



# Airport Link / Northern Busway Project

## Monthly Environmental Monitoring Report

December 2011

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## 1.0 Report Purpose and Scope

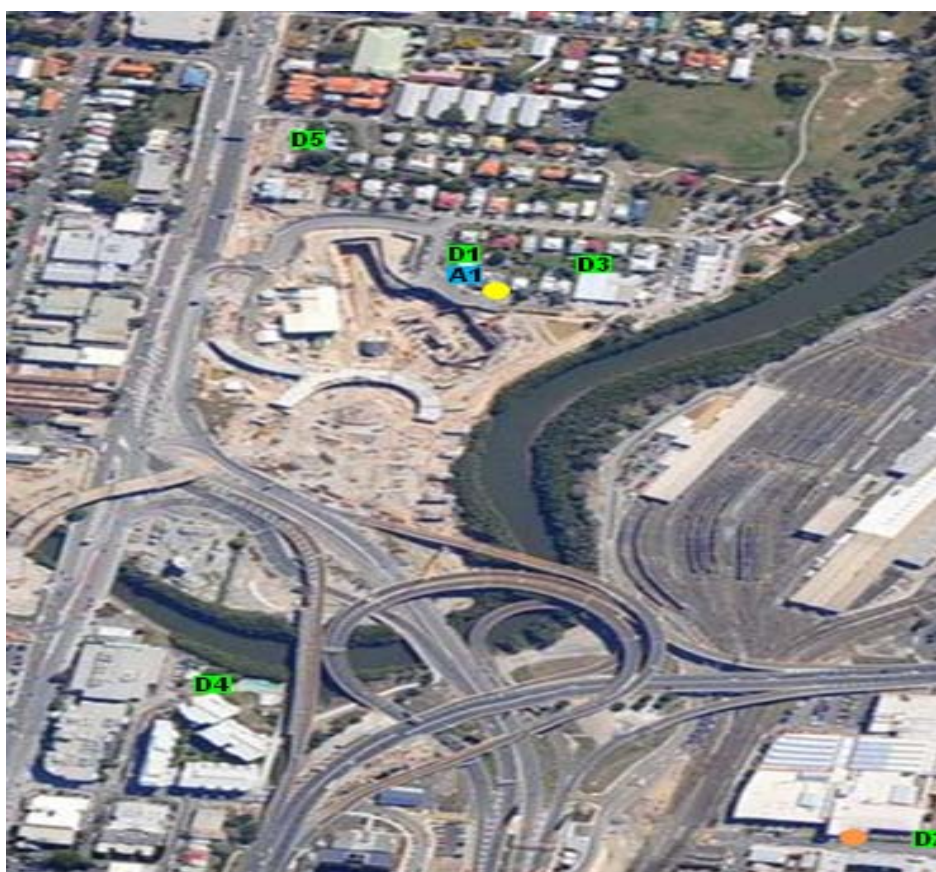
This report has been compiled to summarise the results of noise, air quality and vibration monitoring on the Airport Link and Northern Busway project in the Bowen Hills precinct. The report also compares monitoring results with compliance thresholds for environmental harm, community nuisance and loss of amenity nominated by the Coordinator General (Change Report July 2008).

The monitoring data covered in this report is for the December 2011 reporting period, from 16<sup>th</sup> November 2011 to 15<sup>th</sup> December 2011.

## 2.0 Monitoring Locations

Several monitoring locations exist within the project area as described in Figures 1-5. Note that the aerial photograph overlays used in Figures 1-5 do not accurately portray the extent of the project's progress to December 2011, though do serve a useful purpose in relating the monitoring locations to existing structures and infrastructure.

**Figure 2.1: Bowen Hills Precinct Monitoring Locations**

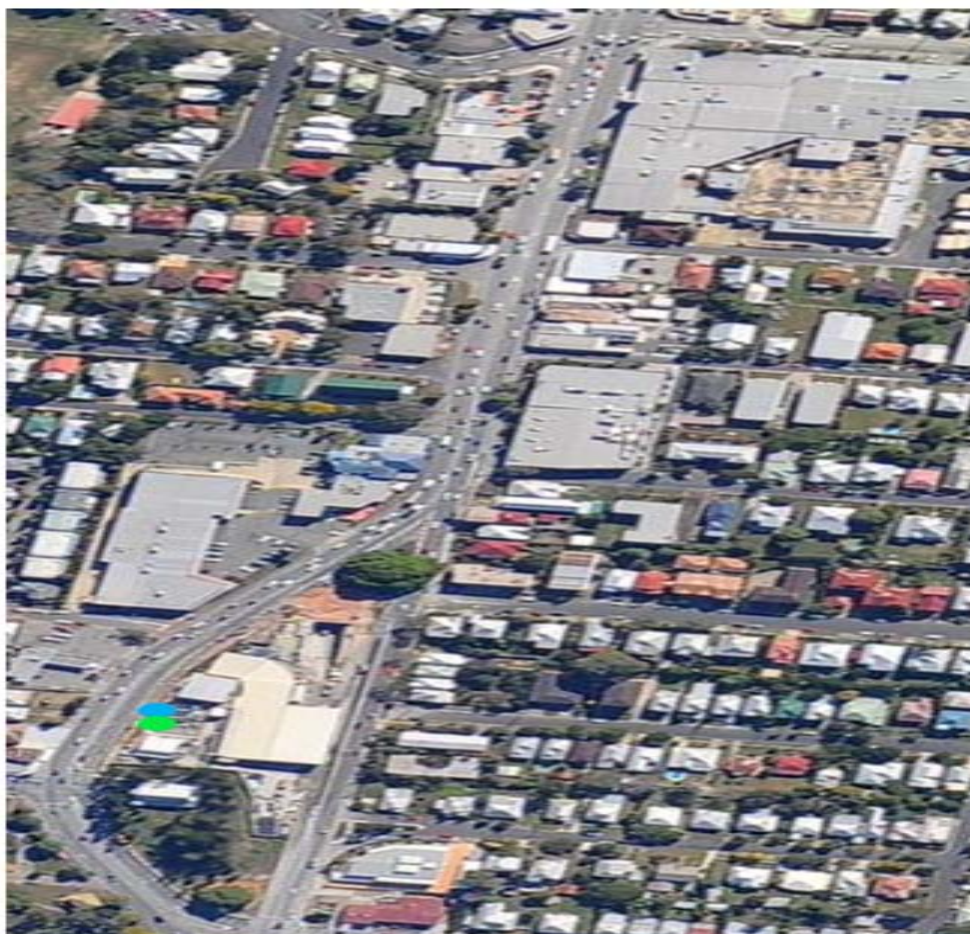


### Legend

- Noise (during construction )
- Vibration
- Air (TSP/PM<sub>10</sub>)
- Air (Dust Deposition)

Note: locations are indicative only

**Figure 2.2: Truro Street Mid Tunnel Monitoring Locations**



**Legend**

- Air (PM<sub>10</sub>)
- Air (Dust Deposition)

Note: locations are indicative only

**Figure 2.3: Northern Busway Monitoring Locations**



**Legend**

● Noise (during construction )

● Air (PM<sub>10</sub>)

● Air (Dust Deposition)

Note: locations are indicative only

**Figure 2.4: Kedron Monitoring Locations**



**Legend**

- Noise (during construction )
- Air (PM<sub>10</sub>)
- Air (Dust Deposition)

Note: locations are indicative only

**Figure 2.5: Woolloowin Monitoring Locations**



**Legend**

● Noise (during construction )

● Vibration

● Air (PM<sub>10</sub>)

● Air (Dust Deposition)

Note: locations are indicative only

**Figure 2.6: Toombul Monitoring Locations**



**Legend**

- Noise (during construction)
- Air (Dust Deposition)
- Air (PM<sub>10</sub>)

Note: locations are indicative only.

### 3.0 Noise Monitoring

TJH undertakes regular monitoring of noise levels at a variety of locations across the project in accordance with DERM's Noise Monitoring Manual (March 2000) and Australian Standard AS 1055:1997 to help measure impacts and assist the team plan works and appropriate mitigations if required. The type and timing of monitoring is influenced by the activities being undertaken and relevant Noise Goals (inside buildings and residents living areas where allowed at night and during the day).

Monitoring involves 'attended' monitoring (where a member of the TJH environment team is observing noise sources and durations whilst noise measurements are taken).

#### 3.1 Overview of Noise Mitigation Measures

Generally the main strategies adopted in order to mitigate noise during construction works have included the following:

1. Undertake noise modelling for sections of works adjacent to sensitive receptors. Additional noise modelling has been undertaken to more accurately reflect the demobilization phase of site works.
2. Reasonable and practical mitigation measures that have been implemented to date include the following:
  - a. Permanent noise barriers (precast concrete barrier)
    - i. Gympie Road (Kedron)
    - ii. Brookfield Road (Kedron)
  - b. Temporary noise barriers (precast concrete barriers and plywood)
    - i. Federation Street, Windsor
    - ii. Lutwyche Road (Lutwyche)
    - iii. Lutwyche Road (Lutwyche, Kedron)
    - iv. Gympie Road (Kedron)
    - v. Rose Street (Woolloowin)
  - c. Temporary noise barrier (shipping container) installations:
    - i. Perry Street, (Kedron)
    - ii. Haines Street, (Kedron)
    - iii. Kalinga Park (Toombul)
    - iv. Wongara Street worksite (Sandgate Road and East-West Arterial Intersection)
  - d. Acoustic shed has been built around the tunnel portals / shafts at:
    - i. Woolloowin
    - ii. Kalinga Park (CC410 Launch Box)
  - e. Consultation with property owners prior to commencing works and during construction works
    - i. Installation of mitigation measures at affected residents on a case-by-case basis Lutwyche Road (Lutwyche)
  - f. Offering of practical mitigation measures at affected residents on a case-by-case basis
  - g. Acoustic shielding of various plant
  - h. Regular awareness, training and reinforcement of work behaviours of staff, subcontractors, spoil haulage drivers to prevent or minimise noise generation in work areas and car parks; and
  - i. Use of temporary acoustic treatment (e.g. sound curtains around onsite generators and access/ egress from sites).
  - j. Installation of directional reversing alarms ('squawkers') on plant and equipment.
  - k. Silencing of various plant including Favco tower crane.
  - l. Activity assessment with community team members, senior area management and responsible engineers for night works

#### 3.2 Noise Monitoring Results

The results of TJH attended noise monitoring efforts are summarised for each project area in Tables 3a-d.

### 3a: Noise Monitoring Results – Bowen Hills

Location	Monitoring Period	Average L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	Average L <sub>A10</sub> (15 min) (dBA)	CoG Goal L <sub>A10</sub> (15 min) (dBA)	Average L <sub>AMAX</sub> (15 min) (dBA)	CoG Goal L <sub>AMAX</sub> (15 min) (dBA)	Comments
<b>30 Federation Street, Windsor</b>								
Living Room, (Doors and Windows closed)	30/11/2011 9:21-9:36 am	37.6	45	38	55	N/A	N/A	<p><b>Monitoring Type</b> Attended Noise Monitoring, doors and windows closed</p> <p><b>Atmospheric Conditions</b> Fine, no wind, 0% cloud cover, 25°C.</p> <p><b>Noise Sources</b> TJH noises came from an excavator, metal on metal bangs from the excavator loading trucks, TJH truck movement, a power saw and squawkers</p> <p><b>Discussion</b> Monitoring was undertaken to determine if construction noise is within the CoG goals. No exceedances were recorded and the session was within CoG goals</p> <p><b>Mitigation Measures</b> This property is mitigated. Precast barriers and ply have been installed along the site boundary</p>

The following properties were offered noise monitoring but access to the properties was denied

Address of Monitoring Location	Date of Request	Time of Requested Monitoring	Construction Activity to be Monitored	Date Access Denied	Comments
38 Federation Street, Windsor	17/11/2011	12:00	Excavation	18/11/2011	Monitoring request withdrawn as noise no longer an issue. Stakeholder will request monitoring again if noise issue recommences
38 Federation Street, Windsor	18/11/2011	15:45	General construction	18/11/2011	Monitoring request withdrawn as noise no longer an issue. Stakeholder will request monitoring again if noise issue recommences
30 Federation Street, Windsor	28/11/2011	13:40	Excavation	28/11/2011	Monitoring request withdrawn as noise no longer an issue. Stakeholder requested monitoring in an hour when noise issue recommences
30 Federation Street, Windsor	28/11/2011	15:00	Excavation	28/11/2011	Monitoring request withdrawn as noise no longer an issue
38 Federation Street, Windsor	1/12/2011	11:05	Excavation / Rock Breaking	1/12/2011	Monitoring request withdrawn as noise no longer an issue

### 3b: Noise Monitoring Results: Kedron

Location	Monitoring Period	Average L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	Average L <sub>A10</sub> (15 min) (dBA)	CoG Goal L <sub>A10</sub> (15 min) (dBA)	Average L <sub>AMAX</sub> (15 min) (dBA)	CoG Goal L <sub>AMAX</sub> (15 min) (dBA)	Comments
<b>3/12 Suez Street</b>								
Living Room (Windows and Doors open)	25/11/2011 07:51am–8:05am	57.1	45	58.1	55	-	-	<p><b>Monitoring Type</b> Attended. Internal.</p> <p><b>Atmospheric Conditions</b> Cloudy, 22.2 Dec C light wind 3km/hr from the South</p> <p><b>Noise Sources</b> Audible noises from site included excavator, squawker, grinder, car horns, and trucks. Non TJH sounds included TV, fans, resident and resident's small child.</p> <p><b>Discussion</b> Both LA10 and LAeq noise goals were exceeded. However, due to the number and volume of non-TJH noise sources detected during the monitoring session, noise from TJH sources cannot be separated from non-TJH noise. Therefore this is not considered an exceedance of the CoG noise goals.</p> <p><b>Mitigation Measures</b> Residence has been identified as possibly being eligible for mitigation for operational phase, possible mitigation to be coordinated by Community Liaison team</p>
Living Room (Windows and Doors closed)	25/11/2011 08:09am–08:23am	53.7	45	55.1	55	-	-	<p><b>Monitoring Type</b> Attended. Internal.</p> <p><b>Atmospheric Conditions</b> Cloudy, 22.9 Dec C light wind 3km/hr from the South</p> <p><b>Noise Sources</b> Audible noises from site included excavator running, trucks being loaded, and a hammer drill on the back side of the unit. Non TJH sounds included TV, fans, resident and the resident's small child.</p> <p><b>Discussion</b> Both LA10 and LAeq noise goals were exceeded. However, due to the number and volume of non-TJH noise sources detected during the monitoring session, noise from TJH sources cannot be separated from non-TJH noise. Therefore this is not considered an exceedance of the CoG noise goals.</p> <p><b>Mitigation Measures</b> Residence has been identified as possibly being eligible for mitigation for operational phase, possible mitigation to be coordinated by Community Liaison team.</p>

### 3c: Noise Monitoring Results - Woolloowin

Location	Monitoring Period	Average L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	Average L <sub>A10</sub> (15 min) (dBA)	CoG Goal L <sub>A10</sub> (15 min) (dBA)	Average L <sub>AMAX</sub> (15 min) (dBA)	CoG Goal L <sub>AMAX</sub> (15 min) (dBA)	Comments
<b>71 Park Road, Woolloowin</b>								
Single Level Brick Flat (Dining Room)	25/11/2011 10:23am – 10:37am	47.1	45	47.6	55	-	-	<p><b>Monitoring Type</b> Attended Noise Monitoring. Doors and Windows Open</p> <p><b>Atmospheric Conditions</b> Partly Cloudy, 27.8 Dec C, Wind 13 km/hr from NNE</p> <p><b>Noise Sources</b> TJH Noise sources included vent fans, concrete trucks, cranes, and metal on metal banging from within the acoustic shed. Non TJH sources of noise included traffic on Park Rd, Dogs, Birds, neighbours, and wind blowing in the trees and sometimes causing limbs to scrape the house.</p> <p><b>Discussion</b> L<sub>Aeq</sub> exceedance was due dominant non TJH noises.</p> <p><b>Mitigation Measures:</b> The acoustic shed was still in place, as well as noise walls place around Woolloowin Site during monitoring period. No mitigation measures have been installed on the property as 71 Park Road is owned by DMR and is used by TJH for monitoring purposes.</p>
Single Level Brick Flat (Dining Room)	25/11/2011 11:31am – 11:46am	35.4	45	38.4	55	-	-	<p><b>Monitoring Type</b> Attended Noise Monitoring. Doors and Windows Closed</p> <p><b>Atmospheric Conditions</b> Partly Cloudy, 28 Dec C, Wind 16 km/hr from NNE</p> <p><b>Noise Sources</b> TJH Noise sources included vent fans, concrete trucks, cranes, and metal on metal banging from within the acoustic shed. Non TJH sources of noise included traffic on Park Rd, Dogs, Birds, neighbours, and wind blowing in the trees and sometimes causing limbs to scrape the house.</p> <p><b>Discussion</b> TJH noise levels complied with CoG goals. This monitoring result was missed out during last month's report.</p> <p><b>Mitigation Measures</b> The acoustic shed was still in place, as well as noise walls place around Woolloowin Site during monitoring period. No mitigation measures have been installed on the property as 71 Park Road is owned by DMR and is used by TJH for monitoring purposes.</p>

### 3d: Noise Monitoring Results – Toombul

Location	Monitoring Period	Average L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	Average L <sub>AMAX</sub> (15 min) (dBA)	CoG Goal L <sub>AMAX</sub> (15 min) (dBA)	Comments
<b>1 Mabel Street, Clayfield</b>						
Highset Weatherboard Queenslander (Main Bedroom)	15/11/2011 08:08pm – 08:23pm	36.43	40	42.7	50	<p><b>Monitoring Type</b> Internal attended monitoring, windows and doors closed with A/C unit on.</p> <p><b>Atmospheric Conditions</b> 80% to 90% cloud cover, no wind.</p> <p><b>Noise Sources</b> TJH noise sources (metal bangs from hammering, site generator hum) plus non-TJH sources (train, resident, dog bark, gecko's, planes).</p> <p><b>Discussion</b> Monitoring indicates that CoG goals are being met.</p> <p><b>Mitigation Measures</b> Include a 6m noise wall and this property is mitigated.</p>

### 3.3 Compliance with Noise Goals

Exceedances of the Coordinator General's Noise Goals have been found during this monitoring period at a number of locations, these include:

### 4.0 Air Quality Monitoring

TJH undertakes regular monitoring of air quality levels at a variety of locations across the project to help measure impacts and assist the team to plan works and appropriate mitigations if required.

Monitoring involves sampling of dust deposition (monthly), and real-time respiratory dust (PM<sub>10</sub>) at a number of locations nominated by the Coordinator General.

Results of monitoring are compared to Air Quality Goals nominated by the Coordinator General (Change Report July 2008) for the Airport Link and Northern Busway projects.

#### 4.1 Overview of Air Quality Mitigation Measures

The key strategies adopted to mitigate dust and air quality impacts during construction works have included the following:

- Continual use of water carts / trucks and hand held hoses to aid dust suppression:
  - Bulk earthworks
  - Haul roads
  - Car parks and hardstands
- Woolloowin Acoustic shed has been left in place to contain any dust generated through demobilisation works
- Hardstand has been left in place to act as haul road to reduce vehicle contact with loose material
- Road sweepers operate at site exits
- Covering of haul vehicle loads
- Stabilisation of cleared areas with hardstand materials such as concrete and crushed rock
- Hydro-mulching and laying geofabric to batters
- Reduction of cleared / exposed soils with concrete paving and geo-fabric installation;
- Continual use of road sweeper and water truck
- Turfing of footpaths where utility works are now complete (Bryden and Cedric Streets, Windsor)
- Hydro-mulching and re-vegetation on sites nearing completion (sites on Lanham and Campbell Streets, Bowen Hills)
- Dust management strategies are visually monitored during routine site inspections

#### 4.2 Air Quality Monitoring Results – PM<sub>10</sub>

PM<sub>10</sub> monitoring was undertaken at various locations along the corridor using an EBAM continuous sampler in accordance with Queensland Department of Environment and Resource Management's Air Sampling Manual. Results are summarised in Figure 4.2.1 below. It should be noted that the placement of the sampler unit does not strictly meet the siting standards described in AS 3580.1.1:2007 due to location and security restrictions. Efforts to comply with location standards have been made however as much as possible.

The outstanding PM10 results for Kedron State High School (KSHS) for the month of Aug-Sep and Sep-Oct have been included in this report.

Elevated PM 10 air quality results on the dates of 17th to 19th September 2011 were recorded at KSHS monitoring location. Elevated air quality results on these dates can be attributed to widespread bushfires across South-East Queensland. DERM Air Quality Monitoring revealed city-wide elevated PM10 levels. Considering this, there were no exceedances of the Coordinator Generals Air Quality Conditions caused as a consequence of TJH construction

activities.

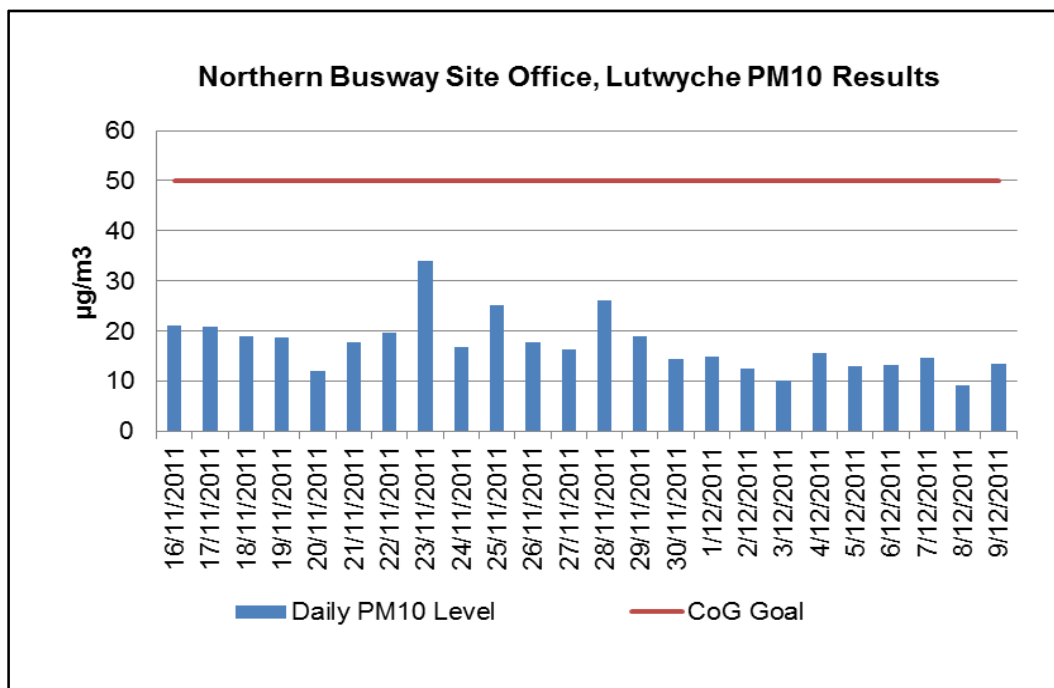


Figure 4.2.1: Northern Busway Site Office, Lutwyche PM10 Results (for location see figure 2.3 – A1)

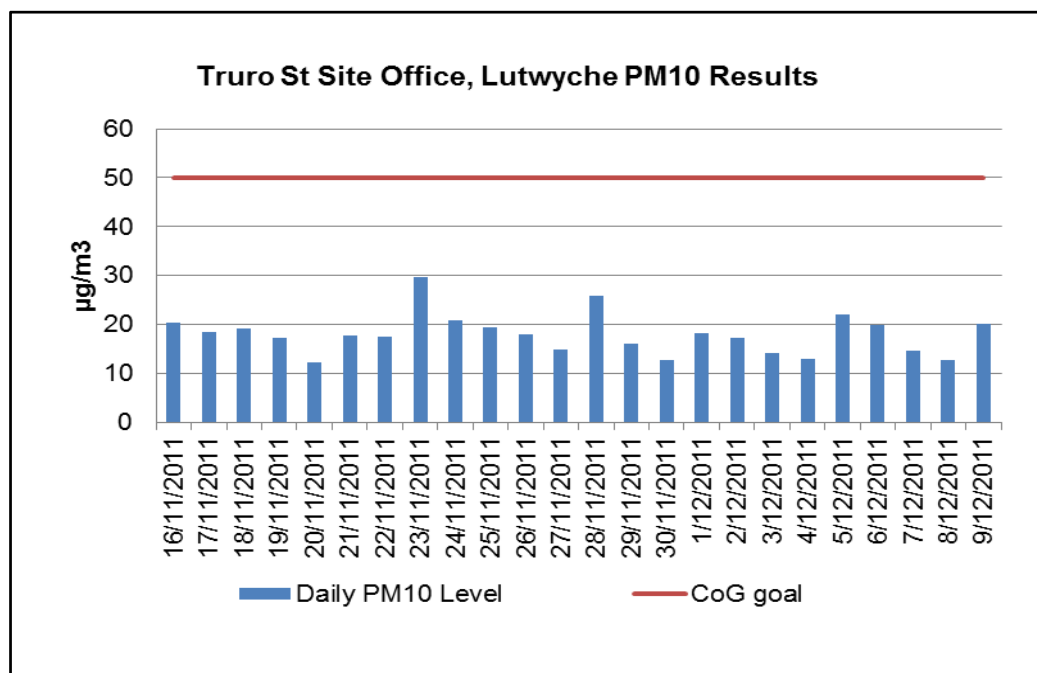


Figure 4.2.2: Truro Street Site Office, PM10 Results (for location see figure 2.2 – A1)

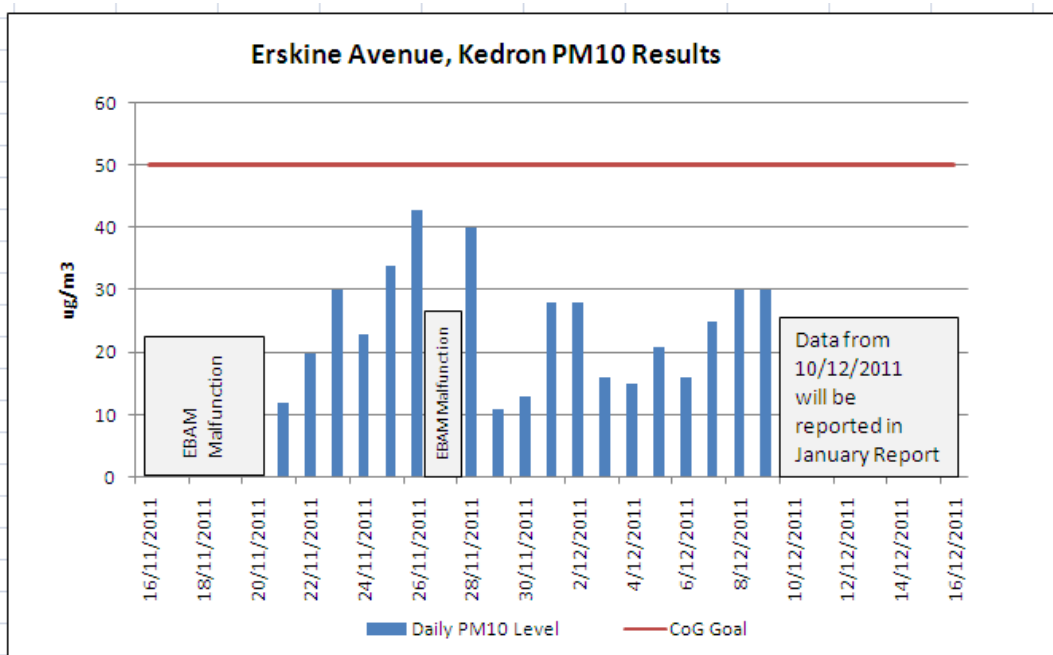


Figure 4.2.3: Erskine Avenue, Kedron PM10 Results (for monitor location see figure 2.4 – A1)

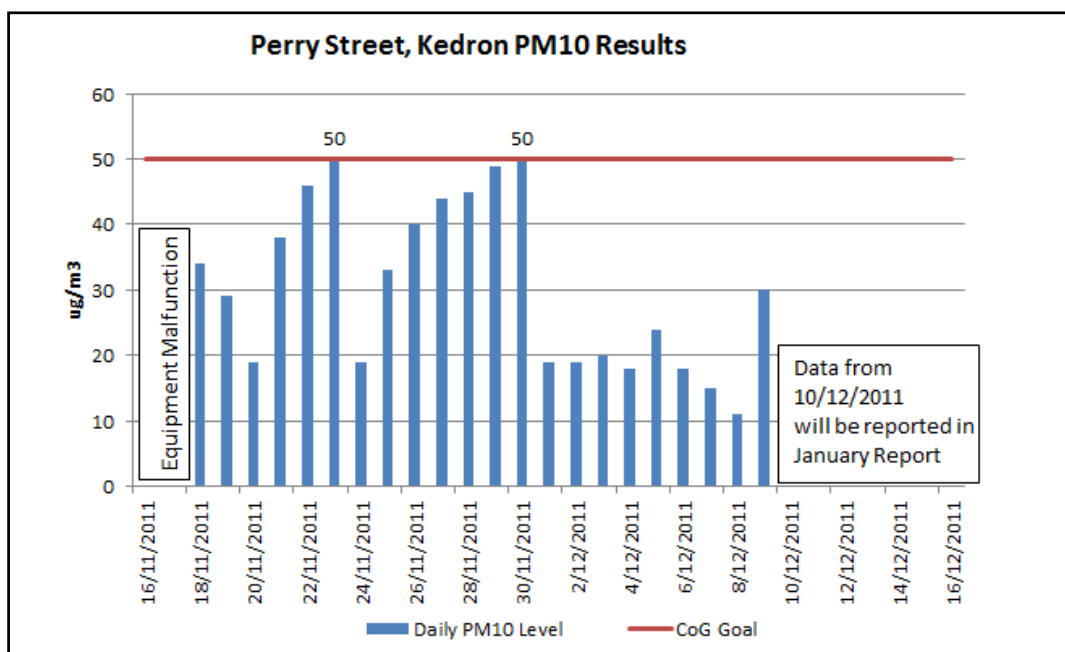


Figure 4.2.4: Perry Street, Lutwyche PM10 Results (for monitor location see figure 2.4 – A3)

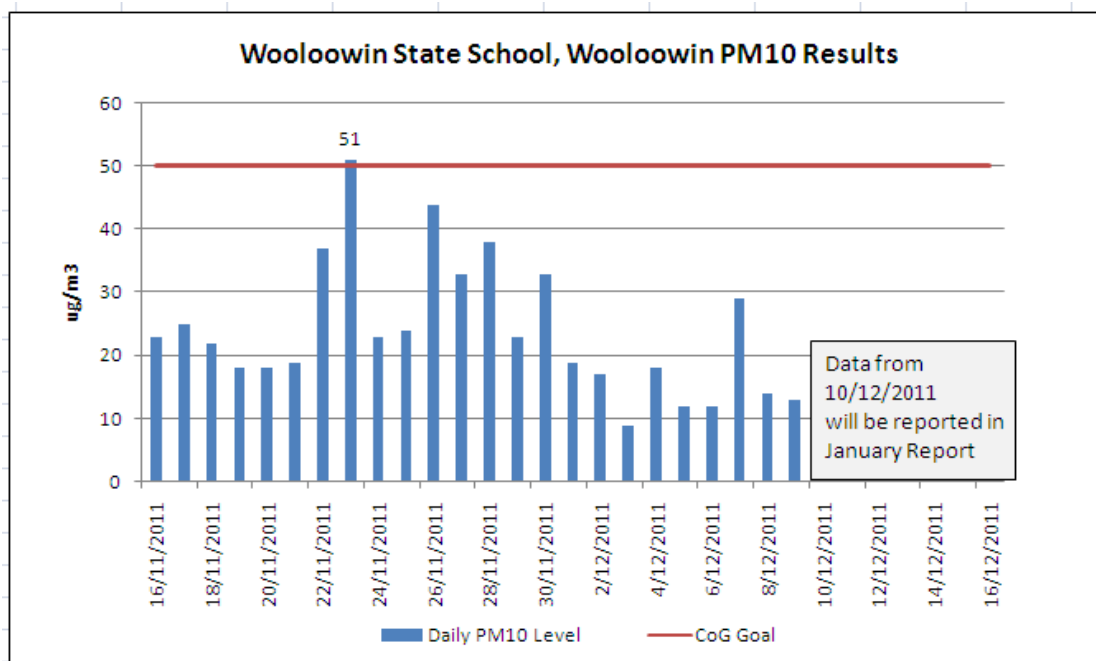


Figure 4.2.5: Wooloowin State School, Lutwyche PM10 Results (for monitor location see figure 2.4 – A4)

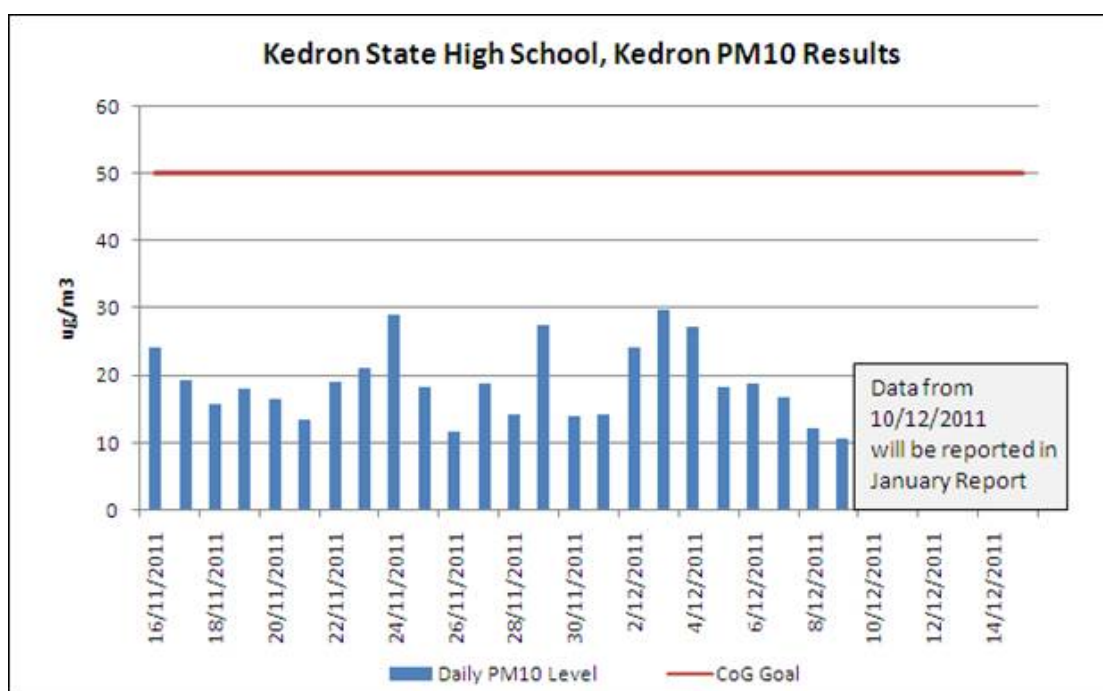


Figure 4.2.6: Kedron State High School, Lutwyche PM10 Results (for monitor location see figure 2.4 – A4)

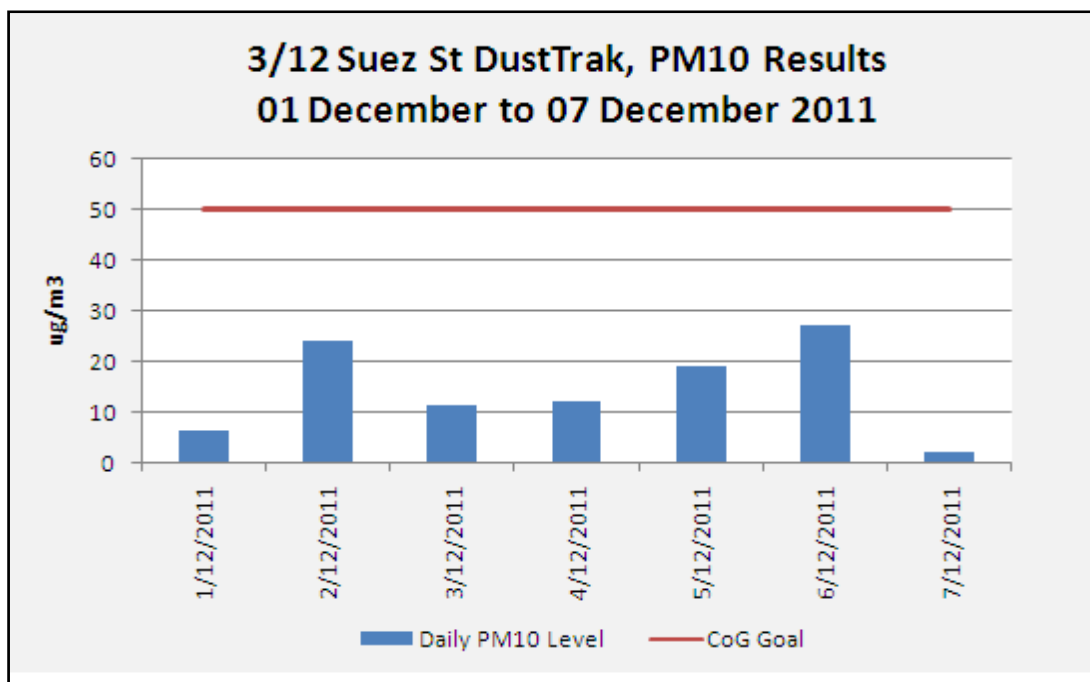


Figure 4.2.7: Mobile Monitoring 3/12 Suez Street PM10 Results (for monitor location see figure 2.4 – A4)

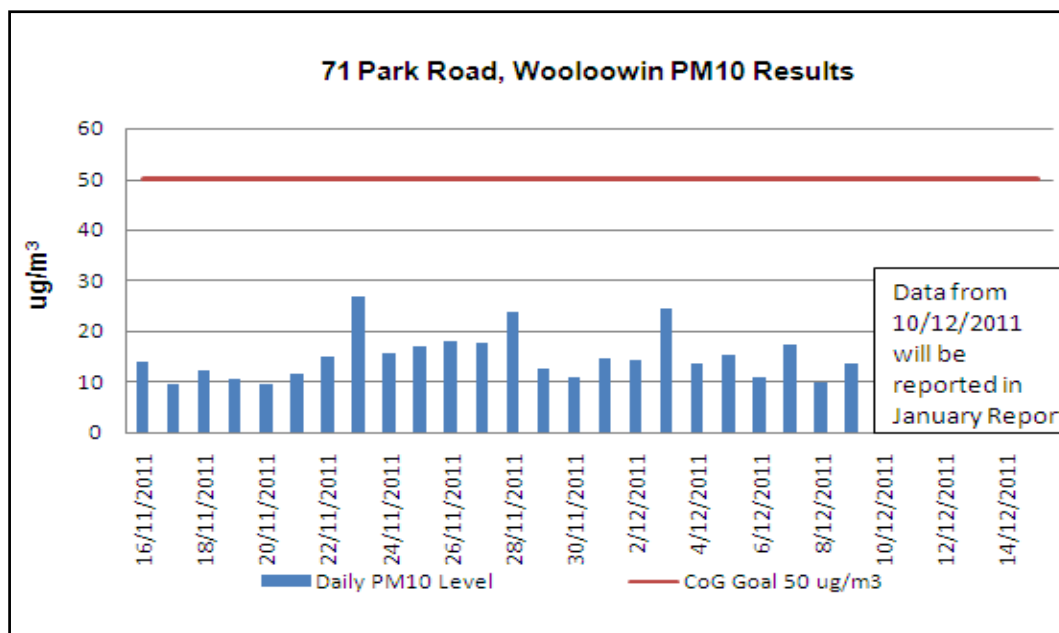


Figure 4.2.8: 71 Park Road, Woolloowin PM10 Results (for monitor location see figure 2.1 – A1)

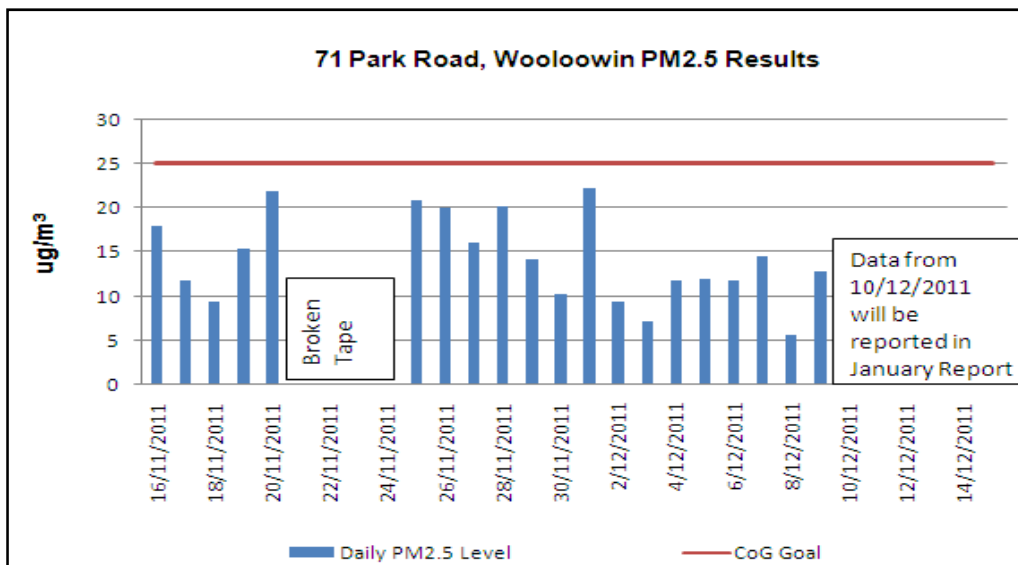


Figure 4.2.9: 71 Park Road, Woolloowin PM2.5 Results (for monitor location see figure 2.1 – A1)

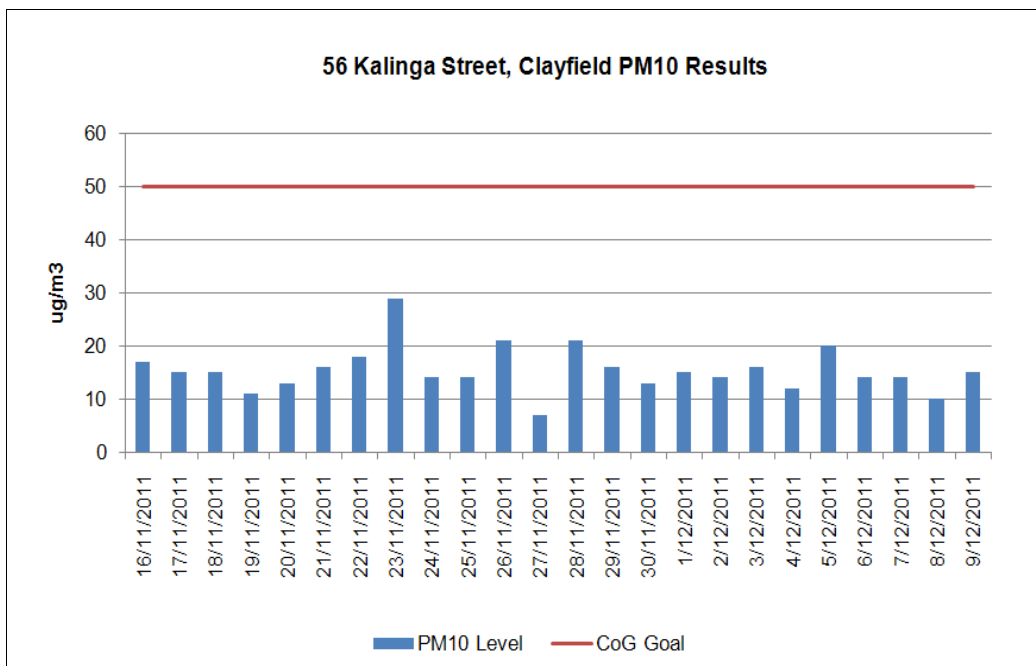


Figure 4.2.10: 56 Kalinga Street, Clayfield PM10 Results (for monitor location see Figure 2.6 – A1)

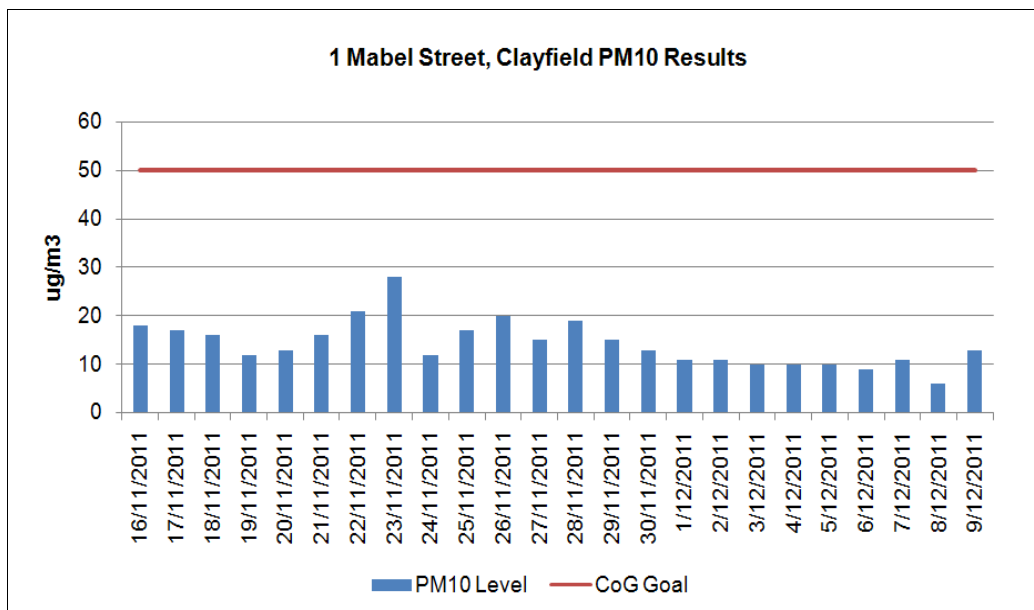


Figure 4.2.11: 1 Mabel Street, Clayfield PM10 Results (for monitor location see Figure 2.6- A2)

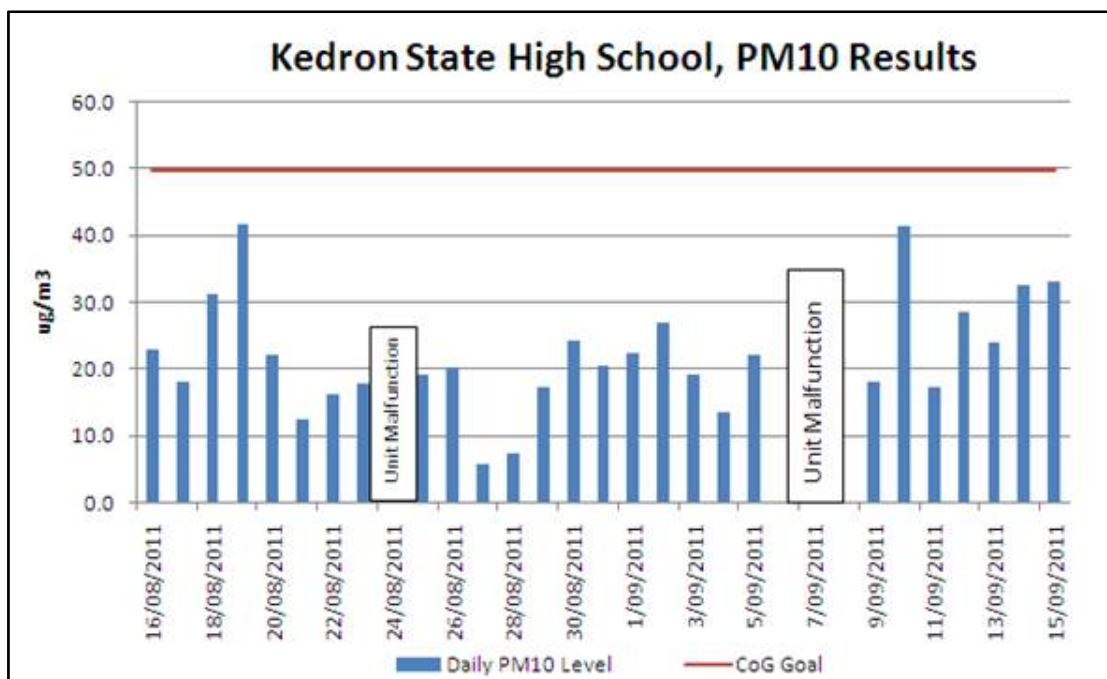


Figure 4.2.12: Kedron State High School, Lutwyche PM10 Results (for monitor location see figure 2.4 – A4)

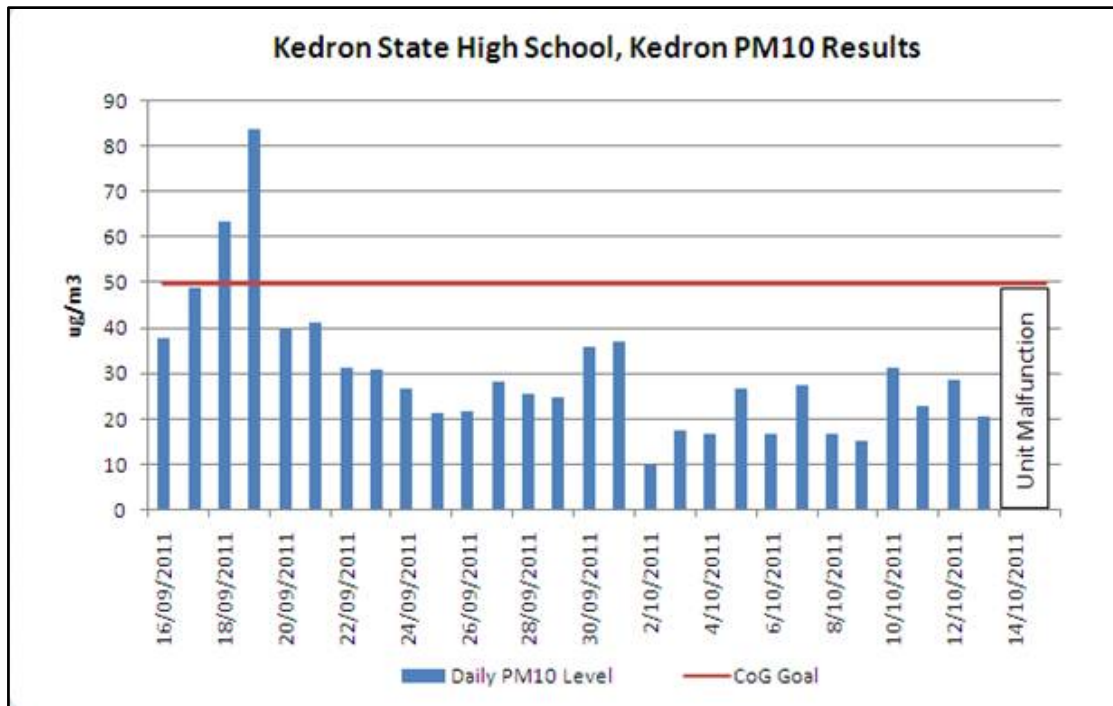


Figure 4.2.13: Kedron State High School, Lutwyche PM10 Results (for monitor location see figure 2.4 – A4)

### 4.3 Air Quality Monitoring Results – Dust Deposition Results

Dust deposition monitoring is undertaken on a monthly basis using a bottle and funnel placed 2m ± 0.2m above ground level in accordance with Australian Standard AS 3580.10.1:2003. It should be noted that in all locations the placement of the deposition gauges does not strictly meet the standard due to location and security restrictions. Efforts to comply with location standards have been made however as much as possible.

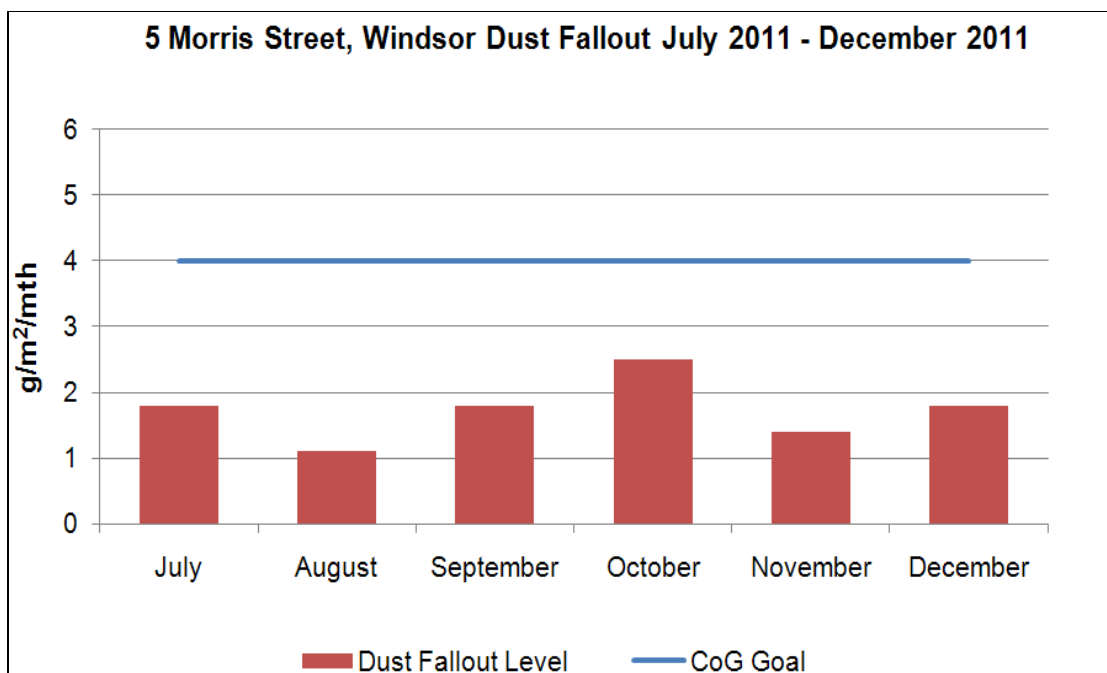


Figure 4.4.1: 5 Morris Street Windsor Dust Deposition Results (for monitor location refer to Figure 2.1 – D1)

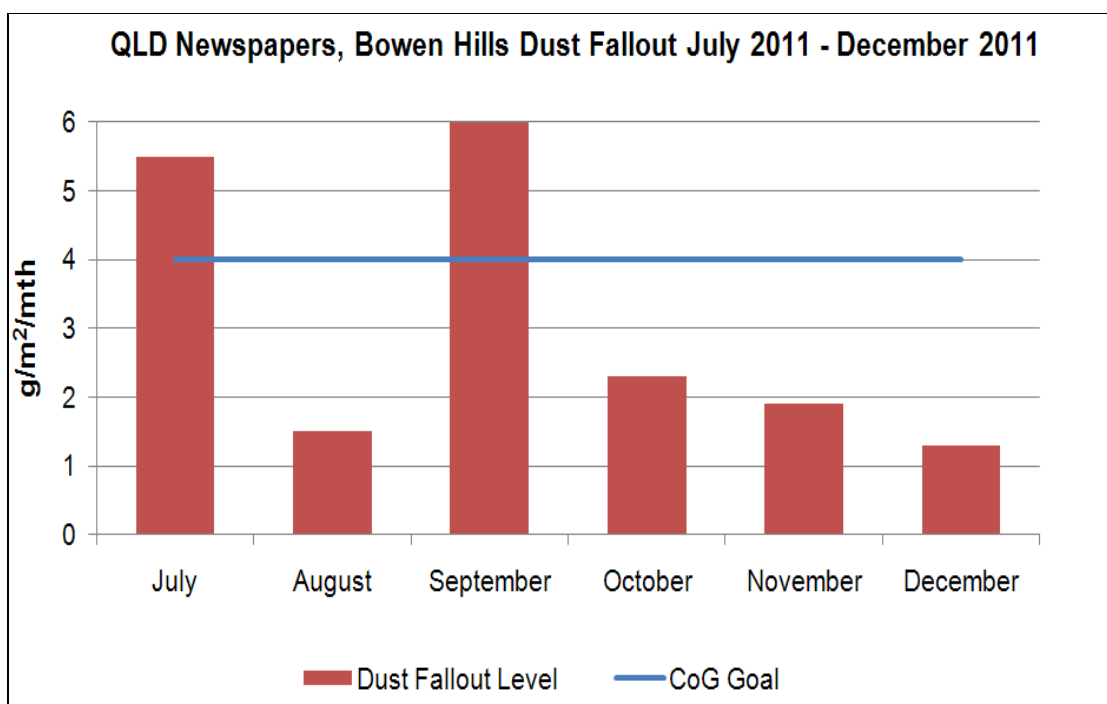


Figure 4.4.2: Queensland Newspapers, Bowen Hills Dust Deposition Results (for monitor location refer to Figure 2.1 – D2)

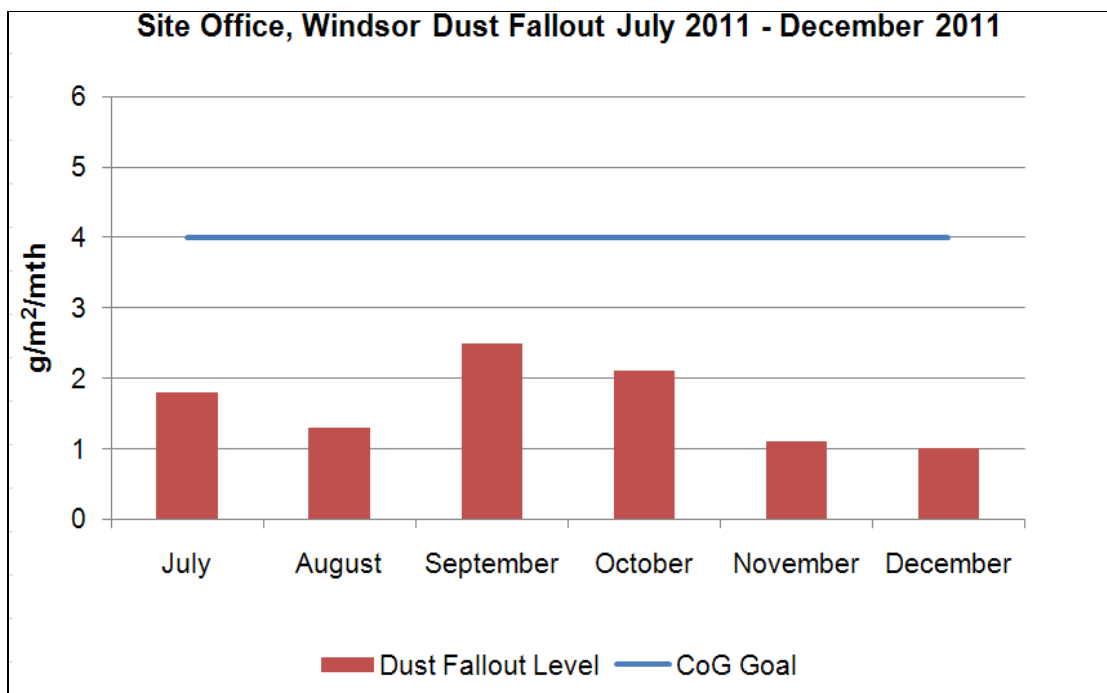


Figure 4.4.3: Site Office, Windsor Dust Deposition Results (for monitor location refer to Figure 2.1- D3)

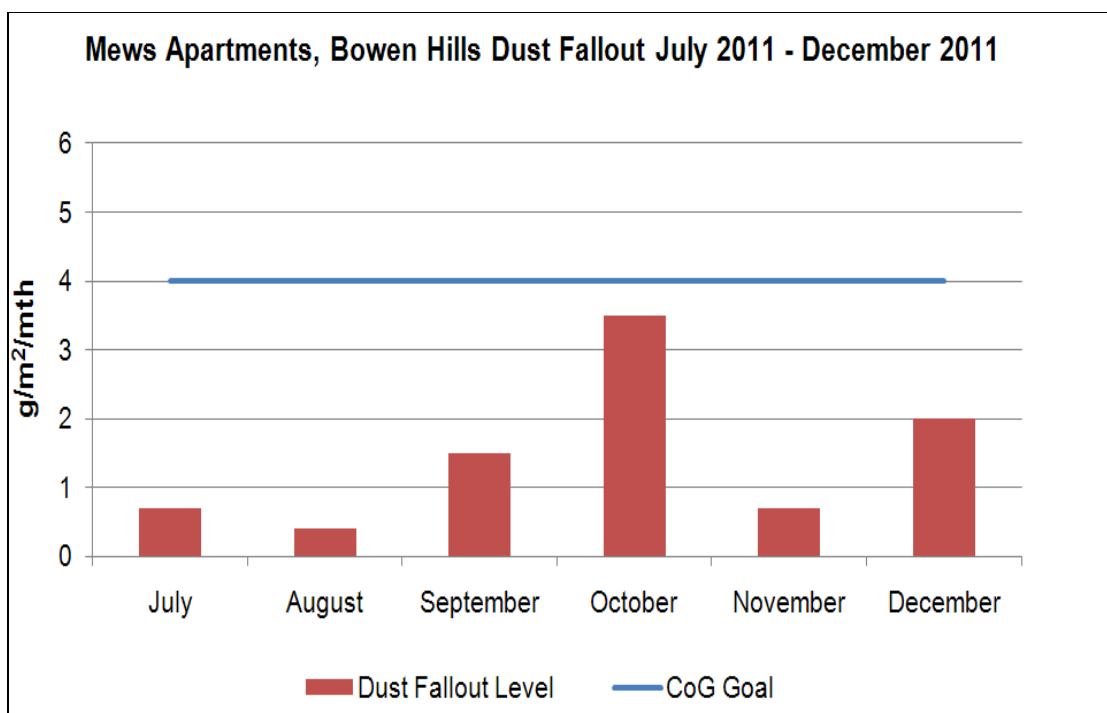


Figure 4.4.4: Mews Apartments, Bowen Hills Dust Deposition Results (for monitor location refer to Figure 2.1 – D4)

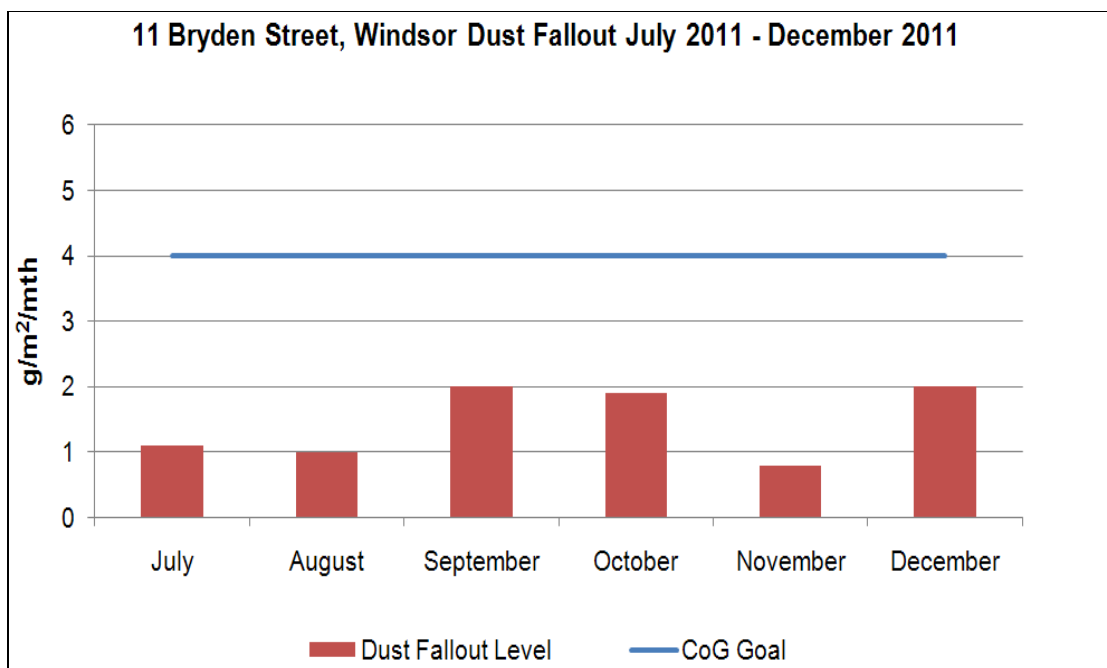


Figure 4.4.5: 11 Bryden Street, Windsor Dust Deposition Results (for monitor location refer to Figure 2.1 – D5)

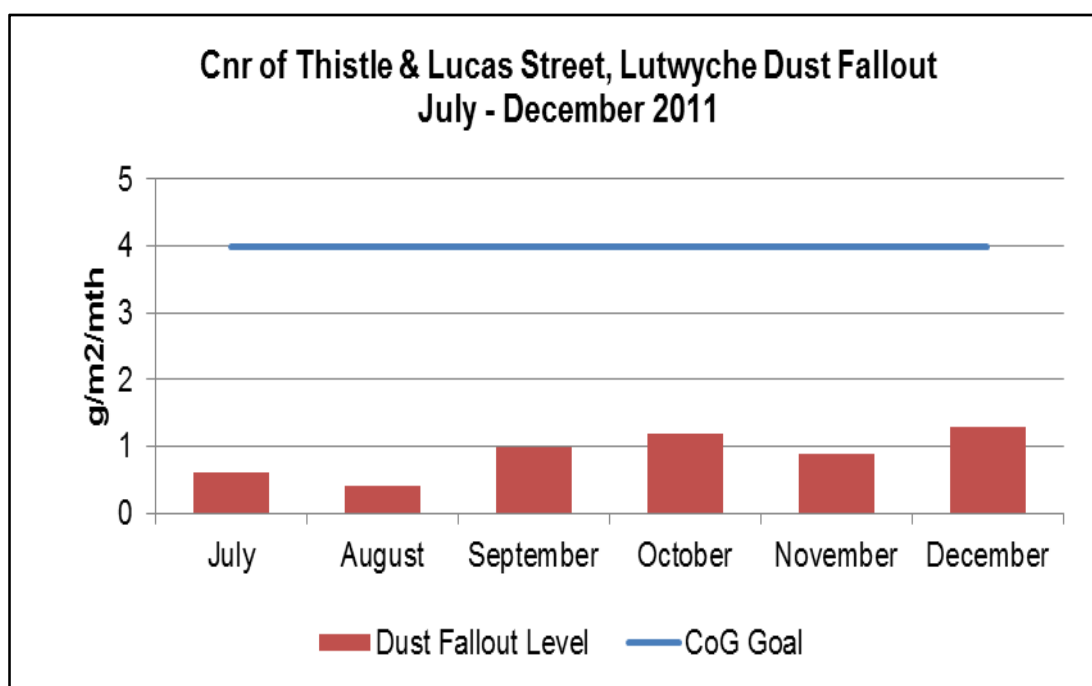


Figure 4.4.6: Cnr of Thistle & Lucas Street, Lutwyche Dust Fallout Results (location refer to figure 2.3 – D2)

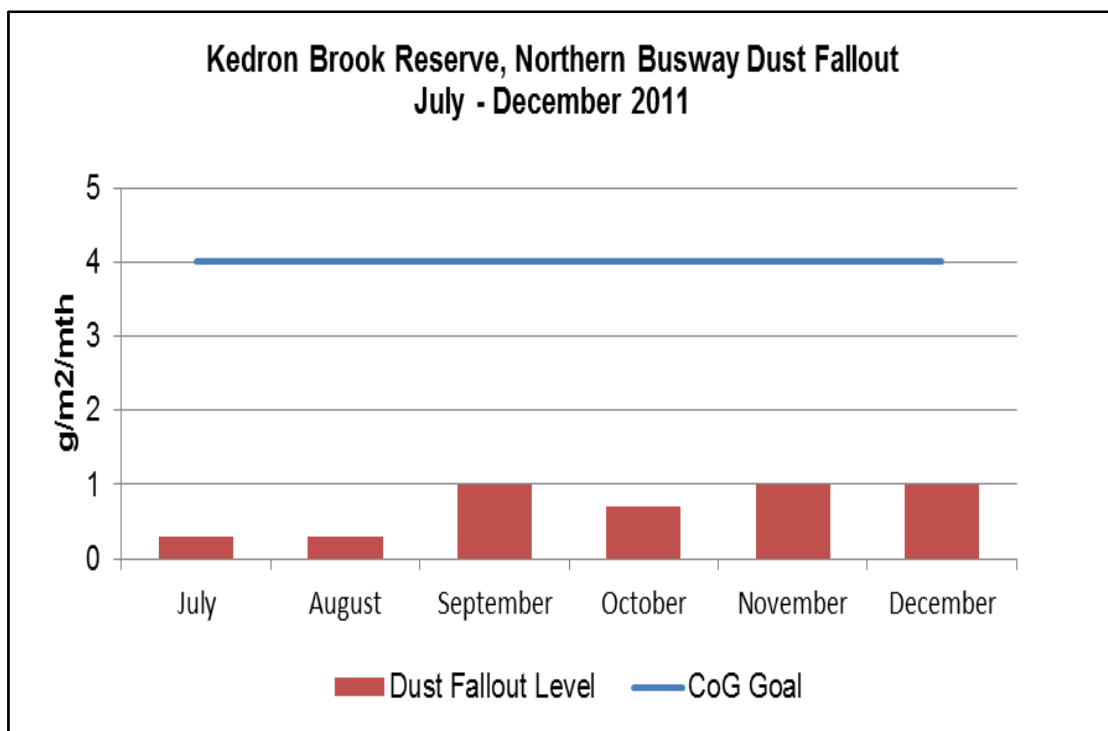


Figure 4.4.7: Kedron Brook Reserve, Northern Busway Dust Fallout Results (location refer to figure 2.3 – D1)

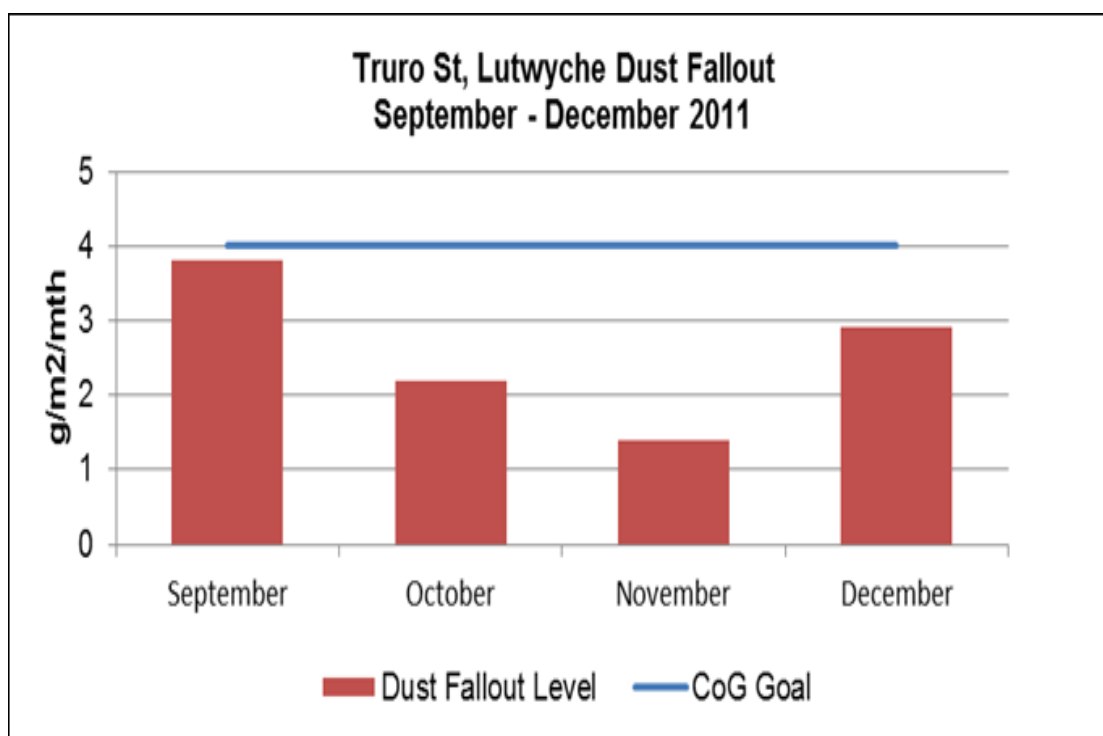


Figure 4.4.8: Truro Street, Lutwyche Fallout Results (location refer to figure 2.2)

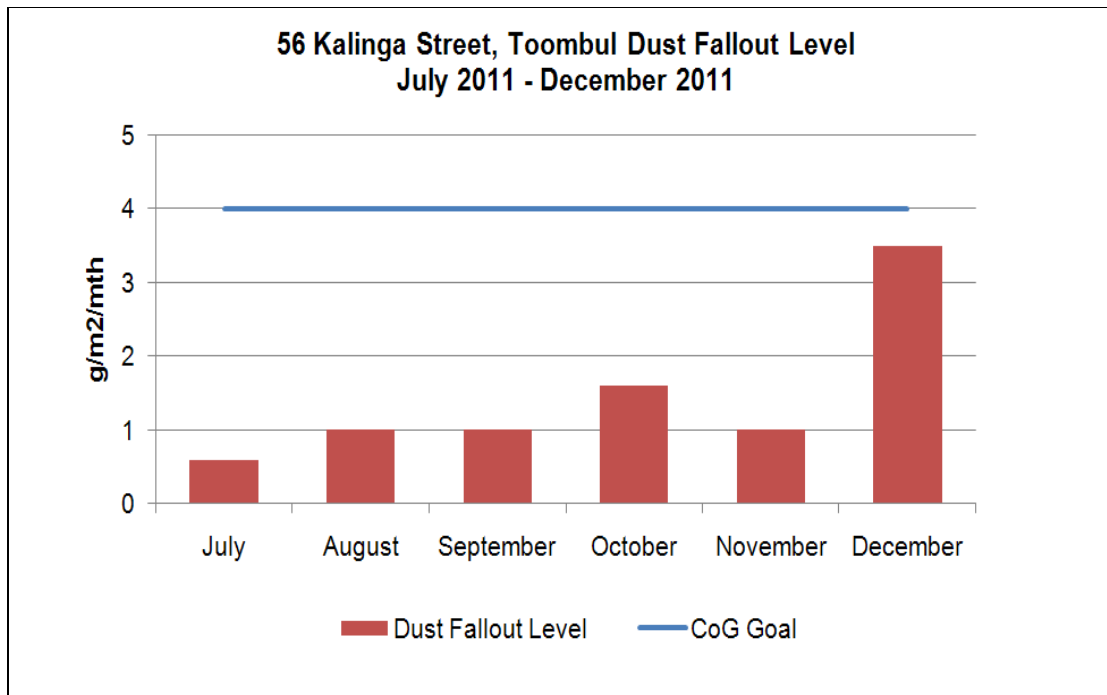


Figure 4.4.9: 56 Kalinga Street Toombul, Dust Fallout (location refer to figure 2.6 – D1)

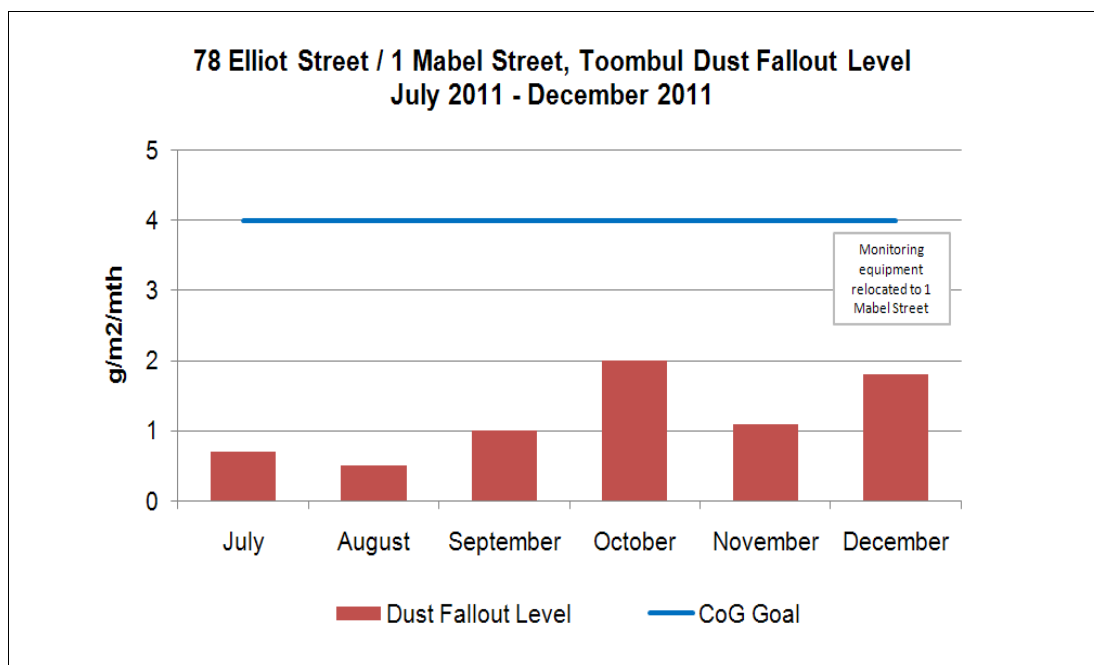


Figure 4.4.10: 78 Elliot Street / 1 Mabel Street Toombul, Dust Fallout (location refer to figure 2.6 – D2)

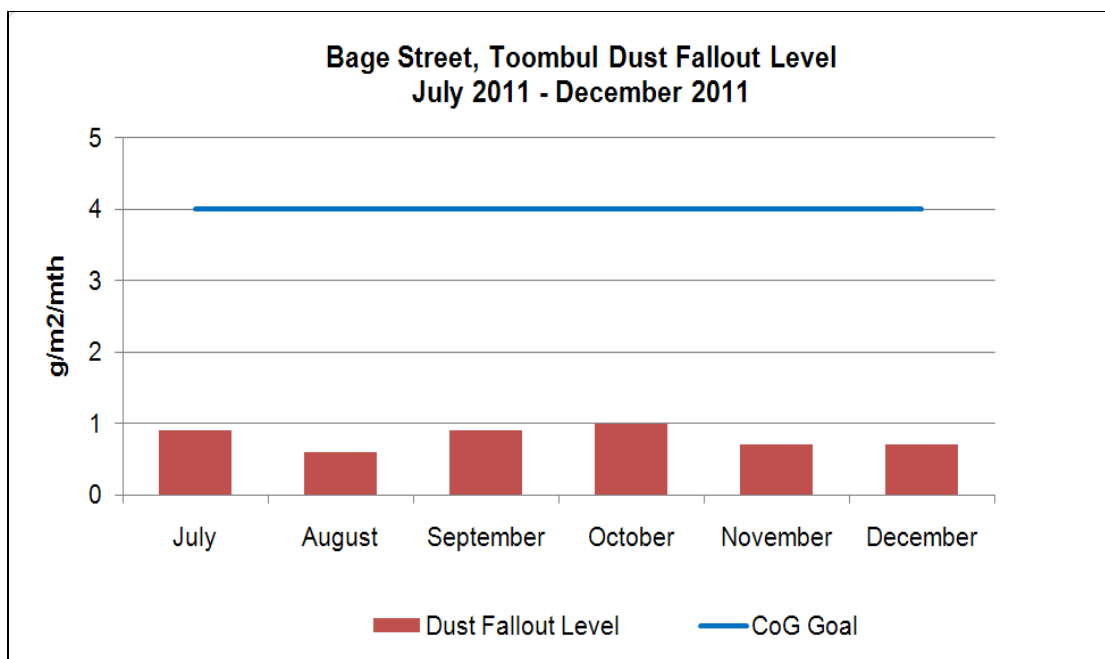


Figure 4.4.11: Bage Street Toombul, Dust Fallout (location refer to figure 2.6 – D3)

#### 4.4 CO/NO<sub>2</sub> Monitoring – Woolloowin Worksite

No CO/NO<sub>2</sub> Monitoring was undertaken during this period as construction phase is complete. There is no diesel powered generator operating at Woolloowin worksite.

#### 4.5 Compliance with Air Quality Goals

There was an exceedance of the Coordinator Generals Air Quality Conditions in this reporting period. The exceedance was recorded at:

- Woolloowin State School on 23rd November 2011. NCR has been raised for this exceedance.

#### 5.0 Vibration Monitoring

TJH undertakes monitoring of vibration levels at a variety of locations across the project to help measure impacts and assist the team plan works and appropriate mitigations if required. Monitoring involves measuring peak particle velocity (mm/s) at sensitive receptors.

Results of monitoring are compared to Vibration Goals adopted as listed by the Coordinator General (Change Report June 2008) for the Airport Link and Northern Busway Projects.

#### 5.1 Overview of Vibration Mitigation Measures

The key strategies adopted during this monitoring period to mitigate vibration impacts during construction works have included:

1. Predictive modelling of anticipated risks and impacts;
2. Building condition surveys of properties which are likely to experience vibration levels in excess of the levels for minimal risk of cosmetic damage outlined in the CoG Report;
3. Selection of alternative construction equipment / methodology where possible; and

4. Review of monitoring data for the activities undertaken.

## 5.2 Vibration Monitoring Results

Monitoring has been undertaken at a variety of sites along the Airport Link Project alignment this period. Results are detailed in Tables 5a.

**Table 5a: Vibration Monitoring Results Summary – Bowen Hills**

Location	Monitoring Period	Event Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
Queensland Newspapers	16/11/11 - 24/11/11	4.91	5	Results are within CoG goals
	25/11/11 - 31/11/11	3.79	5	Results are within CoG goals
	01/12/11 - 09/12/11	3.25	5	Results are within CoG goals

**Table 5b: Vibration Monitoring Results Summary – Woolloowin**

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
71 Park Road, Woolloowin	16/12/2011-9/12/2011	1.78	5	Results are within CoG goals

## 5.3 Compliance with Vibration Goals

There were no exceedences of the Coordinator Generals conditions for this reporting period for vibration.

## 6.0 Community enquiries and complaints

A total of 213 community complaints were reported to the project between 16 November and 15 December 2011. The top issues raised are outlined in the pie chart below.

For further details on how we are managing community issues, please refer to the [Community Enquiries and Complaints page](#) of the project website which is updated each month.

### 6.1 Top 10 issues raised

