



# **Airport Link / Northern Busway Project**

## **Monthly Environmental Monitoring Report**

**October 2010**

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## **1.0 Report Purpose and Scope**

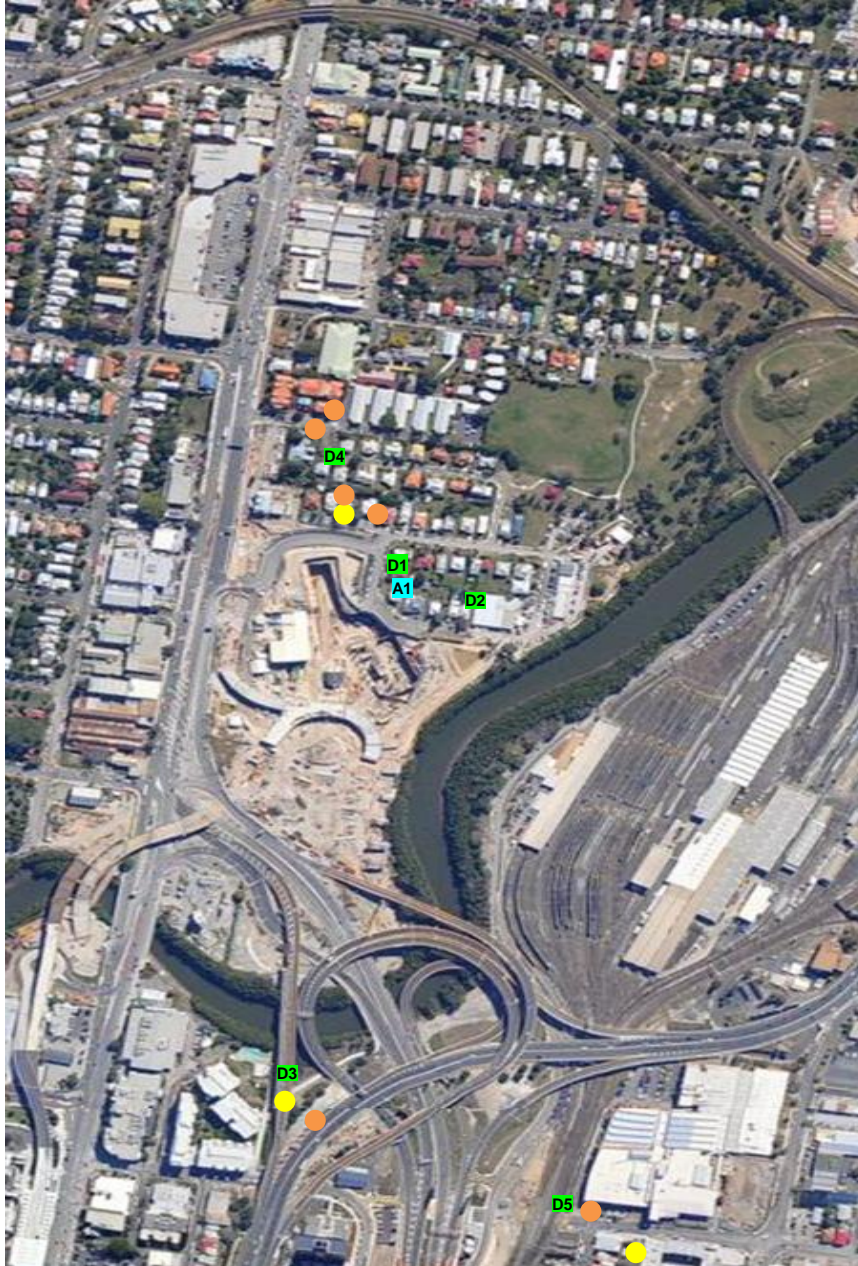
The report has been compiled to summarise the results of noise, air quality and vibration monitoring on the Airport Link and Northern Busway project. The report also compares those results with compliance thresholds for environmental harm, community nuisance and loss of amenity nominated by the Coordinator General (Change Report July 2008 and Woolloowin Worksite Report October 2009).

The monitoring data covered in this report is for the October 2010 reporting period, from 16<sup>th</sup> September 2010 to 15<sup>th</sup> October 2010.

## **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 October 2010, though do serve a useful purpose in relating the monitoring locations to existing structures and infrastructure.

## Bowen Hills Monitoring Locations



Source: NearMap 2010

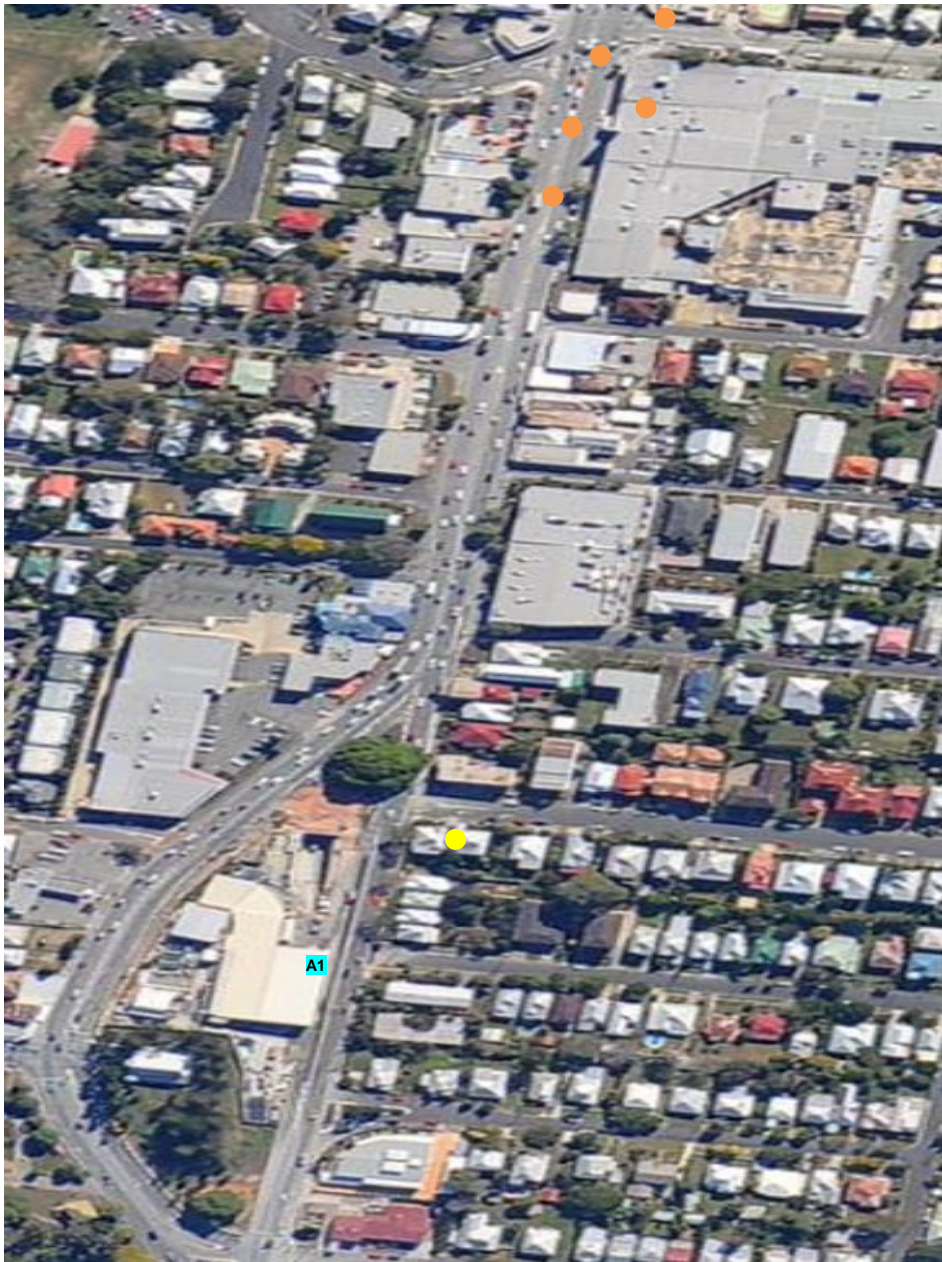
Figure 2.1 – Bowen Hills Monitoring Locations

### Legend

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

Note: locations are indicative only

## Truro Street Mid Tunnel Monitoring Locations



Source: NearMap 2010

Figure 2.2 – Truro Street Mid Tunnel Monitoring Locations

### Legend

- Noise (during construction )
- Vibration

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

Note: locations are indicative only

## Northern Busway Monitoring Locations



Source: NearMap 2010

Figure 2.3 – Northern Busway Monitoring Locations

### Legend

- Noise (during construction )
- Vibration

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

**Note:** locations are indicative only

## Kedron Monitoring Locations



Source: NearMap 2010

**Figure 2.4 – Kedron Monitoring Locations**

**Legend**

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

**Note: locations are indicative only**

## Woolloowin Monitoring Locations



Figure 2.5 – Woolloowin Monitoring Locations

### Legend

- |                                |                                 |
|--------------------------------|---------------------------------|
| ● Noise (during construction ) | ● Air (PM <sub>10</sub> )       |
| ● Vibration                    | ● Air (Dust Deposition)         |
|                                | ● Air (CO and NO <sub>2</sub> ) |

**Note: locations are indicative only**

## Toombul Monitoring Locations



Source: Nearmap 2010

Figure 2.6 – Toombul Monitoring Locations

### Legend

- Noise (during construction)
- Vibration

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

**Note: locations are indicative only.**

### **3.0 Noise Monitoring**

TJH undertakes regular monitoring of noise levels at a variety of locations across the project 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.
2. Reasonable and practical mitigation measures that have been implemented to date include the following:
  - a. Temporary noise barriers (precast concrete barrier and plywood):
    - i. Lutwyche Road (Lutwyche, Kedron)
    - ii. Gympie Road (Kedron)
    - iii. Truro Street on all sides of works (Lutwyche)
    - iv. Federation/Morris Street (Bowen Hills)
    - v. Stafford Road (Kedron)
    - vi. Rose St (Wooloowin)
    - vii. Kalinga Park (Toombul)
    - viii. KBB Worksite (Kedron)
  - b. Temporary noise barrier (shipping container) installations:
    - i. Perry Street, (Kedron)
    - ii. Kalinga Park (Toombul)
  - c. Acoustic shed has been built around the tunnel portals / shafts at:
    - i. Truro Street
    - ii. Wooloowin
    - iii. Kalinga Park (410 launch box)
    - iv. Spoil transfer station (ARU)
  - d. Consultation with property owners prior to commencing works and during construction works
  - e. Installation of mitigation measures at affected residents on a case-by-case basis
  - f. Investigating the early installation of permanent noise barriers at early stages
  - g. Acoustic shielding of various plant
  - h. Regular awareness, training and reinforcement of work behaviours of staff, subcontractors, spoil haulage drivers, and delivery drivers to prevent or minimise noise generation in work areas
  - i. Use of temporary acoustic treatment (e.g. sound curtains around onsite generators and access/ egress from sites)
  - j. Installation of directional reversing alarms (e.g. 'squawkers') on plant (especially those working out of normal working hours)

### **3.2 Noise Monitoring Results**

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

**Table 3a: Noise Monitoring Results – Bowen Hills Civils**

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)	Comments
<b>Room 3401 Mews Apartments, Bowen Hills</b>						
3 <sup>rd</sup> Storey Unit (Living Room)	07/10/2010 10:30am-10:44am	39.8	45	36.6	55	<p><b>Monitoring Type</b> Attended. Internal. Windows and Doors closed</p> <p><b>Noise Sources</b> The dominant noise source throughout the period was traffic moving along the adjacent inner city bypass. TJH noise sources included a jack hammer working in the TJH Area 6 worksite and a truck moving through site</p> <p><b>Discussion</b> Monitoring was to assess the level of impact which was being caused to residents adjacent to the Area 6 worksite. The level recorded for LA<sub>eq</sub> was below CoG goals</p> <p><b>Mitigation</b> Mitigation was not required as results were within CoG goals</p>
<b>Unit 8/32 Campbell Street, Bowen Hills</b>						
3 <sup>rd</sup> Storey Unit (Living Room)	14/10/2010 11:16am-11:30am	41.8	45	40.9	55	<p><b>Monitoring Type</b> Attended. Internal. Windows and Doors closed</p> <p><b>Noise Sources</b> The dominant noise source throughout the period was TJH construction activities on the Area 9 worksite on Campbell Street. TJH noise sources included a piling rig operating, hammering and a squawker. Non TJH noise sources included a truck driving on Campbell Street, internal noise and a plane flying overhead</p> <p><b>Discussion</b> Monitoring was to assess the level of impact which was being caused to residents adjacent to the Area 9 worksite. The noise levels recorded were below CoG goals</p> <p><b>Mitigation</b> Mitigation was not required as results were within CoG goals</p>

**Table 3b: Noise Monitoring Results – Bowen Hills Tunnels**

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)	Comments
<b>14 Gallway Street, Windsor</b>						
Single Storey Brick House (Living Room)	08/10/2010 2:52pm-3:06pm	42.2	45	39.2	55	<p><b>Monitoring Type</b> Attended. Internal. Windows and Doors closed</p> <p><b>Noise Sources</b> The dominant noise source throughout the period was traffic on Lutwyche Road. TJH noise sources included a squawker, bobcat, hammer and a grinder working in Area 1. Internal noise was noted during the period</p> <p><b>Discussion</b> Monitoring was to assess the level of impact which was being caused to residents adjacent to the tunnelling works in Ramp L. No tunnelling activities were noted during the session. The levels recorded were below CoG goals</p> <p><b>Mitigation</b> Mitigation was not required as results were within CoG goals</p>

**Table 3c: Night Time Noise Monitoring Results – Truro Street Mid Tunnel**

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>Unit 3 / 29 Truro Street, Windsor</b>						
2 <sup>nd</sup> Storey Unit (Main Bedroom)	20/09/2010 11:05pm-11:19pm	28.8	40	41.3	50	<p><b>Monitoring Type</b> Attended. Internal. Windows and Doors closed</p> <p><b>Noise Sources</b> The dominant noise source throughout the period was traffic moving along Truro Street. Works on the nearby TJH tunnelling site were noted intermittently. Other noise sources included internal noise and a bird</p> <p><b>Discussion</b> Monitoring was to assess the level of impact which was being caused to residents adjacent to the Truro St tunnel worksite. The majority of noise resulted from the traffic moving along Truro St. The results were within CoG goals</p> <p><b>Mitigation</b> Mitigation was not required as results were within CoG goals</p>

**Table 3d: Noise Monitoring Results – Northern Busway**

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)	Comments
<b>Unit 5/59 Lamington Avenue, Lutwyche</b>						
2 <sup>nd</sup> Storey Unit (Kitchen)	24/09/2010 8:35am-8:49am	40.6	45	40.2	55	<p><b>Monitoring Type</b> Attended. Internal. Windows and Doors closed</p> <p><b>Noise Sources</b> The dominant noise source throughout the period was traffic moving along Lutwyche Road. Piling on the southern end of CC701 was noted intermittently throughout. Other TJH noise sources included saw cutting and a squawker from the Busway site</p> <p><b>Discussion</b> Monitoring was to assess the level of impact which was being caused to residents adjacent to the Northern Busway worksite. The noise levels recorded were below CoG goals</p> <p><b>Mitigation</b> Mitigation was not required as results were within CoG goals</p>

**Table 3e: Noise Monitoring Results – Kedron**

Location	Monitoring Period	L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	L <sub>Amax</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	Comments
<b>1/15 Windsor Avenue, Lutwyche</b>						
Brick townhouse complex bottom floor (Lounge room)	17/09/2010 10:10am-10:25am	48.1	45	49.2	55	<p><b>Monitoring Type</b> Internal attended monitoring, doors and windows open</p> <p><b>Noise Sources</b> The dominate noise sources were piling rigs and the tower crane operation on the Kedron VE200/TW930 work site. Noise from local traffic was also audible</p> <p><b>Discussion</b> The levels recorded were a result of the piling rigs and tower crane operating. An NCR was raised and mitigation offered to the residents</p> <p><b>Mitigation Measures</b> A 4m noise wall and double stacked shipping containers border the VE200 work site. An air conditioning unit is provided to this premises as mitigation, which was not operating during this session</p>
Brick townhouse complex bottom floor (Lounge room)	17/09/2010 10:30am-10:45am	34.4	45	39.9	55	<p><b>Monitoring Type</b> Internal attended monitoring, doors and windows closed</p> <p><b>Noise Sources</b> The predominant noise source monitored was from non-TJH activities, primarily traffic from local traffic. Piling rigs and the tower crane was audible, but was the non-dominate source and difficult to distinguish over the traffic and other background noise</p>

Location	Monitoring Period	L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	L <sub>Amax</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	Comments
						<p><b>Discussion</b> Monitoring indicates that noise levels were within TJH goals</p> <p><b>Mitigation Measures</b> A 4m noise wall and double stacked shipping containers border the VE200 work site. An air conditioning unit is provided to this premise as mitigation, which was not operating during this session</p>

**Table 3f: Noise Monitoring Results – Toombul**

Location	Monitoring Period	L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	L <sub>A10</sub> (15 min) (dBA)	CoG Goal L <sub>A10</sub> (15 min) (dBA)	Comments
<b>89 Jackson Street, Clayfield</b>						
Two Storey Timber House (Front Bedroom)	07/10/2010 9:11am–9:25am	39.1	45	36.9	55	<p><b>Monitoring Type</b> Internal attended monitoring, windows and doors open</p> <p><b>Noise Sources</b> TJH noise sources (engine, bang, gantry crane, franna, drop) plus non-TJH sources (resident, birds, television, car, train, saw, hammering)</p> <p><b>Discussion</b> Monitoring indicates that CoG goals are being met</p> <p><b>Mitigation Measures</b> Include a 6m noise wall</p>
Two Storey Timber House (Front Bedroom)	07/10/2010 9:29am–9:42am	32.6	45	33.1	55	<p><b>Monitoring Type</b> Internal attended monitoring, windows and doors closed</p> <p><b>Noise Sources</b> TJH noise sources (drilling, franna, bang, gantry crane) plus non-TJH sources (birds, television, saw, hammering, dog barking, house, train, plane, sirens)</p> <p><b>Discussion</b> Monitoring indicates that CoG goals are being met</p> <p><b>Mitigation Measures</b> Include a 6m noise wall</p>

Location	Monitoring Period	L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	L <sub>A10</sub> (15 min) (dBA)	CoG Goal L <sub>A10</sub> (15 min) (dBA)	Comments
Two Storey Timber House (Front Bedroom)	07/10/2010 1:36pm–1:50pm	39.2	45	40.0	55	<b>Monitoring Type</b> Internal attended monitoring, windows and doors open <b>Noise Sources</b> TJH noise sources (engine, bang, gate, horn, crane, reverse beeping, drops, kicking bucket, gantry crane) plus non-TJH sources (train, resident, bird, traffic) <b>Discussion</b> Monitoring indicates that CoG goals are being met <b>Mitigation Measures</b> Include a 6m noise wall
Two Storey Timber House (Front Bedroom)	07/10/2010 1:53pm–2:07pm	36.4	45	35.9	55	<b>Monitoring Type</b> Internal attended monitoring, windows and doors closed <b>Noise Sources</b> TJH noise sources (franna, water blasting, drops) plus non-TJH sources (train, television, birds, resident, car, house, gecko) <b>Discussion</b> Monitoring indicates that CoG goals are being met <b>Mitigation Measures</b> Include a 6m noise wall

**Table 3g: Night Shift Noise Monitoring Results – Toombul**

Location	Monitoring Period	L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	L <sub>Amax</sub> (15 min) (dBA)	CoG Goal L <sub>Amax</sub> (15 min) (dBA)	Comments
<b>35 Walkers Way, Nundah</b>						
2 Storey Brick (Main bedroom)	15/09/2010 8:03pm–8:21pm	35.9	35	62.9	50	<b>Monitoring Type</b> Internal attended monitoring, windows and doors closed <b>Noise Sources</b> TJH noise sources (conveyer belt) plus non-TJH sources (traffic, resident, house, gecko) <b>Discussion</b> Monitoring indicates that CoG goals are being exceeded. An NCR was raised regarding this exceedance. <b>Mitigation Measures</b> TJH mitigation has been refused by the stakeholder.
2 Storey Brick (Main bedroom)	15/09/2010 8:20pm–8:35pm	47	35	50.4	50	<b>Monitoring Type</b> Internal attended monitoring, windows and doors open <b>Noise Sources</b> TJH noise sources (conveyer belt) plus non-TJH sources (traffic, possum, plane) <b>Discussion</b>

Location	Monitoring Period	L <sub>Aeq</sub> (15 min) (dBA)	CoG Goal L <sub>Aeq</sub> (15 min) (dBA)	L <sub>Amax</sub> (15 min) (dBA)	CoG Goal L <sub>Amax</sub> (15 min) (dBA)	Comments
						Monitoring indicates that CoG goals are being exceeded An NCR was raised regarding this exceedance. <b>Mitigation Measures</b> TJH mitigation has been refused by the stakeholder.

**Table 3h – 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)	16/09/2010 4:13am–4:27am	35.4	40	N/A	N/A	41.9	50	<p><b>Monitoring Type</b> Attended Noise Monitoring. Doors and Windows Closed</p> <p><b>Noise Sources</b> Site noise included: loader (tidying up stockpile), banging, concrete truck (barely audible), shed door. The other noise source was traffic</p> <p><b>Discussion</b> The L<sub>Amax</sub> was caused by site noise. Monitoring indicates that night time CoG goals are being met</p> <p><b>Mitigation Measures</b> An acoustic shed and noise wall is in place around Woolloowin Site. 71 Park Road is owned by DMR and is used by TJH for monitoring purposes</p>
Single level brick flat (Dining Room)	22/09/2010 11:56am–12:10pm	38.8	45	39.5	55	N/A	N/A	<p><b>Monitoring Type</b> Attended Noise Monitoring. Doors and Windows Closed</p> <p><b>Noise Sources</b> Site noise included: scrubber, loader, trucks, banging, door, horn, truck braking, reverse beeper, voices. Other noise sources included: traffic, bell, birds</p> <p><b>Discussion</b> Monitoring indicates that day time CoG goals are being met</p> <p><b>Mitigation Measures</b> An acoustic shed and noise wall is in place around Woolloowin Site. 71 Park Road is owned by DMR and is used by TJH for monitoring purposes</p>

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
Single level brick flat (Dining Room)	28/09/2010 10:46am–11:00am	39.6	45	40.4	55	N/A	N/A	<p><b>Monitoring Type</b> Attended Noise Monitoring. Doors and Windows Closed</p> <p><b>Noise Sources</b> Site noise included: scrubber, loader, trucks, banging. Other noise sources included: traffic, birds, house creaking and plane</p> <p><b>Discussion</b> Monitoring indicates that day time CoG goals are being met</p> <p><b>Mitigation Measures</b> An acoustic shed and noise wall is in place around Woollowin Site. 71 Park Road is owned by DMR and is used by TJH for monitoring purposes</p>

### **3.3 Compliance with Noise Goals**

Exceedences of the Coordinator General's Noise Goals as a result of TJH construction activities (or a combination of external and TJH construction activities) have been found during this monitoring period at a number of locations, these include:

- 35 Walkers Way, Nundah
- 1/15 Windsor Avenue, Lutwyche

### **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 (PM10) at a number of locations nominated by the Coordinator General. Real-time monitoring of Total Suspended Particulates (TSP) and CO/NO<sub>2</sub> is also occurring at a location in the vicinity of the Woolloowin Worksite.

Results of monitoring are compared to Air Quality Goals nominated by the Coordinator General (Change Report July 2008 & Woolloowin Worksite Modification October 2009) 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:

1. Continual use of water carts
2. Covering of haul vehicles
3. Stabilisation of cleared areas with hardstand materials such as concrete and crushed rock
4. Hydro-mulching and laying geofab to batters
5. Reduction of cleared / exposed soils with concrete paving and geo-fabric installation
6. Road sweepers

## 4.2 Air Quality Monitoring Results – PM10/TSP

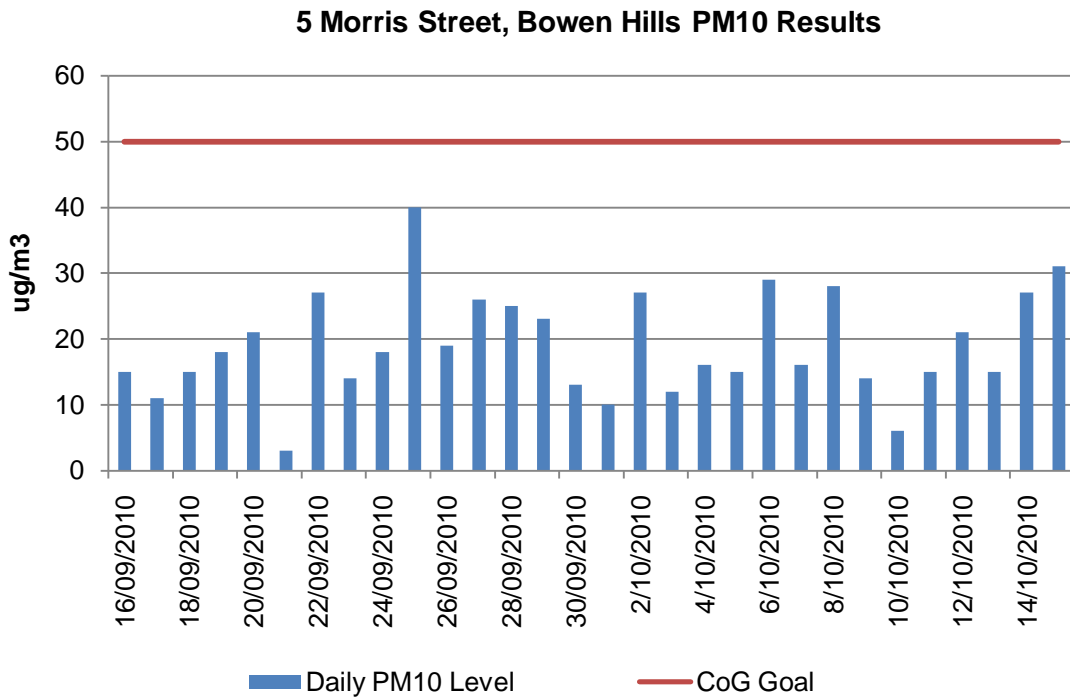


Figure 4.2.1 5 Morris Street, Bowen Hills PM10 Results (for monitor location see figure 2.1 – A1)

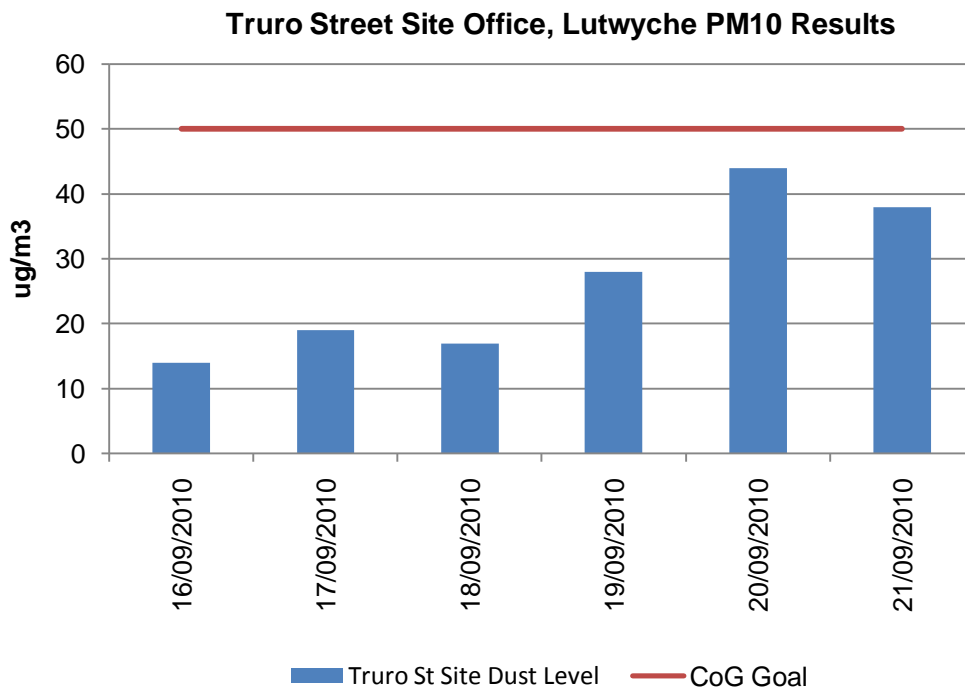


Figure 4.2.2 Truro Street Site Office, Windsor PM10 Results (for location see figure 2.2 – A1)

### Erskine Avenue, Kedron PM10 Results

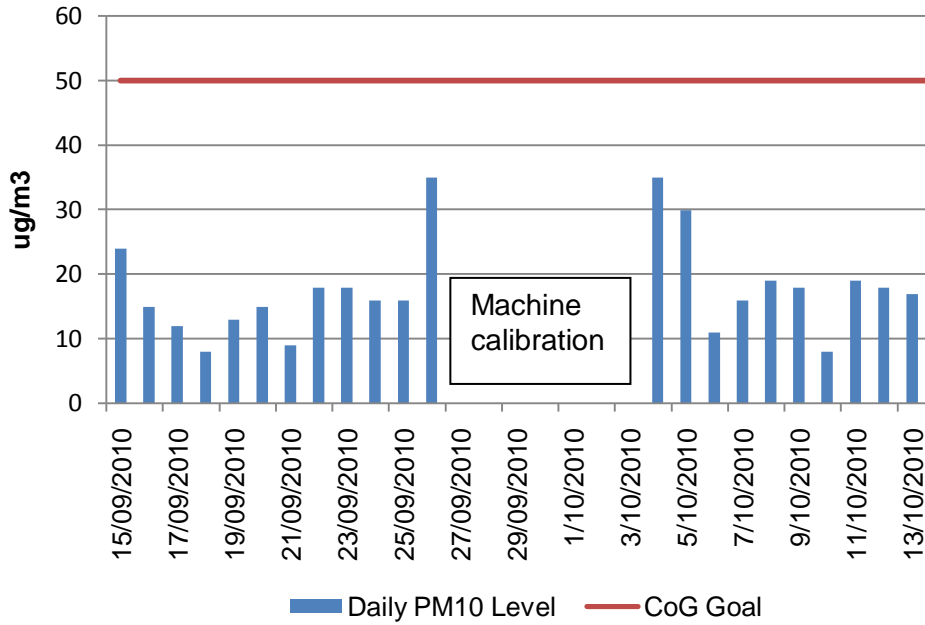


Figure 4.2.3 Erskine Avenue, Kedron PM10 Results (for monitor location see figure 2.4 – A1)

### Kedron State High School, Kedron PM10 Results

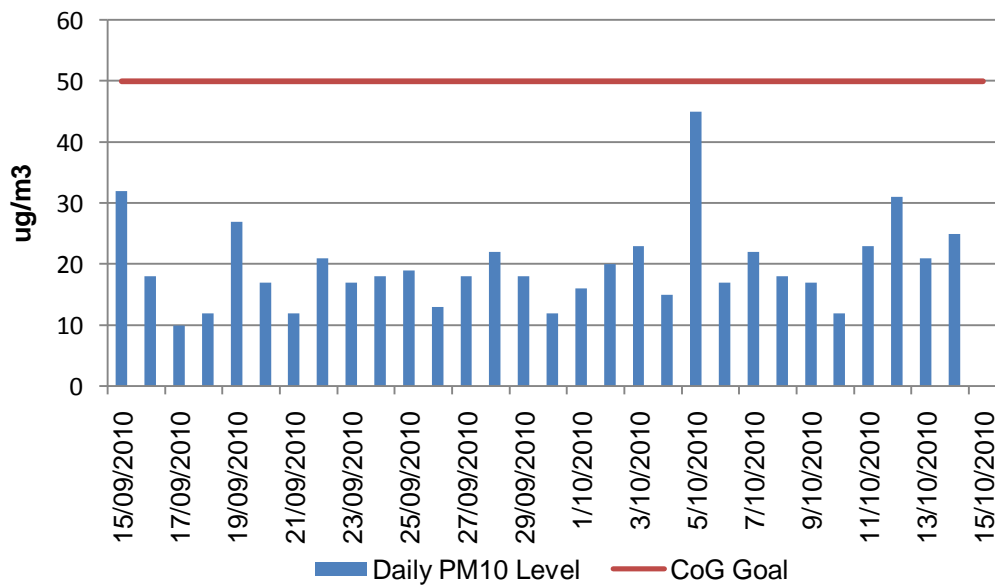


Figure 4.2.4 Kedron State High School (Adj), Kedron PM10 Results (for monitor location see figure 2.4 – A2)

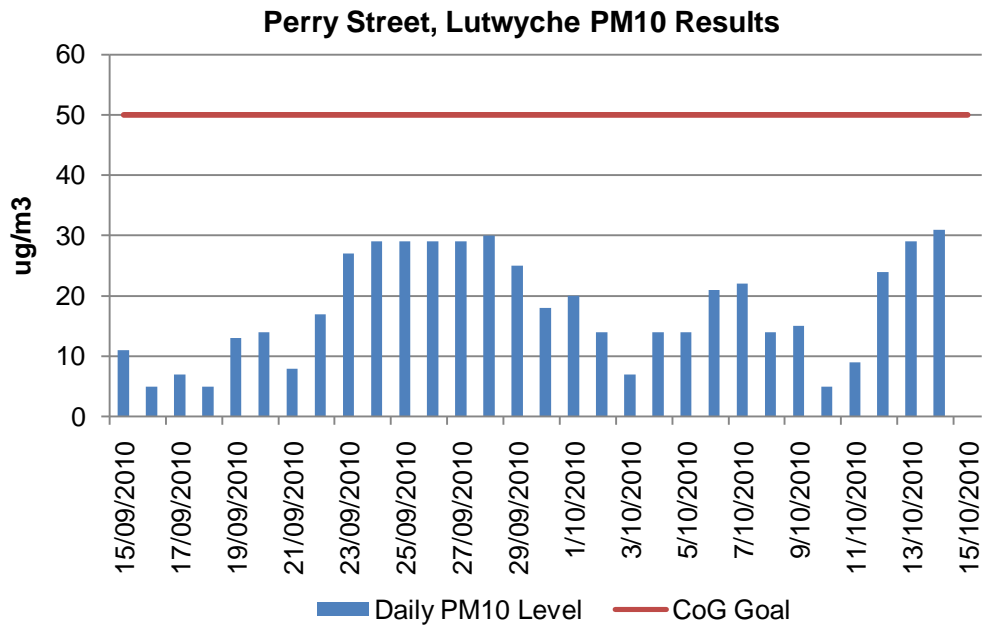


Figure 4.2.5 Perry Street, Lutwyche PM10 Results (for monitor location see figure 2.4 – A3)

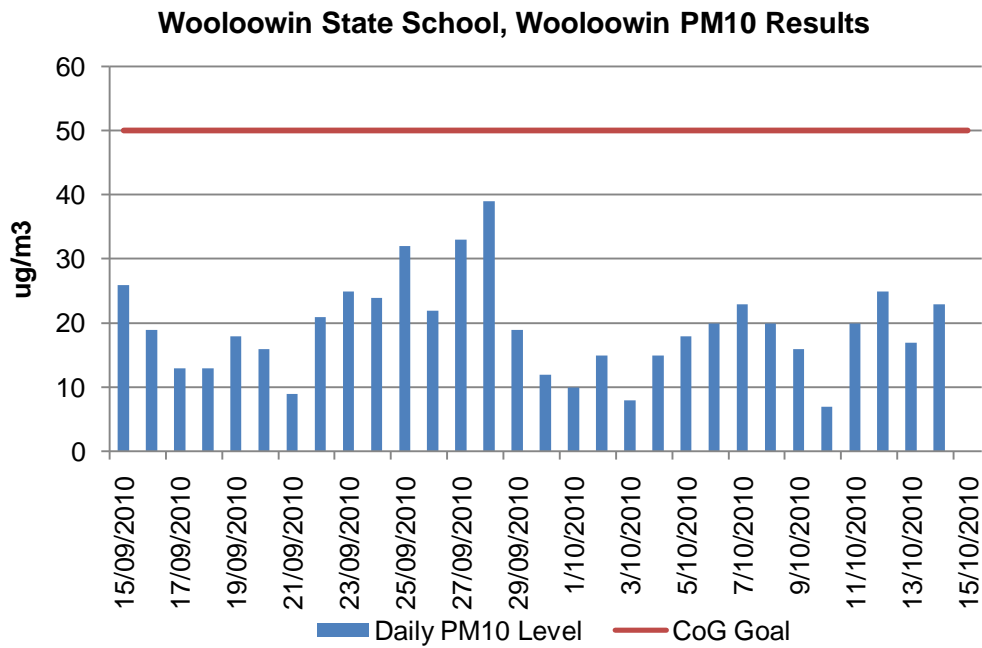


Figure 4.2.6 Woolloowin State School, Lutwyche PM10 Results (for monitor location see figure 2.4 – A4)

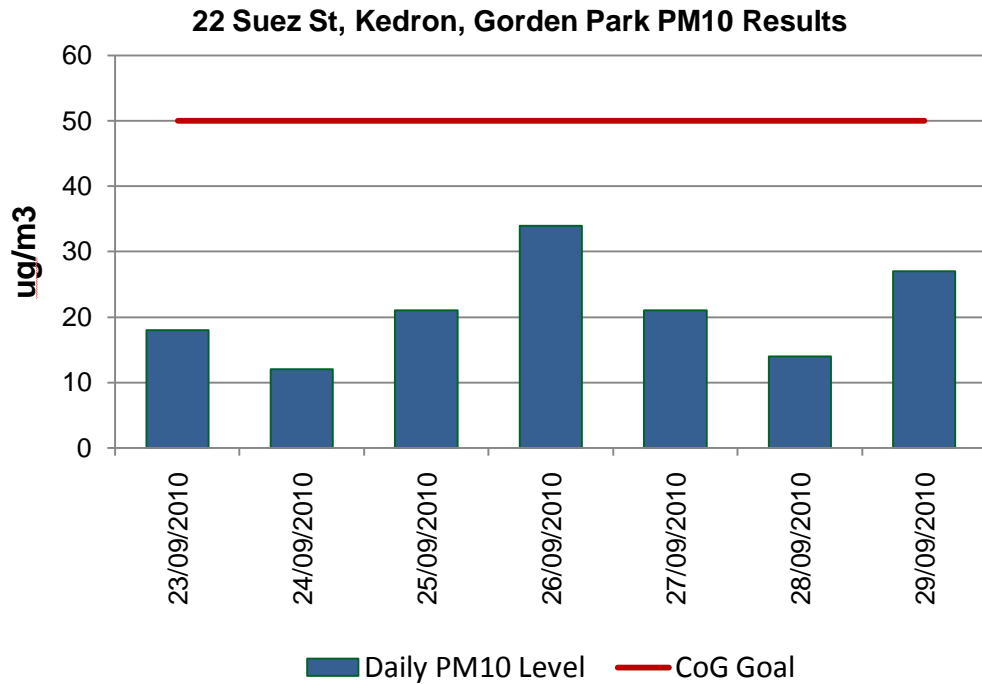


Figure 4.2.7 - 22 Suez Street, Gordon Park, PM10 Results (for monitor location see figure 2.4 – A5)

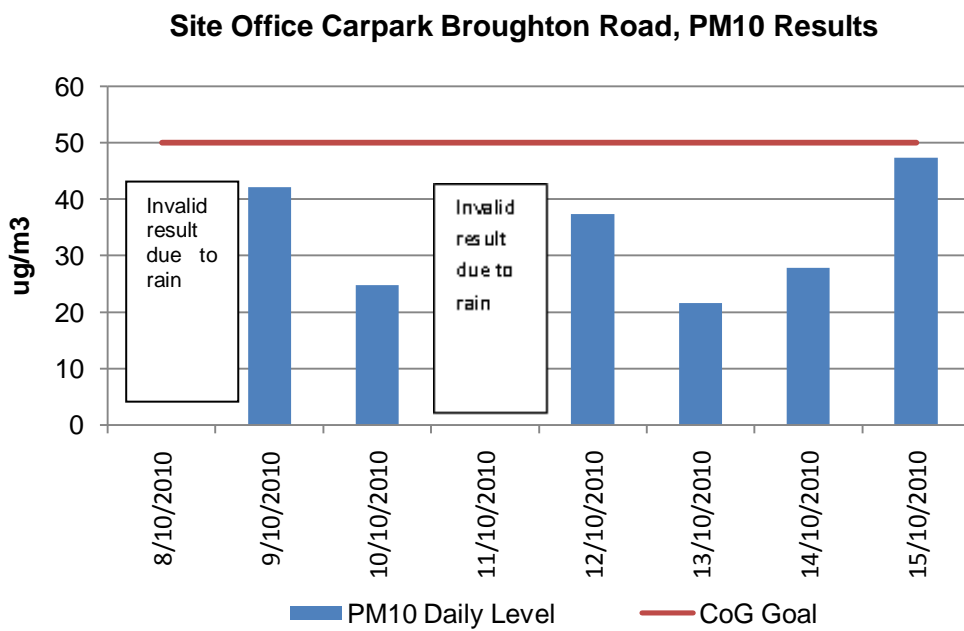


Figure 4.2.8 - 22 Suez Street, Gordon Park, PM10 Results (for monitor location see figure 2.4 – A6)

### 56 Kalinga Street, Clayfield PM10 Results

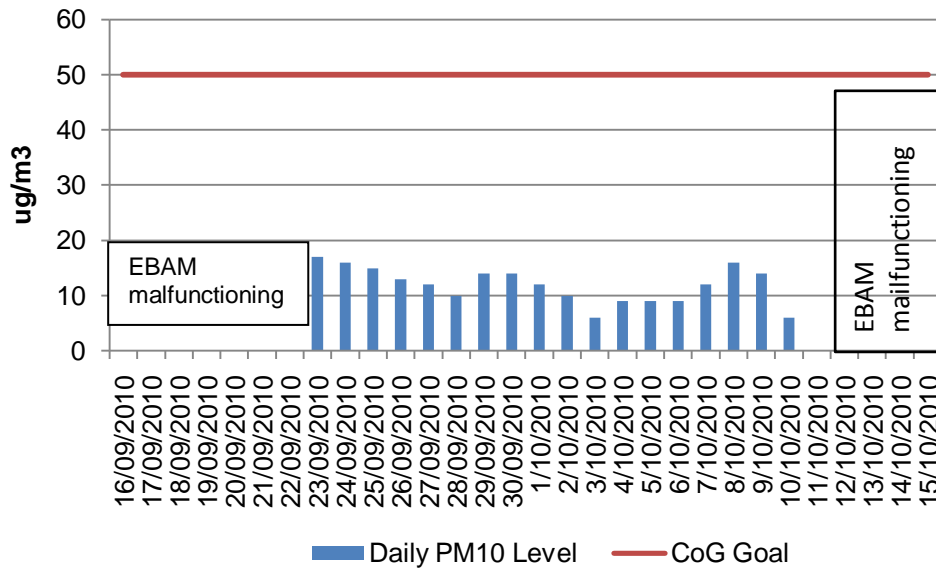
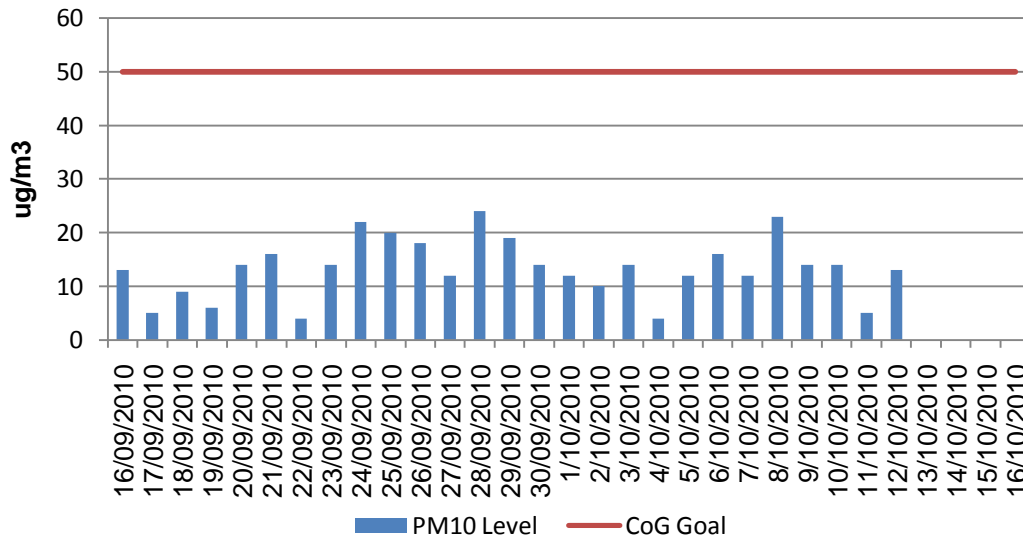


Figure 4.2.9 - 56 Kalinga Street, Toombul PM10 Results (for monitor location see figure 2.6 – A1)

### 5 Mabel Street, Clayfield PM10 Results



4.2.10 Kalinga Park Adj Alma Road, Toombul PM10 Results (for monitor location see figure 2.6- A2)

### 74 Alma Road, Clayfield PM10 Results

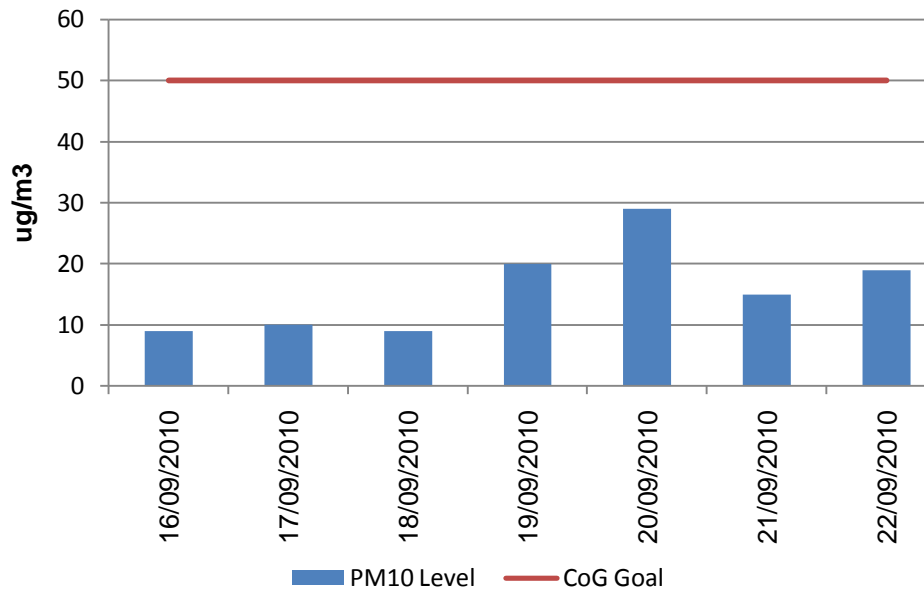


Figure 4.2.11 - 74 Alma Road, Clayfield PM10 Results (for monitor location see figure 2.6- A3)

### 71 Park Road Woolloowin - Daily PM10 Level

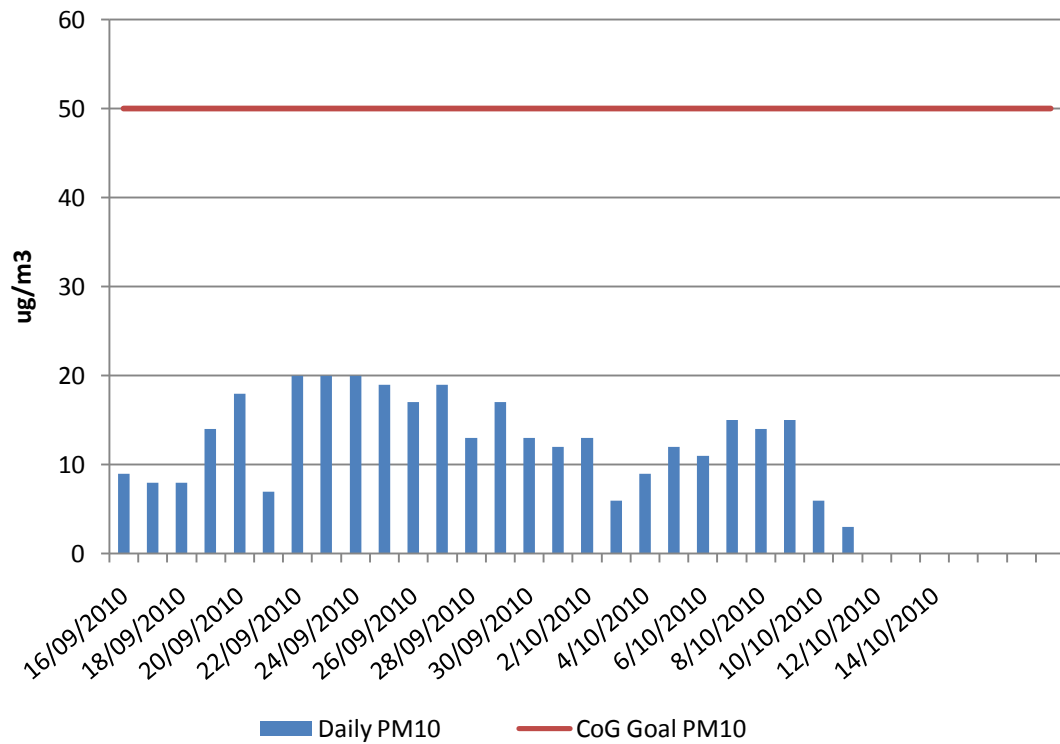


Figure 4.2.12 - 71 Park Road, Woolloowin PM10 Results (for monitor location see figure 2.5)

### 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 most locations the placement of the deposition gauges does not meet the standard due to location and security issues. Note: due to lab processing times and field placement some results are not available at time of report writing thus will be included in next month's report.

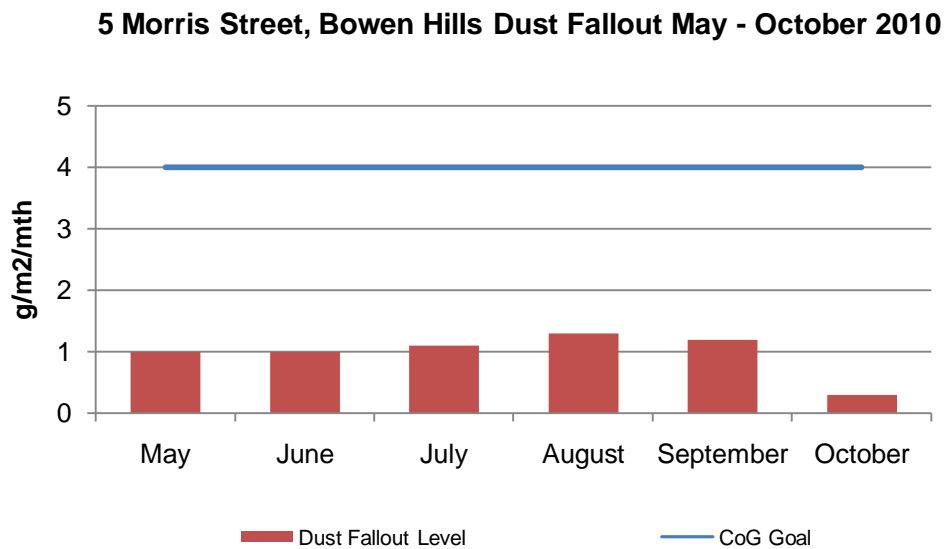


Figure 4.3.1 - 5 Morris Street, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1 – D1)

### Site Office, Bowen Hills Dust Fallout May - October 201

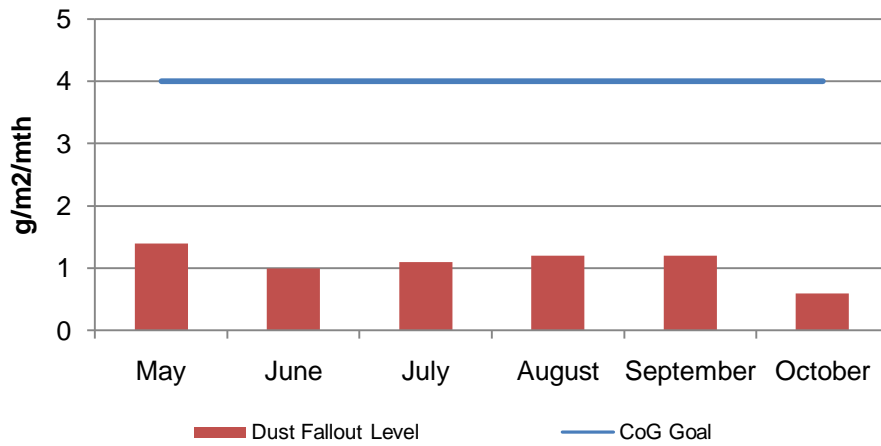


Figure 4.3.2 Site Office, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1- D2)

### Mews Apartments, Bowen Hills Dust Fallout July-October 2010

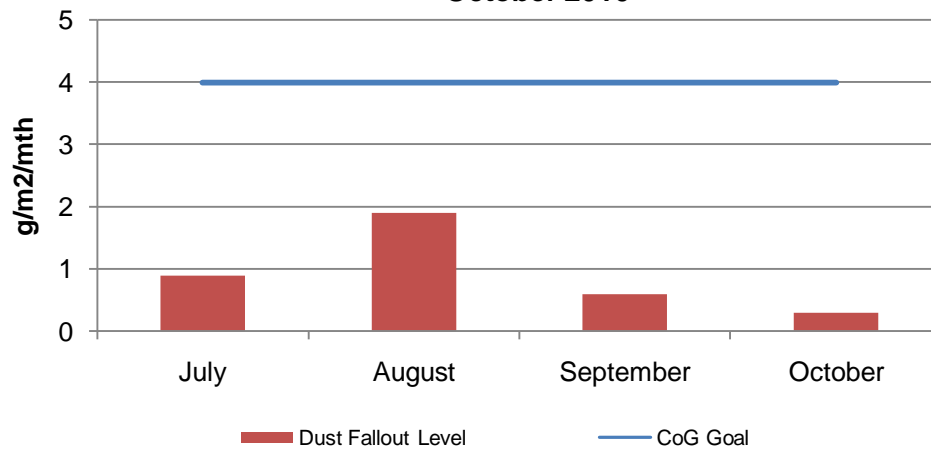


Figure 4.3.3 Mews Apartments, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1- D3)

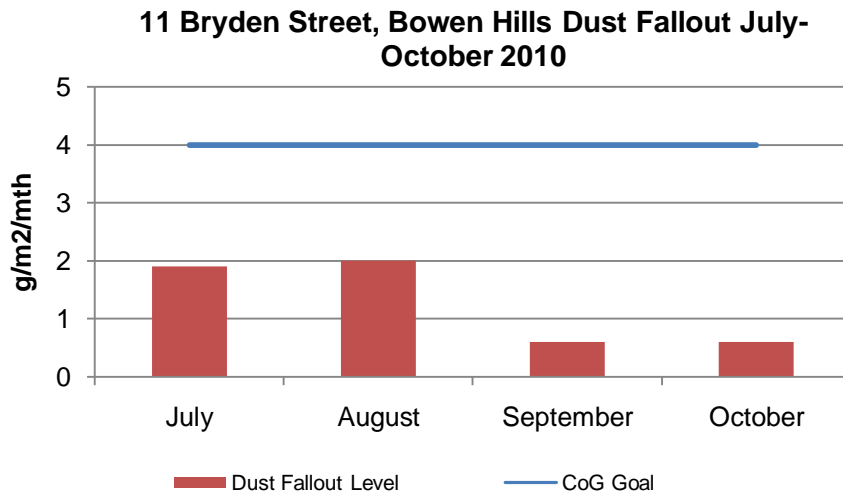


Figure 4.3.4 - 11 Bryden Street, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1- D4)

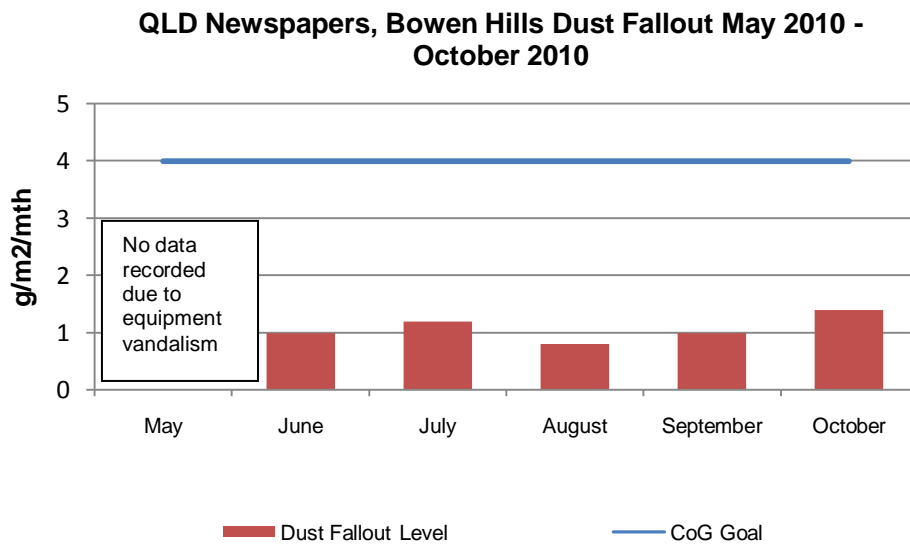


Figure 4.3.5 Queensland Newspapers, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1- D5)

### Cnr of Thistle & Lucas Street, Lutwyche Dust Fallout M October 2010

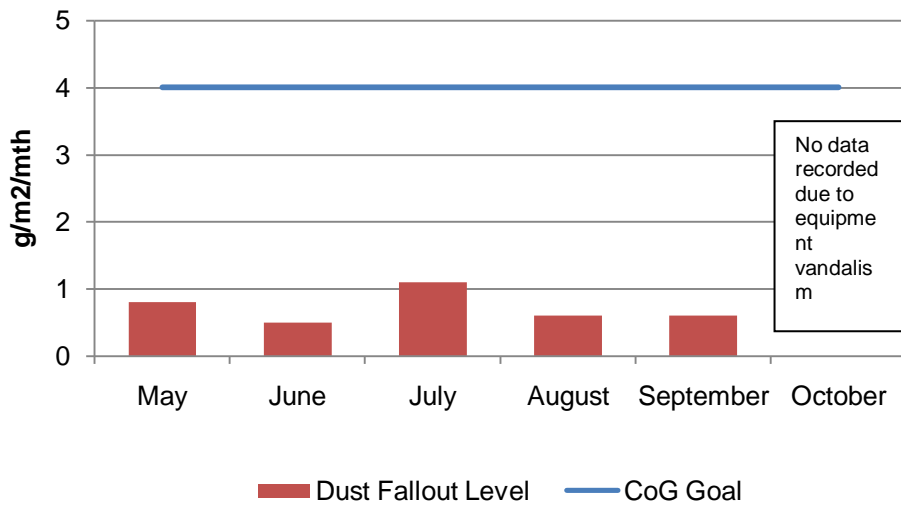


Figure 4.3.6 Cnr of Thistle & Lucas Street, Lutwyche Dust Fallout Results (location refer to figure 2.3 – D2)

### Kedron Brook Reserve, Northern Busway Dust Fallout May- October 2010

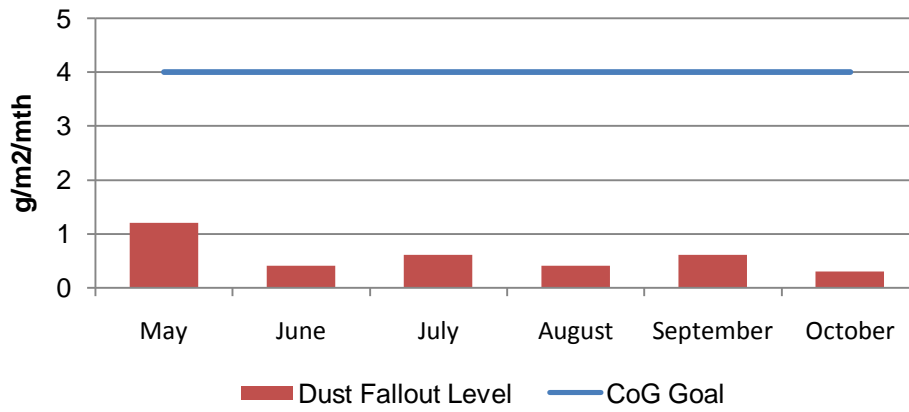


Figure 4.3.7 Kedron Brook Reserve, Northern Busway Dust Fallout Results (location refer to figure 2.3 – D1)

### Dust Fallout Erskyne Avenue, Kedron, April 2010 - September 2010

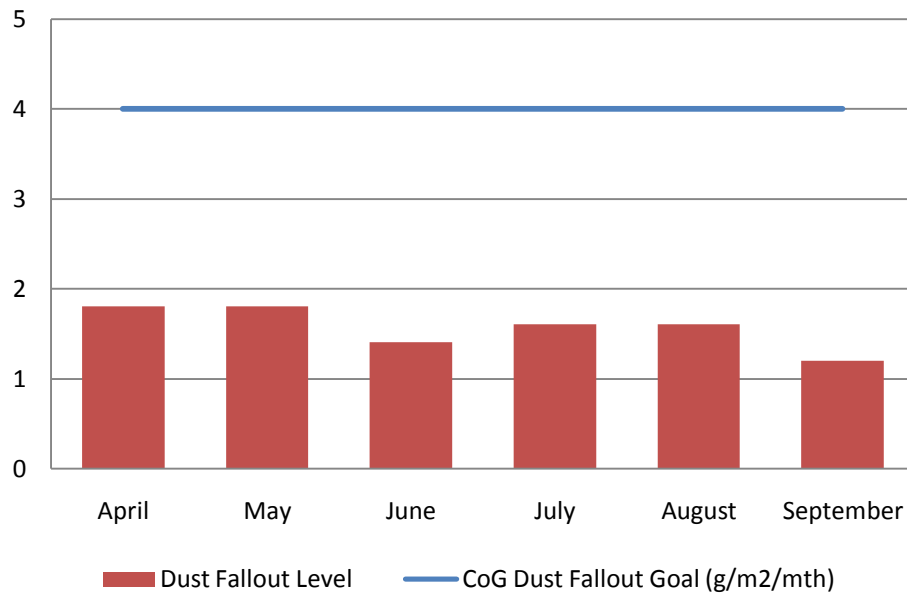


Figure 4.3.8 Erskine Avenue, Kedron Dust Fallout Dust Fallout April 2010 – September 2010 (location refer to figure 2.4 – A1)

### Dust Fallout Perry Street Lutwyche, April 2010 - September 2010

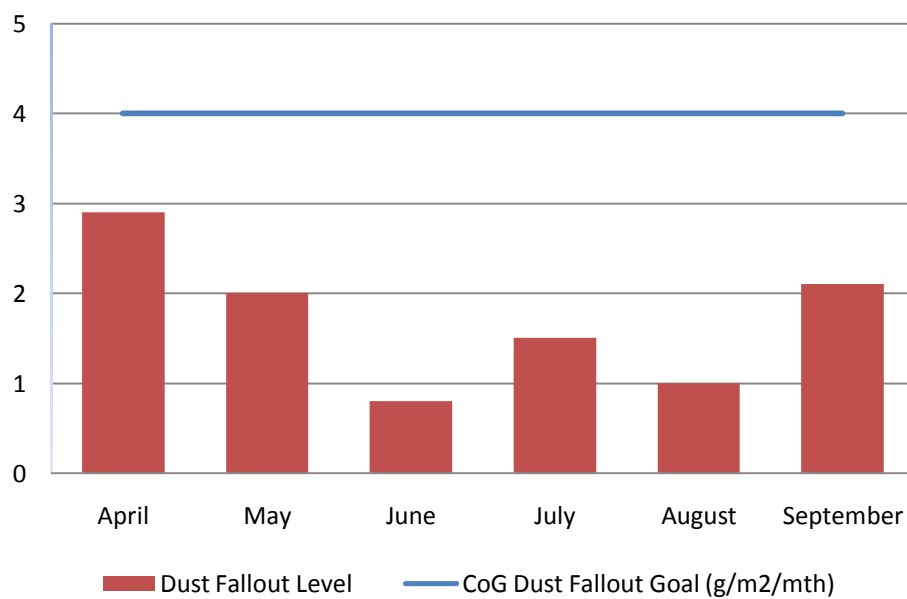


Figure 4.3.9 Perry Street, Lutwyche Dust Fallout Dust Fallout April 2010 – September 2010 (location refer to figure 2.4 – A3)

### Dust Fallout Wooloowin State School, Wooloowin, April 2010 - September 2010

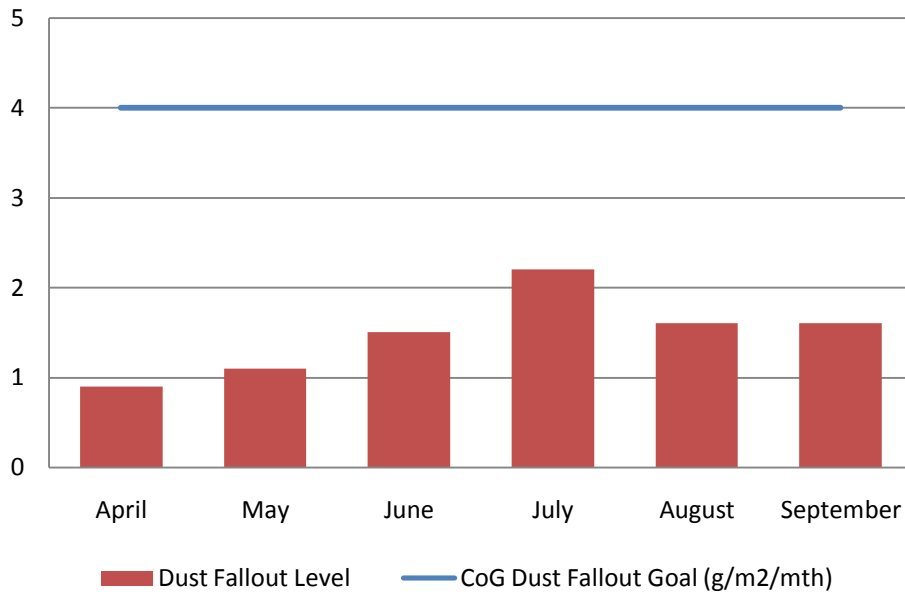


Figure 4.3.10 Wooloowin State School, Dust Fallout April 2010 – September 2010 (location refer to figure 2.4 – A4)

### Dust Fallout Kedron State High School, Kedron, April 2010 - September 2010

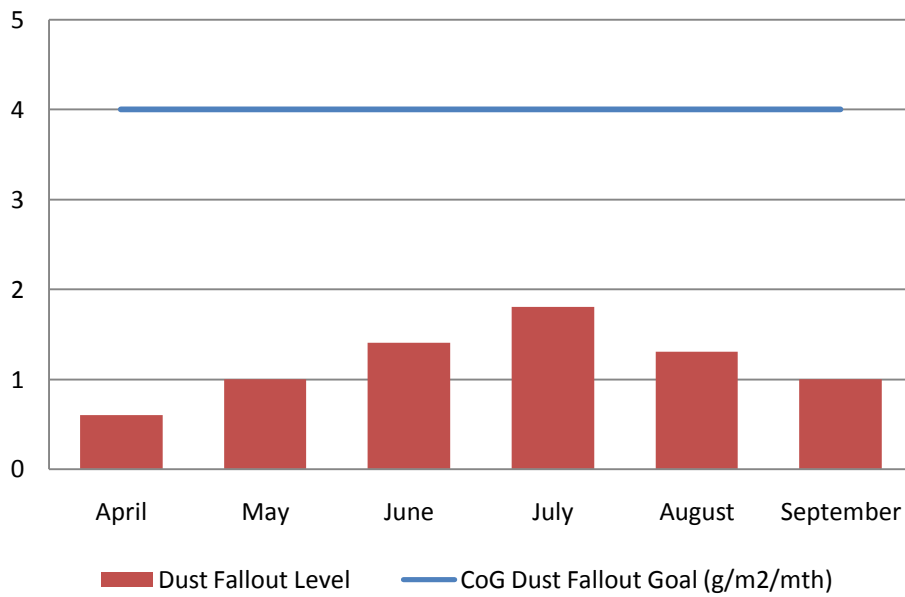


Figure 4.3.10 Kedron State School, Dust Fallout April 2010 – September 2010 (location refer to figure 2.4 – A3)

### Kalinga Street, Toombul Dust Fallout May - October 2010

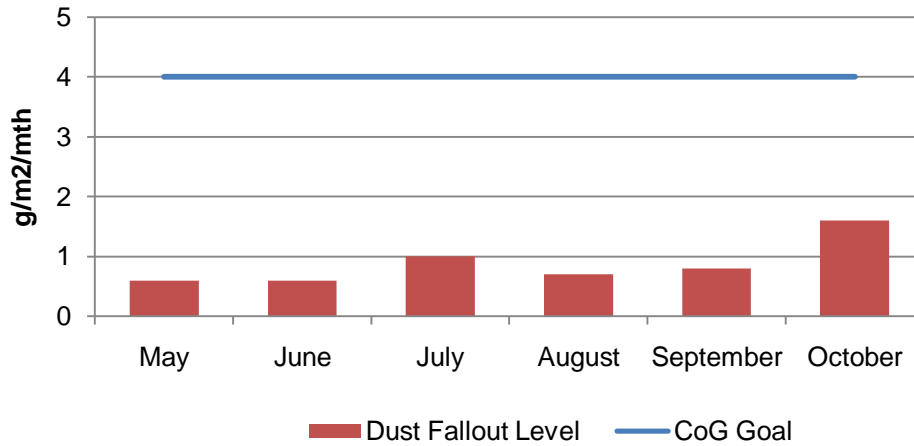


Figure 4.3.11 - 56 Kalinga Street Toombul, Dust Fallout (location refer to figure 2.6 – D1)

### Mabel Street, Toombul Dust Fallout May - October 2010

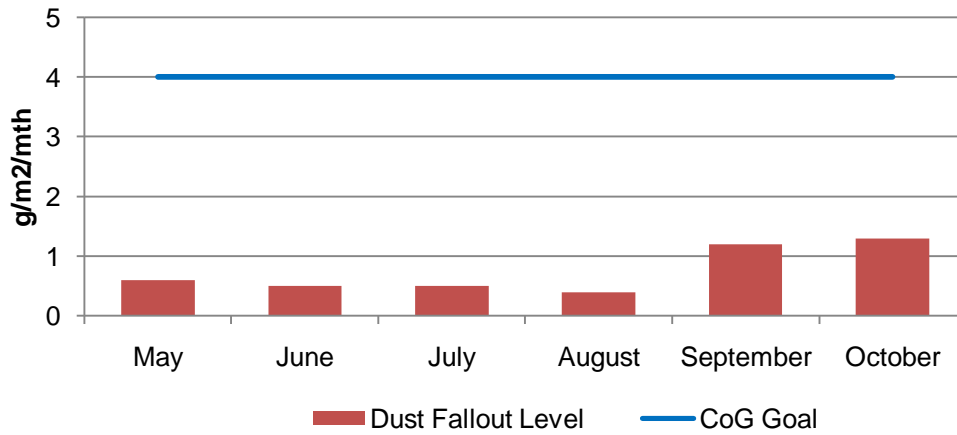


Figure 4.3.12 Mabel Street Toombul, Dust Fallout (location refer to fig 2.6 – D2)

### Bage Street, Toombul Dust Fallout Level May - October 2010

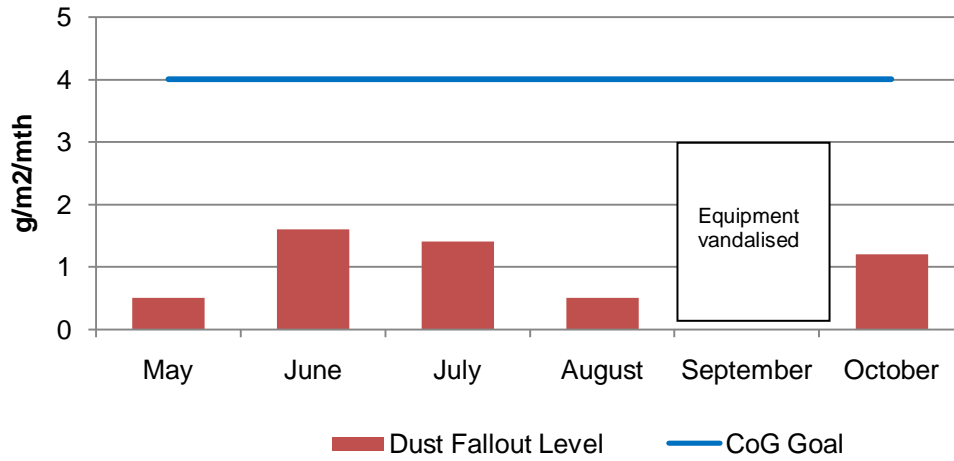


Figure 4.3.13 Bage Street Toombul, Dust Fallout (location refer to fig 2.6 – D3)

### 64 Park Road, Woolloowin Dust Fall Out October 2010

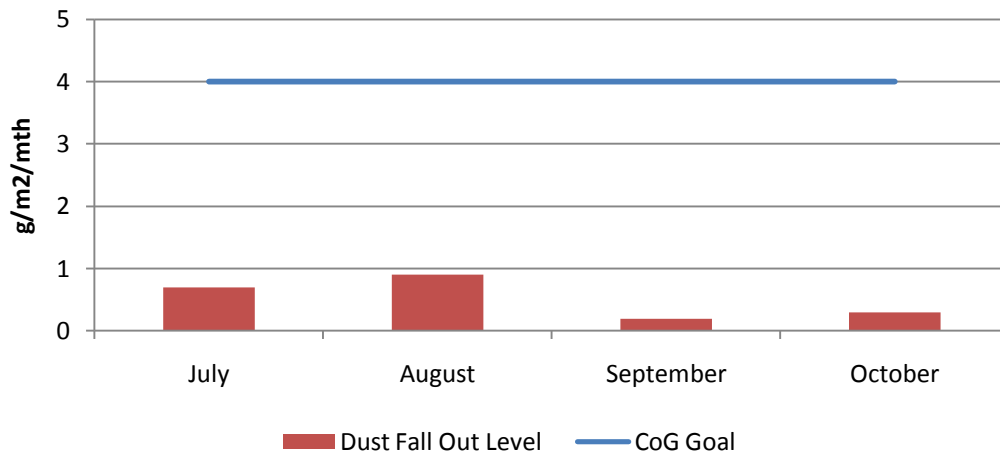


Figure 4.3.14 64, Park Road, Woolloowin Dust Fallout (location refer to fig 2.5 )

Note: The dust deposition gauge at 64 Park Road, Woolloowin is not height compliant with AS/NZS 3580.1.1:2007 due to site constraints and trying to achieve a 120° clear sky angle.

**68 Park Road, Woolloowin  
Dust Fall Out  
October 2010**

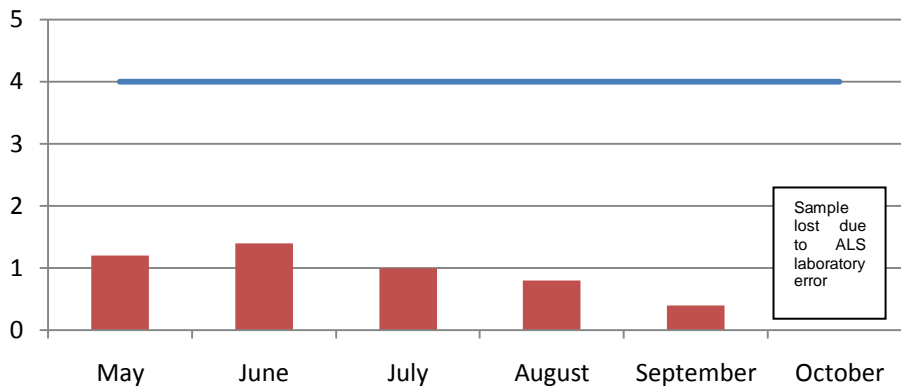


Figure 4.3.15 68 Park Road, Woolloowin Dust Fallout (location refer to fig 2.5)

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

TJH undertakes regular monitoring of CO/NO<sub>2</sub> in the vicinity of the Woolloowin Worksite. Monitoring involves real-time sampling and results of monitoring are compared to Air Quality Goals nominated by the Coordinator General in the Woolloowin Worksite Modification Change Report - October 2009.

Gas Monitor at 71 Park Road, Woolloowin					
Date	Peak Date and Time	CO (mg/m <sup>3</sup> ) Peak	CoG CO Limit (mg/m <sup>3</sup> )	NO <sub>2</sub> (µg/m <sup>3</sup> ) Peak	CoG NO <sub>2</sub> Limit (µg/m <sup>3</sup> )
16/09/2010 to 15/10/2010	23/09/2010 1:10am	0.72	11	-	-
	20/09/2010 2:00pm	-	-	57.89	250

Note:  
For Carbon monoxide (CO) an 8 hour averaging period is used  
For Nitrogen dioxide (NO<sub>2</sub>) a 1 hour averaging period is used

#### 4.5 Compliance with Air Quality Goals

There were no exceedences of the Coordinator Generals Air Quality Conditions during this reporting period. There was some inconsistency in the dust fallout results at Perry Street and Kedron State School in the September 2010 monitoring report. This error was due to reporting of total insoluble values instead of total ash content. Dust fallout results have been rectified in this monitoring report.

#### 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 a number of sensitive receptors.

Results of monitoring are compared to Vibration Goals adopted as listed by the Coordinator General (Change Report June 2008 & Wooloowin Worksite Change Report October 2009) 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
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-j.

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

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
Bryden Street Worksite	16/09/10-15/10/10	0.635	5	Results are within CoG goals

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

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
Queensland Newspapers	16/09/10-15/10/10	5.42	10	Results are within CoG goals
Area 6 (Adjacent to Mews Apartments Boundary)	16/09/10-15/10/10	0.508	5	Results are within CoG goals

**Table 5c: Vibration Monitoring Results Summary – Northern Busway**

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
Lutwyche Centro (Lower level carpark)	16/09/10-15/10/10	0.635	5	Results are within CoG goals

**Table 5d: Blast Monitoring Summary – Truro Street Tunnel (K1 and K2 Tunnel)**

Location	Monitoring Period	Peak Particle Velocity (mm/s)	Vibration Goal (mm/s)	Comments
<b>16<sup>th</sup> September (K1 Tunnel)</b>				
Southwest Corner of Lutwyche Centro	30 seconds	6.35	25	Results are within CoG goals
508 Lutwyche Road (Ray White)	30 seconds	22.2	25	Results are within CoG goals
Footpath adjacent to Airport Link Information Centre	30 seconds	6.98	25	Results are within CoG goals
524 Lutwyche Road (Coronis Real Estate)	30 seconds	15.2	25	Results are within CoG goals
<b>30<sup>th</sup> September (K2 Tunnel)</b>				
23 Bradshaw Road	30 seconds	14.6	25	Results are within CoG goals
Northern Busway worksite (Adjacent to 133 Chalk Street)	30 seconds	18.2	25	Results are within CoG goals
Lutwyche Centro (Lower level carpark)	30 seconds	5.71	25	Results are within CoG goals
<b>6<sup>th</sup> October (K1 Tunnel)</b>				
Lutwyche Centro (North end of lower level carpark)	30 seconds	3.68	25	Results are within CoG goals
Lutwyche Centro (North West corner of lower level carpark)	30 seconds	7.75	25	Results are within CoG goals
Lutwyche Centro (Western side of lower level carpark)	30 seconds	3.30	25	Results are within CoG goals
<b>12<sup>th</sup> October (K2 Tunnel)</b>				
Lutwyche Centro (North end of lower level carpark)	30 seconds	4.19	25	Results are within CoG goals
Lutwyche Centro (North West corner of lower level carpark)	30 seconds	6.10	25	Results are within CoG goals
Lutwyche Centro (Western side of lower level carpark)	30 seconds	3.30	25	Results are within CoG goals

**Table 5e: Blast Monitoring Summary – Bowen Hills Tunnel (XP2 and XP3)**

Location	Monitoring Period	Peak Particle Velocity (mm/s)	Vibration Goal (mm/s)	Comments
<b>23<sup>rd</sup> September (XP3- 1<sup>st</sup> Blast)</b>				
Skilmorlie House	30 seconds	4.95	25	Results are within CoG goals
Formule 1 worksite (Adjacent to 11 Bryden Street)	30 seconds	7.24	25	Results are within CoG goals
<b>23<sup>rd</sup> September (XP3- 2<sup>nd</sup> Blast)</b>				
Skilmorlie House	30 seconds	8.13	25	Results are within CoG goals
Formule 1 worksite (Adjacent to 11 Bryden Street)	30 seconds	11.3	25	Results are within CoG goals
<b>28<sup>th</sup> September (XP3)</b>				
Skilmorlie House	30 seconds	12.3	25	Results are within CoG goals
Formule 1 worksite (Adjacent to 11 Bryden Street)	30 seconds	6.10	25	Results are within CoG goals
<b>8<sup>th</sup> October (XP2)</b>				
14 Gallway Street	30 seconds	6.10	25	Results are within CoG goals
18 Gallway Street	30 seconds	9.91	25	Results are within CoG goals
<b>11<sup>th</sup> October (XP2)</b>				
14 Gallway Street	30 seconds	8.00	25	Results are within CoG goals
18 Gallway Street	30 seconds	12.2	25	Results are within CoG goals

**Table 5f: Vibration Monitoring Results Summary - Kedron**

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
Substation 8	15/09/2010-15/10/2010	1.10	2	Monitoring road header tunnelling and extraction of blasted rock. Results within Goals for heritage building

**Table 5g: Blast Monitoring Results Summary - Kedron Civils Blasting**

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal Day time (mm/s)	Over blast Pressure (dB)	CoG Goal over blast pressure (dB)	Comments
<b>25/09/2010</b>						
Kedron Park Hotel 681 Lutwyche Road	25/09/2010 20 Seconds	1.9	25	126.8	140	Results are within adopted goals
BCC Substation 134 Kedron Park Road	25/09/2010 20 Seconds	0.508	25	128.7	140	Results are within adopted goals
12 Park Terrace	25/09/2010 20 Seconds	6.48	25	128.9	140	Results are within adopted goals
<b>14/10/2010</b>						
12 Park Terrace	14/10/2010 20 seconds	9.27	25	112.8	140	Results are within adopted goals
15 Park Terrace	14/10/2010 20 seconds	8.25	25	109.8	140	Results are within adopted goals
64 Gympie Road	14/10/2010 20 seconds	2.16	25	115.8	140	Results are within adopted goals
46 Gympie Road	14/10/2010 20 seconds	2.03	25	120.9	140	Results are within adopted goals

**Table 5h: Blast Monitoring Results Summary - Kedron Tunnels Blasting**

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal Day time (mm/s)	Comments
<b>28/09/2010</b>				
34 Park Road (Kedron SHS)	28/09/2010 20 seconds	3.56	25	Results are within adopted goals
37 Park Road	28/09/2010 20 seconds	2.54	25	Results are within adopted goals

28 Eveliegh Street	28/09/2010 20 seconds	13.1	25	Results are within adopted goals
94 Kedron Park Road	28/09/2010 20 seconds	4.44	25	Results are within adopted goals
<b>29/09/2010</b>				
Kedron Park Hotel 681 Lutwyche Road	29/09/2010 20 seconds	3.05	25	Results are within adopted goals
BCC Substation 134 Kedron Park Road	29/09/2010 20 seconds	1.02	25	Results are within adopted goals
Anglican Church 671 Lutwyche Road	29/09/2010 20 seconds	0.51	25	Results are within adopted goals
Anglican Church Driveway 671 Lutwyche Road	29/09/2010 20 seconds	0.76	25	Results are within adopted goals
<b>6/10/2010</b>				
34 Park Road (Kedron SHS)	06/10/2010 20 seconds	2.79	25	Results are within adopted goals
37 Park Road	06/10/2010 20 seconds	2.67	25	Results are within adopted goals
28 Eveliegh Street	06/10/2010 20 seconds	10.4	25	Results are within adopted goals
94 Kedron Park Road	06/10/2010 20 seconds	3.17	25	Results are within adopted goals
<b>8/10/2010</b>				
Kedron Park Hotel 681 Lutwyche Road	08/10/2010 20 seconds	14.6	25	Results are within adopted goals
BCC Substation 134 Kedron Park Road	08/10/2010 20 seconds	2.29	25	Results are within adopted goals

Anglican Church 671 Lutwyche Road	08/10/2010 20 seconds	0.762	25	Results are within adopted goals
124 Kedron Park Road	08/10/2010 20 seconds	2.54	25	Results are within adopted goals
<b>15/10/2010</b>				
Kedron Park Hotel 681 Lutwyche Road	15/10/2010 20 seconds	7.75	25	Results are within adopted goals
BCC Substation 134 Kedron Park Road	15/10/2010 20 seconds	1.4	25	Results are within adopted goals
Anglican Church 671 Lutwyche Road	15/10/2010 20 seconds	0.51	25	Results are within adopted goals
124 Kedron Park Road	15/10/2010 20 seconds	0.51	25	Results are within adopted goals

**Table 5i: Vibration Monitoring Results Summary - Woolloowin**

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
71 Park Road, Woolloowin	10:26am 16/09/10 to 1:19pm 17/09/10	2.16	5	Results are within CoG goals. PPV occurred on 1:23pm 16/09/2010 for this monitoring period.
71 Park Road, Woolloowin	11:37am 22/09/10 to 3:37pm 30/09/10	2.29	5	Results are within CoG goals. PPV occurred on 11:07am 28/09/2010 for this monitoring period.
71 Park Road, Woolloowin	4:48pm 1/10/10 to 7:51pm 17/10/10	2.92	5	Results are within CoG goals. PPV occurred on 6:17am 17/10/2010 for this monitoring period.

**Table 5j: Vibration Monitoring Results Summary – Toombul**

Location	Monitoring Period	Peak Particle Velocity* (mm/s)	Adopted Goal (mm/s)	Comments
15 Lewis Street, Clayfield	15/09/2010 - 18/09/2010	0.10	5	Monitoring indicates that CoG goals are being met
	18/09/2010 - 20/09/2010	N/A	5	Monitoring battery failure
	20/09/2010 - 27/09/2010	0.15	5	Monitoring indicates that CoG goals are being met
	27/09/2010 - 05/10/2010	0.111	5	Monitoring indicates that CoG goals are being met
	06/10/2010 - 13/10/2010	0.11	5	Monitoring indicates that CoG goals are being met
31 Lewis Street, Clayfield	16/09/2010 - 21/09/2010	0.22	5	Monitoring indicates that CoG goals are being met
	21/09/2010 - 27/09/2010	0.44	5	Monitoring indicates that CoG goals are being met
	27/09/2010 - 5/10/2010	0.40	5	Monitoring indicates that CoG goals are being met.
34 Lewis Street, Clayfield	16/09/2010 - 21/09/2010	0.41	5	Monitoring indicates that CoG goals are being met
	21/09/2010 - 28/09/2010	0.40	5	Monitoring indicates that CoG goals are being met
U3/32 Wongara Street, Clayfield	30/09/2010 - 04/10/2010	1.97	5	Monitoring indicates that CoG goals are being met

### 5.3 Compliance with Vibration Goals

As a result of vibration monitoring across the project, there were no exceedances of the adopted goals during this monitoring period.

## 6.0 Community Enquiries and Complaints

A total of 239 community complaints were reported to the project between 16 September and 15 October 2010. Issues raised are outlined in the table 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.

Complaints Raised – 16 September to 15 October 2010		
Issues	No.	No. of stakeholders
Site noise out-of-hours	32	21
Parking	31	24
Construction vehicle movements	24	15
Truck noise	17	16
Worker Behaviour	15	12
Pedestrian/Cyclists	14	11
Driver Behaviour	14	12
Site dust	14	12
Site noise	14	12
General Construction	13	12
PUPs noise out-of-hours	12	12
Mitigation	12	9
Traffic Management	11	11
Site lighting	11	7
Road condition	8	7
Water/Flooding	8	8
Consultation	7	7
Blasting vibration	7	6
Site out-of-hours	6	6
Spoil haulage driver behaviour	5	5
Other	58	54
<b>Total complaints</b>	<b>239</b>	<b>154</b>

### 6.1 Top 10 Issues Raised:

