



Airport Link / Northern Busway Project

Monthly Environmental Monitoring Report

June 2010

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1.0 Report Purpose and Scope

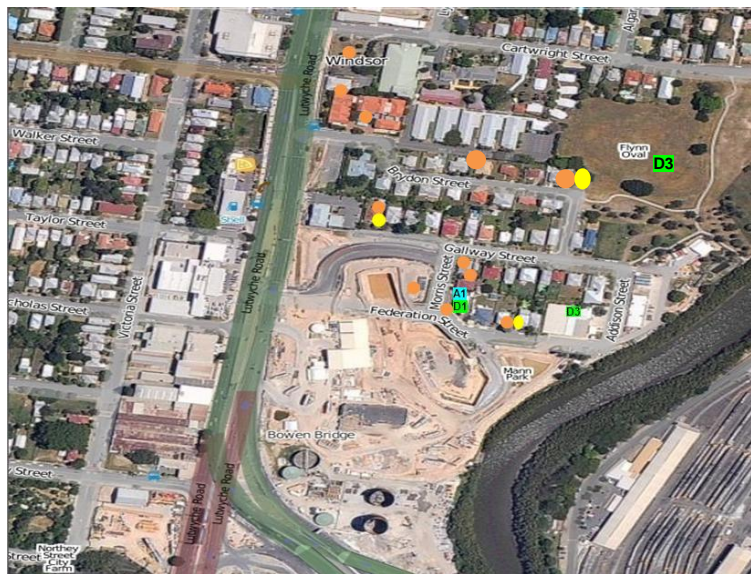
The report has been compiled to summarise the results of noise, air quality and vibration monitoring on the Airport Link and Northern Busway project. The report also compares those results with compliance thresholds for environmental harm, community nuisance and loss of amenity nominated by the Coordinator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

The monitoring data covered in this report is for the June 2010 reporting period, from 15th May 2010 to 15th June 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 June 2010, though do serve a useful purpose in relating the monitoring locations to existing structures and infrastructure.

Bowen Hills Monitoring Locations



Source: Near Map 2010

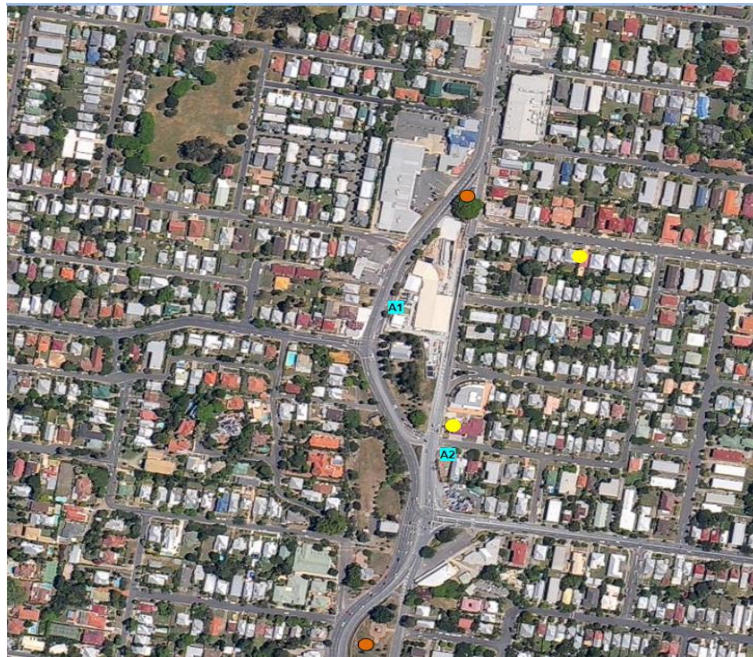
Figure 2.1 – Bowen Hills Monitoring Locations

Legend

- Noise (during construction)
- Vibration
- Air (PM₁₀)
- Air (Dust Deposition)

Note: QNP is not shown due to map extremities – physical location 41 Campbell St Bowen Hills
 Note: 252 Lutwyche Road is not shown due to map extremities
 Note: locations are indicative only

Truro Street Mid Tunnel Monitoring Locations



Source: Near Map 2010

Figure 2.2 – Truro Street Mid Tunnel Monitoring Locations

- Legend**
- Noise (during construction)
 - Vibration
 - Air (PM₁₀)
 - Air (Dust Deposition)

Note: locations are indicative only

Northern Busway Monitoring Locations



Source: Near Map 2010

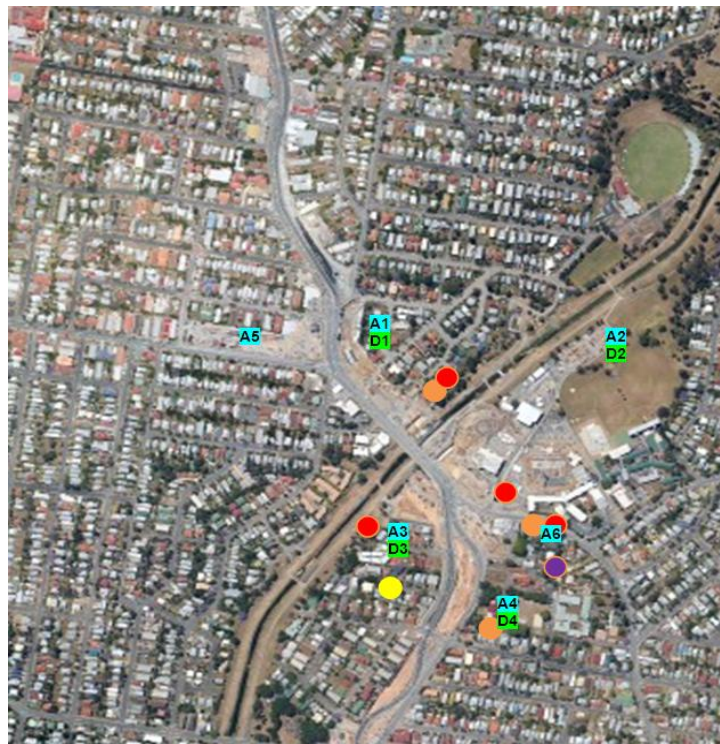
Figure 2.3 – Northern Busway Monitoring Locations

Legend

- Noise (during construction)
- Vibration
- Air (PM₁₀)
- Air (Dust Deposition)

Note: locations are indicative only
Note: Kedron Brook Reserve not shown due to map extremities

Kedron Monitoring Locations



Source: Near Map 2010

Figure 2.4 – Kedron Monitoring Locations
Legend

- | | |
|------------------------------------|---------------------------|
| ● Noise (during construction) | ● Air (PM ₁₀) |
| ● Vibration | ● Air (Dust Deposition) |
| ● Vibration and overblast pressure | ● TSP |

Note: locations are indicative only

Woolloowin Monitoring Locations



Source: Near Map 2010

Figure 2.5 – Woolloowin Monitoring Locations
Legend

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

Toombul Monitoring Locations

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. Bowen Hills
 - iii. Wooloowin
 - iv. Kalinga Park (410 launch box)
 - 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-g.

Table 3a: Noise Monitoring Results – Bowen Hills Civil

Location	Monitoring Period	Average L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	Average L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Average L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
14 Gallway Street, Bowen Hills								
Single Storey Brick House (Living Room)	26/05/2010 1:54-2:08pm	49.3	45	50.7	55	71.7	-	<p>Monitoring Type Attended. Internal. Windows and Doors open</p> <p>Noise Sources The dominant noise source throughout the period was hammering in the nearby TJH construction site at the Formule 1. General construction activities were also audible intermittently</p> <p>Discussion The levels that were recorded were as a result of rock hammering which was occurring in the adjacent construction site</p>
Single Storey Brick House (Living Room)	26/05/2010 2:11-2:25pm	46.8	45	48.2	55	54.3	-	<p>Monitoring Type Attended. Internal. Windows and Doors closed</p> <p>Noise Sources The dominant noise source throughout the period was hammering in the nearby TJH construction site at the Formule 1. General construction activities were also audible intermittently</p> <p>Discussion There was an exceedance recorded for L_{Aeq}. This was caused by rock hammer operations in the adjacent construction site. An NCR was raised for this exceedance</p> <p>Mitigation Reduced work hours have been employed for the area when hammering occurs to reduce impacts to the closest sensitive receptors. Individual mitigation has been applied at this property</p>
34 Federation Street, Bowen Hills								
2 Storey Timber House (Living Room)	08/06/2010 1:30-1:44pm	40.6	45	41.3	55	55.9	-	<p>Monitoring Type Attended. Internal. Windows and Doors closed</p> <p>Noise Sources TJH noise sources included a concrete pour, a squawker, a franna crane in the VSO, and an excavator operating in CC101. Traffic on Lutwyche Road was also noted intermittently. A reverse beeper from a QR Site across Enoggera Creek was audible throughout the period</p> <p>Discussion Monitoring was to assess the level impact that works in the adjacent TJH construction site was having on nearby sensitive receptors. Although the majority of noise was caused by TJH, the results were below CoG goals</p>

Location	Monitoring Period	Average L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	Average L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Average L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
2 Storey Timber House (Living Room)	08/06/2010 3:15-3:29pm	40.9	45	42.5	55	54.3	-	<p>Monitoring Type Attended. Internal. Windows and Doors closed</p> <p>Noise Sources TJH noise sources included rock hammering in CC101 and a franna crane in the VSO. Traffic on Lutwyche Road was also noted intermittently. A reverse beeper from a QR Site across Enoggera Creek was audible throughout the period</p> <p>Discussion Monitoring was to assess the level impact that works in the adjacent TJH construction site was having on nearby sensitive receptors. Although the majority of noise was caused by TJH, the results were below CoG goals</p>

Table 3b: Noise Monitoring Results – Bowen Tunnels

Location	Monitoring Period	Average L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	Average L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Average L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
252 Lutwyche Road, Windsor								
Two Storey Brick House (Main Bedroom)	25/05/2010 8:29-8:43pm	40.8	40	41.3	-	62.1	50	<p>Monitoring Type Attended. Internal. Windows and Doors closed</p> <p>Noise Sources The dominant noise source was the traffic on Lutwyche Road. TJH roadheader operating in the northbound tunnel was noted for a brief period during the session</p> <p>Discussion Monitoring was to assess the level of impact that works in the northbound tunnel heading were causing to nearby residents. Regenerative noise from the roadheader was noted for a brief period. The elevated levels are not as a result of the works being completed by TJH and can be directly attributed to the traffic moving along Lutwyche Road throughout the entire period. The L_{Amax} exceedance was caused the resident speaking during the monitoring session</p>

Location	Monitoring Period	Average L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	Average L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Average L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
Two Storey Brick House (Main Bedroom)	27/05/2010 8:45-8:59pm	43.1	40	44.2	-	56.6	50	<p>Monitoring Type Attended. Internal. Windows and Doors closed</p> <p>Noise Sources The dominant noise source was the traffic on Lutwyche Road. TJH works in the northbound tunnel, including rock hammering and the roadheader operating, were noted intermittently during the session</p> <p>Discussion Monitoring was to assess the level of impact that works in the northbound tunnel heading were causing to nearby residents. Regenerative noise from the roadheader and a rock hammer operating in the tunnel were noted during session. The elevated levels are not as a result of the works being completed by TJH and can be directly attributed to the traffic moving along Lutwyche Road throughout the entire period. The L_{Amax} exceedance was caused by a truck moving along Lutwyche Road past the monitoring location</p>

Table 3c: Noise Monitoring Results – Truro Street Roadheader Mid Tunnel

Location	Monitoring Period	Average L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	Average L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Average L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
148 Stoneleigh Street, Lutwyche								
Single Storey Timber House. (Main Bedroom)	10/06/2010 9:40-9:54pm	42.3	40	41.9	-	62.9	50	<p>Monitoring Type Attended. Internal. Windows and Doors closed</p> <p>Noise Sources The dominant noise source was the traffic on Truro Street. TJH works to relocate essential services on Truro Street were noted during the monitoring session</p> <p>Discussion Monitoring was to assess the level of impact that the Truro Street tunnelling site was having on nearby residents. Works on the tunnelling site were not audible. The service relocation work was audible for a brief period. The elevated levels are not as a result of the works being completed by TJH and can be directly attributed to the traffic moving along Truro Street throughout the entire period. The exceedance for L_{Amax} was as a result of a non TJH truck moving past Truro Street</p>

Location	Monitoring Period	Average L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	Average L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Average L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
Single Storey Timber House. (Main Bedroom)	10/06/2010 10:01-10:15pm	53.5	-	52.2	-	70.8	-	<p>Monitoring Type Attended. Internal. Windows and Doors open</p> <p>Noise Sources The dominant noise source was the traffic on Truro Street. TJH works to relocate essential services on Truro Street were noted during the monitoring session</p> <p>Discussion Monitoring was to assess the level of impact that the Truro Street tunnelling site was having on nearby residents. Works on the tunnelling site were not audible. The service relocation work was audible for a brief period. The elevated levels are not as a result of the works being completed by TJH and can be directly attributed to the traffic moving along Truro Street throughout the entire period</p>
Unit 4/ 25 Truro Street, Lutwyche								
2 nd Storey Brick Unit. (Bedroom)	15/06/2010 9:05-9:19pm	35.2	40	35.8	-	52.2	50	<p>Monitoring Type Attended. Internal. Windows and Doors closed</p> <p>Noise Sources The dominant noise source was the traffic on Truro Street. A loader operating on the adjacent tunnelling site inside the acoustic shed was audible intermittently</p> <p>Discussion Monitoring was to assess the level of impact that the Truro Street tunnelling site was having on nearby residents. Works on the tunnelling site were audible intermittently. The level received for L_{Amax} was as a result of a car driving along Truro Street. The L_{Aeq} result was within the CoG Goal</p>

Table 3d: Noise Monitoring Results – Northern Busway

Location	Monitoring Period	Average L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	Average L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Average L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
57 Lamington Avenue, Lutwyche								
2 Storey Timber House (Living Room)	11/06/2010 8:07-8:21 am	47.7	45	47.1	55	65.9	-	<p>Monitoring Type Attended. Internal. Windows and Doors closed</p> <p>Noise Sources The dominant noise source was traffic on Lutwyche Road. Other noise sources noted were internal noise (e.g. resident talking, moving items around the kitchen). TJH works were noted intermittently throughout the session</p> <p>Discussion Monitoring was to assess the level of impact that the Northern Busway Site at Lutwyche was having on nearby residents. TJH works noted during the period include an excavator bulking out material, a franna crane moving a skip bin, and a vibratory roller being moved across site. The elevated level for L_{Aeq} was a direct result of the internal noise within the property</p>

Table 3e: Noise Monitoring Results – Kedron

Location	Monitoring Period	Average L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	Average L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Comments
30 Windsor Avenue, Kedron						
Two Storey Timber Queenslander (Dining Room)	08/06/2010 4:31 – 4:46pm	47.9	45	48.9	55	<p>Monitoring Type Internal attended monitoring, doors and windows open</p> <p>Noise Source The TJH noise sources occurring throughout the session were from earth works and the tower crane in Kedron South and from piling in Kedron Central. External noise sources included local and Lutwyche Road traffic and local fauna.</p> <p>Discussion This monitoring indicates that whilst windows/doors are open L_{Aeq} CoG conditions are not being met. This was a windows/doors open session which does not represent the full attenuation the exterior of a house provides. The noise monitored during this session was a combination of TJH and non-TJH sources and no single source could be attributed to the level.</p> <p>Mitigation Measures Monitoring will continue to occur in this area to ascertain the extent of any TJH construction noise. No mitigation measures are proposed at this time.</p>

Location	Monitoring Period	Average L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	Average L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Comments
Two Storey Timber Queenslander (Dining Room)	08/06/2010 4:49 – 5:03pm	37.9	45	38.6	55	<p>Monitoring Type Internal attended monitoring, doors and windows closed</p> <p>Noise Source The TJH noise sources occurring throughout the session were from earth works and the tower crane in Kedron South and from piling in Kedron Central. External noise sources included local and Lutwyche Road traffic and passing aeroplanes.</p> <p>Discussion This monitoring indicates that whilst internal windows/doors are closed CoG conditions are being met.</p> <p>Mitigation Measures Monitoring will continue to occur in this area to ascertain the extent of any TJH construction noise. No mitigation measures are proposed at this time.</p>
Two Storey Timber Queenslander (Dining Room)	10/06/2010 10:27 – 10:42am	46.7	45	48.3	55	<p>Monitoring Type Internal attended monitoring, doors and windows open</p> <p>Noise Source The TJH noise sources occurring throughout the session were from earth works and the tower crane in Kedron South and from piling and rock breaking in Kedron Central. External noise sources included local and Lutwyche Road traffic, local fauna (dogs barking, birds) and leaves rustling.</p> <p>Discussion This monitoring indicates that whilst internal windows/doors are open LAeq CoG conditions are not being met. This was a windows/doors open session which does not represent the full attenuation the exterior of a house provides. The noise monitored during this session was a combination of TJH and non-TJH sources and no single source could be attributed to the level.</p> <p>Mitigation Measures Monitoring will continue to occur in this area to ascertain the extent of any TJH construction noise. No mitigation measures are proposed at this time.</p>

Location	Monitoring Period	Average L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	Average L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Comments
Two Storey Timber Queenslander (Dining Room)	10/06/2010 10:46– 11:01am	36.9	45	37.6	55	<p>Monitoring Type Internal attended monitoring, doors and windows closed</p> <p>Noise Source The TJH noise sources occurring throughout the session were from earth works and the tower crane in Kedron South and from piling in Kedron Central. External noise sources included local and Lutwyche Road traffic and passing aeroplanes.</p> <p>Discussion This monitoring indicates that whilst internal windows/doors are closed all noise CoG conditions are being met.</p> <p>Mitigation Measures Monitoring will continue to occur in this area to ascertain the extent of any TJH construction noise. No mitigation measures are proposed at this time.</p>

Table 3f – Noise Monitoring								
Monitoring Period	Average L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	Average L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Average L _{AMAX} (15 min) (dBA)	CoG Goal L _{AMAX} (15 min) (dBA)	Comments	
Unit 1/71 Park Road, Woolloowin								
Brick Unit Block (Dining Room)	28/05/2010 5:00 - 5:14pm	40.6	45	41.4	55	N/A	N/A	<p>Monitoring Type Attended Noise Monitoring. Doors and Windows Closed</p> <p>Noise Sources Roadheader, diesel engines (a low hum with occasional banging), traffic, birds, plane.</p> <p>Discussion Monitoring indicates that CoG goals are being met</p> <p>Mitigation Measures An acoustic shed and noise wall is in place around Rose Street Site. This location is owned by DMR and is used by TJH for monitoring purposes.</p>

Table 3f – Noise Monitoring	Monitoring Period	Average L_{Aeq} (15 min) (dBA)	CoG Goal L_{Aeq} (15 min) (dBA)	Average L_{A10} (15 min) (dBA)	CoG Goal L_{A10} (15 min) (dBA)	Average L_{AMAX} (15 min) (dBA)	CoG Goal L_{AMAX} (15 min) (dBA)	Comments
Brick Unit Block (Dining Room)	28/05/2010 5:17 - 5:37pm	42.1	45	42.8	55	N/A	N/A	Monitoring Type Attended Noise Monitoring. Doors and Windows Closed Noise Sources Roadheader in operation, diesel engines. Traffic, plane, voices and crickets. Discussion Monitoring indicates that CoG goals are being met Mitigation Measures An acoustic shed and noise wall is in place around Rose Street Site. This location is owned by DMR and is used by TJH for monitoring purposes.
Brick Unit Block (Dining Room)	4/06/2010 1:10 -1:38pm	39.9	45	40.6	55	-	-	Monitoring Type Attended Noise Monitoring. Doors and Windows Closed Noise Sources Diesel engine noise, banging from site, traffic, plane, birds, wind and siren. Discussion Monitoring indicates that CoG goals are being met Mitigation Measures An acoustic shed and noise wall is in place around Rose Street Site. This location is owned by DMR and is used by TJH for monitoring purposes.
Brick Unit Block (Dining Room)	5/06/2010 9:43 -10:00am	40.3	45	41.2	55	-	-	Monitoring Type Attended Noise Monitoring. Doors and Windows Closed Noise Sources Construction (Banging, diesel engines, scraping of the excavator bucket). Non-TJH sources: Traffic, birds, horn, plane, door, barking. Discussion Monitoring indicates that CoG goals are being met Mitigation Measures An acoustic shed and noise wall is in place around Rose Street Site. This location is owned by DMR and is used by TJH for monitoring purposes.

Table 3f – Noise Monitoring	Monitoring Period	Average L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	Average L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Average L _{AMAX} (15 min) (dBA)	CoG Goal L _{AMAX} (15 min) (dBA)	Comments
Brick Unit Block (Dining Room)	5/06/2010 10:03 - 10:17am	40.0	45	41.1	55	-	-	Monitoring Type Attended Noise Monitoring. Doors and Windows Closed Noise Sources Construction (Banging, diesel engines, roadheader, scraping of the excavator bucket), Non-TJH sources: Traffic, birds, horn, Plane, Barking. Discussion Monitoring indicates that CoG goals are being met Mitigation Measures An acoustic shed and noise wall is in place around Rose Street Site. This location is owned by DMR and is used by TJH for monitoring purposes.
Brick Unit Block (Dining Room)	9/06/2010 4:02 -4:19pm	37.2	45	37.8	55	-	-	Monitoring Type Attended Noise Monitoring. Doors and Windows Closed Noise Sources Construction (Low hum, diesel engines, banging, crane lift). Non-TJH sources: Traffic, birds, plane, barking, and someone outside. Discussion Monitoring indicates that CoG goals are being met Mitigation Measures An acoustic shed and noise wall is in place around Rose Street Site. This location is owned by DMR and is used by TJH for monitoring purposes.
Brick Unit Block (Dining Room)	15/06/2010 8:12 -8:26pm	34.9	45	-	-	44.8	50	Monitoring Type Attended Noise Monitoring. Doors and Windows Closed Noise Sources Construction (Banging, diesel engines, roadheader, and rockbolting), Non-TJH sources: Traffic, plane and train horn. Discussion Monitoring indicates that CoG goals are being met. Mitigation Measures An acoustic shed and noise wall is in place around Rose Street Site. This location is owned by DMR and is used by TJH for monitoring purposes.

Table 3g: Noise Monitoring Results – Toombul

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Comments
83 Stuckey Road, Clayfield						
Two Storey Queenslander (Living Room)	9/06/2010 9:35 – 9:49am	46.9	45	46.1	55	<p>Monitoring Type Internal attended monitoring, windows and doors closed, air-conditioning on</p> <p>Noise Sources General construction (jet blasting, jackhammer, TJH machinery) plus non-TJH sources (resident, traffic, birds).</p> <p>Discussion Monitoring indicates that CoG goals are being exceeded. However, the readings were significantly influenced by noise from resident. Due to these internal influences the majority of the TJH noise sources could not be isolated.</p> <p>Mitigation Measures Include a 6m noise wall and double stack containers. Individual property mitigation is in place.</p>
Two Storey Queenslander (Living Room)	9/06/2010 9:50 – 10:05am	41.1	45	39.1	55	<p>Monitoring Type Internal attended monitoring, windows and doors closed, air-conditioning on</p> <p>Noise Sources General construction (jet blasting, jackhammer, TJH machinery) plus non-TJH sources (resident, traffic, birds).</p> <p>Discussion Monitoring indicates that CoG goals are being met.</p> <p>Mitigation Measures Include a 6m noise wall and double stack containers. Individual property mitigation is in place.</p>
Two Storey Queenslander (Living Room)	9/06/2010 1:33 – 1:48pm	41.5	45	41.7	55	<p>Monitoring Type Internal attended monitoring, windows and doors closed, air-conditioning on</p> <p>Noise Sources General construction (jet blasting, TJH machinery, jackhammer, drilling) plus non-TJH sources (resident, train, birds).</p> <p>Discussion Monitoring indicates that CoG goals are being met.</p> <p>Mitigation Measures Include a 6m noise wall and double stack containers. Individual property mitigation is in place.</p>

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Comments
Two Storey Queenslander (Living Room)	9/06/2010 1:48 – 2:03pm	42.5	45	41.9	55	<p>Monitoring Type Internal attended monitoring, windows and doors closed, air-conditioning on</p> <p>Noise Sources General construction (jet blasting, TJH machinery, jackhammer, drilling) plus non-TJH sources (resident, train, birds).</p> <p>Discussion Monitoring indicates that CoG goals are being met.</p> <p>Mitigation Measures Include a 6m noise wall and double stack containers. Individual property mitigation is in place.</p>
78 Elliott Street, Clayfield						
Two Storey Timber House (Living Room)	10/06/2010 1:14 – 1:29pm	39.4	45	40.5	55	<p>Monitoring Type Internal attended monitoring, windows and doors closed.</p> <p>Noise Sources General TJH construction and non-TJH sources (resident, people, train, birds, dogs, traffic).</p> <p>Discussion Monitoring indicates that CoG goals are being met.</p> <p>Mitigation Measures Include a 6m noise wall and double stack containers.</p>
Two Storey Timber House (Living Room)	10/06/2010 1:29 – 1:44pm	41.2	45	41.0	55	<p>Monitoring Type Internal attended monitoring, windows and doors closed.</p> <p>Noise Sources General TJH construction and non-TJH sources (resident, people, train, birds, dogs, traffic).</p> <p>Discussion Monitoring indicates that CoG goals are being met.</p> <p>Mitigation Measures Include a 6m noise wall and double stack containers.</p>
89 Jackson Street, Clayfield						
Two Storey Timber House (Front Bedroom)	3/06/2010 9:38 – 9:52am	37.3	45	34.7	55	<p>Monitoring Type Internal attended monitoring, windows and doors closed</p> <p>Noise Sources General construction (Drilling, banging, engine, steel dropping, horn, air horn, gantry crane) plus non-TJH sources (resident, birds, train, plane, traffic, plane)</p> <p>Discussion Monitoring indicates that CoG goals are being met.</p> <p>Mitigation Measures Include a 6m noise wall and double stack containers and blinds.</p>

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Comments
Two Storey Timber House (Front Bedroom)	3/06/2010 1:43 – 1:58pm	38.4	45	37.3	55	<p>Monitoring Type Internal attended monitoring, windows and doors open</p> <p>Noise Sources General construction (Jack hammering, banging, grinding, steel dropping) plus non-TJH sources (resident, birds, train, plane, traffic, construction site (hammering and steel bang))</p> <p>Discussion Monitoring indicates that CoG goals are being met.</p> <p>Mitigation Measures Include a 6m noise wall and double stack containers and blinds.</p>
Two Storey Timber House (Front Bedroom)	3/06/2010 2:01 – 2:16pm	33.7	45	33.5	55	<p>Monitoring Type Internal attended monitoring, windows and doors closed</p> <p>Noise Sources General construction (Jack hammering, banging, grinding, steel dropping) plus non-TJH sources (resident, birds, train, plane, traffic, construction site (hammering and steel bang))</p> <p>Discussion Monitoring indicates that CoG goals are being met.</p> <p>Mitigation Measures Include a 6m noise wall and double stack containers and blinds.</p>
82 Alma Street, Clayfield						
Two Storey Timber House (Living Room)	25/05/2010 2:08 – 2:22pm	51.8	45	51.6	55	<p>Monitoring Type Internal attended monitoring, windows and doors open</p> <p>Noise Sources General construction (Jack hammering, truck horn, air horn, engines, shed hammering) plus non-TJH sources (Inside noise, train, sirens, birds, dog barking)</p> <p>Discussion Monitoring indicates that CoG goals are being exceeded. With all external noise sources excluded the LAeq goals are still exceeded (54.2 dB). However, the readings were heavily influenced by noise from residents and a majority of the TJH noise sources could not be isolated. A CoG notification was launched and further investigation is being undertaken.</p> <p>Mitigation Measures Include a 6m noise wall and double stack containers. Community consultation has been undertaken for individual property mitigation.</p>

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Comments
Two Storey Timber House (Living Room)	25/05/2010 2:26 – 2:40pm	47.7	45	45.3	55	<p>Monitoring Type Internal attended monitoring, windows and doors closed</p> <p>Noise Sources General construction (Engines, horn, jack hammering, air horn) plus non-TJH sources (train, inside noise, cat meowing)</p> <p>Discussion Monitoring indicates that CoG goals are being exceeded. With all external noise sources excluded the LAeq goals were met (41.8 dB).</p> <p>Mitigation Measures Include a 6m noise wall and double stack containers. Community consultation has been undertaken for individual property mitigation.</p>
Two Storey Timber House (Living Room)	10/06/2010 7:31 – 7:45am	43.62	45	43.47	55	<p>Monitoring Type Internal attended monitoring, windows and doors closed</p> <p>Noise Sources General construction (Jack hammer, machinery hum, TJH construction) plus non-TJH sources (Resident preparing to leave for work, Train)</p> <p>Discussion Monitoring indicates that CoG goals are being met</p> <p>Mitigation Measures Include a 6m noise wall and double stack containers. Community consultation has been undertaken for individual property mitigation.</p>
Two Storey Timber House (Living Room)	10/06/2010 7:51 – 8:07am	49.4	45	50.2	55	<p>Monitoring Type Internal attended monitoring, windows and doors open</p> <p>Noise Sources General construction (jack hammer, pressure blaster/ angle grinder, TJH machinery, metal/ metal, materials being moved onsite, excavator loading out) plus non-TJH sources (dog, resident, horn)</p> <p>Discussion Monitoring indicates that CoG goals for LAeq are being exceeded. The predominant noise source was from TJH works, a CoG NCR notification has been completed and investigation is underway.</p> <p>Mitigation Measures Include a 6m noise wall and double stack containers. Community consultation has been undertaken for individual property mitigation.</p>
3/25 Walkers Way, Nundah						

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Comments
Unit Block First Floor (Living Room)	17/05/2010 9:03 – 9:17am	49.0	45	48.4	55	<p>Monitoring Type Internal attended monitoring, windows and doors open</p> <p>Noise Sources General construction (jack hammering, hydraulics) plus non-TJH sources (Air train, Widdop Street traffic, plane)</p> <p>Discussion Monitoring was to assess the level of impact that the EWA widening works was having on nearby residents. Works on the EWA were audible intermittently. The dominant noise source was the traffic from Widdop Street and the East West Arterial. Further monitoring will be undertaken at a later date and on request from the resident</p> <p>Mitigation Measures This property has no mitigation measures in place.</p>
Unit Block First Floor (Living Room)	17/05/2010 9:21 – 9:35am	40.2	45	40.5	55	<p>Monitoring Type Internal attended monitoring, windows and doors closed</p> <p>Noise Sources General construction (jack hammering, banging, air horn, misc. TJH noise, engine) plus non-TJH sources (birds, traffic, inside noise)</p> <p>Discussion Monitoring indicates that CoG goals are being met.</p>
Unit Block First Floor (Living Room)	17/05/2010 4:31 – 4:45pm	47.9	45	48.4	55	<p>Monitoring Type Internal attended monitoring, windows and doors open</p> <p>Noise Sources General construction (excavator, banging, squawker) plus non-TJH sources (air train, birds, traffic,)</p> <p>Discussion Monitoring was to assess the level of impact that the EWA widening works was having on nearby residents. Works on the EWA were audible intermittently. The dominant noise source was the traffic from Widdop Street and the East West Arterial. Further monitoring will be undertaken at a later date and on request from the resident</p> <p>Mitigation Measures This property has no mitigation measures in place.</p>

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Comments
Unit Block First Floor (Living Room)	17/05/2010 4:49 - 5:03pm	38.9	45	39.1	55	Monitoring Type Internal attended monitoring, windows and doors closed Noise Sources General construction (horn, squawker, grinder) plus non-TJH sources (traffic, plane, air train, inside noise) Discussion Monitoring indicates that CoG goals are being met. Mitigation Measures This property has no mitigation measures in place.
57 The Promenade, Millbrook Estate, Hendra						
Living Room, First Floor	04/06/2010 2:32 - 2:46 pm	42.4	45	39.2	55	Monitoring Type Internal attended monitoring, windows and doors closed Noise Sources General construction (none detected) plus non-TJH sources (internal noise, traffic, plane, talking outside, air train, house creaking, wind) Discussion Monitoring indicates that CoG goals are being met. Mitigation Measures This property has no mitigation measures in place.
Living Room, First Floor	04/06/2010 2:50 - 3:04pm	46.1	45	45.7	55	Monitoring Type Internal attended monitoring, windows and doors open Noise Sources General construction (jack hammering, horn, air brakes) plus non-TJH sources (internal noise, birds, traffic, wind chime, wind) Discussion Monitoring indicates that CoG goals are being exceeded. No TJH works were being undertaken adjacent to the property at the time of the monitoring. Exceedances were due to external noise sources. Further monitoring will be undertaken at a later date and on request from the resident. Mitigation Measures This property has no mitigation measures in place.
179 York Street, Nundah						

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{A10} (15 min) (dBA)	CoG Goal L _{A10} (15 min) (dBA)	Comments
Single storey brick house (Living Room)	25/05/2010 10:14 – 10:28am	53.8	45	54.9	55	<p>Monitoring Type Internal attended monitoring, windows and doors open</p> <p>Noise Sources General construction (none) plus non-TJH sources (Nudgee Road traffic, birds, talking outside)</p> <p>Discussion Monitoring indicates that CoG goals are being exceeded. Exceedances were due to external noise sources and no TJH noise sources were detected during the monitoring session.</p> <p>Mitigation Measures This property has no mitigation measures in place.</p>
Single storey brick house (Living Room)	25/05/2010 10:32 – 10:46am	41.0	45	41.2	55	<p>Monitoring Type Internal attended monitoring, windows and doors closed.</p> <p>Noise Sources General construction (none) plus non-TJH sources (Nudgee Road traffic, plane, birds, inside noise)</p> <p>Discussion Monitoring indicates that CoG goals are being met.</p> <p>Mitigation Measures This property has no mitigation measures in place.</p>

3.3 Compliance with Noise Goals

Exceedances 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:

- Bowen Hills
 - 14 Gallway Street, Windsor
- Toombul
 - 82 Alma Road, Clayfield

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/NO₂ 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

5 Morris Street, Bowen Hills PM10 Results

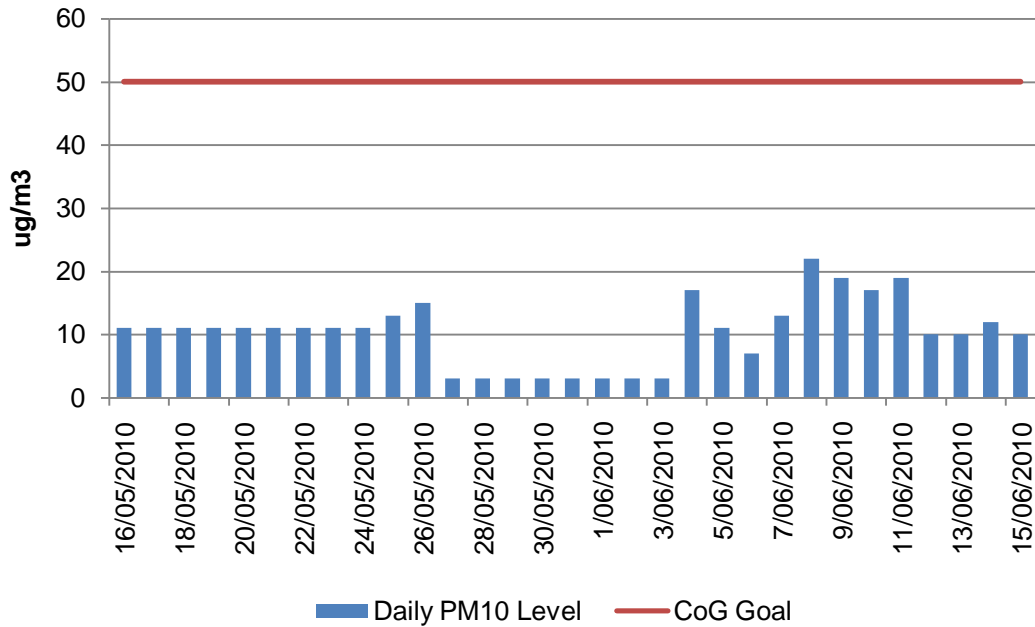


Figure 4.2.1 5 Morris Street, Bowen Hills PM10 Results (for monitor location see figure 2.1 – A1)

Truro Street (Site Office), Lutwyche PM10 Results

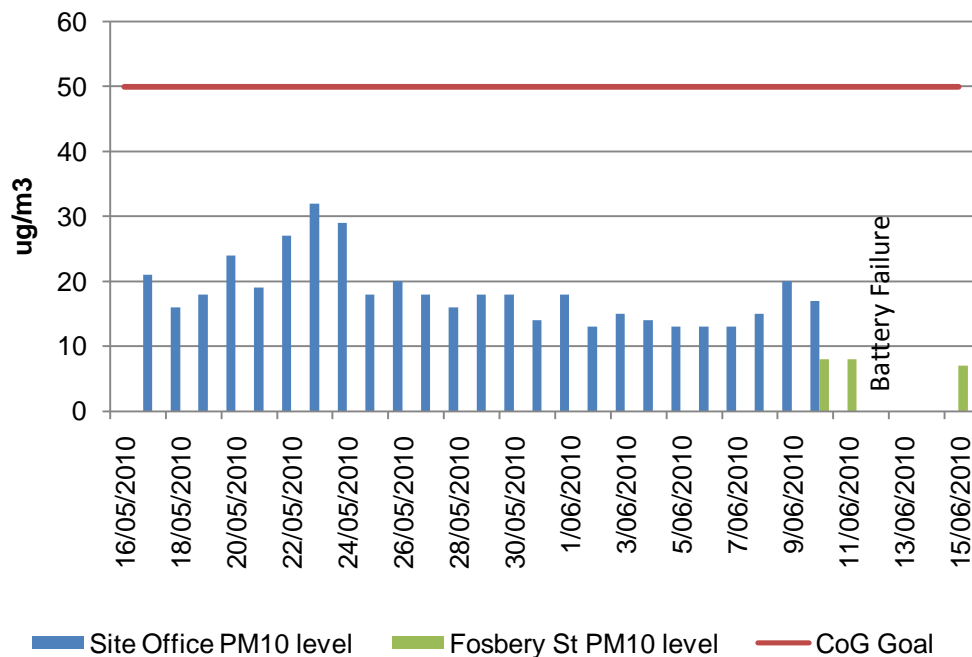


Figure 4.2.2 Truro St Site Office, Lutwyche PM10 Results (for Site Office monitor location see figure 2.2 – A1 and for Fosbery St Monitor location see figure 2.2 – A2)

Northern Busway (Site Office), Lutwyche PM10 Result

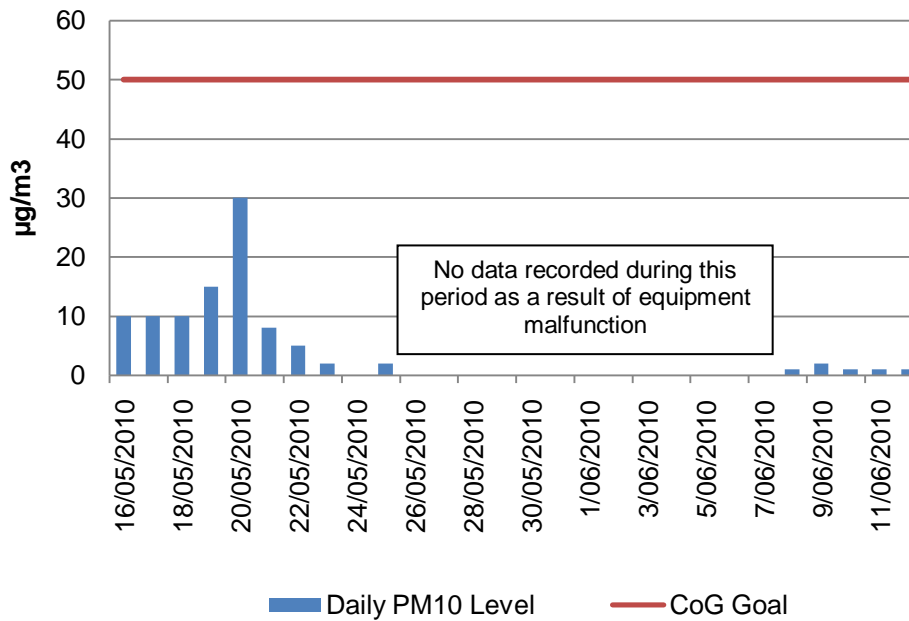


Figure 4.2.3 Northern Busway Site Office, Lutwyche PM10 Results (for monitor location see figure 2.3 – A1)

Woolloowin State School, Woolloowin PM10 Results

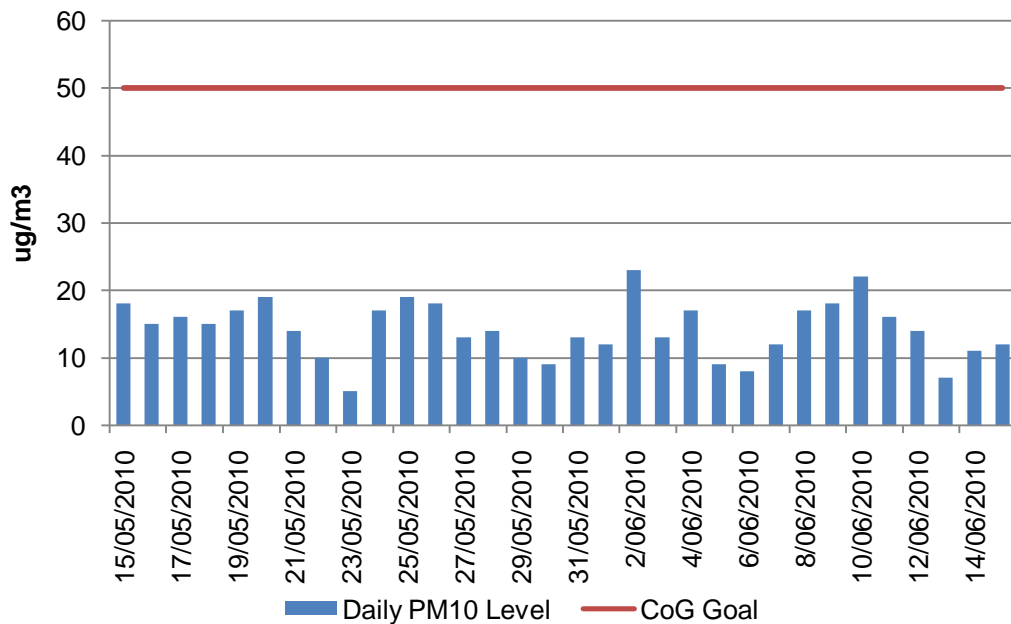
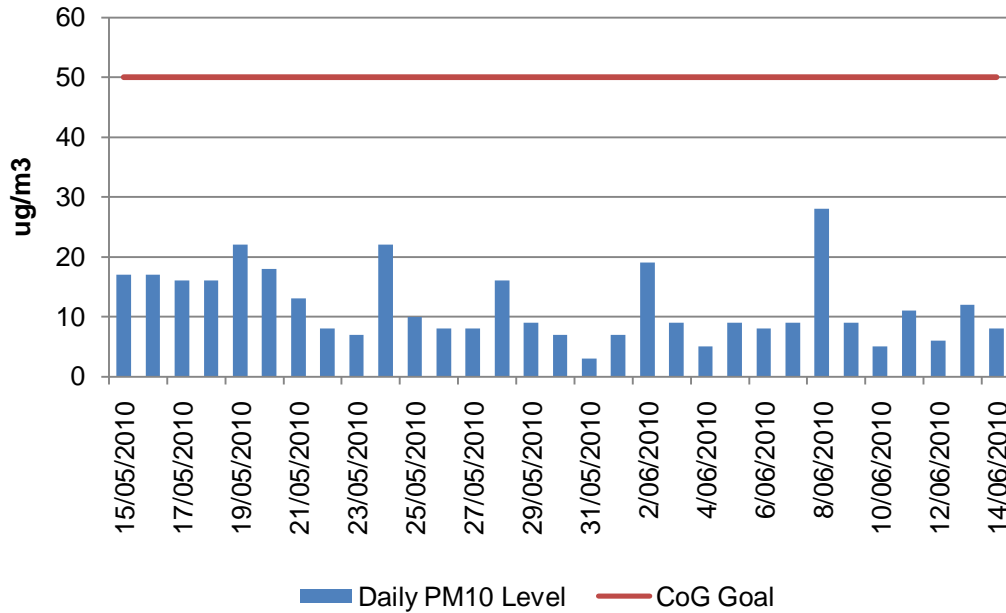


Figure 4.2.4 Woolloowin State School, Lutwyche PM10 Results (for monitor location see figure 2.4 – A4)

Perry Street, Lutwyche PM10 Results



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

Kedron State High School, Kedron PM10 Results

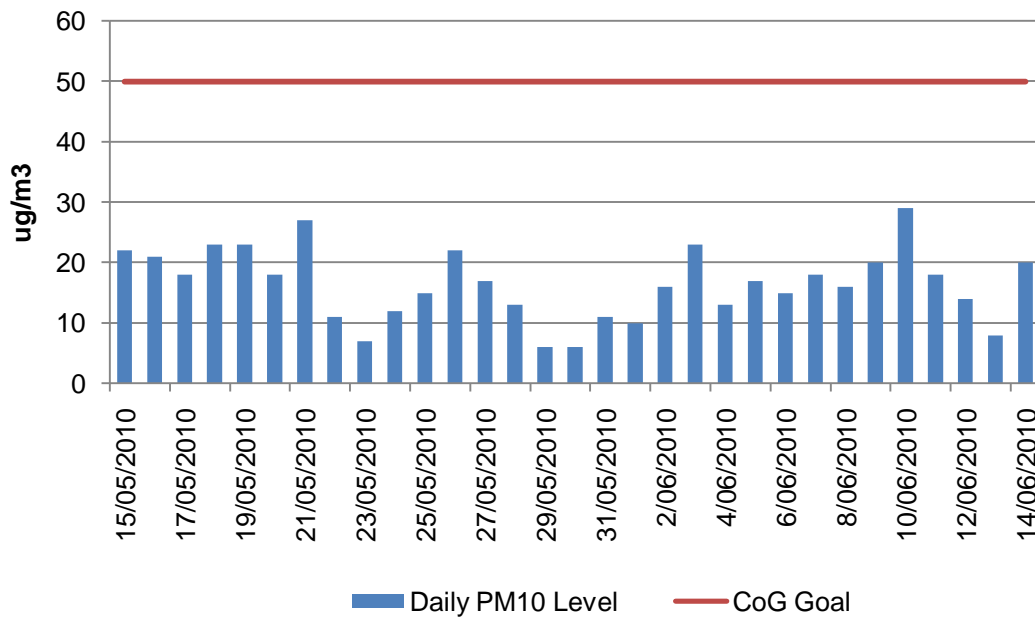


Figure 4.2.6 Kedron State High School (Adj), Kedron PM10 Results (for monitor location see figure 2.4 – A2)

Erskine Avenue, Kedron PM10 Results

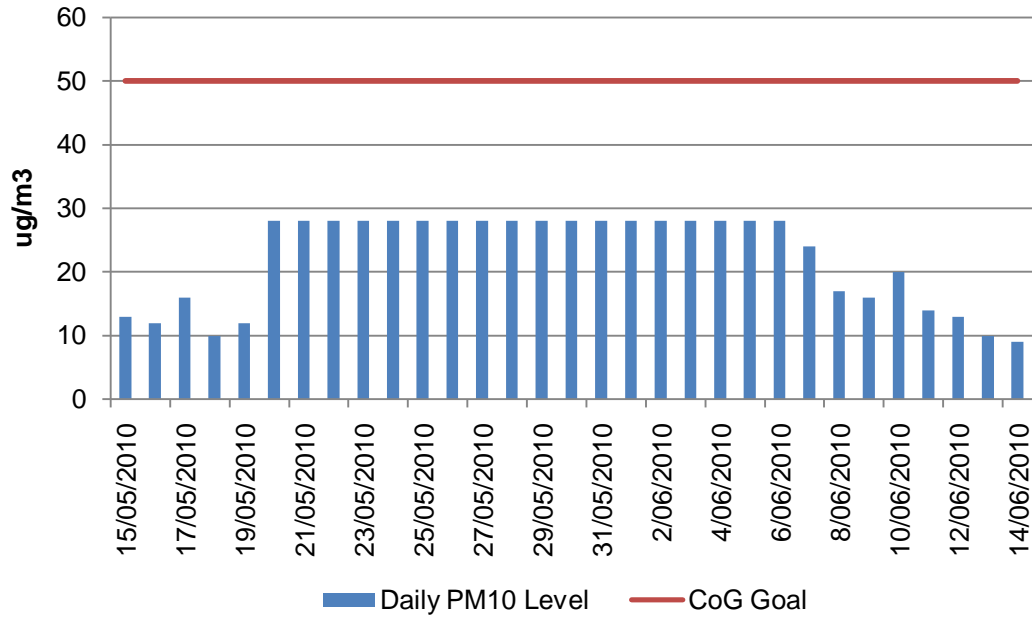


Figure 4.2.7 Erskine Avenue, Kedron PM10 Results (for monitor location see figure 2.4 – A1)

35 Brookfield Road, Kedron, PM10 Results

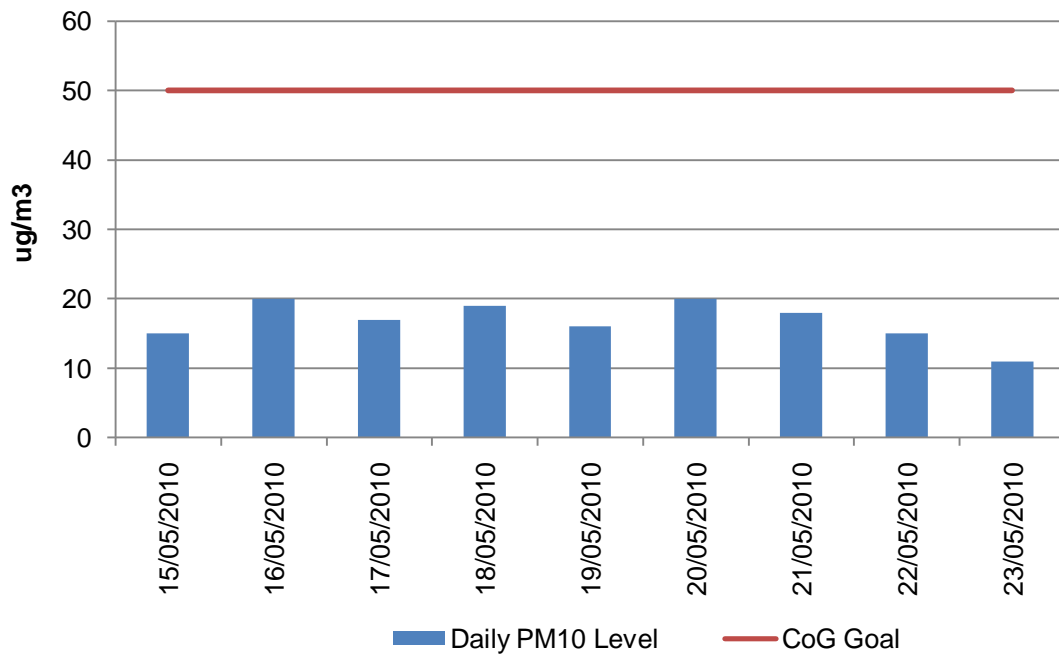


Figure 4.2.8 35 Brookfield Road, Kedron, PM10 Results (for monitor location see figure 2.4 – A5).

128 Kedron Park Rd, Wooloowin, TSP Results

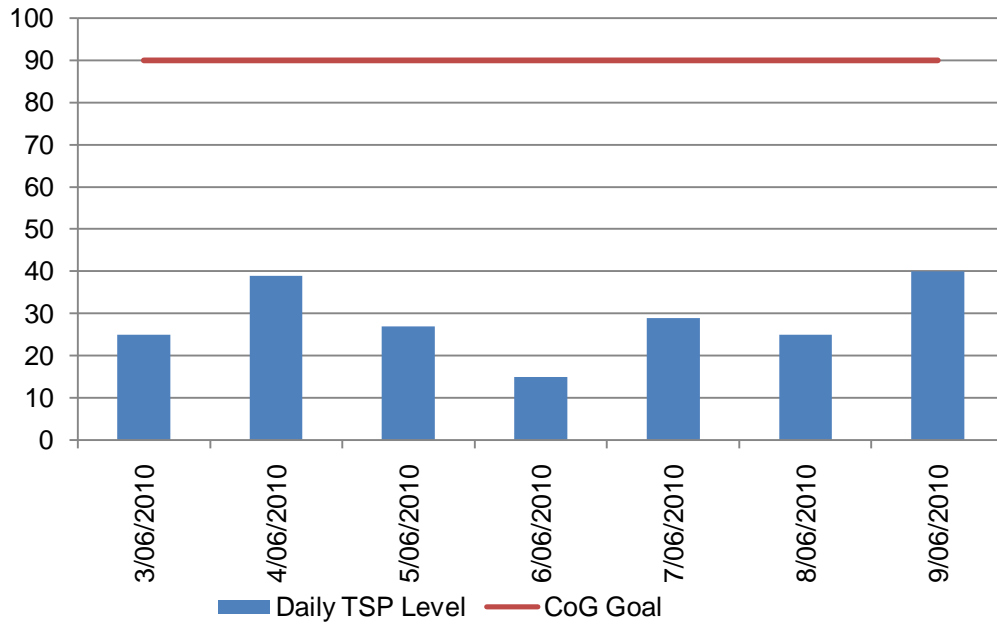


Figure 4.2.9 128A Kedron Park Road, Kedron, TSP Results (for monitor location see figure 2.4 – A6).

73 Park Road Wooloowin - Daily PM10 Level

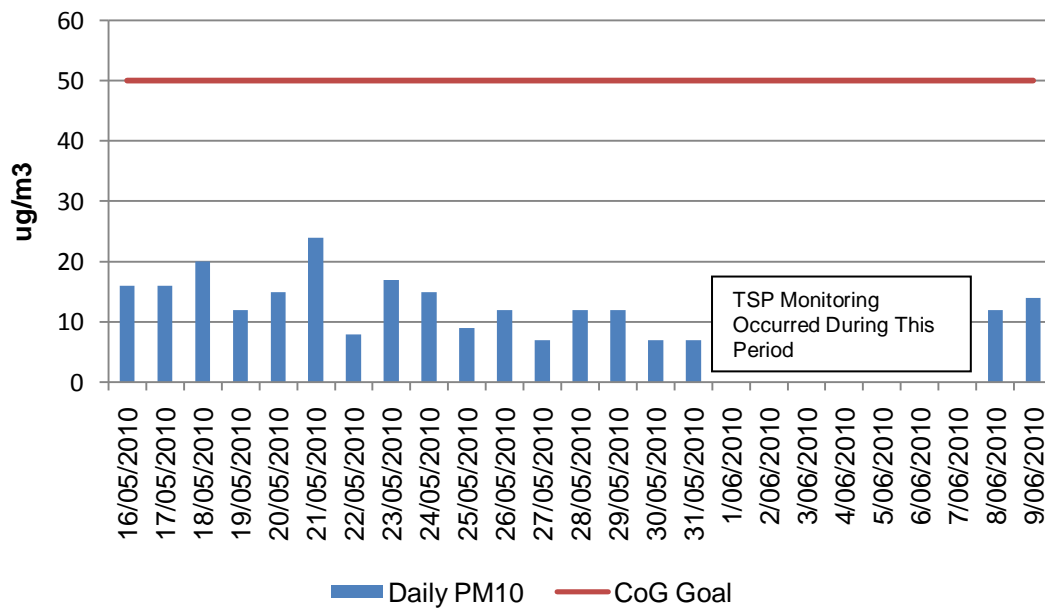


Figure 4.2.10 73 Park Road Wooloowin – Daily PM10 Level (for monitor location see figure 2.5 – A1)

56 Kalinga Street, Clayfield PM10 Results

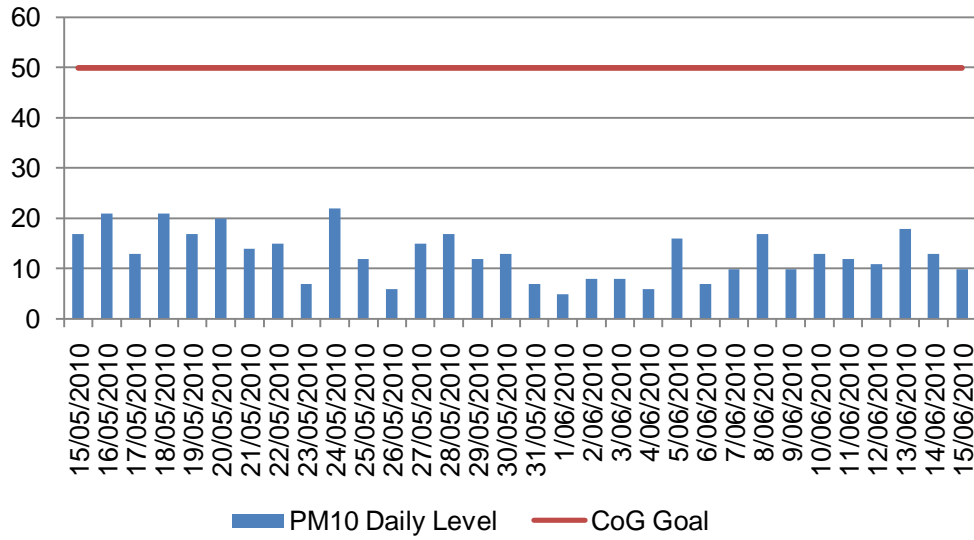


Figure 4.2.11 56 Kalinga Street, Clayfield PM10 Results (for monitor location see figure 2.6 – A1)

5 Mabel Street, Clayfield PM10 Results

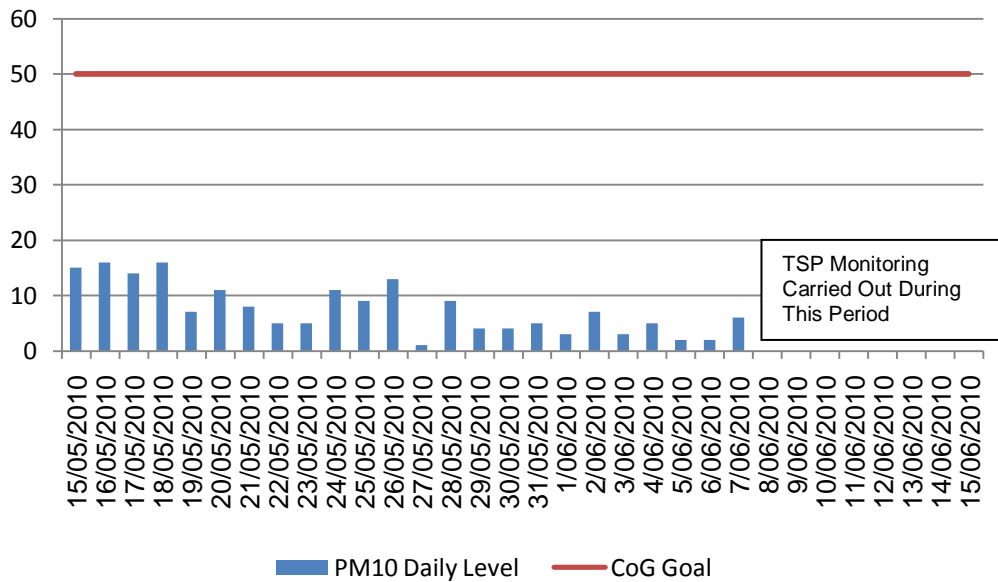


Figure 4.2.12 5 Mabel Street, Clayfield (for monitor location see figure 2.6- A2)

179 York Street, Nundah PM10 Results

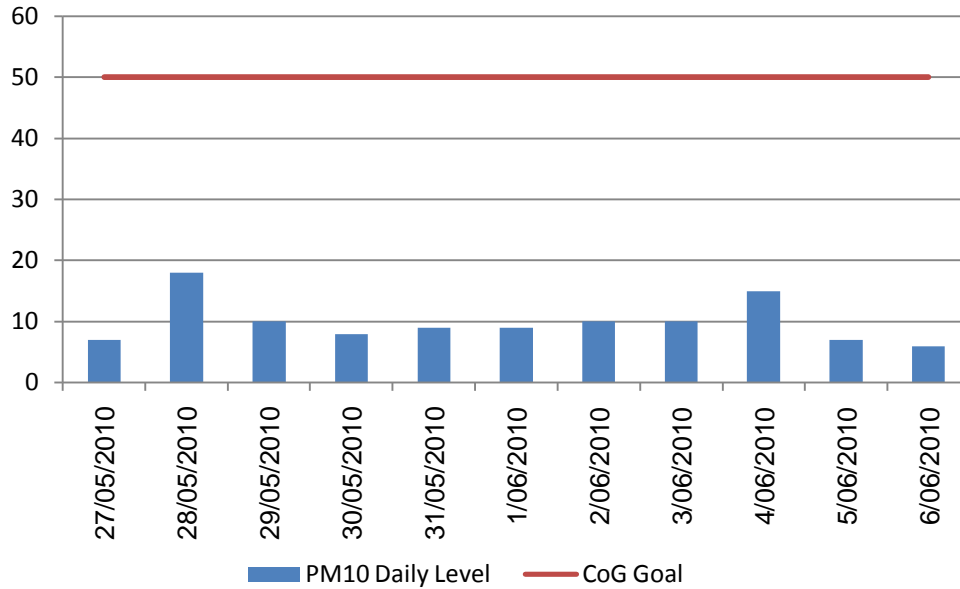


Figure 4.2.13 Corner of York Street & Nudgee Road, Toombul PM10 Results (for monitor location see figure 2.6- A3)

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.

5 Morris Street, Bowen Hills Dust Fallout January 2010 - June 2010

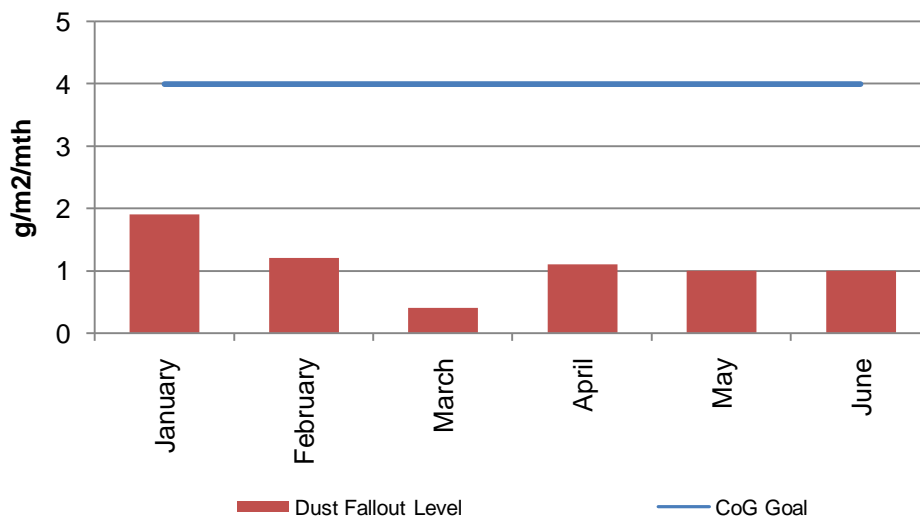


figure 4.3.1: 5 Morris St, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1 – D1)

QLD Newspapers, Bowen Hills Dust Fallout January 2010 - June 2010

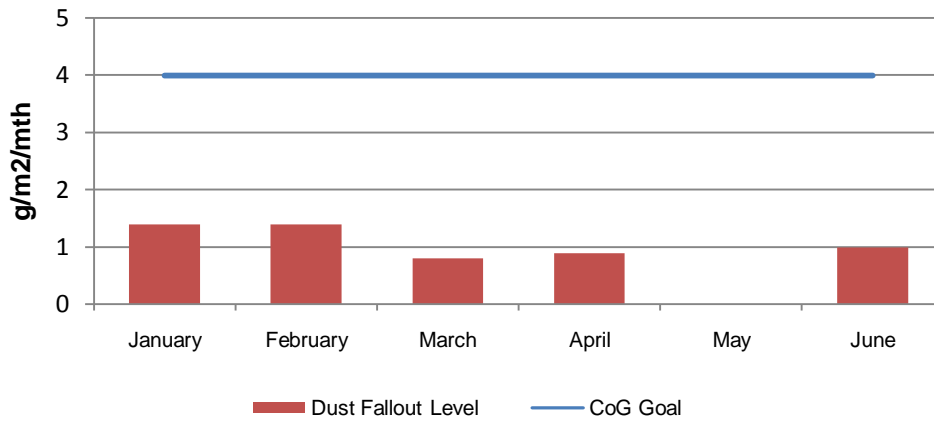


Figure 4.3.2: Queensland Newspapers, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1- D2)

Site Office, Bowen Hills Dust Fallout January 2009 - June 2010

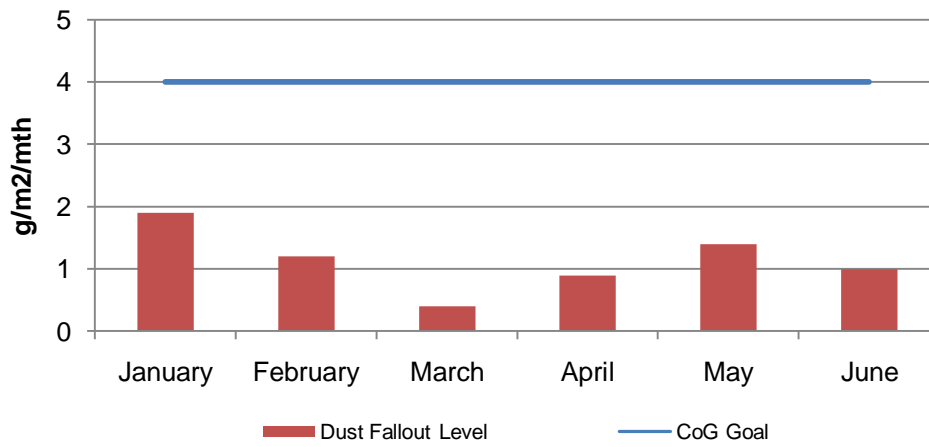


Figure 4.3.3: Site Office, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1- D3)

Kedron Brook Reserve, Northern Busway Dust Fallout January - June 2010

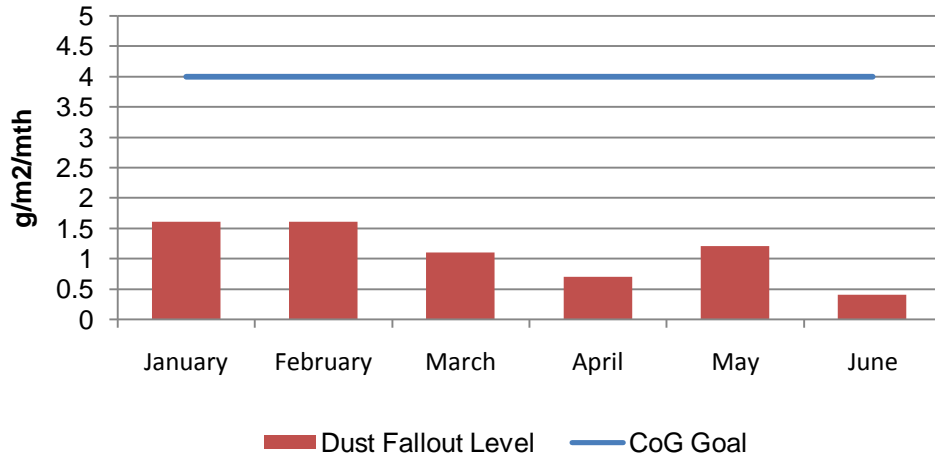


Figure 4.3.4: Kedron Brook Reserve, Northern Busway Dust Fallout Results (location refer to figure 2.3 – D1)

Cnr of Thistle & Lucas Street, Lutwyche Dust Fallout Jan - June 2010

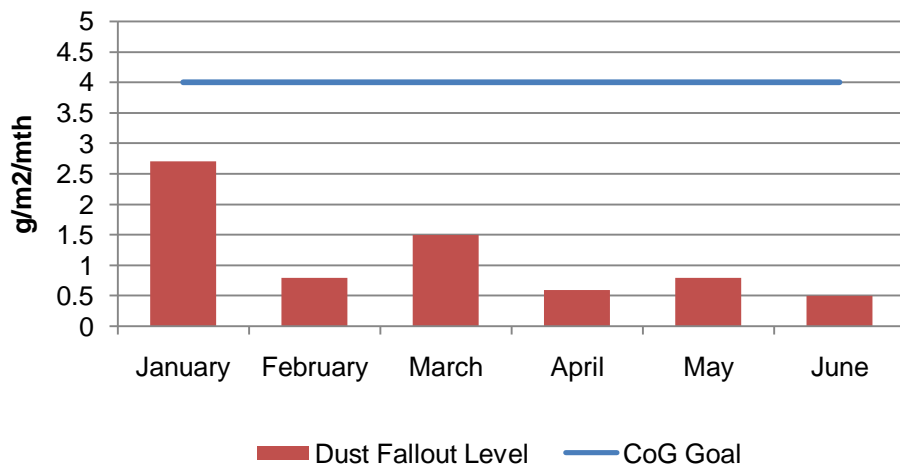
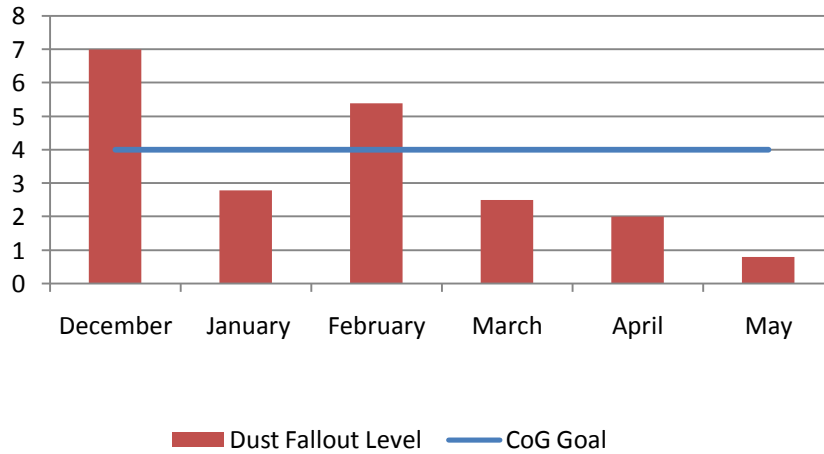


Figure 4.3.5: Corner of Thistle & Lucas Street, Lutwyche Dust Fallout Results (location refer to figure 2.3 – D2)

Dust Fallout Perry Street Lutwyche, December 2010 - May 2010



4.3.6: Perry St, Lutwyche Dust Fallout Results (location refer to figure 2.4 – D3)

Dust Fallout, Erskine Avenue Kedron, December 2009 - May 2010

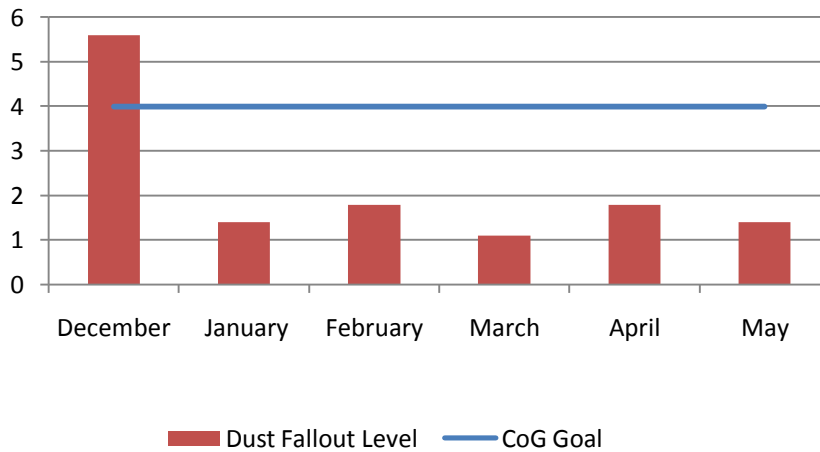


Figure 4.3.7: Erskine Avenue, Kedron Dust Fallout October 2009 – April 2010 (location refer to figure 2.4 – D1)

Dust Fallout Woolloowin State School Wolloowin, October 2009 - May 2010

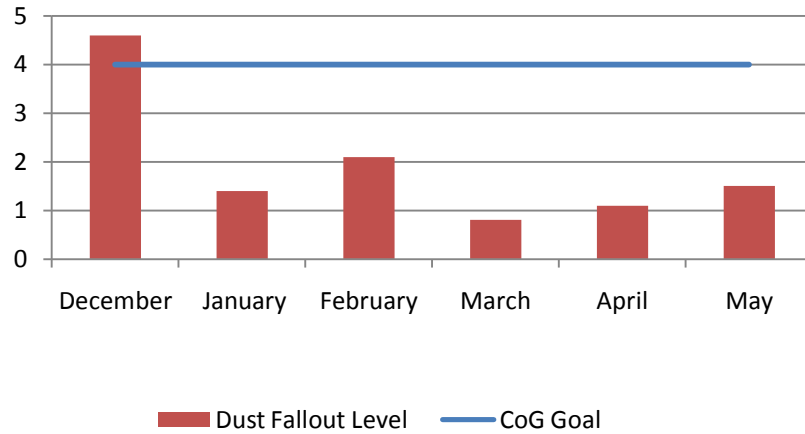


Figure 4.3.8: Woolloowin State School, Dust Fallout October 2009 – April 2010 (location refer to figure 2.4 – D4)

Dust Fallout Kedron State High School Kedron, October 2009 - May 2010

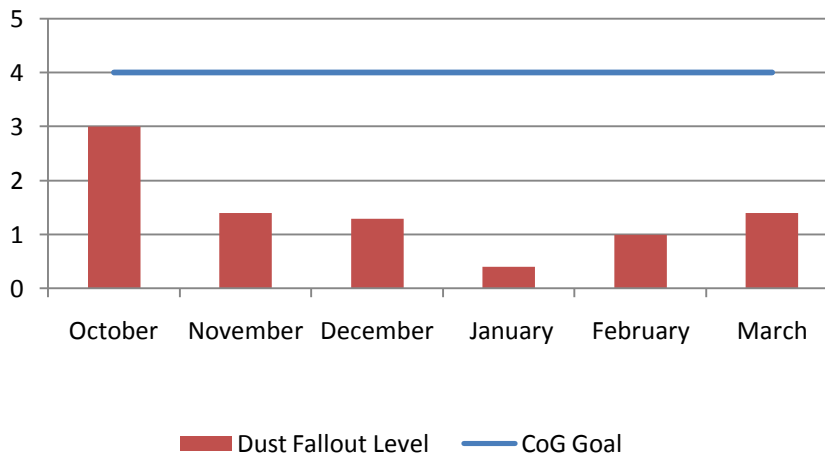


Figure 4.3.9: Kedron State High School (Adj), Dust Fallout April 2009 – April 2010 (location refer to figure 2.4 – A2)

68 Park Road, Wooloowin Dust Fall Out January - May 2010

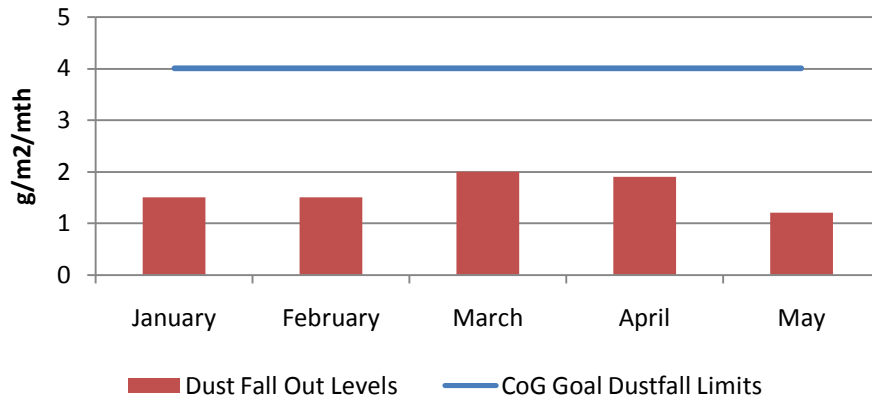


Figure 4.3.10: 68 Park Road, Dust Fallout January – May 2010 (location refer to figure 2.5 – D1)

56 Kalinga Street, Toombul Dust Fallout January - June 2010

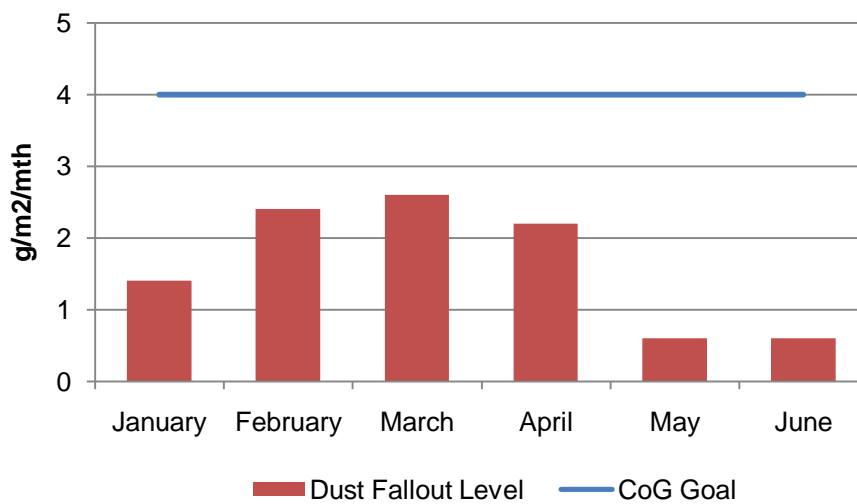


Figure 4.3.11: 56 Kalinga Street Toombul, Dust Fallout January – June 2010 (location refer to figure 2.6 – D1)

5 Mabel Street, Toombul Dust Fallout Level April - June 2010

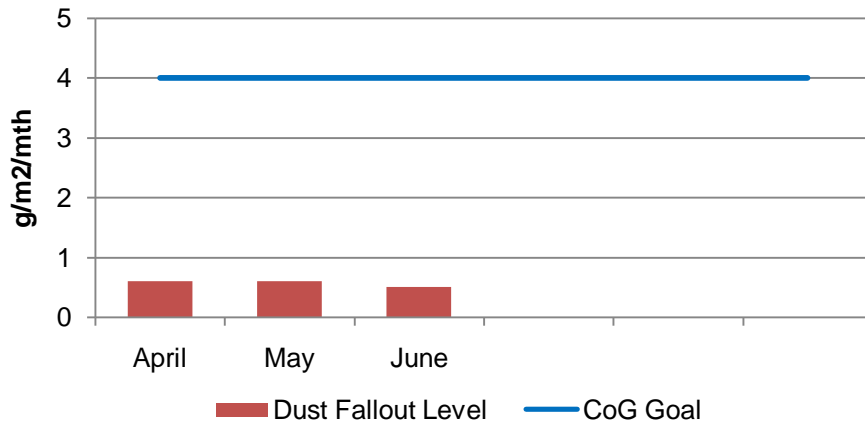


Figure 4.3.11: Mabel Street Toombul, Dust Fallout April - June 2010 (location refer to fig 2.6 – D2)

Bage Street, Toombul Dust Fallout Level November 2009 - June 2010

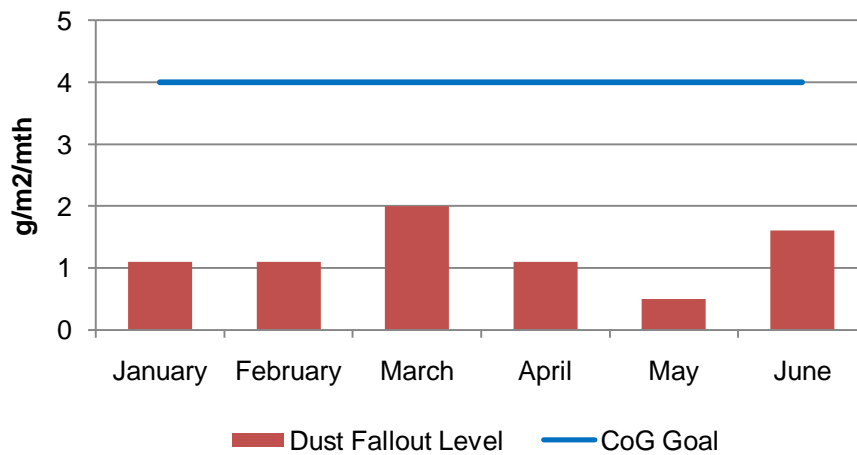


Figure 4.3.12: Bage Street Toombul, Dust Fallout November 2009 - June 2010 (location refer to fig 2.6 – D3)

4.4 CO/NO₂ Monitoring – Woolloowin Worksite

TJH undertakes regular monitoring of CO/NO₂ 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 monitoring results

Gas Monitor at 71 Park Road, Woolloowin					
Date	Peak Date and Time	CO (mg/m ³) Peak	CoG CO Limit (mg/m ³)	NO ₂ (□ mg ³) Peak	CoG NO ₂ Limit (□ (m ³))
15/05/2010 - 15/06/2010	15/05/2010 1:25pm	1.21	11	-	-
	18/05/2010 7:00pm	-	-	73.71	250

Note:

For Carbon monoxide (CO) an 8 hour averaging period is used

For Nitrogen dioxide (NO₂) a 1 hour averaging period is used

4.5 Compliance with Air Quality Goals

There were no exceedances of the Coordinator Generals Air Quality Conditions this reporting period

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 & Woollooin 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-g

Table 5a: Vibration Monitoring Results Summary – Bowen Hills

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
14 Gallway Street	15/05/10-15/06/10	0.89	5	Results are within CoG goals
Queensland Newspapers	01/06/2010-15/06/2010	0.25	5	Results are within CoG goals

Table 5b: Vibration Monitoring Results Summary – Northern Busway

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
Lutwyche Centro (Nth End of Building)	15/05/2010-15/06/2010	0.85	5	Results are within CoG goals

Table 5c: Blast Monitoring Results Summary – Roadheader Mid Tunnel

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
5th June 2010 (Trial blast)				
Corner Lutwyche Road and Lowersone Street	10 Seconds	4.32	25	Results within Goals
488 Lutwyche Road (Jetts Fitness)	10 Seconds	2.41	25	Results within Goals
483 Lutwyche Road (Mr Rentals)	10 Seconds	3.81	25	Results within Goals
493 Lutwyche Road (Retro Clothes)	10 Seconds	7.62	25	Results within Goals

Table 5d: Blast Monitoring Results Summary – Bowen Hills Tunnels South Bound Tunnel

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
25th May (Eastern Side of Southbound Tunnel Bench)				
Skilmorlie	20 seconds	40.6	25	An Initial investigation indicated that an unidentified rock type was in the area where the blast was to occur. This resulted in increased ground vibration. The blast model in place for Bowen Hills has now been revised by an external party to take into account the unidentified rock type. This will be utilised for future blasts
Rosemount (Arthritis Qld)	20 seconds	30.5	25	An Initial investigation indicated that an unidentified rock type was in the area where the blast was to occur. This resulted in increased ground vibration. The blast model in place for Bowen Hills has now been revised by an external party to take into account the unidentified rock type. This will be utilised for future blasts
Rosemount (QSMA)	20 seconds	26.2	25	An Initial investigation indicated that an unidentified rock type was in the area where the blast was to occur. This resulted in increased ground vibration. The blast model in place for Bowen Hills has now been revised by an external party to take into account the unidentified rock type. This will be utilised for future blasts

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
11 Bryden Street	20 seconds	34.5	25	An Initial investigation indicated that an unidentified rock type was in the area where the blast was to occur. This resulted in increased ground vibration. The blast model in place for Bowen Hills has now been revised by an external party to take into account the unidentified rock type. This will be utilised for future blasts
10th June 2010 (Western Side of Southbound Tunnel Bench)				
Skilmorlie	20 seconds	25.9	25	An initial investigation suggests that the structure of the insitu ground had a higher level of vibration transference than modelled by our blast consultant. The amount of explosive used was below the level suggested by the consultant after re-modelling of the blast pattern due to the results from the previous blast. A full blast investigation has been conducted by the blast consultant. This investigation has demonstrated that the vibration levels are directly contributed to the charge weights per delay (MIC) and the rock type
Rosemount (Arthritis Qld)	20 seconds	32.1	25	An initial investigation suggests that the structure of the insitu ground had a higher level of vibration transference than modelled by our blast consultant. The amount of explosive used was below the level suggested by the consultant after re-modelling of the blast pattern due to the results from the previous blast. A full blast investigation has been conducted by the blast consultant. This investigation has demonstrated that the vibration levels are directly contributed to the charge weights per delay (MIC) and the rock type
Rosemount (QSMA)	20 seconds	20.3	25	Results within Goals
11 Bryden Street	20 seconds	23.5	25	Results within Goals

Table 5e: Vibration Monitoring Results Summary - Kedron

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
Woolloowin State School	13/05/2010-21/05/2010	0.25	2	Monitoring road header tunnelling Results within Goals for heritage building
Substation 8	15/05/2010-15/06/2010	1.05*	2	Monitoring road header tunnelling Results within Goals for heritage building

* Please note a 90% percentile was used for this data on recommendation from project consultant

Table 5f: Blast Monitoring Results Summary - Kedron – CC210 South Blasting

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal Day time (mm/s)	Over blast Pressure (db)	CoG Coal Over blast Pressure (db)	Comments
18th May 2010						
Fence line, 17 Park Terrace, Kedron	10 seconds	0.127	25	119.9	130	Results are within adopted goals
Fence line, 10 Perry Street, Lutwyche	10 seconds	Less than 0.9	25	Less than 110	130	Results are within adopted goals
DES Boundary	10 seconds	0.127	25	117.5	130	Results are within adopted goals
Substation No. 8	10 seconds	Less than 0.6	25	Less than 118	130	Results are within adopted goals
22nd May 2010						
Fence line, 17 Park Terrace, Kedron	10 seconds	2.54	25	109.2	130	Results are within adopted goals
Substation 8	10 seconds	Less than 0.51	2	Less than 118	130	Results are within adopted goals
DES Boundary	10 seconds	0.64	25	108	130	Results are within adopted goals
Fence line, 10 Perry Street, Lutwyche	10 seconds	1.78	25	97.5	130	Results are within adopted goals
27th May 2010						

Fence line, 17 Park Terrace, Kedron	10 seconds	1.93	25	108.4	130	Results are within adopted goals
Substation 8	10 seconds	0.66	2	102.8	130	Results are within adopted goals
Kedron Park Hotel	10 seconds	8.36	25	107	130	Results are within adopted goals
DES Pool boundary	10 seconds	1.61	25	104.2	130	Results are within adopted goals
1st June 2010						
Fence line, 17 Park Terrace, Kedron	10 seconds	1.65	25	109.2	130	Results are within adopted goals
Substation 8	10 seconds	0.64	2	106.5	130	Results are within adopted goals
Kedron Park Hotel	10 seconds	3.43	25	109.2	130	Results are within adopted goals
DES Pool Boundary	10 seconds	2.16	25	117.1	130	Results are within adopted goals
Fence line 10 Perry Street, Lutwyche	10 seconds	1.4	25	101.9	130	Results are within adopted goals
5th June 2010						
Fence line, 17 Park Terrace, Kedron	10 seconds	0.96	25	108.7	130	Results are within adopted goals
Substation 8	10 seconds	1.02	2	NA	130	Results are within adopted goals
Kedron Park Hotel	10 seconds	5.98	25	111.1	130	Results are within adopted goals
DES Pool Boundary	10 seconds	2.05	25	116.1	130	Results are within adopted goals

Fence line 10 Perry Street, Lutwyche	10 seconds	1.58	25	108.7	130	Results are within adopted goals
11TH June 2010						
Fence line, 17 Park Terrace, Kedron	10 seconds	2.29	25	108.4	130	Results are within adopted goals
Substation 8	10 seconds	0.64	2	108	130	Results are within adopted goals
Kedron Park Hotel	10 seconds	4.44	25	110.2	130	Results are within adopted goals
DES Pool boundary	10 seconds	2.29	25	117.4	130	Results are within adopted goals
Fence line 10 Perry Street, Lutwyche	10 seconds	1.40	25	101.9	130	Results are within adopted goals

Table 5g: Vibration Monitoring Results Summary - Woolloowin

Location	Monitoring Period	Peak Particle Velocity (mm/s)	CoG Vibration Goal (mm/s)	Comments
71 Park Road Woolloowin	11:25am 22/5/2010 - 11:07am 24/05/2010	0.64	5	Results are within CoG goals. This data was collected during the start up of the Roadheader. PPV occurred 24/05/2010 during the morning.
71 Park Road Woolloowin	9:39am 5/06/2010 - 9:56pm 17/06/2010	1.27	5	Results are within CoG goals. PPV occurred at 11:07am 10/06/2010 and 1:16pm 17/06/2010.

Table 5h: Vibration Monitoring Results Summary – Toombul

Location	Monitoring Period	Peak Particle Velocity* (mm/s)	Adopted Goal (mm/s)	Comments
916 Sandgate Road Clayfield	10/06/2010	0.762	5	Results are within adopted goals

5.3 Compliance with Vibration Goals

As a result of vibration monitoring across the project exceedances of the adopted goals were identified at:

- Bowen Hills Tunnels
 - 11 Bryden Street
 - Rosemount (QSMA)
 - Rosemount (Arthritis Qld)
 - Skilmorlie

The level recorded was above the adopted goal of 25mm/s. Investigation suggests that the structure of the insitu ground had a higher level of vibration transference than modelled by our blast consultant. The amount of explosive used was below the level suggested by the consultant after re-modelling of the blast pattern due to the results from the previous blast. A full blast investigation has been conducted by the blast consultant. This investigation has demonstrated that the vibration levels are directly contributed to the charge weights per delay (MIC) and the rock type.

6.0 Community Enquiries and Complaints

A total of 329 community complaints were reported to the project between 16 May and 15 June 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 May – 15 June 2010		
Issues	No.	No. of stakeholders
Site noise	63	37
Site noise out-of-hours	58	40
Parking	38	26
Site out-of-hours	29	19
Construction vehicle movements	29	23
Truck noise	19	15
General Construction	19	16
PUPs out-of-hours	19	19
Mitigation	18	16
Site dust	18	16
PUPs noise	18	18
Driver Behaviour	17	12
Site lighting	14	6
Traffic Management	12	11
PUPs noise out-of-hours	10	10
Spoil haulage routes and queuing	10	10
Worker Behaviour	9	9
Spoil haulage driver behaviour	8	8
Roadheader noise	8	7
PUPs service outage	7	7
Truck dust	7	6
PUPs reinstatement	7	7
Road condition	7	7
PUPs un-notified work	6	5
Spoil haulage dust	6	6
Other	67	62
Total complaints	329	197

Top 10 issues raised

