



Airport Link / Northern Busway Project

Monthly Environmental Monitoring Report

May 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 Wooloowin Worksite Report October 2009).

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

Bowen Hills Monitoring Locations



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: Muruk Haus is not shown due to map extremities – physical location 230 Lutwyche Rd Windsor

Note: locations are indicative only

Truro Street Mid Tunnel Monitoring Locations

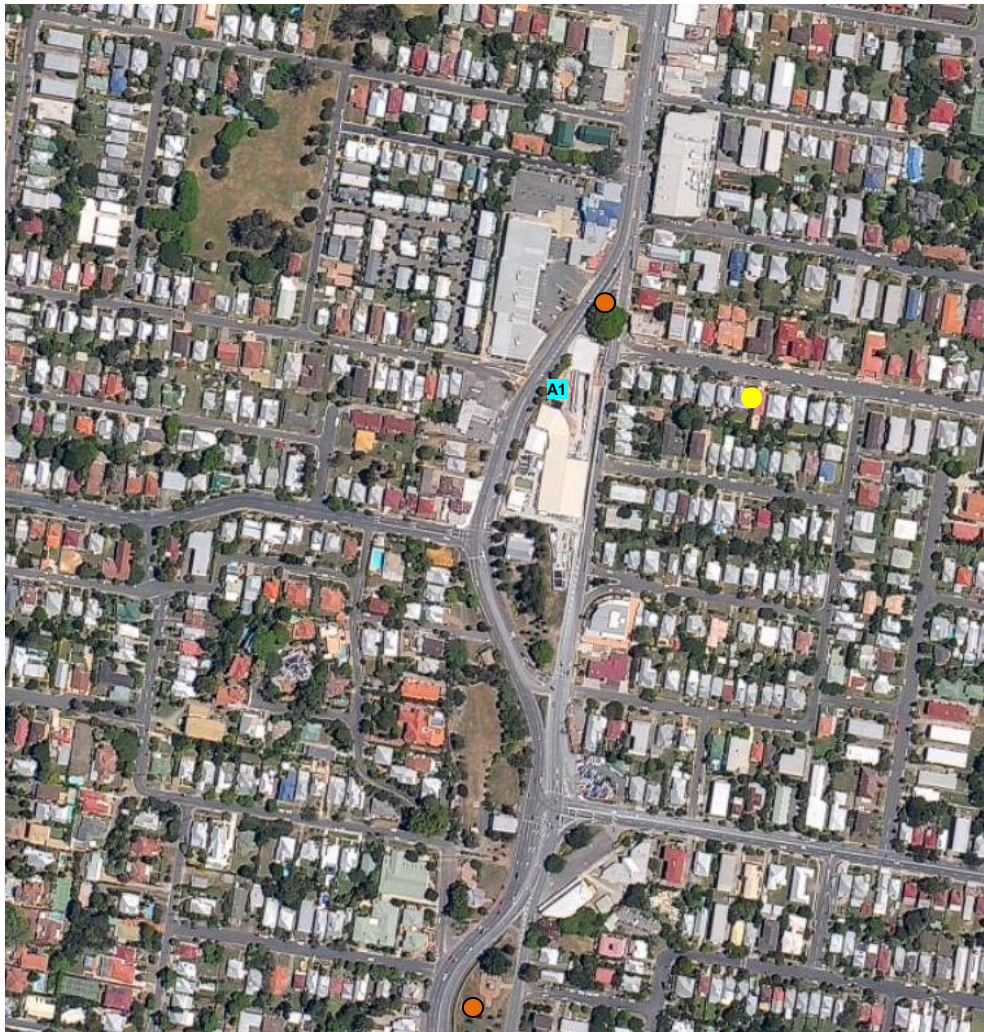






Figure 2.2 – Truro Street Mid Tunnel Monitoring Locations
Legend

- | | |
|--|---|
|  Noise (during construction) |  Air (PM ₁₀) |
|  Vibration |  Air (Dust Deposition) |

Note: locations are indicative only

Northern Busway Monitoring Locations

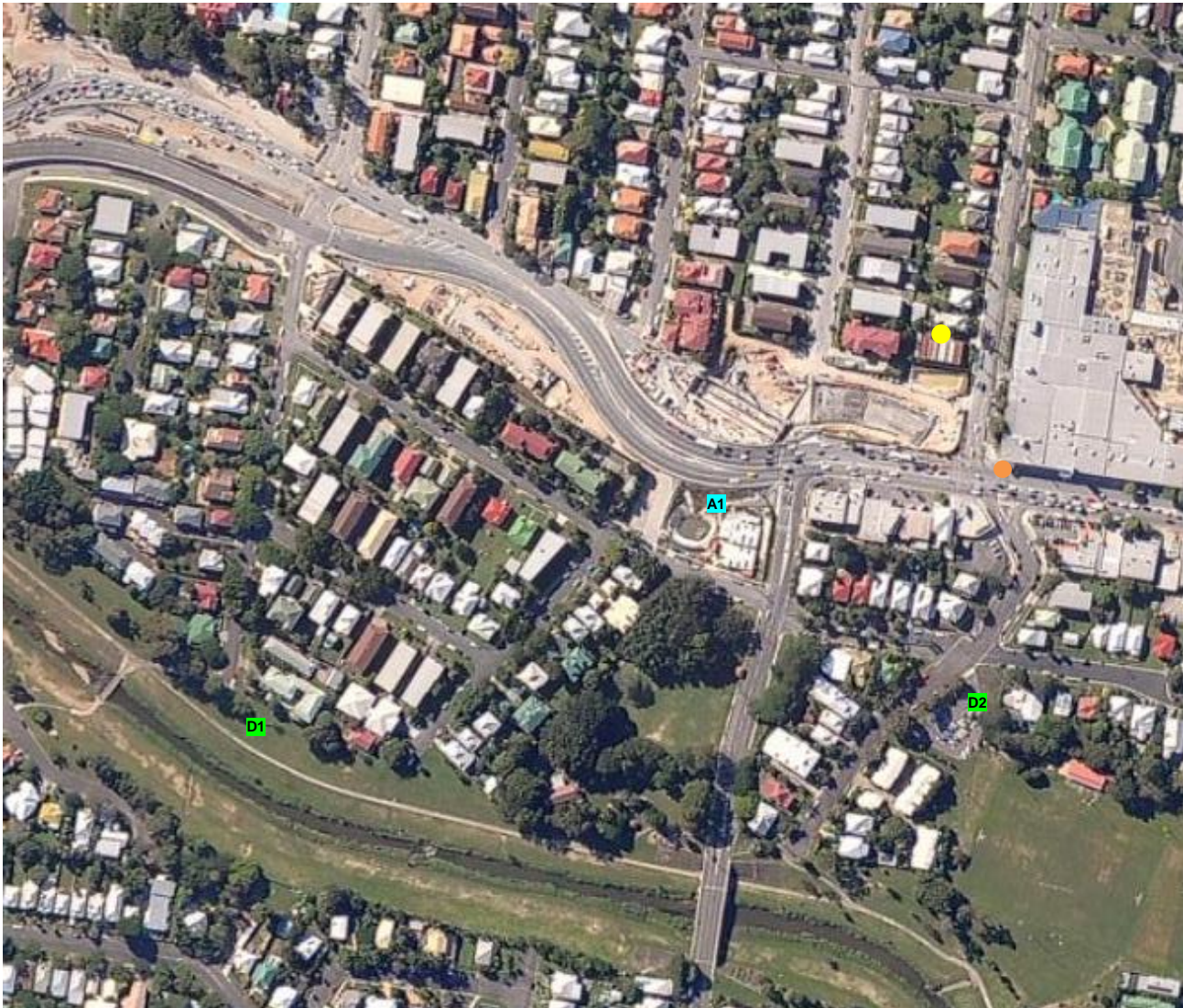


Figure 2.3 – Northern Busway Monitoring Locations

Legend

● Noise (during construction)

● Vibration

● Air (PM₁₀)

● Air (Dust Deposition)

Note: locations are indicative only

Kedron Monitoring Locations



Figure 2.4 – Kedron Monitoring Locations

Legend

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

Note: locations are indicative only

Woolloowin Monitoring Locations



Figure 2.5 – Woolloowin Monitoring Locations

Legend

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

Note: locations are indicative only

Toombul Monitoring Locations



Figure 2.6 – Toombul Monitoring Locations

Legend

- Noise (during construction)
- Vibration
- Air (PM₁₀)
- 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. Bowen Hills
 - iii. Wooloowin
 - iv. Kalinga Park (TBM 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-f.

Table 3a: Noise Monitoring Results – Bowen Hills

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)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
14 Gallway Street								
Living Room Southern side of Building	14/05/10 2.02pm-2.16pm	46.2	45	47.5	55	-	-	<p>Monitoring Type Attended Internal, Windows and Doors Open</p> <p>Noise Sources The dominant noise source was the traffic on Lutwyche Road. Construction activities on the adjacent TJH site were audible. Works included line drilling, a pump operating and general construction activities</p> <p>Discussion The levels recorded exceeding the goals were as a result of the traffic on Lutwyche Road</p> <p>Mitigation Measures Timber noise walls are installed around the perimeter of the works site along Morris / Federation Sts</p>
Living Room Southern side of Building	14/05/10 2.18pm-2.32pm	38.0	45	39.9	55	-	-	<p>Monitoring Type Attended. Internal, Windows and Doors closed</p> <p>Noise Sources The dominant noise source was the traffic on Lutwyche Road. Construction activities on the adjacent TJH site were audible. Works included rock hammering, a pump operating and general construction activities</p> <p>Discussion Results were within CoG goals</p> <p>Mitigation Measures Timber noise walls are installed around the perimeter of the works site along Morris / Federation Sts</p>

Table 3b: Noise Monitoring Results – Northern Busway

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)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
Unit 2/133 Chalk Street, Lutwyche								
2 nd Storey Unit Living Room	12/05/10 12.06pm-12.20pm	50.9	45	52.1	55	-	-	<p>Monitoring Type Attended Internal, Windows and Doors Open</p> <p>Noise Sources The dominant noise source was the traffic on Lutwyche Road. Works on the adjacent Northern Busway Site were audible intermittently. Works occurring onsite included hammering near CC602, extraction fan for works under CC602 and an excavator bulking out material</p> <p>Discussion</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)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
								The levels recorded exceeding the goals were as a result of the traffic on Lutwyche Road Mitigation Measures Timber noise walls are installed around the perimeter of the worksite
2 nd Storey Unit Living Room	12/05/10 12.24pm-12.38pm	41.1	45	41.9	55	-	-	Monitoring Type Attended Internal, Windows and Doors Closed Noise Sources The dominant noise source was the traffic on Lutwyche Road. Works on the adjacent Northern Busway Site were audible throughout the monitoring period. Works occurring onsite included hammering near CC602, extraction fan for works under CC602 and an excavator bulking out material Discussion Results were within CoG goals Mitigation Measures Timber noise walls are installed around the perimeter of the worksite

Table 3c: Noise Monitoring Results – Roadheader Mid Tunnel

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)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
128 Stoneleigh Street, Lutwyche								
Single Storey Timber House Main Bedroom	14/05/10 9.06pm-9.20pm	42.2	40	-	-	55	50	Monitoring Type Attended Internal, Windows and Doors open Noise Sources The dominant noise source was the traffic on Lutwyche Road. Works on the nearby Truro Street Site were audible. Works included haul trucks being loaded in the acoustic shed, haul trucks entering and leaving the slip lane Discussion The levels recorded exceeding the goals were as a result of the traffic on Lutwyche Road Mitigation Measures The site is predominantly bounded by a timber noise wall and an acoustic shed over the portal

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)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
Single Storey Timber House Main Bedroom	14/05/10 9.25pm-9.40pm	33.3	40	-	-	59.5	50	<p>Monitoring Type Attended Internal Windows and Doors closed</p> <p>Noise Sources The dominant noise source was the traffic on Lutwyche Road. Works on the nearby Truro Street Site were audible. Works included haul trucks being loaded in the acoustic shed, haul trucks entering and leaving the slip lane</p> <p>Discussion The L_{Amax} exceedance was caused by creaking of floor boards in the house where monitoring was occurring. No exceedance of the goals was recorded as a result of TJH construction activities</p> <p>Mitigation Measures The site is predominantly bounded by a timber noise wall and an acoustic shed over the portal</p>

Table 3d: Noise Monitoring Results – Kedron

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
Qian Jin Massage (172a), Gympie Rd, Kedron						
Treatment Room	05/05/2010 11:11am – 11:26am	58.1	45	58.2	55	<p>Monitoring Type Internal Attended Monitoring, Doors and Windows Open</p> <p>Noise Source TJH noise sources predominant throughout the session were Kedron North works (CC702); piling, and earthworks. External noise sources included local and Gympie Road traffic and business related noises such as telephone conversations, typing and doors open/closing</p> <p>Discussion This monitoring indicates that the CoG goals are not being met. Both Gympie Road traffic and CC702 construction were the dominant noise sources</p> <p>Mitigation Measures Investigations into mitigation measures for this premises are ongoing including the extension of the noise wall along Gympie Rd</p>
Treatment Room	05/05/2010 11:31am – 11:46am	50.3	45	51	55	<p>Monitoring Type Internal Attended Monitoring, Doors and Windows Closed</p> <p>Noise Source TJH noise sources predominant throughout the session were Kedron North works (CC702); piling and earthworks. External noise sources included local and Gympie Road traffic and business related noises such as telephone conversations, typing and doors open/closing</p> <p>Discussion This monitoring indicates that the CoG goals are not being met. Both Gympie Road traffic and CC702 construction were the dominant noise sources</p> <p>Mitigation Measures Investigations into mitigation measures for this premises are ongoing including the extension of the noise wall along Gympie Rd</p>
172 Gympie Road, Kedron						
Reception/Office	05/05/2010 11:57am – 12:12pm	64.5	45	65.2	55	<p>Monitoring Type Internal attended monitoring, doors open</p> <p>Noise Source TJH noise sources predominant throughout the session were Kedron North works (CC702); piling, and earthworks. External noise sources included local and Gympie Road traffic and business related noises such as telephone conversations and typing</p> <p>Discussion This monitoring indicates that the CoG goals are not being met. Both</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
						Gympie Road traffic and CC702 construction were the dominant noise sources Mitigation Measures Investigations into mitigation measures for this premises are ongoing including the extension of the noise wall along Gympie Rd
Reception/Office	05/05/2010 12:15pm– 12:30pm	52.7	45	53.4	55	Monitoring Type Internal Attended Monitoring, Doors Closed Noise Source TJH noise sources occurring during the session were Kedron North works (CC702); piling, and earthworks. Non TJH noise sources included a computer server, local and Gympie Road traffic and business related noises such as telephone conversations and typing Discussion This monitoring indicates that the CoG goals are not being met. In this monitoring session a computer server in the office and traffic on Gympie Rd (non-TJH sources) were the dominant noise sources Mitigation Measures Investigations into mitigation measures for this premises are ongoing including the extension of the noise wall along Gympie Rd
Unit 1/233 Gympie Road, Kedron						
Lounge Room	06/05/2010 8:42am –8:57am	66.4	45	66.8	55	Monitoring Type Internal attended monitoring, doors and windows open Noise Source Gympie Road traffic is the predominant noise source. Construction noise (excavators) at CC702 were barely audible even when there was no traffic present on Gympie Road Discussion CoG goals were exceeded during this monitoring session due to the noise generated from traffic on Gympie Road. The stakeholder specifically asked for monitoring at this time of the day, and therefore the predominant noise source was from Gympie Road Mitigation Measures Portable concrete barriers with 1.8m timber barriers border the CC702 works site
Lounge Room	06/05/2010 9:00am – 9:15am	50	45	50.8	55	Monitoring Type Internal Attended Monitoring, Doors and Windows Closed Noise Source Gympie Road traffic is the predominant noise source. Construction noise (excavators) at CC702 was barely audible even when there was no traffic present on Gympie Road Discussion CoG goals were exceeded during this monitoring session due to the

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
						noise generated from traffic on Gympie Road. The stakeholder specifically asked for monitoring at this time of the day, and therefore the predominant noise source was from Gympie Road Mitigation Measures Portable concrete barriers with 1.8m timber barriers border the CC702 works site
Unit 25, 20 Leckie Road, Kedron						
Lounge Room	14/05/2010 3:03pm – 3:18pm	57.8	45	58.7	55	Monitoring Type Internal Attended Monitoring, Doors and Windows Open Noise Source Gympie Rd traffic was the predominant noise source during this time. Piling works and construction noise (excavators) were intermittently audible during the session Discussion CoG goals were exceeded during this monitoring session due to the noise generated from traffic on Gympie Road Mitigation Measures Site boundary hoardings are in place
Lounge Room	14/05/2010 3:32pm-3:37pm	51.9	45	51.7	55	Monitoring Type Internal Attended Monitoring, Doors and Windows Closed Noise Source Gympie Rd traffic was the predominant noise source during this time. Piling works and construction noise (excavators) were intermittently audible during the session Discussion CoG goals were exceeded during this monitoring session due to the noise generated from traffic on Gympie Road Mitigation Measures Site boundary hoardings are in place

Table 3e – Noise Monitoring Results Woolloowin

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)	L _{AMAX} (15 min) (dBA)	CoG Goal L _{AMAX} (15 min) (dBA)	Comments
68 Park Road, Woolloowin								
1 st Floor Bedroom	21/04/2010 7:05pm-7:20pm	41.7	40	-	-	60.5	50	<p>Monitoring Type Attended Noise Monitoring, Doors and Windows Open</p> <p>Noise Sources Traffic, site noise, dog bark, train, train horn, plane</p> <p>Discussion TJH noise could barely be heard in (diesel engine noise) the breaks in the louder traffic movements. The exceedance of the goals was a result of traffic</p> <p>Mitigation Measures An acoustic shed and noise wall is in place around Rose Street Site</p>
1 st Floor Bedroom	21/04/2010 7:25pm-7:41pm	32.7	40	-	-	58.3	50	<p>Monitoring Type Attended Noise Monitoring, Doors and Windows Closed</p> <p>Noise Sources Traffic, site noise, plane, train, hammer, talking, train horn, unknown</p> <p>Discussion Traffic noise was dominant, TJH construction activities could not be heard during the monitoring session. Exceedance of the goals was a result of traffic</p> <p>Mitigation Measures An acoustic shed and noise wall is in place around Rose Street Site</p>
73 Park Road, Woolloowin								
1 st Floor Bedroom	22/04/2010 8:32pm-8:47pm	40.2	40	-	-	48.3	50	<p>Monitoring Type Attended Noise Monitoring, Doors and Windows Closed</p> <p>Noise Sources Hydraulic hammer, house noise, traffic, train horn, sirens</p> <p>Discussion Dominant noise source was hydraulic hammer. Minor exceedance as a result of TJH construction activity</p> <p>Mitigation Measures An acoustic shed and noise wall is in place around Rose Street Site. Consultation with the resident in relation to the short term impact has been undertaken</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)	L _{AMAX} (15 min) (dBA)	CoG Goal L _{AMAX} (15 min) (dBA)	Comments
1 st Floor Bedroom	22/04/2010 8:49pm-9:04pm	46.5	40	-	-	52.8	50	<p>Monitoring Type Attended Noise Monitoring, Doors and Windows Open</p> <p>Noise Sources Hydraulic hammer, traffic, Internal noise, plane, engine noise</p> <p>Discussion Dominant noise source was hydraulic hammer. Exceedance of the goals was a result of the hydraulic hammer operating</p> <p>Mitigation Measures An acoustic shed and noise wall is in place around Rose Street Site. Consultation with the resident in relation to the short term impact has been undertaken</p>
78 Park Road, Woolloowin								
1 st Floor Bedroom	12/05/2010 7:32pm-7:47pm	45.6	40	-	-	68.3	50	<p>Monitoring Type Attended Noise Monitoring, Doors and Windows Open</p> <p>Noise Sources Traffic noise, house noise, train, plane, hydraulic hammer</p> <p>Discussion The dominant noise source was traffic. Background noise (hum) of diesel engines could be heard with the occasional bang from construction activities. Exceedance of the goals was as a result of traffic</p> <p>Mitigation Measures An acoustic shed and noise wall is in place around Rose Street Site</p>
1 st Floor Bedroom	12/05/2010 7:53pm-8:07pm	33.8	40	-	-	56.4	50	<p>Monitoring Type Attended Noise Monitoring, Doors and Windows Closed</p> <p>Noise Sources Traffic, House noise, Horns, Dogs, Train, Hammer</p> <p>Discussion Exceedences were as a result of traffic noise. Engine hum could be heard from the construction worksite which did not exceed the goals</p> <p>Mitigation Measures An acoustic shed and noise wall is in place around Rose Street Site</p>
104 Kent Road, Woolloowin								
1 st Floor Bedroom	23/04/2010 8:04pm-8:19pm	39.8	40	-	-	42.4	50	<p>Monitoring Type Attended Noise Monitoring, Doors and Windows Open</p> <p>Noise Sources Traffic, diesel engine noise, hydraulic hammering, car and train horns, helicopter, sirens, dog barking</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)	L _{AMAX} (15 min) (dBA)	CoG Goal L _{AMAX} (15 min) (dBA)	Comments
								Discussion No exceedences of the goals was recorded Mitigation Measures An acoustic shed and noise wall is in place around Rose Street Site
1 st Floor Bedroom	23/04/2010 8:23pm-8:38pm	29.9	40	-	-	49.7	50	Monitoring Type Attended Noise Monitoring, Doors and Windows Closed Noise Sources Traffic, planes, neighbours, hammering diesel engine noise, dogs barking. Discussion No exceedences of the goals was recorded Mitigation Measures An acoustic shed and noise wall is in place around Rose Street Site
105 Kent Road, Woolloowin								
Rumpus / Living Room	22/04/2010 3:03pm 3:17pm	42.6	45	42.9	55	-	-	Monitoring Type Attended Noise Monitoring, Doors and Windows Open Noise Sources Traffic, birds, plane, voices in street, construction noise, train horn, dog barking Discussion The dominant noise source was traffic. No exceedance of the goals was recorded Mitigation Measures An acoustic shed and noise wall is in place around Rose Street Site
Rumpus / Living Room	22/04/2010 3:22pm 3:36pm	35.8	45	36.4	55	-	-	Monitoring Type Attended Noise Monitoring, Doors and Windows Closed Noise Sources Traffic, birds, car horn, dog barking, occupant moving about and noises in the street Discussion The dominant noise source was traffic. No exceedance of the goals was recorded Mitigation Measures An acoustic shed and noise wall is in place around Rose Street Site

Table 3f: 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						
Living Room	4/05/2010 10:03am – 10:17am	43.2	45	44	55	<p>Monitoring Type Internal Attended Monitoring, Windows and Doors Closed</p> <p>Noise Sources General construction (banging, jack hammering) plus non-TJH sources (inside noise, train, car, plane)</p> <p>Discussion No exceedences of the goals was recorded</p> <p>Mitigation Measures Include a 6m noise wall and double stack containers. This property has received individual property mitigation. At the time of monitoring the air conditioner was in use</p>
Living Room	4/05/2010 10:20am – 10:34am	42.3	45	44	55	<p>Monitoring Type Internal Attended Monitoring, Windows and Doors Closed</p> <p>Noise Sources General construction (reverse beeping, jack hammering, banging, engines, horn) plus non-TJH sources (inside noise, train, bird)</p> <p>Discussion No exceedences of the goals was recorded</p> <p>Mitigation Measures Include a 6m noise wall and double stack containers. This property has received individual property mitigation. At the time of monitoring the air conditioner was in use</p>
Living Room	4/05/2010 1:57pm – 2:11pm	39.8	45	40.8	55	<p>Monitoring Type Internal attended monitoring, windows and doors closed</p> <p>Noise Sources General construction (welding, franna, piling, banging, horn, banging) plus non-TJH sources (inside noise, clock, train, bird)</p> <p>Discussion No exceedences of the goals was recorded</p> <p>Mitigation Measures Include a 6m noise wall and double stack containers. This property has received individual property mitigation. At the time of monitoring the air conditioner was in use.</p>
Living Room	4/05/2010 2:14pm – 2:28pm	36.6	45	36	55	<p>Monitoring Type Internal Attended Monitoring, Windows and Doors Closed</p> <p>Noise Sources General construction (welding, jet blasting, banging, engines, jack hammering, squeaking) plus non-TJH sources (train, inside noise, clock, birds)</p> <p>Discussion No exceedences of the goals was recorded</p> <p>Mitigation Measures Include a 6m noise wall and double stack containers. This property has received</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
						individual property mitigation. At the time of monitoring the air conditioner was in use
35 McGregor Street, Clayfield						
Living Room	11/05/2010 10:33am – 10:47am	38.0	45	39.2	55	<p>Monitoring Type Internal Attended Monitoring, Windows and Doors Open</p> <p>Noise Sources General construction (truck, banging, jack hammering, steel dropping, loud drilling, reverse beeping) plus non-TJH sources (inside noise, train, birds, plane, Local Traffic).</p> <p>Discussion No exceedences of the goals was recorded</p> <p>Mitigation Includes a 6m noise wall. This property has received individual property mitigation. The stakeholder refused to allow TJH to undertake monitoring with the property mitigation in place; therefore the windows and doors were left open during the monitoring session</p>
Living Room	11/05/2010 10:50am – 11:04am	44.1	45	38.9	55	<p>Monitoring Type Internal Attended Monitoring, Windows and Doors Open</p> <p>Noise Sources General construction (jack hammering, reverse beeping, banging, truck, steel dropping, loud drilling) plus non-TJH sources (inside noise, birds, local traffic, children, dog barking, plane, train)</p> <p>Discussion No exceedences of the goals was recorded</p> <p>Mitigation Measures Includes a 6m noise wall. This property has received individual property mitigation. The stakeholder refused to allow TJH to undertake monitoring with the property mitigation in place; therefore the windows and doors were left open during the monitoring session.</p>
78 Elliot Street, Clayfield						
Living Room	29/04/2010 3:06pm – 3:20pm	54.6	45	44.4	55	<p>Monitoring Type Internal Attended Monitoring, Windows and Doors Open</p> <p>Noise Sources General construction (crane hum, electric saw, drill, metal hammer) plus non-TJH sources (resident, bird, train)</p> <p>Discussion Monitoring indicates that CoG goals are being exceeded. The LAeq exceedance can be attributed to non-TJH noise source / level which impacted the result. Note the LA10 result is compliant</p> <p>Mitigation Measures Include a 6m noise wall and double stack containers</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
Living Room	29/04/2010 3:24pm – 3:38pm	43.1	45	41.7	55	<p>Monitoring Type Internal Attended Monitoring, Windows and Doors Closed</p> <p>Noise Sources General construction (machine hum, materials moving onsite,) plus non-TJH sources (train, resident, bird, wind chimes)</p> <p>Discussion No exceedences of the goals was recorded</p> <p>Mitigation Measures Include a 6m noise wall and double stack containers</p>
89 Jackson Street, Clayfield						
Front Room	12/05/2010 9:17am - 9:31am	41.2	45	39.7	55	<p>Monitoring Type Internal Attended Monitoring, Windows and Doors Open</p> <p>Noise Sources General construction (metal/ metal, hammer, crane, grating/ shovelling gravel, electric saw) plus non- TJH sources (train, resident, horn, plane, birds)</p> <p>Discussion No exceedences of the goals was recorded</p> <p>Mitigation Measures Include a 6m noise wall</p>
Front Room	12/05/2010 9:35am - 9:49am	41.4	45	36.5	55	<p>Monitoring Type Internal Attended Monitoring, Windows and Doors Closed</p> <p>Noise Sources General construction (electric saw/ drill, metal/ metal, hammer, rock hammer) plus non – TJH sources (plumbing, train, house creak, wind, aeroplane, resident)</p> <p>Discussion No exceedences of the goals was recorded</p> <p>Mitigation Measures Include a 6m noise wall</p>
Front Room	12/05/2010 1:28pm – 1:42pm	51.5	45	38.6	55	<p>Monitoring Type Internal Attended Monitoring, Windows and Doors Open</p> <p>Noise Sources General construction (crane, electric drill/saw, hammer) plus non – TJH sources (bird, local traffic, rubbish truck, aeroplane, house door, car door, resident)</p> <p>Discussion Monitoring indicates that CoG goals are being exceeded. The predominant noise source contributing to the exceedance was rubbish collection occurring on Jackson Street. Note the LA10 result is compliant</p> <p>Mitigation Measures Include a 6m noise wall</p>
Front Room	12/05/2010 1.46pm – 2.00pm	39.0	45	38.4	55	<p>Monitoring Type Internal Attended Monitoring, Windows and Doors Closed</p> <p>Noise Sources</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
						<p>General construction (metal, crane, truck tailgate, drill, squawker) plus non – TJH sources (train bird, aeroplane, resident)</p> <p>Discussion No exceedences of the goals was recorded</p> <p>Mitigation Measures Include a 6m noise wall.</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:

- Kedron
 - 172 Gympie Road
 - 172a Gympie Road
- Woolloowin
 - 73 Park Road

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

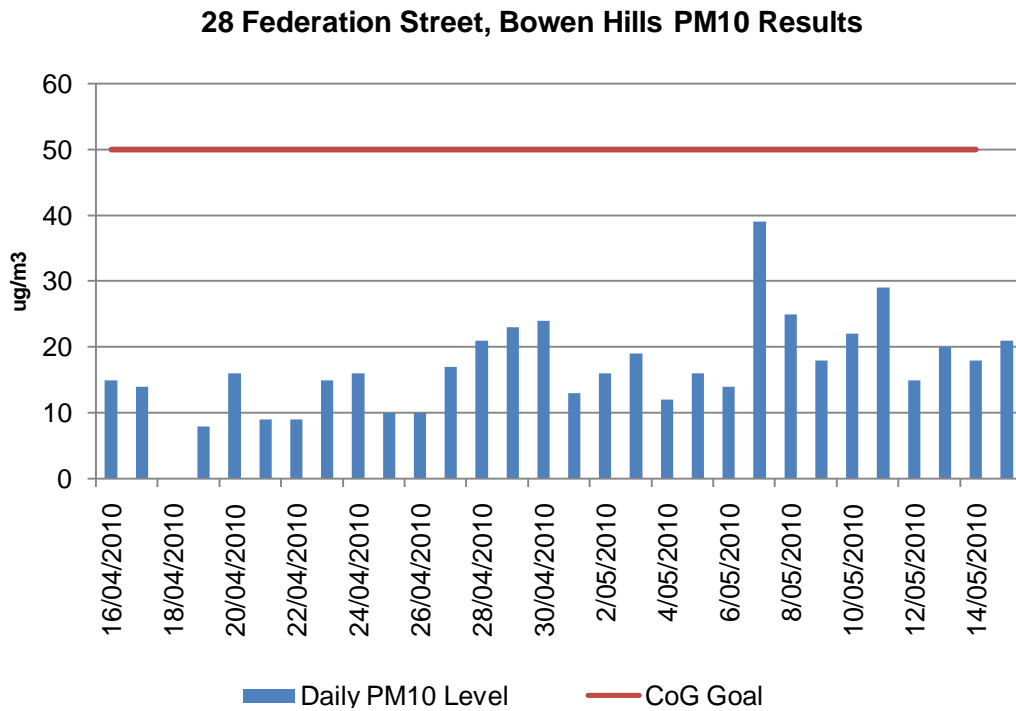


Figure 4.2.1 28 Federation St, Bowen Hills PM10 Results (for monitor location see figure 2.1 – A1)

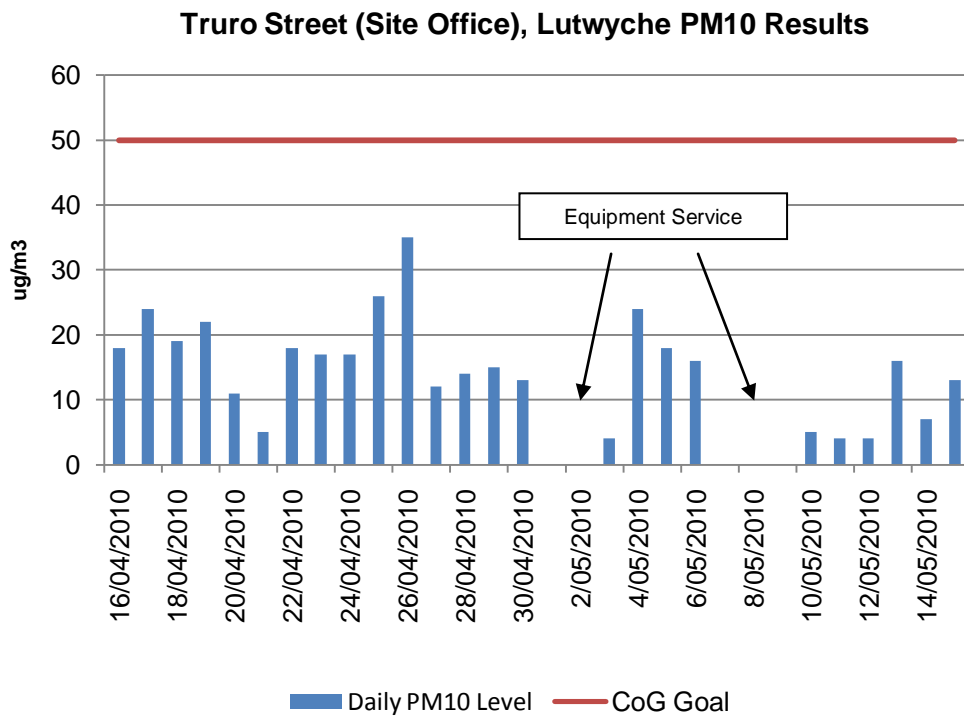


Figure 4.2.2 Truro St Site Office, Lutwyche PM10 Results (for monitor location see figure 2.2 – A1)

Northern Busway (Site Office), Lutwyche PM10 Results

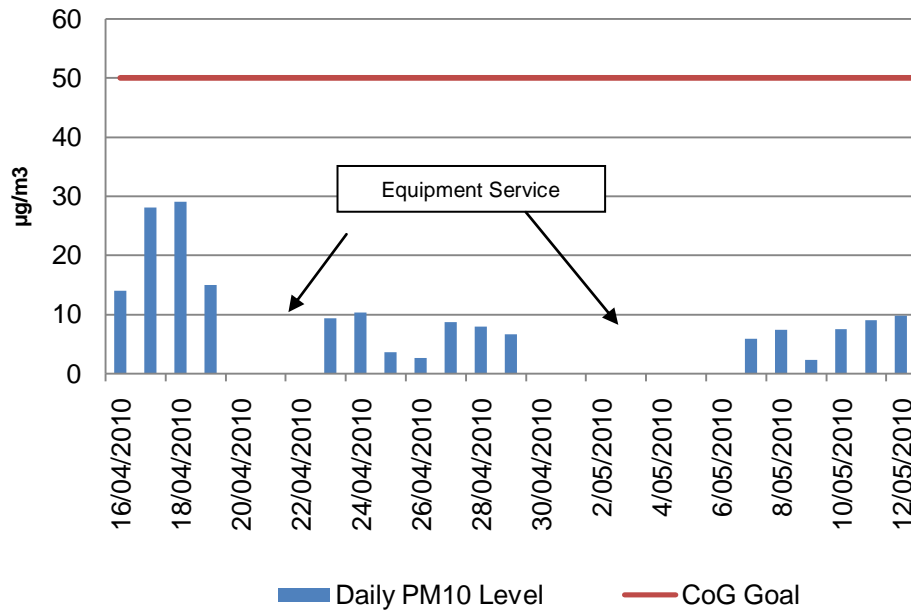


Figure 4.2.3 Northern Busway Site Office, Lutwyche PM10 Results (for monitor location see figure 2.3 – A1)

Wooloowin State School, Wooloowin PM10 Results

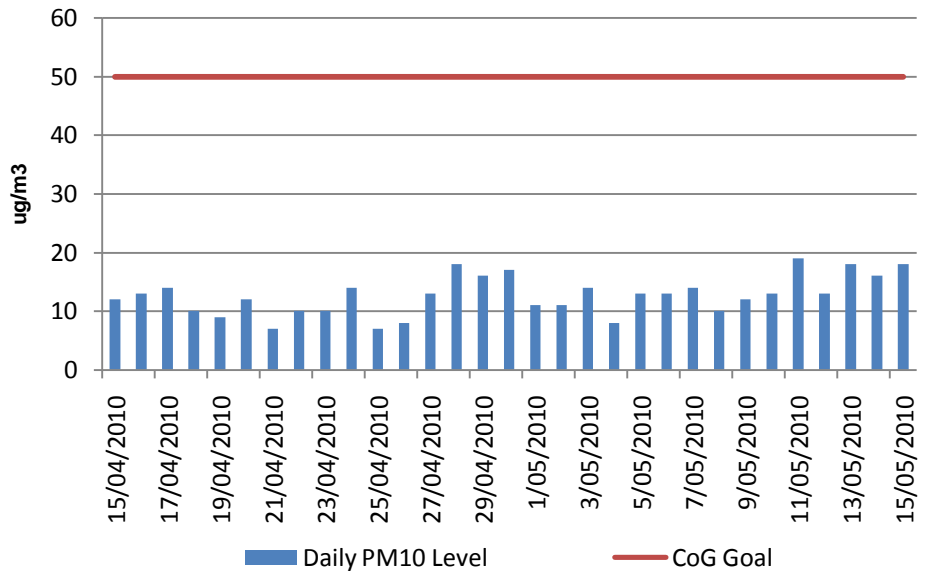


Figure 4.2.4 Wooloowin State School, Lutwyche PM10 Results (for monitor location see figure 2.4 – A3)

Perry Street, Lutwyche PM10 Results

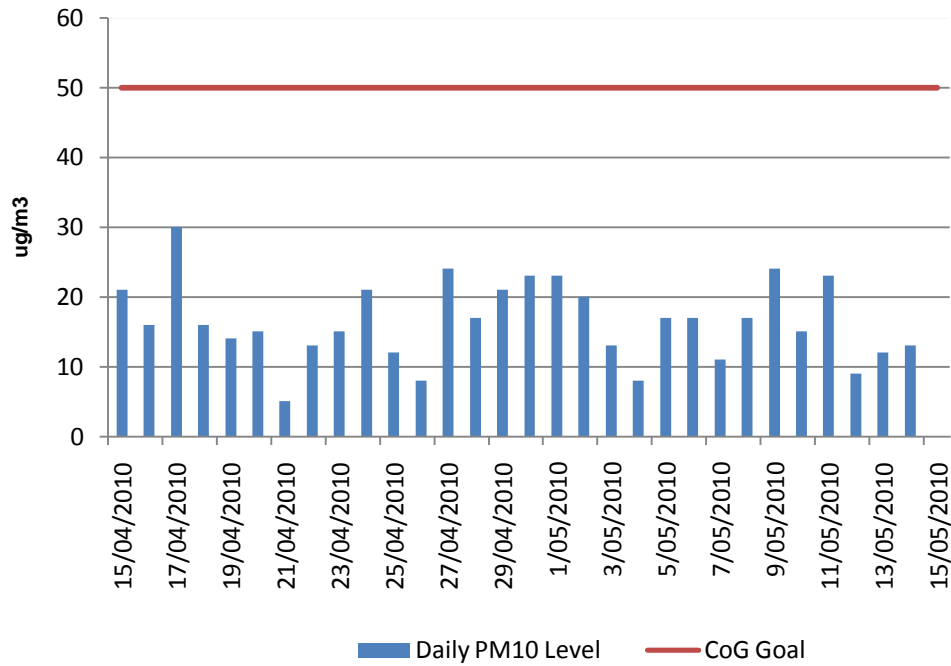


Figure 4.2.5 Perry Street, Lutwyche PM10 Results (for monitor location see figure 2.4 – A4)

Kedron State High School, Kedron PM10 Results

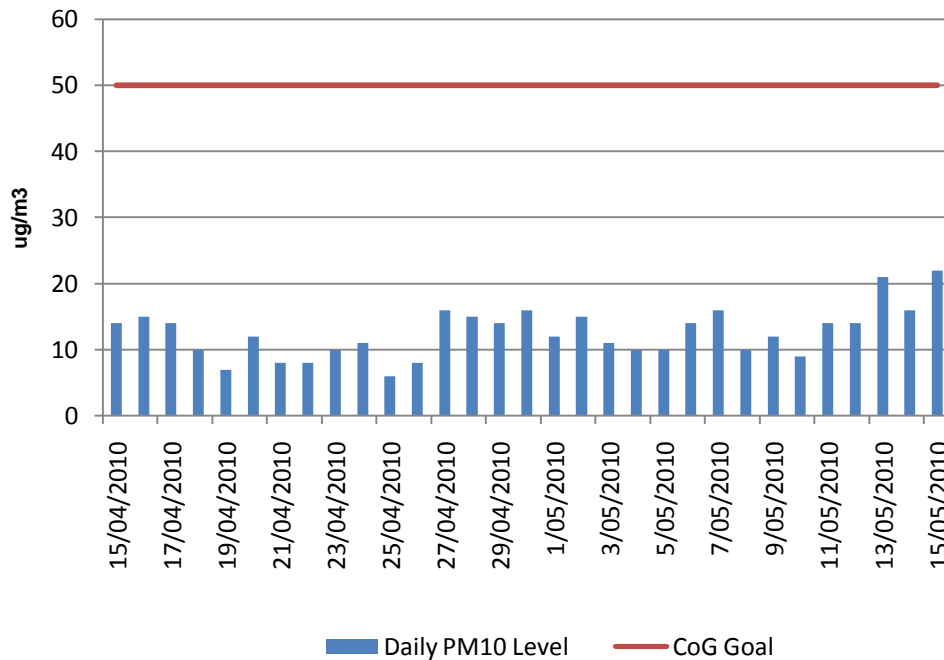


Figure 4.2.6 Kedron State High School (Adj), Kedron PM10 Results (for monitor location see figure 2.4 – A2)

Erskine Ave, Kedron PM10 Results

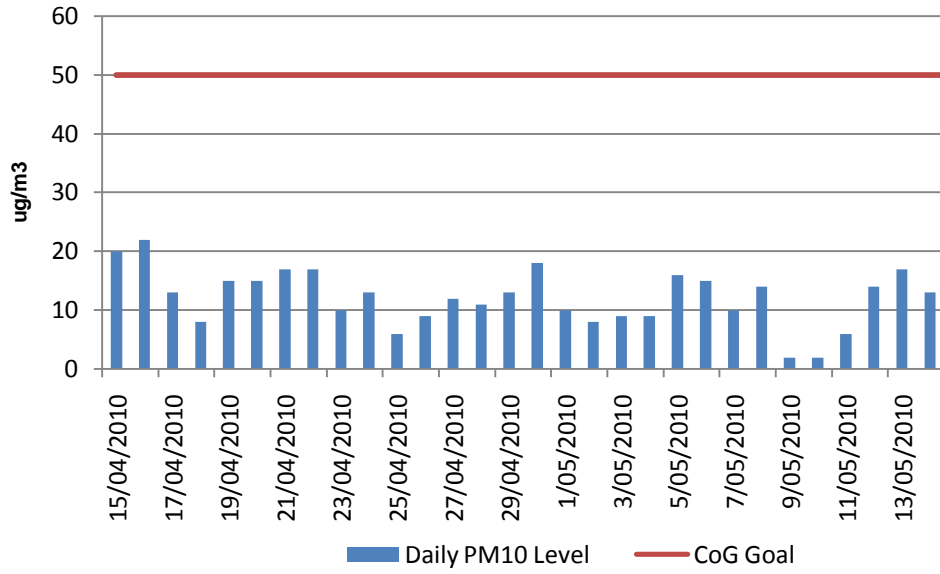


Figure 4.2.7 Erskine Avenue, Kedron PM10 Results (for monitor location see figure 2.4 – A1)

18 Jack St, Gordon Park PM10 Results

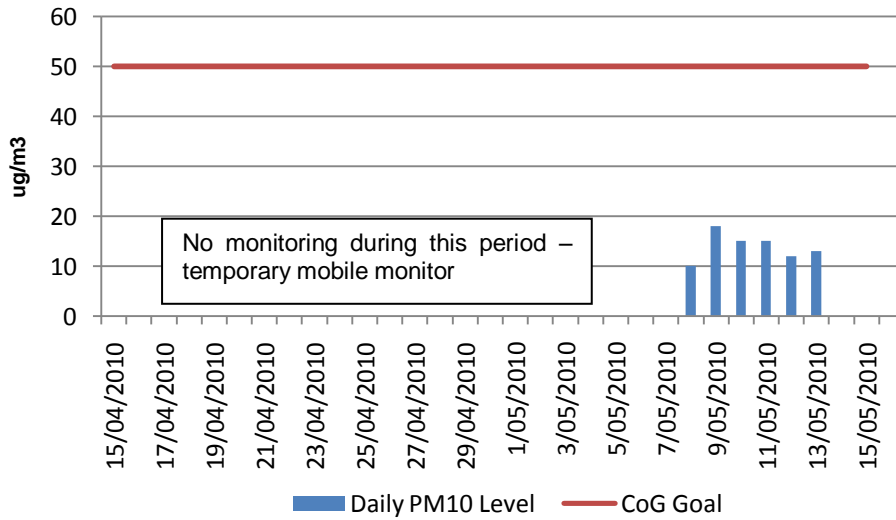


Figure 4.2.8 18 Jack St, Gordon Park, PM10 Results (for monitor location see figure 2.4 – A5)

73 Park Rd, Woolloowin TSP Results

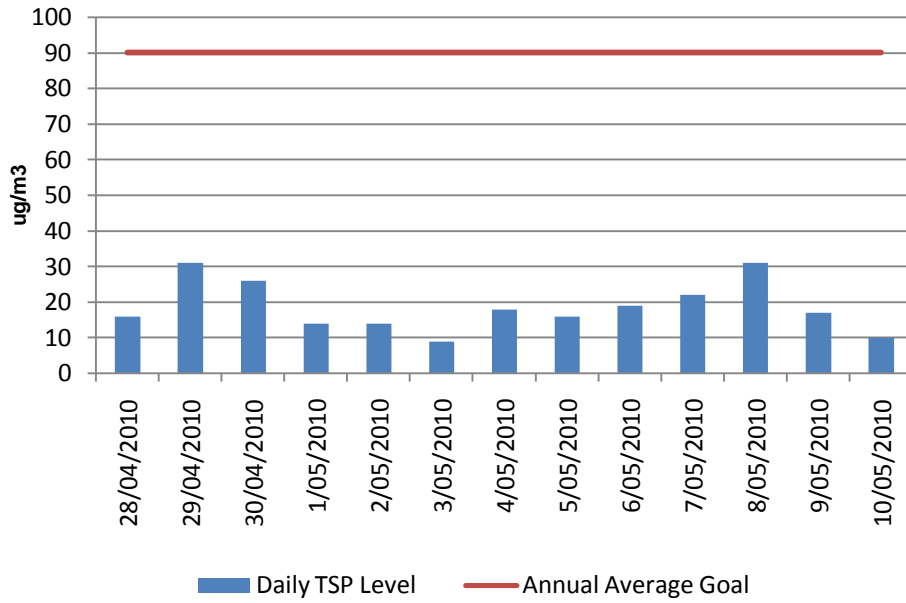


Figure 4.2.9 73 Park Rd, Woolloowin PM10 Results (for monitor location see figure 2.5 - A1)

73 Park Rd, Woolloowin PM10 Results

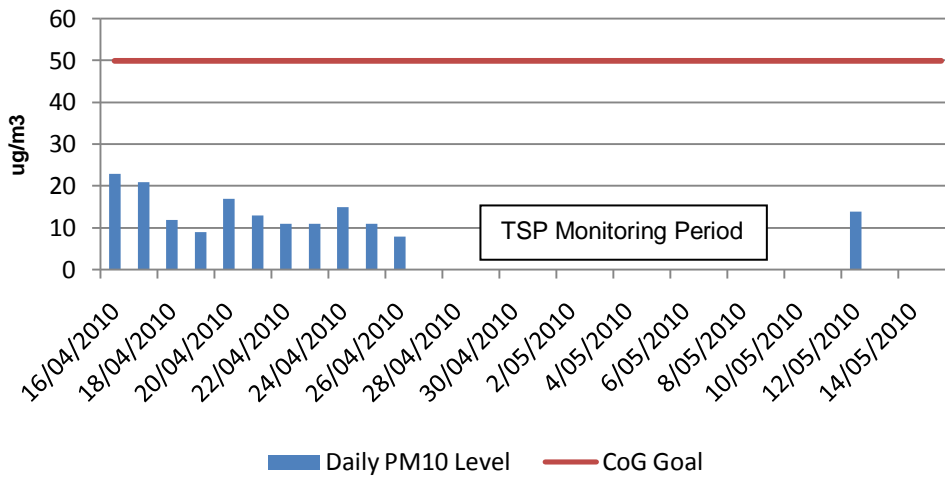


Figure 4.2.10 73 Park Rd, Woolloowin PM10 Results (for monitor location see figure 2.5 - A1)

56 Kalinga Street, Toombul PM10 Results

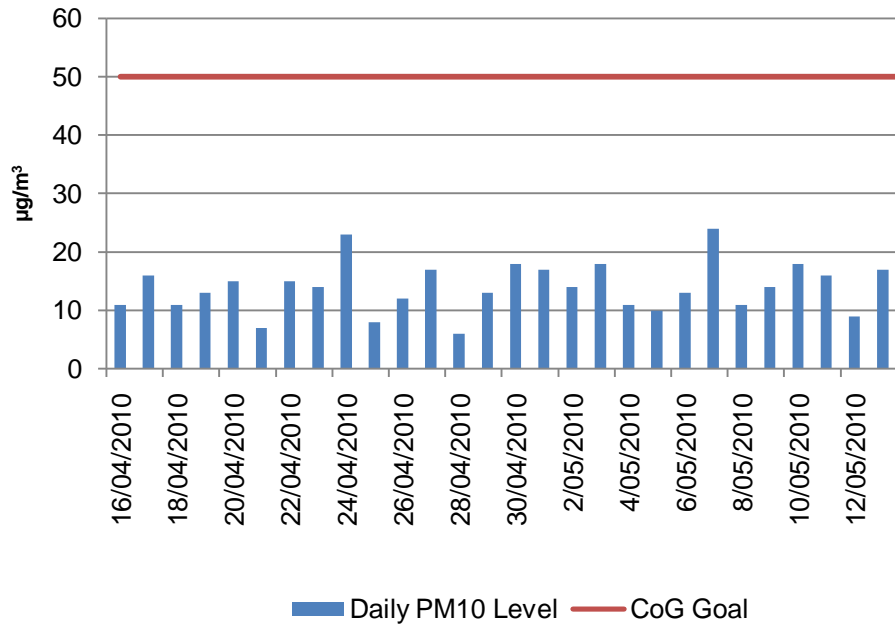


Figure 4.2.11 56 Kalinga Street, Toombul PM10 Results (for monitor location see figure 2.6 – A1)

5 Mabel Street, Toombul PM10 Results

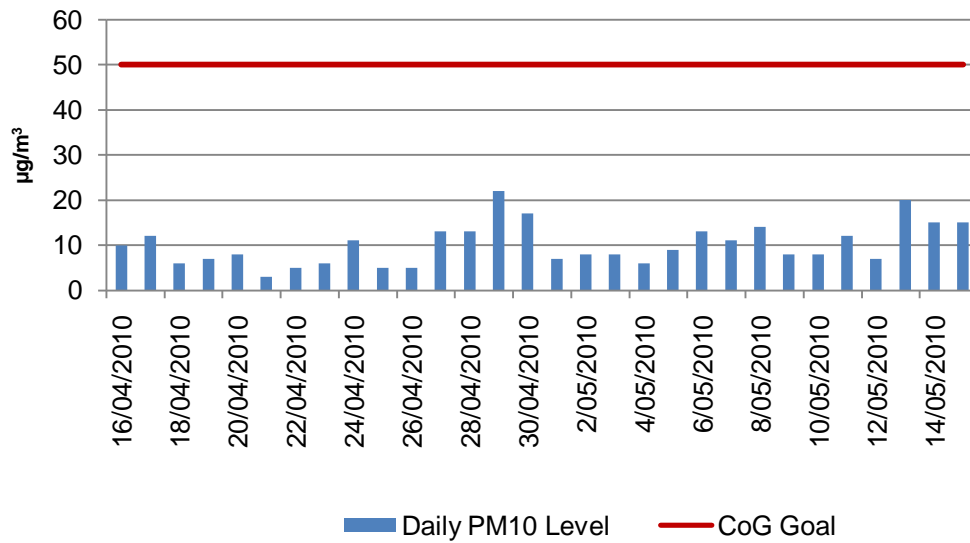


Figure 4.2.12 5 Mabel Street, Toombul PM10 Results (for monitor location see figure 2.6- A2)

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 months report.

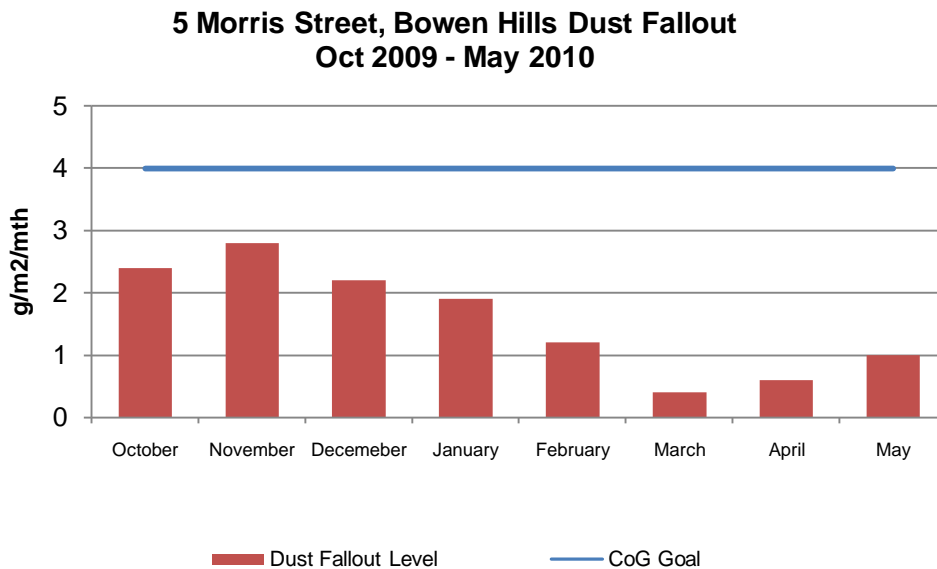


Figure 4.3.1 5 Morris St, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1 – D1)

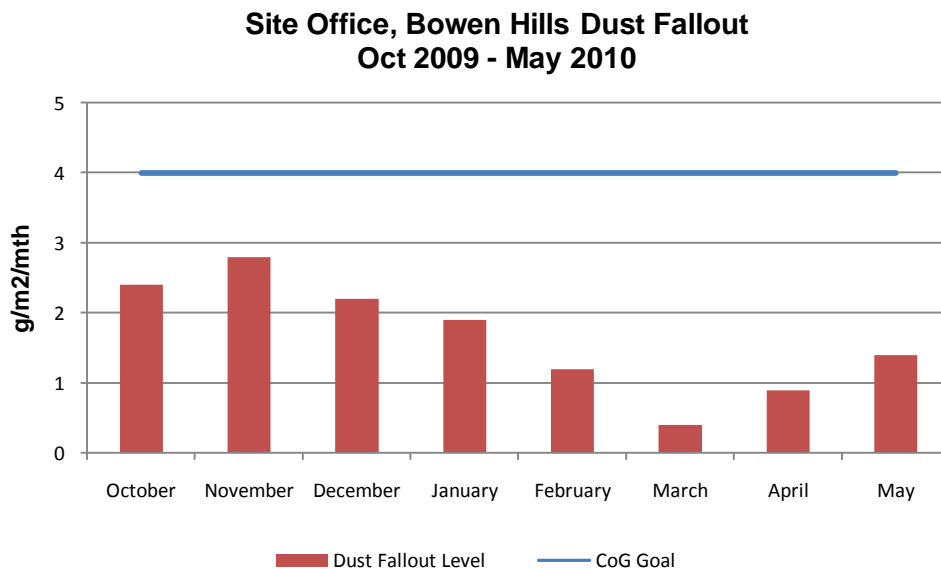


Figure 4.3.2 Site Office, Bowen Hills Dust Deposition Results (for monitor location refer to figure 2.1- D2)

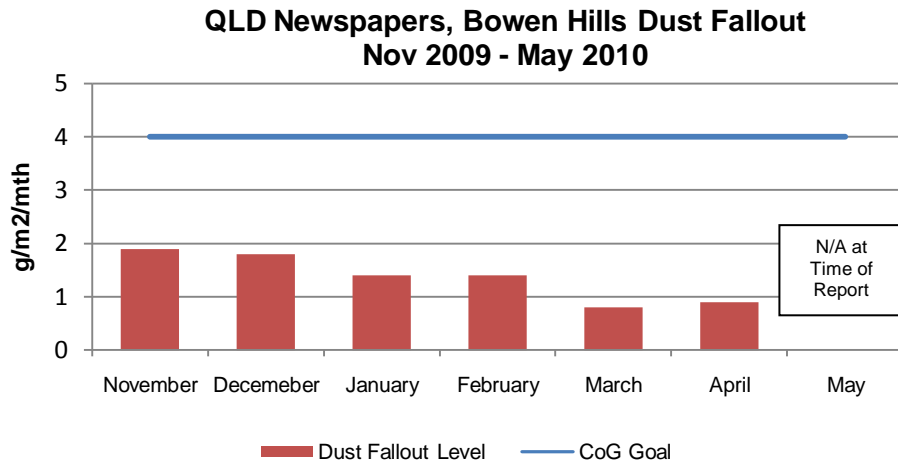


Figure 4.3.3 QNP, Bowen Hills Dust Deposition Results (monitor location 41 Campbell St, Bowen Hills)

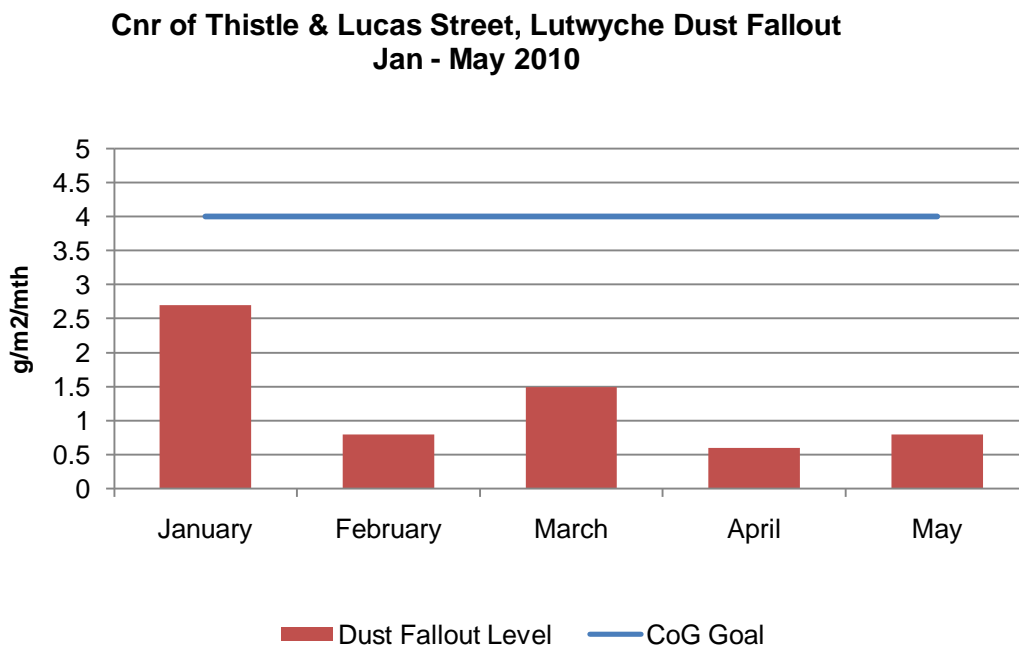


Figure 4.3.4 Cnr of Thistle & Lucas Street, Lutwyche Dust Fallout Results (location refer to figure 2.3 – D2)

Kedron Brook Reserve, Northern Busway Dust Fallout Jan - May 2010

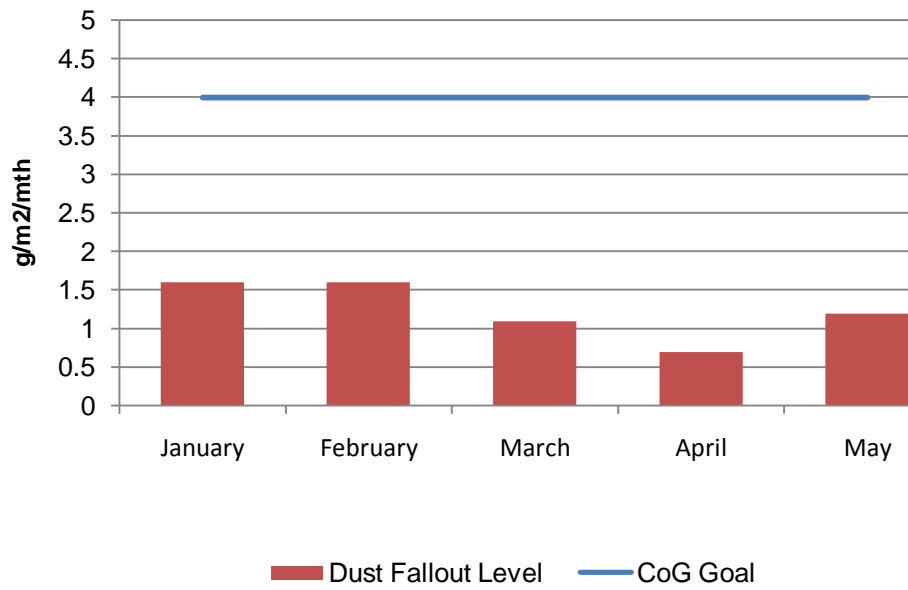


Figure 4.3.5 Kedron Brook Reserve, Northern Busway Dust Fallout Results (location refer to figure 2.3 – D1)

Dust Fallout, Erskine Avenue Kedron Oct 2009 - April 2010

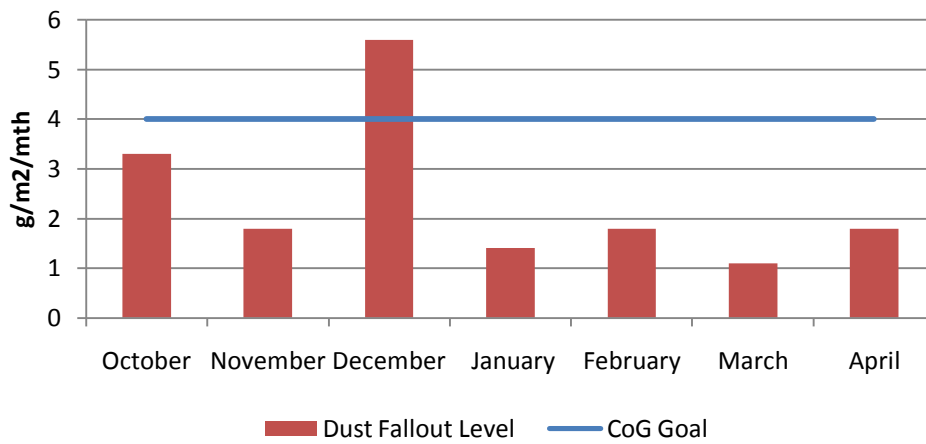


Figure 4.3.6 Erskine Avenue, Kedron Dust Fallout Results (location refer to figure 2.4 – D1)

Dust Fallout Kedron State High School Kedron Oct 2009 - April 2010

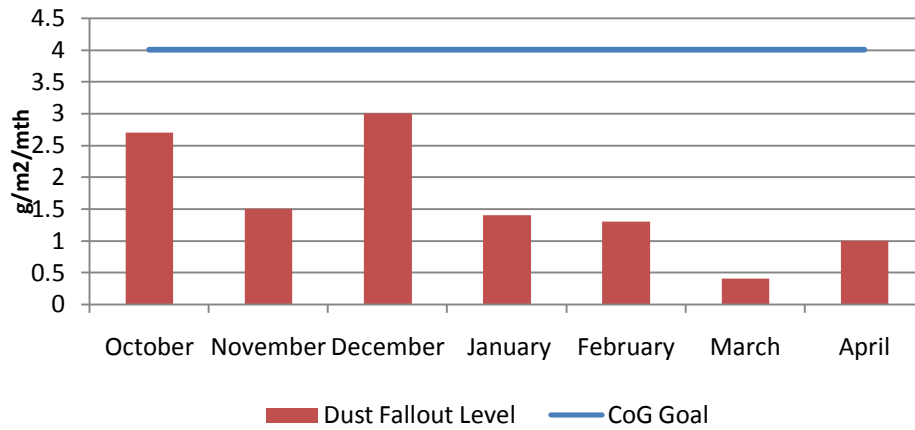


Figure 4.3.7 Adj Kedron SHS, Kedron Dust Fallout Results (location refer to figure 2.4 – D2)

Dust Fallout Wooloowin State School Wooloowin Oct 2009 - April 2010

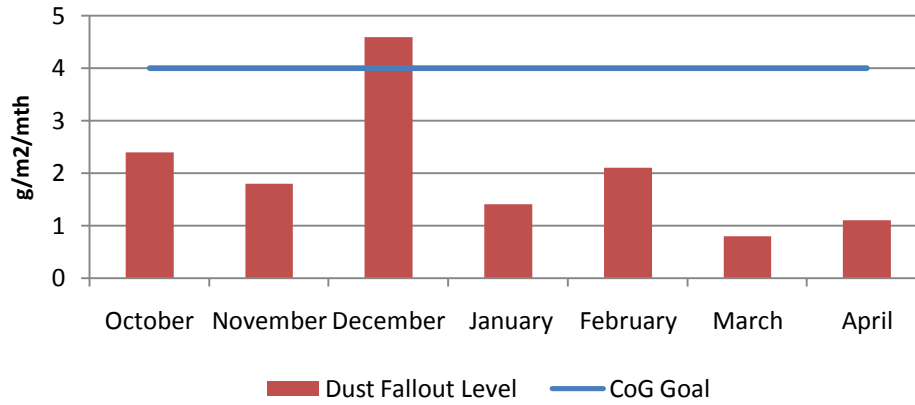


Figure 4.3.8 Wooloowin SS, Kedron Dust Fallout Results (location refer to figure 2.4 – D3)

Dust Fallout Perry Street Lutwyche Oct 2009- April 2010

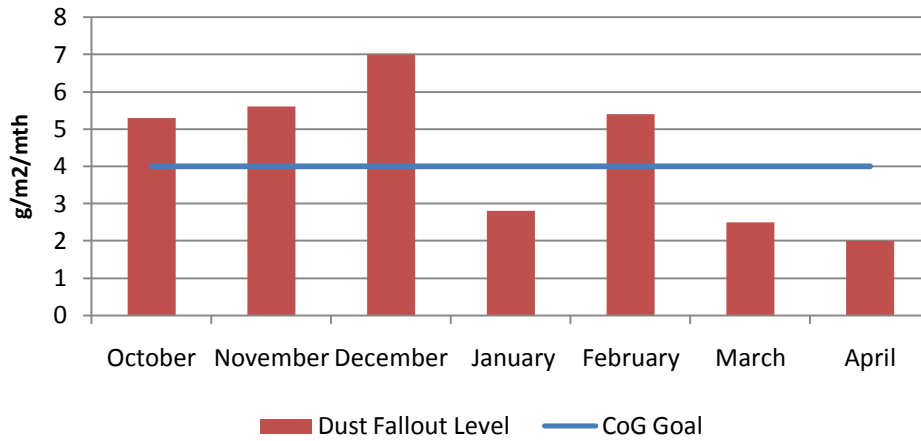


Figure 4.3.9 Perry St, Lutwyche Dust Fallout Results (location refer to figure 2.4 – D4)

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

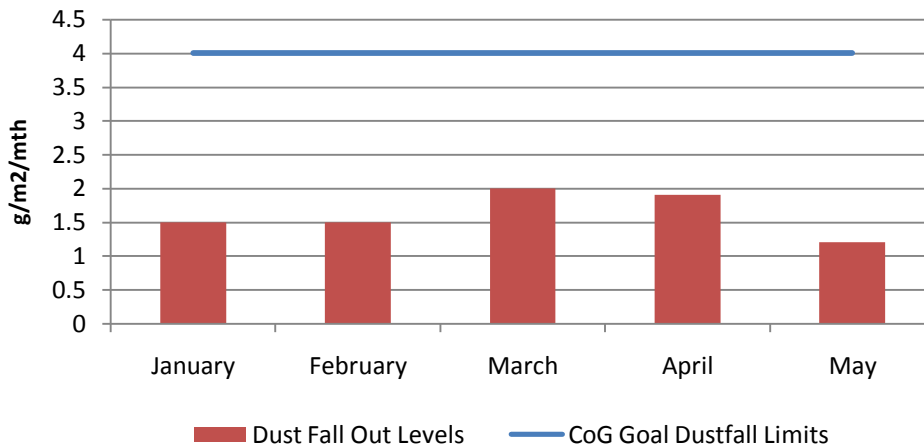


Figure 4.3.10 68 Park Road, Wooloowin Dust Fallout Results (location refer to figure 2.5 – D1)

Kalinga Street, Toombul Dust Fallout Nov 2009 - April 2010

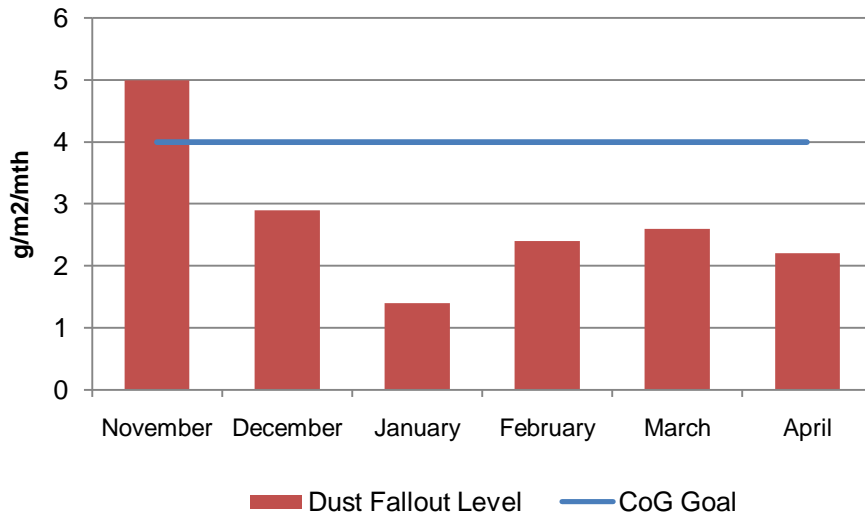


Figure 4.3.11 56 Kalinga Street Toombul, Dust Fallout Results (location refer to figure 2.6 – D1)

Mabel Street, Toombul Dust Fallout Level April 2010

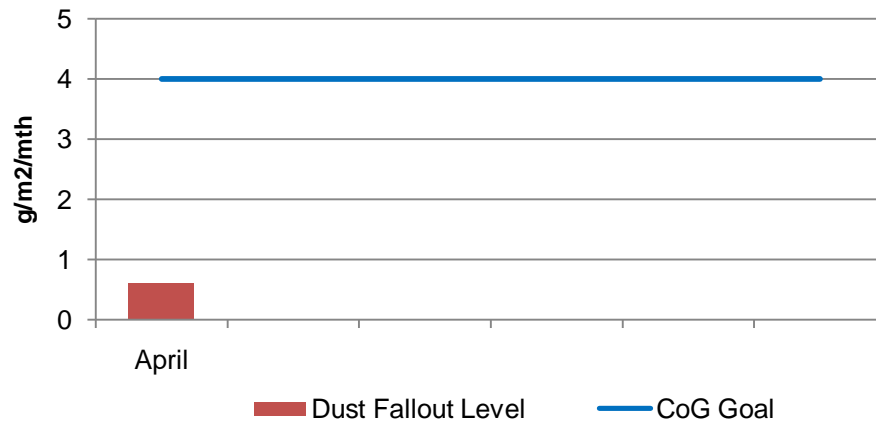


Figure 4.3.12 Mabel Street, Clayfield Dust Fallout Results (location refer to figure 2.6 – D2)

Bage Street, Toombul Dust Fallout Level Nov 2009 - April 2010

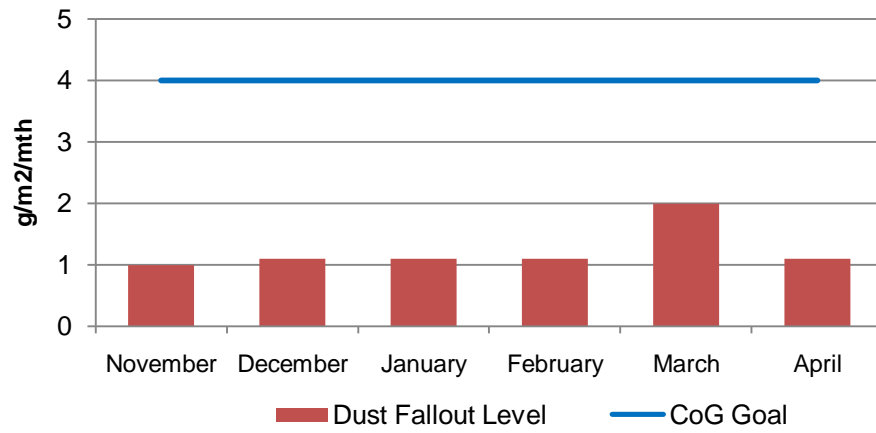


Figure 4.3.13 Bage Street Toombul, Dust Fallout Results (location refer to fig 2.6 – D3)

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.

71 Park Road, Woolloowin					
Date	Peak Date and Time	CO (mg/m ³) Peak	CO Goal (mg/m ³)	NO ₂ (µg/m ³) Peak	NO ₂ Goal (µg/m ³)
30/04/2010 to 15/05/2010	15/05/2010 13:50	1.23	11	-	-
21/04/2010 to 15/05/2010	7/05/2010 18:00	-	-	83.08	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 exceedences 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 Tunnels

Location	Monitoring Period	Peak Particle Velocity* (mm/s)	Adopted Goal (mm/s)	Comments
14 Gallway Street	16/04/10-15/05/10	1.09	5	Results are within adopted goals
15 Bryden Street	16/04/10-15/05/10	2.59	5	Results are within adopted goals
Muruk Haus (230 Lutwyche Road)	16/04/10-15/05/10	0.31	5	Results are within adopted goals
Area 1 Site (Opposite 5 Morris Street)	06/05/10-15/05/10	0.65	5	Results are within adopted goals

Table 5b: Vibration Monitoring Results Summary – Northern Busway

Location	Monitoring Period	Peak Particle Velocity (mm/s)	Adopted Goal (mm/s)	Comments
Wallace Park (Heritage listed bomb shelter)	15/04/10-04/05/10	0.41	2	Results are within adopted goals
Lutwyche Centro (Nth End of Building)	28/04/10-15/05/10	0.64	2	Results are within adopted goals

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

Location	Monitoring Period	Peak Particle Velocity (mm/s)	Adopted Goal (mm/s)	Comments
Windsor Memorial Park	15/03/10-15/04/10	0.65	2	Results are within adopted goals

Table 5d: Vibration Monitoring Results Summary – Bowen Hills Tunnels Southbound Portal

Location	Monitoring Period	Peak Particle Velocity (mm/s)	Adopted Goal (mm/s)	Comments
19th April (Southbound Portal)				
Cnr Morris and Federation Street	10 seconds	9.14	25	Results are within adopted goals
14 Gallway Street	10 seconds	30.0	25	The level recorded was above the adopted goal of 25mm/s. After an initial review of the blasting practices it was determined that subsequent blasts will use a reduced level of explosive
Cnr Gallway and Morris Street	10 seconds	25.0	25	Results are within adopted goals
15 Bryden Street	10 seconds	19.3	25	Results are within adopted goals
29 Gallway Street	10 seconds	24.6	25	Results are within adopted goals
34 Federation Street	10 seconds	4.75	25	Results are within adopted goals
23rd April (Southbound Portal)				
Cnr Morris and Federation Street	10 seconds	12.1	25	Results are within adopted goals
14 Gallway Street	10 seconds	28.0	25	The level recorded was above the adopted goal of 25mm/s. After a review of the blasting practices it was determined that for subsequent blasts a further reduction in the level of explosives will be used as a well as

Location	Monitoring Period	Peak Particle Velocity (mm/s)	Adopted Goal (mm/s)	Comments
				an alteration to the hole pattern to reduce the maximum instantaneous charge of the blast
Cnr Gallway and Morris Street	10 seconds	23.5	25	Results are within adopted goals
15 Bryden Street	10 seconds	19.0	25	Results are within adopted goals
29 Gallway Street	10 seconds	21.6	25	Results are within adopted goals
34 Federation Street	10 seconds	6.56	25	Results are within adopted goals

Table 5e: Vibration Monitoring Results Summary - Kedron

Location	Monitoring Period	Peak Particle Velocity (mm/s)	Adopted Goal (mm/s)	Comments
Wooloowin State School	16/04/2010-03/05/2010	0.38	2	Results are within adopted goals
Substation 8	15/04/2010-07/05/2010	0.82	2	Results are within adopted goals

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

Location	Monitoring Period	Peak Particle Velocity (mm/s)	Adopted Goal (mm/s)	Comments
1st May 2010				
Fence line, 17 Park Terrace	30 seconds	3.56	25	Results are within adopted goals
Fence line, 10 Perry Street	30 seconds	1.52	25	Results are within adopted goals
8th May 2010				
Fence line, 17 Park Terrace	30 seconds	0.13	25	Results are within adopted goals
Substation 8	30 seconds	Less than 1.5	2	Results are within adopted goals

1 Gympie Road	30 seconds	Less than 1.5	25	Results are within adopted goals
Fence line, 10 Perry Street	30 seconds	Less than 1.5	25	Results are within adopted goals
13th May 2010				
Fence line, 17 Park Terrace	30 seconds	Less than 1.5	25	Results are within adopted goals
Substation 8	30 seconds	Less than 1.5	2	Results are within adopted goals
1 Gympie Road	30 seconds	Less than 1.5	25	Results are within adopted goals
Fence line, 10 Perry Street	30 seconds	Less than 1.5	25	Results are within adopted goals

Table 5g: Vibration Monitoring Results Summary - Woolloowin

Location	Monitoring Period	Peak Particle Velocity (mm/s)	Adopted Goal (mm/s)	Comments
71 Park Road	15/04/2010 to 19/04/2010	1.79	5	Results are within adopted goals
71 Park Road	20/04/2010 to 27/04/2010	1.59	5	Results are within adopted goals
71 Park Road	28/04/2010 to 4/05/2010	2.95	5	Results are within adopted goals
47 Rose Street	6/05/2010 to 17/05/2010	0.40	5	Results are within adopted goals

5.3 Compliance with Vibration Goals

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

Bowen Hills

- 14 Gallway St on 19/4/2010 and 23/4/2010

The level recorded was above the adopted goal of 25mm/s. After a review of the blasting practices it was determined that for subsequent blasts a further reduction in the level of explosives will be used as well as an alteration to the hole pattern to reduce the maximum instantaneous charge of the blast. After the works complete the property will be re-inspected against the original condition survey to identify any discrepancies / changes to the building.

6.0 Community Enquiries and Complaints

A total of 311 community complaints were reported to the project between 15 April and 15 May 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: 15 April 2010 - 15 May 2010		
Issues	No.	No. of stakeholders
Site noise	108	41
Site out-of-hours	80	28
Parking	30	27
PUPs out-of-hours	29	26
PUPs noise	19	18
Traffic Management	17	14
Mitigation	15	12
Construction vehicle movements	14	9
Worker Behaviour	13	13
Site lighting	12	6
Site dust	11	11
Road condition	11	10
PUPs service outage	10	10
Roadheader noise	9	5
Driver Behaviour	9	7
Truck noise	8	8
Monitoring	7	5
Safety	7	7
Pedestrian/Cyclists	6	4
PUPs reinstatement	5	5
General Construction	4	4
PUPs un-notified work	4	4
Consultation	4	4
Site un-notified work	4	3
Vehicle Damage	4	3
Other	43	41
Total complaints	311	170

6.1 Top 10 issues raised

