fault

**Note:**

1 In the opinion of the data reviewer.



## **9.0 DISCUSSION**

### **9.1 Comparison with Air Quality Objectives**

#### **9.1.1 PM<sub>2.5</sub> and PM<sub>10</sub>**

Assessment criteria for PM<sub>2.5</sub> and PM<sub>10</sub> are taken from the State Environment Protection Policy (Air Quality Management) (SEPP {AQM}) Schedule B intervention levels. The intervention levels for PM<sub>10</sub> and PM<sub>2.5</sub> are as follows:

- PM<sub>10</sub> (24-hour) 60 µg/m<sup>3</sup>;
- PM<sub>2.5</sub> (24 hour) 36 µg/m<sup>3</sup>.

There were no exceedence days of the PM<sub>2.5</sub> intervention level during the reported period, however, the maximum 24-hour average PM<sub>2.5</sub> concentration on 02/11/2009 at Chaim Court monitoring station equalled the intervention level (36 µg/m<sup>3</sup>).

There were no exceedence days of the PM<sub>10</sub> intervention level during the reported period. The maximum 24-hour average PM<sub>10</sub> concentration was 37 µg/m<sup>3</sup> on 19/11/2009 at Craig Road monitoring station.

#### **9.1.2 Nitrogen Dioxide**

The assessment criterion for NO<sub>2</sub> is taken from the SEPP (AQM) Schedule B intervention level. The intervention level for NO<sub>2</sub> is as follows:

- NO<sub>2</sub> (1 hour) 140 ppb.

There were no exceedences of the NO<sub>2</sub> intervention level during the reported period at any of the monitoring stations. The maximum 1-hour average NO<sub>2</sub> concentration was 41 ppb on 20/11/2009 06:00 hours at Heads Road monitoring station.

#### **9.1.3 Carbon Monoxide**

Assessment criteria for CO are taken from the (SEPP AQM) Schedule B intervention level and the State Environment Protection Policy (Ambient Air Quality) {SEPP (AAQ)} air quality objective. The intervention and SEPP (AAQ) levels for CO are as follows:

- CO (1 hour) 29 ppm {SEPP (AQM)};
- CO (8-hour) 9 ppm {SEPP (AAQ)}.

There were no exceedences of the CO intervention level or SEPP (AAQ) objective during the reported period at any of the monitoring stations. The maximum 1-hour average CO concentration was 1.1 ppm on 20/11/2009 06:00 hours at Heads Road monitoring station. The maximum 8-hour average CO concentration was 0.67 ppm on 11/10/2009 07:00 hours reported at the Craig Road monitoring station.



## 9.2 Data Capture Year to Date

2009 data capture statistics for the period 01/01/2009 to 31/12/2009 are presented in Table 45.

	<b>PM<sub>2.5</sub></b>	<b>PM<sub>10</sub></b>	<b>NO<sub>x</sub></b>	<b>CO</b>
Chaim Court	96.3	98.6	95.3	96.4
Craig Road	-	99.4	94.1	95.9
Heads Road	-	97.8	91.1	94.1



# EASTLINK AMBIENT AIR QUALITY MONITORING REPORT OCTOBER-DECEMBER 2009

## Report Signature Page

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# **APPENDIX A**

## **Limitations**



## EASTLINK AMBIENT AIR QUALITY MONITORING REPORT OCTOBER-DECEMBER 2009

### LIMITATIONS

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