



Airport Link / Northern Busway Project

Monthly Environmental Monitoring Report

April 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) | ● Air (PM ₁₀) |
| ● Vibration | ● Air (Dust Deposition) |
- Note: Muruk Haus not shown due to map extremities – physical location 230 Lutwyche Rd, Windsor
 Note: AAMI not shown due to map extremities – physical location 195 Lutwyche Rd, Windsor
 Note: QNP is not shown due to map extremities – physical location 41 Campbell St Bowen Hills

Truro Street Mid Tunnel Monitoring Locations

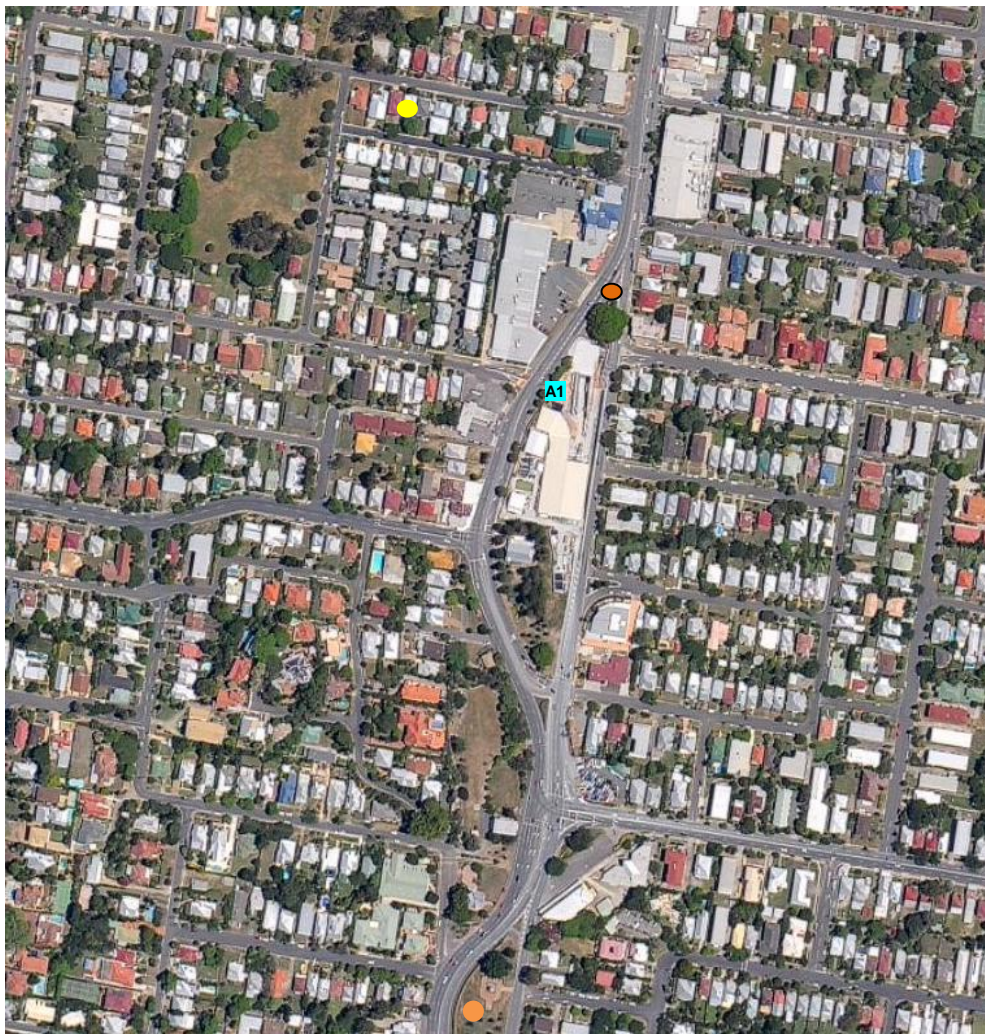


Figure 2.2 – Truro Street Mid Tunnel Monitoring Locations

Legend

- Noise (during construction)
- Vibration

- Air (PM₁₀)
- Air (Dust Deposition)

Note: locations are indicative only

Northern Busway Monitoring Locations



Figure 2.3 – Nthn Busway Monitoring Locations

Legend

● Noise (during construction)

● Vibration

● Air (PM₁₀)

● Air (Dust Deposition)

Note: locations are indicative only

Kedron Monitoring Locations

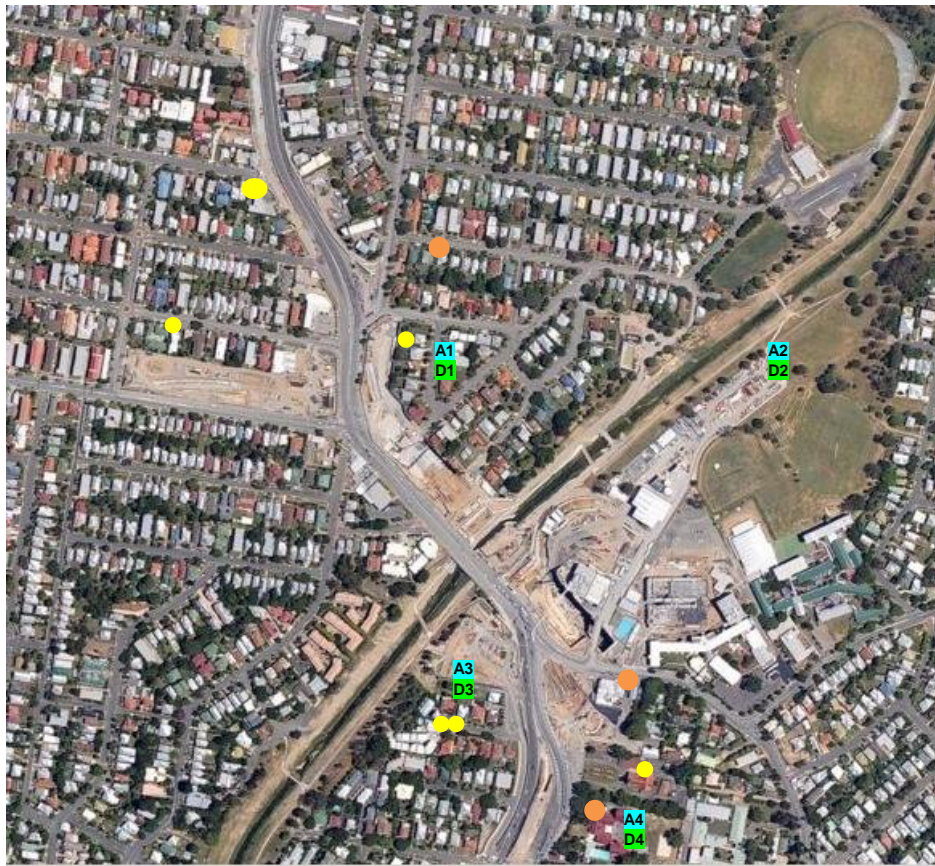


Figure 2.4 – Kedron Monitoring Locations

Legend

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

Note: locations are indicative only

Woollooin Monitoring Locations



Figure 2.5 – Woollooin Monitoring Locations

Legend

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

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. Truro Street on all sides of works
 - iii. Federation/Morris Street (Bowen Hills)
 - iv. Gympie Road (Kedron)
 - b. Temporary noise barrier (shipping container) installations:
 - i. Perry Street, (Kedron)
 - ii. Kalinga Park (Toombul)
 - c. Acoustic sheds have been built at the tunnel portals / access points at:
 - i. Truro Street
 - ii. Bowen Hills
 - iii. Kedron
 - iv. Toombul (TBM)
 - v. Wooloowin Worksite
 - 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. Installation of permanent noise barriers at early stages:
 - i. Gympie Road (Kedron)
 - ii. Stafford Road (Kedron)
 - 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.

3.2 Noise Monitoring Results

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

Table 3a: Noise Monitoring Results – Bowen Hills

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
109 Victoria Street, Windsor								
2 nd Storey, eastern side of building	20/03/2010 9:43am – 9:58am	60.9	45	62	55	-	-	<p>Monitoring Type Attended, Internal monitoring occurred in the living area closest to construction. Windows and doors open</p> <p>Noise Sources The dominant noise source included traffic on Lutwyche Road and rock hammering form construction near Formula 1 Hotel</p> <p>Discussion Exceedences of the goals were attributed to traffic noise from Lutwyche Road and TJH rock hammering activities</p> <p>Mitigation A noise wall is in place along Lutwyche Road. Further consultation will be undertaken with the property owner</p>
2 nd Storey, eastern side of building	20/03/2010 9:59am- 10:13am	55.9	45	58	55	-	-	<p>Monitoring Type Attended, Internal monitoring occurred in the living area closest to construction. Windows and doors closed</p> <p>Noise Sources The dominant noise source included traffic on Lutwyche Road and rock hammering form construction near Formula 1 Hotel</p> <p>Discussion Exceedences of the goals were attributed to traffic noise from Lutwyche Road and TJH rock hammering activities</p> <p>Mitigation A noise wall is in place along Lutwyche Road. Further consultation will be undertaken with the property owner</p>
107 Victoria Street, Windsor								
2 nd Storey, eastern side of building	30/03/2010 2:53pm – 3:07pm	54.5	45	56.1	55	-	-	<p>Monitoring Type Attended. Internal monitoring occurred in the living area closest to construction. Windows and doors open</p> <p>Noise Sources Traffic and rock hammering were the dominant noise sources, air-conditioning unit from the adjacent property was also audible during the monitoring session</p> <p>Discussion Exceedences of the goals were attributed to traffic noise from Lutwyche Road and TJH rock hammering activities</p> <p>Mitigation A noise wall is in place along Lutwyche Road. Further consultation will be undertaken with the property owner</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 nd Storey, eastern side of building	30/03/2010 3:09pm – 3:23pm	41.8	45	43.1	55	-	-	<p>Monitoring Type Attended, Internal monitoring occurred in the living area closest to construction. Windows and doors closed</p> <p>Noise Sources Traffic and TJH rock hammering activities were the dominant noise sources</p> <p>Discussion No exceedance of the CoG goals were recorded during the session whilst the windows and doors were closed</p> <p>Mitigation A noise wall is in place along Lutwyche Road</p>
2 nd Storey eastern side of building	14/04/2010 11:19am – 11:33am	59.5	45	61.4	55	-	-	<p>Monitoring Type Attended. Internal monitoring occurred in the living area closest to construction. Windows and doors open</p> <p>Noise Sources Dominant noise source were TJH rock hammering activities and traffic from Lutwyche Road</p> <p>Discussion Exceedences of the goals were attributed to traffic noise from Lutwyche Road and TJH rock hammering activities</p> <p>Mitigation A noise wall is in place along Lutwyche Road. Further consultation will be undertaken with the property owner</p>
2 nd Storey, eastern side of building	14/04/2010 11:38am – 11:53am	44.5	45	46.4	55	-	-	<p>Monitoring Type Attended. Internal monitoring occurred in the living area closest to construction. Windows and doors closed</p> <p>Noise Sources The dominant noise source was TJH rock hammering activities, with some traffic audible</p> <p>Discussion No exceedance of the CoG goals were recorded during the session whilst the windows and doors were closed</p> <p>Mitigation A noise wall is in place along Lutwyche Road</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
30 Federation Street, Bowen Hills								
2 nd Storey, Flat adjoined to house, left side	09/04/2010 8:40am – 8:54am	56.4	45	57.3	55	-	-	<p>Monitoring Type Attended. Internal monitoring occurred in the living area closest to construction. Windows and doors open</p> <p>Noise Sources The dominant noise source was rock hammering and audible traffic</p> <p>Discussion A noise wall is in place along Federation Street. This property has previously received individual property mitigation</p>
2 nd Storey, Flat adjoined to house left side	09/04/2010 9:00am – 9:14am	41.9	45	42.7	55	-	-	<p>Monitoring Type Attended, Internal monitoring occurred in the living area closest to construction. Windows and Doors closed</p> <p>Noise Sources The dominant noise source was rock hammering and audible traffic</p> <p>Discussion No exceedance recorded</p> <p>Mitigation A noise wall is in place along Federation Street. This property has previously received individual property mitigation</p>
2 nd Storey, Flat adjoined to house	09/04/2010 9:17am – 9:31am	42.8	45	43.7	55	-	-	<p>Monitoring Type Attended, Internal monitoring occurred in the living area closest to construction. Windows and Doors closed</p> <p>Noise Sources The dominant noise source was rock hammering and audible traffic</p> <p>Discussion No exceedance recorded</p> <p>Mitigation A noise wall is in place along Federation Street. This property has previously received individual property mitigation</p>
34 Federation Street, Bowen Hills								
2 nd Storey, living room	8/04/2010 8:08pm- 8:22pm	36.72	40	-	-	54.5	50	<p>Monitoring Type Attended. Internal monitoring occurred in living room. Windows and Doors open</p> <p>Noise Sources Dominant noise source was traffic and TJH construction activities</p> <p>Discussion Exceedance of the LAmax goal was a result of internal noise within the house</p> <p>Mitigation A noise wall is in place along the length of Federation 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
2 nd Storey, living room	8/04/2010 8:08pm-8:22pm	36.72	40	-	-	54.5	50	Monitoring Type Attended. Internal monitoring occurred in living room. Windows and Doors open Noise Sources Dominant noise source was traffic and TJH construction activities Discussion Exceedance of the LA _{max} goal was a result of internal noise within the house Mitigation A noise wall is in place along the length of Federation Street
2 nd Storey, living room	8/04/2010 8:26pm-8:40pm	37.09	40	-	-	64.3	50	Monitoring Type Attended, Internal monitoring occurred in living room. Windows and Doors closed Noise Sources Dominant noise source was traffic and TJH construction activities Discussion Exceedance of the LA _{max} goal was a result of internal noise within the house Mitigation A noise wall is in place along the length of Federation Street

Table 3b: 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
8 McGregor Avenue, Lutwyche								
2 Storey House. Living Room in centre of house	16/03/2010 11:10am-11:24am	45.1	45	45.7	55	62.8	-	Monitoring Type Attended, Internal monitoring. Windows and Doors open Noise Sources The dominant noise source was the traffic on Lutwyche Road. Works on the nearby Northern Busway site were audible. Works included saw cutting and crane movements around site Discussion Monitoring was to assess the level of impact that the continuous operation of the onsite generator was causing to nearby residents. The levels recorded were as a result of the traffic on Lutwyche Road. No exceedances of the goals was recorded Mitigation The Northern Busway Site (West Lutwyche Rd) has a timber noise wall in place

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 House. Living Room in centre of house	16/03/2010 11:26am- 11:40am	37.4	45	38.1	55	59.9	-	<p>Monitoring Type Attended. Internal monitoring. Windows and Doors closed</p> <p>Noise Sources The dominant noise source was the traffic on Lutwyche Road. Works on the nearby Northern Busway site were audible. Works included saw cutting and crane movements around site</p> <p>Discussion The levels recorded were as a result of the traffic on Lutwyche Road. TJH works did not cause an increase in the level of noise throughout the monitoring period. No exceedences of the goals was recorded</p> <p>Mitigation The Northern Busway Site (West Lutwyche Road) has a timber noise wall in place</p>
2 Storey House. Bedroom, northern end of house.	18/03/2010 7:58pm- 8:12pm	38.5	40	39.6	-	55.4	50	<p>Monitoring Type Attended. Internal monitoring. Windows and Doors open</p> <p>Noise Sources The dominant noise source was the traffic on Lutwyche Road. The generator on the CC702 site was audible intermittently throughout the period</p> <p>Discussion The levels recorded were as a result of the traffic on Lutwyche Road. No exceedences of the goals was recorded</p> <p>Mitigation The Northern Busway Site (West Lutwyche Rd) has a timber noise wall in place</p>
2 Storey House, Bedroom northern end of house.	18/03/2010 8:14pm- 8:28pm	33.5	40	34.2	-	49.9	50	<p>Monitoring Type Attended, Internal monitoring. Windows and Doors closed</p> <p>Noise Sources The dominant noise source was the traffic on Lutwyche Road. The generator on the CC702 site was audible intermittently throughout the period</p> <p>Discussion The levels recorded were as a result of the traffic on Lutwyche Road. No exceedences of the goals was recorded</p> <p>Mitigation The Northern Busway Site (West Lutwyche Rd) has a timber noise wall in place</p>
Unit 3/ 26 Bradshaw Road, Lutwyche								
2 nd Storey Unit. Bedroom western side of unit.	23/03/2010 9:13am- 9:27am	47.4	45	48.7	55	57.6	-	<p>Monitoring Type Attended. Internal monitoring. Windows and Doors closed</p> <p>Noise Sources The dominant noise sources during the period were hammering in CC602 and air blasting and saw cutting on BR702</p> <p>Discussion The exceedance of the goals was a result of TJH construction works on the adjacent</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
								Northern Busway Site Mitigation After consultation with the community team the resident will be supplied with mitigation. Once the mitigation is installed future noise monitoring will be undertaken to ascertain its effectiveness
2 nd Storey Unit. Bedroom western side of unit.	23/03/2010 9:30am-9:44am	61.5	45	62.4	55	73.1	-	Monitoring Type Attended, Internal. Windows and Doors open Noise Sources The dominant noise sources during the period were hammering in CC602 and air blasting and saw cutting on BR702 Discussion The exceedance of the goals was a result of TJH construction works on the adjacent Northern Busway Site Mitigation After consultation with the community team the resident will be supplied with mitigation. Once the mitigation is installed future noise monitoring will be undertaken to ascertain its effectiveness

Table 3c: Noise Monitoring Results – Truro Street 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
24 Wesley Street, Lutwyche								
2 Storey house. 1 st Floor Rumpus room	08/04/2010 10:55am-11:09am	35.5	40	34.4	-	45.7	50	Monitoring Type Attended. Internal. Windows and Doors closed Noise Sources The dominant noise source was internal noise (i.e. house creaking/ spa bath on deck of house). Traffic on Lutwyche Road was also audible throughout Discussion Monitoring was to determine the impact from the tunnelling operations in the northbound tunnel heading at Truro Street. No TJH tunnelling works were audible during the monitoring period. The result was within CoG goals Mitigation N/A
2 Storey house. 1 st Floor Rumpus room	09/04/2010 9:26pm-9:40pm	33.2	40	32.1	-	62.0	50	Monitoring Type Attended. Internal. Windows and Doors closed Noise Sources The dominant noise source was internal noise (i.e. house creaking). TJH tunnelling

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
								<p>activities were audible intermittently though no results recorded were above the CoG goals. Traffic on Lutwyche Road was also audible throughout</p> <p>Discussion Monitoring was to determine the impact from the tunnelling operations in the northbound tunnel heading at Truro Street. The exceedance of the goal was a result of internal noise inside the property (i.e. house creaking/ dog barking)</p> <p>Mitigation N/A</p>

Table 3d: 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
Unit 11/ 14 Le Geyt Street, Windsor								
1 st Floor Unit on eastern side of complex	09/04/2010 10:19pm- 10:33pm	34.7	40		-	52.7	50	<p>Monitoring Type Attended. Internal. Windows and Doors closed</p> <p>Noise Sources The dominant noise source was traffic on Lutwyche Road. A train operating on the adjacent Ferry Grove rail line was noted during the period</p> <p>Discussion Monitoring was to determine the impact from the tunnelling operations in both the North and Southbound tunnel. No TJH tunnelling works were audible during the monitoring period. The exceedance of the goal was from a train running on the Ferry Grove line adjacent to the unit complex</p> <p>Mitigation N/A</p>

Table 3e: 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
14-16 Erskine Avenue, Kedron						
Dining/ Lounge Area	31/03/2010 8:58am – 9:13am	56.3	45	57.9	55	<p>Monitoring Type Internal attended monitoring, doors and windows open</p> <p>Noise Source TJH noise sources predominant throughout the session were CC210 works; an excavator and hammer were audible. External noise sources included local and Gympie Road traffic, movement within the premises and local fauna</p> <p>Discussion The dominant noise sources and resultant exceedance of the goals were as a result of TJH Works</p> <p>Mitigation Measures A 1.8m wood paling fence is currently in place, double stacked containers will be installed in the coming weeks</p>
Dining/ Lounge Area	31/03/2010 9:17am – 9:32am	44.3	45	45.6	55	<p>Monitoring Type Internal attended monitoring, doors and windows closed</p> <p>Noise Source TJH noise sources audible throughout the session were CC210 works; including an excavator and hammer. External noise sources included local and Gympie Road traffic, movement within the premises and local fauna</p> <p>Discussion No exceedance was recorded, this indicates CoG goals can be achieved if the doors and windows remain closed</p> <p>Mitigation Measures A 1.8m wood paling fence is currently in place, double stacked containers will be installed in the coming weeks</p>
22 Colton Avenue, Lutwyche						
Lounge Room	31/03/2010 8:00am – 8:15am	43.6	45	44.3	55	<p>Monitoring Type Internal attended monitoring, doors and windows closed</p> <p>Noise Source Kedron South Works (piling, earthworks), Kedron Central Works (piling, rock breaking), external noise (local and Lutwyche Road traffic, passing aeroplanes, local fauna)</p> <p>Discussion This monitoring indicates CoG goals are being met. TJH works were the</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
						predominant noise source throughout the session, background noise was audible intermittent with construction noise Mitigation Measures Mitigation measures include a noise wall along the western side of Lutwyche Road and double stacked shipping containers running parallel to Colton Ave
Lounge Room	31/03/2010 8:20am – 8:35am	52.3	45	53.1	55	Monitoring Type Internal attended monitoring, doors and windows open Noise Source Kedron South Works (piling, earthworks), Kedron Central Works (piling, rock breaking), external noise (local and Lutwyche Road traffic, passing aeroplanes, local fauna) Discussion TJH works were the predominant noise source throughout the session, background noise was audible intermittent with construction noise. TJH construction activities caused an exceedance of the CoG goals Mitigation Measures Mitigation measures include a noise wall along the western side of Lutwyche Road and double stacked shipping containers running parallel to Colton Ave
Lounge Room	31/03/2010 2:06pm – 2:21pm	43.8	45	45.2	55	Monitoring Type Internal attended monitoring, doors and windows closed Noise Source Kedron South Works (piling, earthworks), Kedron Central Works (piling, rock breaking), external noise (local and Lutwyche Road traffic, passing aeroplanes, local fauna) Discussion This monitoring indicates CoG goals are not being exceeded. TJH works were the predominant noise source throughout the session, background noise was audible intermittent with construction noise Mitigation Measures Mitigation measures include a noise wall along the western side of Lutwyche Road and double stacked shipping containers running parallel to Colton Ave
Lounge Room	31/03/2010 2:26pm – 2:41pm	47.3	45	47.5	55	Monitoring Type Internal attended monitoring, doors and windows closed Noise Source Kedron South Works (piling, earthworks), Kedron Central Works (piling, rock breaking), external noise (local and Lutwyche Road traffic, passing aeroplanes, local fauna) Discussion TJH works were the predominant noise source throughout the session, background noise was audible intermittent with construction noise. TJH construction activities

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
						caused an exceedance of the CoG goals Mitigation Measures Mitigation measures include a noise wall along the western side of Lutwyche Road and double stacked shipping containers running parallel to Colton Ave
24 Colton Avenue, Lutwyche						
Bedroom	26/03/2010 2:00pm – 2:15pm	47.1	45	47.7	55	Monitoring Type Internal attended monitoring, doors and windows open Noise Source Kedron South Works (piling, earthworks), External noise (local and Lutwyche Road traffic, passing aeroplanes, local fauna) Discussion The predominant noise sources were from TJH. Background noise sources were audible when construction noise was intermittent. TJH construction activities caused an exceedance of the CoG goals Mitigation Measures Mitigation measures include a noise wall along the western side of Lutwyche Road and double stacked shipping containers running parallel to Colton Ave
Bedroom	26/03/2010 2:20pm – 2:35pm	38.3	45	37.9	55	Monitoring Type Internal attended monitoring, doors and windows closed Noise Source Kedron South Works (piling, earthworks), External noise (local and Lutwyche Road traffic, passing aeroplanes, local fauna) Discussion The results indicate that the CoG goals are being met. Both TJH and external noise sources were audible intermittently throughout the monitoring session Mitigation Measures Mitigation measures include a noise wall along the western side of Lutwyche Road and double stacked shipping containers running parallel to Colton Ave
223 Gympie Road, Kedron						
Lounge Room	16/03/2010 2:26pm – 2:40pm	43.9	45	43.6	55	Monitoring Type Internal attended windows and doors closed Noise Source TJH CC702 Works (Franna, excavator, drill rig, plant movement and idling onsite), External (Gympie Road traffic, fauna) Discussion The predominant noise source was traffic on Gympie Road. As bulk excavation continues into the cut and cover structure TJH noise sources are further below ground level, reducing the horizontal projection of noise sources. No exceedance of the goals were recorded Mitigation Measures

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
						This house is currently vacant and is used to gather noise data on the border of the construction footprint for CC702. Mitigation for the CC702 work includes bulk excavation to pile cut-off level and temporary hoarding around sensitive receptors
Lounge Room	16/03/2010 2:44pm – 2:58pm	45.7	45	46.6	55	<p>Monitoring Type Internal attended windows and doors closed</p> <p>Noise Source TJH CC702 Works (Franna, excavator, drill rig, plant movement and idling onsite), External (Gympie Road traffic, fauna, aeroplane)</p> <p>Discussion The predominant noise source was traffic on Gympie Road. As bulk excavation continues into the cut and cover structure TJH noise sources are further below ground level, reducing the horizontal projection of noise sources. A minor of exceedance of the goals was as a result of Gympie Road traffic</p> <p>Mitigation Measures This house is currently vacant and is used to gather noise data on the border of the construction footprint for CC702. Mitigation for the CC702 work includes bulk excavation to pile cut-off level and temporary hoarding around sensitive receptors</p>
Lounge Room	30/03/2010 2:49pm – 3:03pm	45.9	45	45.86	55	<p>Monitoring Type Internal attended windows and doors closed</p> <p>Noise Source TJH CC702 Works (pump, generator, Franna, general construction, pressure hose, plant, grinder), External (Gympie Road traffic, fauna)</p> <p>Discussion The predominant noise source was traffic on Gympie Road. As bulk excavation continues into the cut and cover structure TJH noise sources are further below ground level, reducing the horizontal projection of noise sources. A minor of exceedance of the goals was as a result of Gympie Road traffic</p> <p>Mitigation Measures This house is currently vacant and is used to gather noise data on the border of the construction footprint for CC702. Mitigation for the CC702 work includes bulk excavation to pile cut-off level and temporary hoarding around sensitive receptors</p>
Lounge Room	30/03/2010 3:10pm – 3:24pm	51.6	45	49.76	55	<p>Monitoring Type Internal attended windows and doors closed</p> <p>Noise Source TJH CC702 Works (pump, generator, Franna, general construction, pressure hose, plant, grinder, drill rig, auger), External (Gympie Road traffic, fauna)</p> <p>Discussion The predominant noise source resulted from a combination of TJH works and external noise sources. As bulk excavation continues into the cut and cover</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
						structure TJH noise sources are further below ground level, reducing the horizontal projection of noise sources. An exceedance of the goals was as a result of Gympie Road traffic and TJH construction activities Mitigation Measures This house is currently vacant and is used to gather noise data on the border of the construction footprint for CC702. Mitigation for the CC702 work includes bulk excavation to pile cut-off level and temporary hoarding around sensitive receptors
673 Lutwyche Road, Lutwyche						
Conference Room, Church Hall	09/04/2010 9:20am – 9:35am	48.8	45	50.1	55	Monitoring Type Internal attended with windows and doors closed Noise Source The predominant noise sources were from excavators on TW930 and piling at Perry Street Discussion The predominant sources of noise were from excavators used at TW930, which were operating on the construction site/Church boundary. As works proceed construction noise sources will be situated down lower in the TW930 excavation pit, which will further baffle noise. Exceedance of the goals was as a result of TJH construction activities Mitigation Measures A 3.5 metre noise wall has been constructed along the Church boundary. This room has received mitigation in the form of air conditioning
Conference Room, Church Hall	09/04/2010 9:42am – 9:56am	54.5	45	55	55	Monitoring Type Internal attended with windows and doors closed. The air conditioner in the room was turned on for this session Noise Source The predominant source of noise for this session was from the air conditioner. External noise sources were from excavators at TW930 Discussion The air conditioner in the room operated at an average background level of 54.4 dba, which is above the CoG goals. This session saw a reduction in the amount of construction noise observed due to the mitigation supplied (a/c). As works proceed construction noise sources will be situated down lower in the TW930 excavation pit, which will further baffle noise. Exceedance of the goals was as a result of the air-conditioning unit and TJH construction activities Mitigation Measures A 3.5 metre noise wall has been constructed along the Church boundary. This room has received mitigation in the form of air conditioning

Table 3f – Night Time Noise Monitoring Results - Kedron

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
40 Brookfield Road, Kedron						
Lounge / Dining Room	23/03/2010 9:54pm – 10:09pm	43.7	35	57.3	45	<p>Monitoring Type Internal attended windows and doors closed</p> <p>Noise Source The predominant noise sources were from background noises including adjacent residents talking outside, movement and talking inside the premises and cars in the street</p> <p>Discussion The exceedance of the CoG goals is a result of external noise sources</p> <p>Mitigation A permanent concrete noise wall is in place along the Stafford Rd worksite boundary</p>
Lounge / Dining Room	23/03/2010 9:38pm – 9:53pm	41.4	35	60.8	45	<p>Monitoring Type Internal attended windows and doors open</p> <p>Noise Source The predominant noise sources were from background noises including adjacent residents talking outside, movement and talking inside the premises and cars in the street</p> <p>Discussion The exceedance of the CoG goals is a result of external noise sources</p> <p>Mitigation A permanent concrete noise wall is in place along the Stafford Rd worksite boundary</p>

Table 3g – Noise Monitoring Results Wooloowin

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)	L _{AMAX} (15 min) (dBA)	CoG Goal L _{AMAX} (15 min) (dBA)	Comments
71 Park Road, Wooloowin								
Unit 1 (closest room to worksite)	13/04/2010 7:25 – 7:40PM	45.8	40	-	-	60.4	50	<p>Monitoring Type Attended Noise Monitoring. Doors and Windows Open</p> <p>Noise Sources Engine rev from elevated work platform (EWP), road traffic noise, banging, plane, drill, talking, dog, steel banging</p> <p>Discussion Engine rev from the EWP and Road Traffic Noise also prevalent. Exceedance was a result of the engine revving noises from the worksite</p> <p>Mitigation Measures A noise wall is in place around the entire Rose Street site. The acoustic shed is now enclosed. The units at 71 Park Road are the closest property to the worksite. The building is vacant and is used by TJH for monitoring purposes</p>
Unit 1 (closest room to worksite)	13/04/2010 10:00pm-10:15pm	38.6	40	-	-	53.2	50	<p>Monitoring Type Attended Noise Monitoring. Doors and Windows Closed</p> <p>Noise Sources Engine rev from elevated work platform (EWP), traffic, drilling, plane horn, banging, train</p> <p>Discussion Engine rev from the EWP and Road Traffic Noise also prevalent. Exceedance was a result of the engine revving noises from the worksite</p> <p>Mitigation Measures A noise wall is in place around the entire Rose Street site. The acoustic shed is now enclosed. The units at 71 Park Road are the closest property to the worksite. The building is vacant and is used by TJH for monitoring purposes</p>
Unit 1 (closest room to worksite)	14/04/2010 4:29am 4:44am	37	40	-	-	46.5	50	<p>Monitoring Type Attended Noise Monitoring. Doors and Windows Closed</p> <p>Noise Sources Engine rev from elevated work platform (EWP) prevalent</p> <p>Discussion No exceedance of the goals was recorded</p> <p>Mitigation Measures A noise wall is in place around the entire Rose Street site. The acoustic shed is now enclosed. The units at 71 Park Road are</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)	L _{AMAX} (15 min) (dBA)	CoG Goal L _{AMAX} (15 min) (dBA)	Comments
								the closest property to the worksite. The building is vacant and is used by TJH for monitoring purposes
Unit 1 (closest room to worksite)	14/04/2010 9:45pm 10:00pm	34	40	-	-	44.5	50	<p>Monitoring Type Attended Noise Monitoring. Doors and Windows Closed</p> <p>Noise Sources Engine rev from elevated work platform (EWP) and traffic was prevalent</p> <p>Discussion No exceedance of the goals was recorded</p> <p>Mitigation Measures A noise wall is in place around the entire Rose Street site. The acoustic shed is now enclosed. The units at 71 Park Road are the closest residential buildings to the shaft. The building is vacant and is used by TJH for monitoring purposes.</p>
Unit 1 (closest room to worksite)	14/04/2010 10:03pm 10:18pm	41.4	40	-	-	50.9	50	<p>Monitoring Type Attended Noise Monitoring. Doors and Windows Open</p> <p>Noise Sources Engine rev from elevated work platform (EWP) and road traffic noise prevalent</p> <p>Discussion Minor exceedance of the goals was as a result of TJH construction activity and traffic</p> <p>Mitigation Measures A noise wall is in place around the entire Rose Street site. The acoustic shed is now enclosed. The units at 71 Park Road are the closest residential buildings to the shaft. The building is vacant and is used by TJH for monitoring purposes.</p>
Unit 1 (closest room to worksite)	15/04/2010 11:22pm 11:36pm	48.1	40	-	-	54.5	50	<p>Monitoring Type Attended Noise Monitoring. Doors and Windows Open</p> <p>Noise Sources Diesel engines, grinding, banging, traffic, horn</p> <p>Discussion Exceedance of the goals was a result of TJH construction activity and traffic</p> <p>Mitigation Measures A noise wall is in place around the entire Rose Street site. The acoustic shed is now enclosed. The units at 71 Park Road are the closest residential buildings to the shaft. The building is vacant and is used by TJH for monitoring purposes.</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)	L _{AMAX} (15 min) (dBA)	CoG Goal L _{AMAX} (15 min) (dBA)	Comments
Unit 1 (closest room to worksite)	15/04/2010 11:45pm 12:01am	40.6	40	-	-	45.9	50	<p>Monitoring Type Attended Noise Monitoring. Doors and Windows Closed</p> <p>Noise Sources Diesel engines, grinding, banging, traffic, horn</p> <p>Discussion No exceedance of the CoG goals was recorded</p> <p>Mitigation Measures A noise wall is in place around the entire Rose Street site. The acoustic shed is now enclosed. The units at 71 Park Road are the closest residential buildings to the shaft. The building is vacant and is used by TJH for monitoring purposes.</p>
68 Park Road, Woolloowin								
Lounge Room	26/03/2010 4:33pm 4:47pm	37.5	45	38.2	55	-	-	<p>Monitoring Type Attended Noise Monitoring. Doors and Windows Closed</p> <p>Noise Sources Engine rev from elevated work platform (EWP) and traffic noise was prevalent</p> <p>Discussion No exceedance of the CoG goals was recorded</p> <p>Mitigation Measures An acoustic shed and noise wall is in place around Rose Street Site</p>

Table 3h: Noise Monitoring Results – Toombul (Daytime)

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
33 Kalinga Street, Clayfield						
Living Room 1 st Floor	18/03/2010 7:48am – 8:02am	47.1	45	47.8	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (Engines, Steel Dropping, Boom Crane, Rattle Gun, Banging, Drilling, Reverse Beeping, Air Horn) plus non-TJH sources (Train, Plane, Birds)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance is due to the construction of the TBM launch box shed. The TBM shed is above the 6m noise wall surrounding the site. Once constructed the shed will aid noise mitigation measures during operation of the TBMs</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Living Room 1 st Floor	18/03/2010 8:06am – 8:20am	41.6	45	42.9	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (Reverse Beeping, Engines, Air Horn, Drilling, Boom Crane TJH Traffic, Banging, Steel on Steel) plus non-TJH sources (Train, Birds, 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. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Living Room 1 st Floor	22/03/2010 10:56am – 11:10am	57.0	45	57.9	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (Engines, Water Blasting, Steel Dropping, Banging, Franna) plus non-TJH sources (Birds)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was due to a delivery via the Lewis Street gate</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</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 1 st Floor	22/03/2010 11:13am – 11:27am	45.2	45	46.1	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (Engines, Steel Dropping, Air Horn, Water Blasting, TJH Traffic, Rattle Gun) plus non-TJH sources (Birds, Train)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance is due to external sources</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Living Room 1 st Floor	22/03/2010 1:34pm – 1:48pm	48.5	45	48.9	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (Engines, Banging, Boom Crane, Grinder, Air Horn) plus non-TJH sources (Leaf Blower, Train)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance is due to the construction of the TBM launch box shed. The TBM shed is above the 6m noise wall surrounding the site. Once constructed the shed will aid noise mitigation measures during operation of the TBMs</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Living Room 1 st Floor	22/03/2010 1:51pm – 2:05pm	39.9	45	40.4	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (Engines, Boom Crane, Rattle Gun, Grinder, Water Blasting, Air Horn, Banging) plus non-TJH sources (Train, Leaf Blower, Local 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. The property was purchased by DMR prior to commencement of the project and is unoccupied</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 1 st Floor	29/03/2010 9:19am – 9:33am	51.0	45	50.3	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (Engines, Banging, Grinder, Truck, Franna, TJH Traffic, Horn, Air Horn, Street Works) plus non-TJH sources (Bird, Train)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance is due to the construction of the TBM launch box shed. The TBM shed is above the 6m noise wall surrounding the site. Once constructed the shed will aid noise mitigation measures during operation of the TBMs</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Living Room 1 st Floor	29/03/2010 9:37am – 9:51am	41.2	45	42.8	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (Engines, Grinder, Banging, Truck, Franna) plus non-TJH sources (Bird, Plane, 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. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Living Room 1 st Floor	29/03/2010 3:40pm – 3:54pm	50.5	45	50.5	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (Engines, Banging, Traffic, Steel Dropping, Air Horn, Horn, Rattle Gun, Drilling, Grinder) plus non-TJH sources (Train, Bird)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance is due to the construction of the TBM launch box shed. The TBM shed is above the 6m noise wall surrounding the site. Once constructed the shed will aid noise mitigation measures during operation of the TBMs</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</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 1 st Floor	29/03/2010 4:05pm – 4:19pm	44.1	45	45.2	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (Engines, Franna, Drill) plus non-TJH sources (Talking, Motor Bike, Bird, 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. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Living Room 1 st Floor	8/4/2010 10:27am – 10:42am	37.6	45	38.4	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (Crane, Franna, Electric Saw) plus non-TJH sources (Train, Birds, Aeroplane)</p> <p>Discussion: Monitoring indicates CoG goals are being met</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Living Room 1 st Floor	8/04/2010 10:47am – 11:01am	47.9	45	49.3	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (Crane, Franna, Electric Saw, Squawker) plus non-TJH sources (Train, Birds)</p> <p>Discussion: Monitoring indicates CoG goals are being exceeded. The exceedance is due to the construction of the TBM launch box shed. The TBM shed is above the 6m noise wall surrounding the site. Once constructed the shed will aid noise mitigation measures during operation of the TBMs</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</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 1 st Floor	13/04/2010 9:24am – 9:38am	52.4	45	53.0	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (Jet Blasting, Air Horn, Engines, Hammering, Banging) plus non-TJH sources (Train, Birds)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance is due to the construction of the TBM launch box shed. The TBM shed is above the 6m noise wall surrounding the site. Once constructed the shed will aid noise mitigation measures during operation of the TBMs</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Living Room 1 st Floor	13/04/2010 9:41am – 9:55am	43.1	45	43.6	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (Engines, Franna, Air Horn, Banging, Truck, Reverse Beeping) plus non-TJH sources (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. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Living Room 1 st Floor	13/04/2010 2:48am – 3:02pm	52.6	45	53.3	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (Engines, Banging, Air Horn, Jet Blasting, TJH Traffic) plus non-TJH sources (Train, Birds, Next Door Banging)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance is due to the construction of the TBM launch box shed. The TBM shed is above the 6m noise wall surrounding the site. Once constructed the shed will aid noise mitigation measures during operation of the TBMs</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</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 1 st Floor	13/04/2010 3:05am – 3:19pm	42.3	45	42.9	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (Engines, Jet Blasting, Air Horn, Grinder, TJH Traffic) plus non-TJH sources (Train, 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. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
70 Kalinga Street, Clayfield						
Back Room 1 st Floor	20/03/2010 8:48am – 9:02am	46.7	45	45.8	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (TJH Truck, Steel on Steel, Banging, Reverse Beeping, Steel Dropping, Workers Talking, Grinding, Air Horn, Engines) plus non-TJH sources (Dog Barking)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance is due to trucks accessing the site through the Lewis Street gate during the monitoring session</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Back Room 1 st Floor	20/03/2010 9:05am – 9:19am	34	45	35.6	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (Reverse Beeping, TJH Truck, Grinding, Air Horn, Banging, Engines, Loud Moving Noise) plus non-TJH sources (Plane, 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. The property was purchased by DMR prior to commencement of the project and is unoccupied</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
Back Room 1 st Floor	20/03/2010 11:15am – 11:29am	43.6	45	44.3	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (Engines, Steel Dropping, Reverse Beeping, Water Blasting, TJH Truck, Banging, Grinder, Truck Horn, Air Horn) plus non-TJH sources (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. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Back Room 1 st Floor	20/03/2010 11:33am – 11:47am	32	45	33.2	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (Engines, Banging, TJH Truck, Water Blasting, Air Horn, Grinder)</p> <p>Discussion: Monitoring indicates that CoG goals are being met</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Back Room 1 st Floor	23/03/2010 7:22am – 7:36am	41.6	45	42.2	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (Engines, Steel Dropping, Banging, Drilling, Reverse Beeping, Air Horn, Franna, Grinder, TJH Traffic) plus non-TJH sources (Train, Local 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. The property was purchased by DMR prior to commencement of the project and is unoccupied</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
Back Room 1 st Floor	23/03/2010 7:39am – 7:53am	31.6	45	32.6	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (engines, reverse beeping, steel dropping, Franna, banging, hammering, air horn) plus non-TJH sources (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. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Back Room 1 st Floor	23/03/2010 1:25pm – 1:39pm	46.2	45	46.2	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (engines, steel on steel, Franna, air horn, workers talking, banging, TJH traffic, banging, steel dropping) plus non-TJH sources (train)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance is due to trucks accessing the site through the Lewis Street gate during the monitoring session</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Back Room 1 st Floor	23/03/2010 1:42pm – 1:56pm	40.3	45	40.6	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (engines, Franna, banging, air horn, rattle gun) plus non-TJH sources (train)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance is due to trucks accessing the site through the Lewis Street gate during the monitoring session</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</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
Back Room 1 st Floor	30/03/2010 10:08am – 10:22am	48.7	45	49.4	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open General construction (rattle gun, spraying noise, engines, steel dropping, horn) plus non-TJH sources (train, plane)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance is due to the construction of the TBM launch box shed. The TBM shed is above the 6m noise wall surrounding the site. Once constructed the shed will aid noise mitigation measures during operation of the TBMs</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Back Room 1 st Floor	30/03/2010 10:26am – 10:40am	37.6	45	38.1	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (engines, Franna, unloading noise) plus non-TJH sources (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. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Back Room 1 st Floor	30/03/2010 1:34pm – 1:48pm	48.3	45	49	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (engines, spraying noise, grinder, banging, rattle gun, air horn, Franna, reverse beeping) plus non-TJH sources (train, local traffic)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance is due to the construction of the TBM launch box shed. The TBM shed is above the 6m noise wall surrounding the site. Once constructed the shed will aid noise mitigation measures during operation of the TBMs</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</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
Back Room 1 st Floor	30/03/2010 1:51pm – 2:05pm	50.7	45	40.2	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (engines, rattle gun, air horn, dropping steel, Franna) plus non-TJH sources (train, phone, plane)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance is due to external sources. When external sources are excluded the LAeq is 36.3 and within the CoG goals</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Back Room 1 st Floor	9/04/2010 10:43am – 10:58am	43.2	45	43.8	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (machinery, materials being moved onsite, beeping) plus non-TJH sources (train, bird, aeroplane)</p> <p>Discussion: Monitoring indicates that CoG goals are being met</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Back Room 1 st Floor	9/04/2010 11:03am – 11:17am	55.1	45	55.4	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (machinery, materials being moved onsite, beeping, crane/boom lifting, metal/ metal, electric saw) plus non-TJH sources (train, bird, aeroplane)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedances were due to both TJH and external sources</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</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
Back Room 1 st Floor	12/04/2010 10:40am-10:54am	49.3	45	49.8	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (engines, water blasting, banging) plus non-TJH sources (train, local traffic)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance is due to the construction of the TBM launch box shed. The TBM shed is above the 6m noise wall surrounding the site. Once constructed the shed will aid noise mitigation measures during operation of the TBMs</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Back Room 1 st Floor	12/04/2010 10:57am-1:11am	39.4	45	38.7	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (engines, water blasting, banging, smaller engines, gantry crane, truck, Franna) plus non-TJH sources (train, 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. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Back Room 1 st Floor	12/04/2010 2:27pm – 2:41pm	46	45	46.3	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (engines, air blasting, unloading bang, truck horn, TJH car) plus non-TJH sources (train)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance is due to the construction of the TBM launch box shed. The TBM shed is above the 6m noise wall surrounding the site. Once constructed the shed will aid noise mitigation measures during operation of the TBMs</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</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
Back Room 1 st Floor	12/04/2010 2:45pm – 2:59pm	36	45	36.6	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (engines, banging, TJH 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. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
5 Wattle Street, Nundah						
Living Area 2 nd Floor	25/03/2010 1:27pm – 1:41pm	52.6	45	52.5	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (plant noise) plus non-TJH sources (wind, radio, plane, and resident interference, train, drilling (neighbours), traffic and helicopter)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance is due to a combination of TJH and external noise sources. The property is on the Brisbane Airport flight path and there is a heavy influence from local traffic on the East West Arterial and the Air Train. TJH plant noise was observed, but was not obtrusive</p> <p>Mitigation Measures: Noise modelling has not identified any mitigation requirements</p>
Living Area 2 nd Floor	25/03/2010 1:10pm – 1:24pm	50.9	45	51.6	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (plant noise) plus non-TJH sources (wind, radio, plane, resident interference, siren, and helicopter)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance is due to a combination of TJH and external noise sources. The property is on the Brisbane Airport flight path and there is a heavy influence from local traffic on the East West Arterial and the Air Train. TJH plant noise was observed, but was not obtrusive</p> <p>Mitigation Measures: Noise modelling has not identified any mitigation requirements</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
89 Jackson Street, Clayfield						
Front Room	15/03/2010 9:37am – 9:51am	47.4	45	48.3	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (crane, Franna, drilling, electric saw, horn, hammer, metal on metal, beeping, grinding attachment - excavator) plus non-TJH sources (train, resident, house gate, local traffic)</p> <p>Discussion: Monitoring indicates that COG goals are being exceeded. The exceedance is due to a combination of TJH and external sources. Additional noise monitoring will occur to further investigate levels</p> <p>Mitigation Measures: Includes a 6m high noise wall</p>
Front Room	15/03/2010 9:55am–10:09am	42.3	45	43.1	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (crane, Franna, gantry crane, bell skip, drilling, horn, hammering, metal on metal, beeping, grinding attachment - excavator) plus non-TJH sources (train, resident, house creak, plane, local fauna)</p> <p>Discussion: Monitoring indicates CoG goals were met</p> <p>Mitigation Measures: Includes a 6m high noise wall</p>
Front Room	15/03/2010 2:05pm – 2:19pm	47.3	45	48.3	55	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (crane, horn, drilling, bell skip, metal on metal, Franna, beeping, grinding attachment - excavator) plus non-TJH sources (train, resident talking, residents car, external house gate, local fauna)</p> <p>Discussion: Monitoring indicates that COG goals are being exceeded. The exceedance is due to a combination of TJH and external sources. Additional noise monitoring will occur to further investigate levels</p> <p>Mitigation Measures: Includes a 6m high noise wall</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
Front Room	15/03/2010 2:22pm-2:36pm	43.1	45	43.8	55	<p>Monitoring Type: Attended internal monitoring, windows and doors closed</p> <p>Noise Sources: General construction (crane, Franna, horn, metal on metal, drilling, bell skip, banging, beeping, bell skip being emptied, grinding attachment - excavator) plus non-TJH sources (train, resident talking, footsteps in house, knocking on door, plane, cough, local traffic)</p> <p>Discussion: Monitoring indicates CoG goals are being met</p> <p>Mitigation: Includes a 6m high noise wall</p>

Table 3i: Night Shift Noise Monitoring Results – Toombul

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
33 Kalinga Street, Clayfield						
Front Bedroom 1 st Floor	16/03/2010 9:57pm- 10:11pm	40.2	40	53.6	50	<p>Monitoring Type: Attended internal monitoring, windows and doors open</p> <p>Noise Sources: General construction (Generators/Engines, Franna, Banging, Steel on Steel, Angle Grinder/Saw, Hammering, Gurney) and non-TJH sources (Train)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedences were caused by a combination of TJH construction activities and external sources</p> <p>Mitigation: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Front Bedroom 1 st Floor	16/03/2010 10:14pm- 10:28pm	30.6	40	40.5	50	<p>Monitoring Type: Attended internal monitoring, windows and door closed</p> <p>Noise Sources: General construction (Generators/Engines, Franna, Banging, Steel on Steel, Compressor/Pump) and non-TJH sources (Train, Bats/Birds, Plane)</p> <p>Discussion: Monitoring indicates that CoG goals are being met</p> <p>Mitigation: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
Front Bedroom 1 st Floor	19/03/2010 7:09pm – 7:23pm	39.7	40	51.8	50	Monitoring Type: Attended internal monitoring, windows and doors open Noise Sources: General construction (Steel on steel) and non-TJH sources (Traffic, train, train horn, plane, car in street) Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was due to a Train Mitigation: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Front Bedroom 1 st Floor	19/03/2010 7:27pm – 7:41pm	34.2	40	56.1	50	Monitoring Type: Attended internal monitoring, windows and door closed Noise Sources: General construction (steel on steel, oxy cutting) and non-TJH sources (traffic, bird, yelling (ext), plane, neighbour emptying recycling bin) Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was due to a plane Mitigation: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Front Bedroom 1 st Floor	22/03/2010 12:38am- 12:52am	43.7	40	53.2	50	Monitoring Type: Attended internal monitoring, windows and door open Noise Sources: General construction (Steel on Steel, Excavators/Loaders, Concrete Pumps) Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedances were due to concreting works Mitigation: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Front Bedroom 1 st Floor	22/03/2010 12:55am- 1:09am	30.7	40	41.5	50	Monitoring Type: Attended internal monitoring, windows and door closed Noise Sources: General construction (Franna, Banging, Steel on Steel, Concrete Pumps) and non-TJH sources (Local Traffic) Discussion: Monitoring indicates that CoG goals are being met Mitigation: Include a 6m noise wall and double stack containers. The property was purchased

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
						by DMR prior to commencement of the project and is unoccupied
Front Bedroom 1 st Floor	23/03/2010 8:30pm- 8:44pm	44.4	40	50.3	50	<p>Monitoring Type: Attended internal monitoring, windows and door open</p> <p>Noise Sources: General construction (Generators/Engines, Cranes, Franna, Banging, Steel on Steel, Drilling, Air Blaster) and non-TJH sources (Train, Dog barking, Sirens)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities</p> <p>Mitigation: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Front Bedroom 1 st Floor	23/03/2010 8:48pm- 9:02pm	32.8	40	44.3	50	<p>Monitoring Type: Attended internal monitoring, windows and door closed</p> <p>Noise Sources: General construction (Generators/Engines, Franna, Banging, Angle Grinder/Saw, Drilling, Hammering, Air Blaster) and non-TJH sources (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. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Front Bedroom 1 st Floor	25/03/2010 11:09pm – 11:23pm	32.9	40	54.8	50	<p>Monitoring Type: Attended internal monitoring, windows and door closed</p> <p>Noise Sources: General construction (concrete pour, steel banging, vibrator, banging and engine rev)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities – concrete pour</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Front Bedroom 1 st Floor	25/03/2010 11:32pm – 11:46pm	42.3	40	53.0	50	<p>Monitoring Type: Attended internal monitoring, windows and door open</p> <p>Noise Sources: General construction (concrete pour, steel banging, airbrakes, squawker, beeper, banging and engine revving) and non-TJH sources (train horn)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a</p>

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
						result of TJH construction activities – concrete pour Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Front Bedroom 1 st Floor	29/03/2010 1:09am- 1:25am	43.2	40	55.6	50	Monitoring Type: Attended internal monitoring, windows and door open Noise Sources: General construction (Cranes, Franna, Banging, Steel on Steel, Angle Grinder/Saw, Hammering) Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities – engine revving from Franna Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Front Bedroom 1 st Floor	29/03/2010 1:25am- 1:39am	34.0	40	47.4	50	Monitoring Type: Attended internal monitoring, windows and door closed Noise Sources: General construction (Cranes, Franna, Banging, Steel on Steel, Angle Grinder/Saw, Hammering) Discussion: Monitoring indicates that CoG goals are being met Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Front Bedroom 1 st Floor	31/03/2010 1:50am- 2:04am	37.3	40	54.3	50	Monitoring Type: Attended internal monitoring, windows and door open Noise Sources: General construction (Cranes, Franna, Banging, Steel on Steel, Angle Grinder/Saw, Drilling, Hammering, Gantry Crane, Hydraulic Crane) Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities – steel on steel banging and crane engine revving Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Front Bedroom 1 st Floor	31/03/2010 2:09am- 2:23am	31.1	40	46.2	50	Monitoring Type: Attended internal monitoring, windows and door closed Noise Sources: General construction (Franna, Banging, Steel on Steel, Hammering, Hydraulic

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
						Crane) and non-TJH sources (Local Traffic) Discussion: Monitoring indicates that CoG goals are being met Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Front Bedroom 1 st Floor	1/04/2010 10:48pm – 11:02pm	40.3	40	65.5	50	Monitoring Type: Attended internal monitoring, windows and door open Noise Sources: General construction (crane hum, metal on metal banging, materials dropping, engine noise) and non-TJH sources (local traffic, bird, train, train horn, car door, voices) Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was as a result of external noise sources Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Front Bedroom 1 st Floor	1/04/2010 11:07pm – 11:21pm	31.4	40	44.1	50	Monitoring Type: Attended internal monitoring, windows and door closed Noise Sources: General construction (crane hum, crane lifting, machinery rev, engine noise, Franna, hammering, spoil removal) and non-TJH sources (train, aeroplane, local traffic, windows shaking) Discussion: Monitoring indicates that CoG goals are being met Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Front Bedroom 1 st Floor	7/04/2010 9:00pm- 9:14pm	42.8	40	64.1	50	Monitoring Type: Attended internal monitoring, windows and door open Noise Sources: General construction (Generators/Engines, Cranes, Franna, Banging, Reversing Squawker, Steel on Steel, Angle Grinder/Saw, Hammering, Gantry Crane) and non-TJH sources (Train, Local Traffic) Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities – steel banging, engine revving and grinding Mitigation: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
Front Bedroom 1 st Floor	7/04/2010 9:17pm- 9:31pm	32.3	40	40.2	50	<p>Monitoring Type: Attended internal monitoring, windows and door closed</p> <p>Noise Sources: General construction (Generators/Engines, Cranes, Franna, Banging, Steel on Steel, Hammering, Gantry Crane) and non-TJH sources (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. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Front Bedroom 1 st Floor	09/04/2010 8.48pm-9.03pm	44.5	40	52.9	50	<p>Monitoring Type: Attended internal monitoring, windows and door open</p> <p>Noise Sources: General construction (Concrete pump, squealing, squawker, scraping, angle grinder, grinding/drilling) and non-TJH sources (train horn, train, dog barking)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities – concrete works</p> <p>Mitigation Measures: Flow rates on the pumps were adjusted to reduce noise impact; in addition site based controls include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Front Bedroom 1 st Floor	9/04/2010 9:05pm – 9:20pm	37.0	40	54.6	50	<p>Monitoring Type: Attended internal monitoring, windows and door closed</p> <p>Noise Sources: General construction (generator, steel on steel, squeal, horn, grinding/drilling, concrete truck, concrete pump) and non-TJH sources (Train)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities – concrete works</p> <p>Mitigation Measures: Flow rates on the pumps were adjusted to reduce noise impact; in addition site based controls include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Front Bedroom 1 st Floor	14/04/2010 8:30pm- 8:44pm	49.6	40	59.0	50	<p>Monitoring Type: Attended internal monitoring, windows and door open</p> <p>Noise Sources: General construction (Banging, Steel on Steel, Concrete Pumps)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities – concrete works</p>

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
						Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Front Bedroom 1 st Floor	14/04/2010 8:46pm- 9:00pm	37.9	40	54.2	50	Monitoring Type: Attended internal monitoring, windows and door closed Noise Sources: General construction (Concrete Pumps) Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities – concrete works Mitigation Measures: Flow rates on the pumps were adjusted to reduce noise impact; in addition site based controls include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
70 Kalinga Street, Clayfield						
Bedroom 1 st Floor	16/03/2010 1:30am-1:44am	37.5	40	46.8	50	Monitoring Type: Attended internal monitoring, window and door open Noise Sources: General construction (Generators/Engines, Cranes, Banging, Steel on Steel, Angle Grinder/Saw, Drilling, Air Blower, Scraping/Dragging) and non-TJH sources (Geckos) Discussion: Monitoring indicates that CoG goals are being met Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Bedroom 1 st Floor	16/03/2010 1:46am- 2:00am	27.2	40	40	50	Monitoring Type: Attended internal monitoring, window and door closed Noise Sources: General construction (Cranes, Franna, Banging, Steel on Steel, Angle Grinder/Saw, Air Blower) Discussion: Monitoring indicates that CoG goals are being met Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Bedroom 1 st Floor	18/03/2010 12:12am- 12:26am	40.3	40	57.7	50	Monitoring Type: Attended internal monitoring, window and door open Noise Sources: General construction (Generators/Engines, Cranes, Banging, Steel on Steel, Angle Grinder/ Saw, Hammering) Discussion:

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
						Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities – general engine noise and cutting / steel on steel noise Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Bedroom 1 st Floor	18/03/2010 12:29am- 12:43am	26.9	40	40	50	Monitoring Type: Attended internal monitoring, window and door closed Noise Sources: General construction (Generators/Engines, Cranes, Franna, Banging, Steel on Steel, Hammering) and non-TJH sources (Train) Discussion: Monitoring indicates that CoG goals are being met Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Bedroom 1 st Floor	19/03/2010 1:49am – 2:03am	34.5	40	53.6	50	Monitoring Type: Attended internal monitoring, window and door open Noise Sources: General construction (grinding/ratchet gun, steel on steel, gantry) and non-TJH sources (cats fighting) Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities – steel on steel banging and grinding Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Bedroom 1 st Floor	19/03/2010 2:07am – 2:21am	24.8	40	45.8	50	Monitoring Type: Attended internal monitoring, window and door closed Noise Sources: General construction (grinding/rattle gun, steel on steel, gantry) Discussion: Monitoring indicates that CoG goals are being met Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Bedroom 1 st Floor	20/03/2010 8:32pm- 8:46pm	41.4	40	54.8	50	Monitoring Type: Attended internal monitoring, window and door open Noise Sources: General construction (Banging, Steel on Steel, Hammering, Concrete Pump) Discussion:

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
						Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities – concrete pour Mitigation Measures: Flow rates on the pumps were adjusted to reduce noise impact; in addition site based controls include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Bedroom 1 st Floor	20/03/2010 8:48pm- 9:02pm	42.7	40	58.3	50	Monitoring Type: Attended internal monitoring, window and door closed Noise Sources: General construction (Banging, Hammering, Concrete Pump) Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities – concrete pour Mitigation Measures: Flow rates on the pumps were adjusted to reduce noise impact; in addition site based controls include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Bedroom 1 st Floor	22/03/2010 8:33pm- 8:46pm	40.3	40	62.7	50	Monitoring Type: Attended internal monitoring, window and door open Noise Sources: General construction (Generators/Engines, Cranes, Franna, Banging, Steel on Steel, Hammering, Beeping, Crane Movement) and non-TJH sources (Train, Local Traffic) Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities – demobbing on cranes from site using the Lewis St gates Mitigation Measures: A protocol has been put in place to minimise use of the Lewis St gates after 6:30pm. Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Bedroom 1 st Floor	22/03/2010 8:49pm- 9:03pm	41.9	40	61.1	50	Monitoring Type: Attended internal monitoring, window and door closed Noise Sources: General construction (Generators/Engines, Banging, Steel on Steel, Hammering, Beeping, Crane Movement) Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities – demobbing on cranes from site using the Lewis St gates Mitigation Measures: A protocol has been put in place to minimise use of the Lewis St gates after 6:30pm.

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
						Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Bedroom 1 st Floor	25/03/2010 12:32am- 12:46am	37.1	40	48.1	50	<p>Monitoring Type: Attended internal monitoring, window and door open</p> <p>Noise Sources: General construction (Generators/Engines, Franna, Steel on Steel, Bell/Mud Skip, Angle Grinder/Saw, Hammering, Air Blaster) and non-TJH sources (Local 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. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Bedroom 1 st Floor	25/03/2010 12:49am- 1:03am	27.5	40	46.5	50	<p>Monitoring Type: Attended internal monitoring, window and door closed</p> <p>Noise Sources: General construction (Generators/Engines, Steel on Steel, Hammering, Air Blaster) and non-TJH sources (Train, Local 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. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Bedroom 1 st Floor	26/03/2010 10:52pm – 11:07pm	31.5	40	61.5	50	<p>Monitoring Type: Attended internal monitoring, window and door closed. Night time monitoring</p> <p>Noise Sources: General construction (banging, air blasting, and gantry crane) and non-TJH sources (train)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedences were due to non-TJH activities (train)</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Bedroom 1 st Floor	26/03/2010 11:08pm – 11:23pm	39.4	40	54.9	50	<p>Monitoring Type: Attended internal monitoring, window and door open. Night time monitoring</p> <p>Noise Sources: General construction (grinding, air blasting, and gantry crane) and non-TJH sources (train)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities – utilisation of the gantry crane under load</p>

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{Amax} (15 min) (dBA)	CoG Goal L _{AMax} (15 min) (dBA)	Comments
						Mitigation Measures: TJH is currently investigating additional measures for the gantry crane operation mitigation. Site based controls include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Bedroom 1 st Floor	27/03/2010 9:16pm – 9:30pm	44.7	40	54.0	50	Monitoring Type: Attended internal monitoring, window and door open Noise Sources: General construction (concrete pump, banging, Franna, steel on steel) and non-TJH sources (train) Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities – concrete pour Mitigation Measures: Flow rates on the pumps were adjusted to reduce noise impact; in addition site based controls include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Bedroom 1 st Floor	27/03/2010 9:33pm- 9:47pm	32.6	40	38.6	50	Monitoring Type: Attended internal monitoring, window and door closed Noise Sources: General construction (Cranes, Banging, Steel on Steel, Concrete Pumps) Discussion: Monitoring indicates that CoG goals are being met Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Bedroom 1 st Floor	29/03/2010 8:44pm- 8:58pm	37.9	40	48.6	50	Monitoring Type: Attended internal monitoring, window and door open Noise Sources: General construction (Cranes, Franna, Banging, Steel on Steel, Angle Grinder/Saw, Hammering) and non-TJH sources (Train, Local Traffic, Plane) Discussion: Monitoring indicates that CoG goals are being met Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Bedroom 1 st Floor	29/03/2010 9:03pm- 9:17pm	27.2	40	46.6	50	Monitoring Type: Attended internal monitoring, window and door closed Noise Sources: General construction (Cranes, Franna, Banging, Steel on Steel, Angle Grinder/Saw, Hammering) and non-TJH sources (Train, Dog Barking)

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
						<p>Discussion: Monitoring indicates that CoG goals are being met</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Bedroom 1 st Floor	31/03/2010 8:46pm- 9:00pm	41.1	40	47	50	<p>Monitoring Type: Attended internal monitoring, window and door open</p> <p>Noise Sources: General construction (Banging, Steel on Steel, Concrete Pumps, Beeping)</p> <p>Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities – concrete pour</p> <p>Mitigation Measures: Flow rates on the pumps were adjusted to reduce noise impact; in addition site based controls include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Bedroom 1 st Floor	31/03/2010 9:03pm- 9:17pm	33	40	44.3	50	<p>Monitoring Type: Attended internal monitoring, window and door closed</p> <p>Noise Sources: General construction (Banging, Steel on Steel, Concrete Pumps)</p> <p>Discussion: Monitoring indicates that CoG goals are being met</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Bedroom 1 st Floor	6/04/2010 12:34am- 12:48am	36	40	47	50	<p>Monitoring Type: Attended internal monitoring, windows and door open</p> <p>Noise Sources: General construction (Generators/Engines, Cranes, Franna, Banging, Reversing Squawker, Steel on Steel, Angle Grinder/Saw, Jackhammer, Drilling, Hammering, Gantry Crane) and non-TJH sources (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. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>
Bedroom 1 st Floor	6/04/2010 12:51am- 1:05am	26.6	40	43	50	<p>Monitoring Type: Attended internal monitoring, windows and door closed</p> <p>Noise Sources: General construction (Cranes, Franna, Banging, Reversing Squawker, Hammering)</p> <p>Discussion:</p>

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
						Monitoring indicates that CoG goals are being met Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Bedroom 1 st Floor	8/04/2010 10:14pm – 10:28pm	31.5	40	45.6	50	Monitoring Type: Attended internal monitoring, windows and door open Noise Sources: General construction (steel on steel, machinery movement, grinding, generator, yelling) and non-TJH sources (train) Discussion: Monitoring indicates that CoG goals are being met Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Bedroom 1 st Floor	8/04/2010 10:31pm – 10:46pm	28.7	40	58.1	50	Monitoring Type: Attended internal monitoring, windows and door closed Noise Sources: General construction (generator and machinery movement) Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities – engine noise and gantry crane operation Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Bedroom 1 st Floor	14/04/2010 12:39am- 12:53am	39.5	40	58.6	50	Monitoring Type: Attended internal monitoring, window and door open Noise Sources: General construction (Cranes, Banging, Reversing Squawker, Steel on Steel, Unknown Rattling) Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a result of TJH construction activities – general construction works Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied
Bedroom 1 st Floor	14/04/2010 12:56am- 1:10am	29.3	40	53.2	50	Monitoring Type: Attended internal monitoring, window and door closed. Noise Sources: General construction (Cranes, Banging, Hammering, Unknown Banging) Discussion: Monitoring indicates that CoG goals are being exceeded. The exceedance was a

Location	Monitoring Period	L _{Aeq} (15 min) (dBA)	CoG Goal L _{Aeq} (15 min) (dBA)	L _{Amax} (15 min) (dBA)	CoG Goal L _{Amax} (15 min) (dBA)	Comments
						<p>result of TJH construction activities – engine noise and general construction works possible</p> <p>Mitigation Measures: Include a 6m noise wall and double stack containers. The property was purchased by DMR prior to commencement of the project and is unoccupied</p>

3.3 Compliance with Noise Goals

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

- Bowen Hills
 - 109 Victoria Street, Windsor
 - 107 Victoria Street, Windsor
 - 30 Federation Street, Windsor
- Northern Busway
 - Unit 3/26 Bradshaw Road, Lutwyche
- Kedron
 - 14-16 Erskine Avenue, Kedron
 - 22 Colton Avenue, Lutwyche
 - 24 Colton Avenue, Lutwyche
 - 223 Gympie Road, Kedron
 - 673 Lutwyche Road, Lutwyche
- Wooloowin
 - 71 Park Road, Wooloowin
- Toombul
 - 33 Kalinga Street, Clayfield
 - 70 Kalinga Street, Clayfield
 - 5 Wattle Street, Nundah
 - 89 Jackson Street, Clayfield

For the AirportLink works an NCR will be raised covering the noise exceedences at the properties mentioned above. The NCR details the reasonable and practical mitigation strategies applied where exceedences of the noise goals are applicable. (i.e some properties above are vacant test monitoring locations)

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) is also occurring at a location in the vicinity of the Wooloowin Worksite.

Results of monitoring are compared to Air Quality Goals nominated by the Coordinator General (Change Report July 2008 & Wooloowin 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 during the following activities:
 - i. Bulk earthworks
 - ii. Haul roads
 - iii. Car parks and hardstands
 - iv. Rock hammering activities

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 – Respirable Dust (PM10)

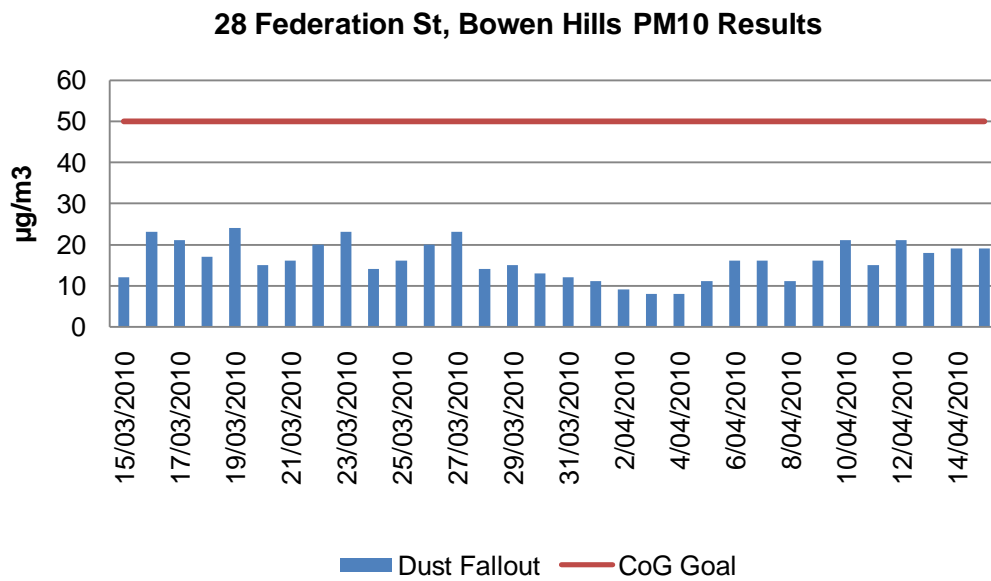


Figure 4.1 Federation Street Bowen Hills PM10 Results (for monitor location refer to figure 2.1-A1)

Truro Street (Site Office), Lutwyche PM10 Results

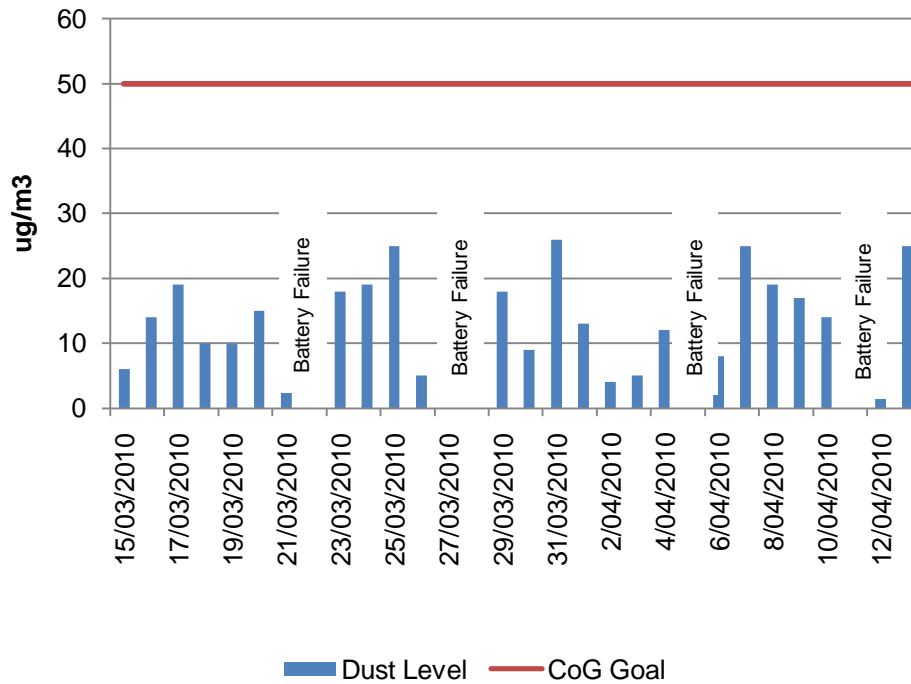


Figure 4.2 Site Office, Truro St PM10 Results (for monitor location refer to figure 2.2- A1)

Northern Busway (Site Office), Lutwyche PM10 Results

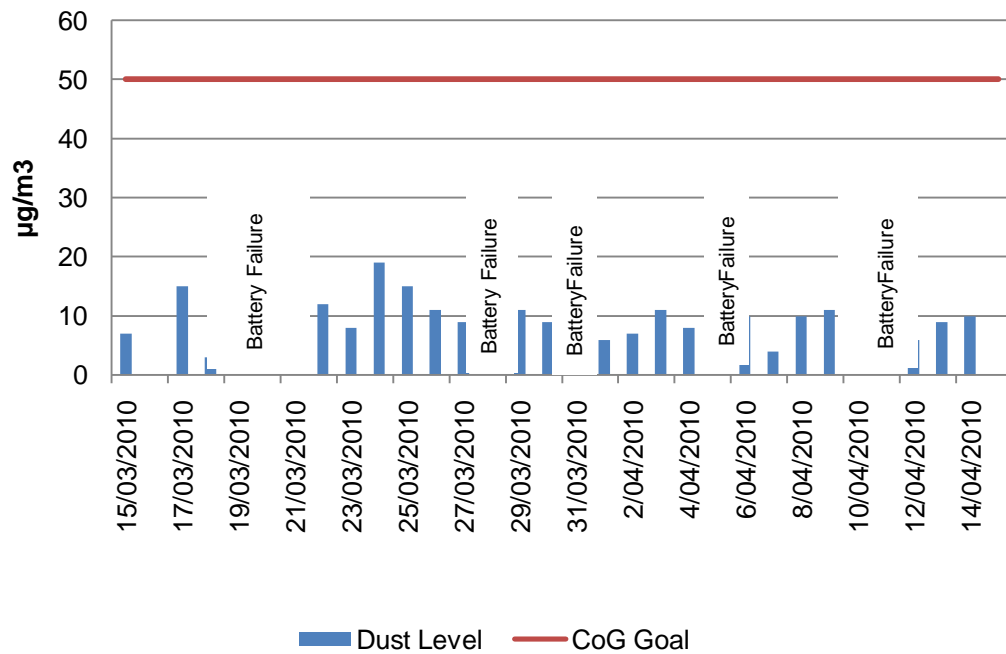


Figure 4.3 Site Office, Northern Busway PM10 Results (for monitor location see figure 2.3 – A1)

Woolowin State School, Kedron PM10 Results

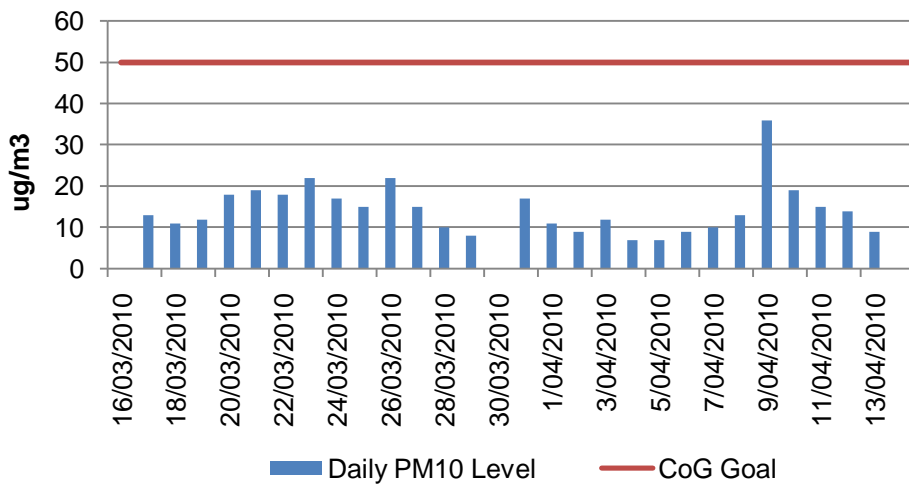


Figure 4.4 Woolowin State School, Kedron PM10 Results (for monitor location see figure 2.4 – A4)

Perry Street, Kedron PM10 Results

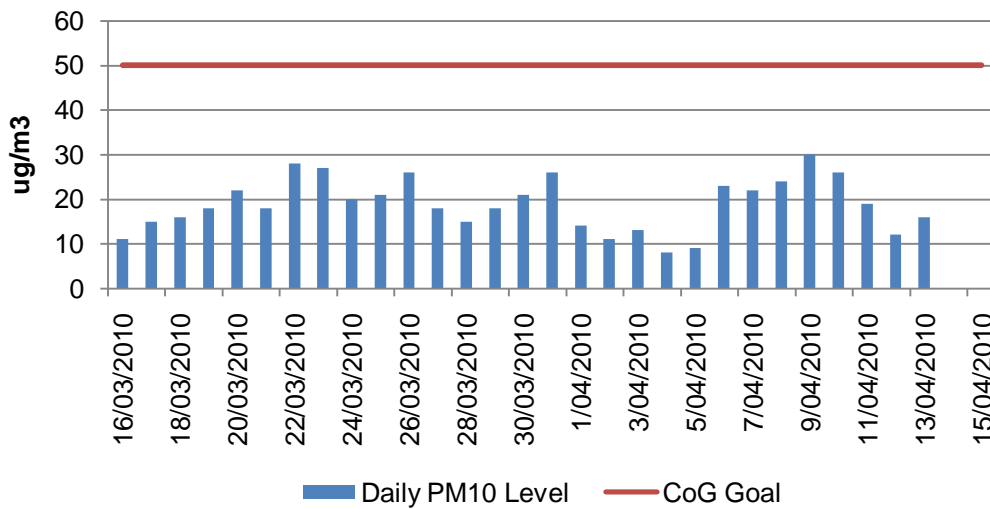


Figure 4.5 Perry Street, Kedron PM10 Results (for monitor location see figure 2.4 – A3)

Kedron State High School, Kedron PM10 Results

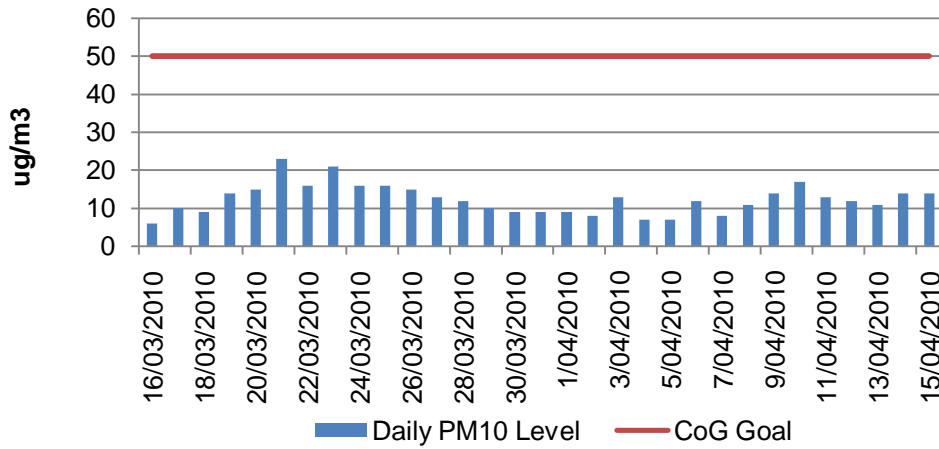


Figure 4.6 Kedron State High School (Adj), Kedron PM10 Results (for monitor location see figure 2.4 – A2)

Erskine Ave, Kedron PM10 Results

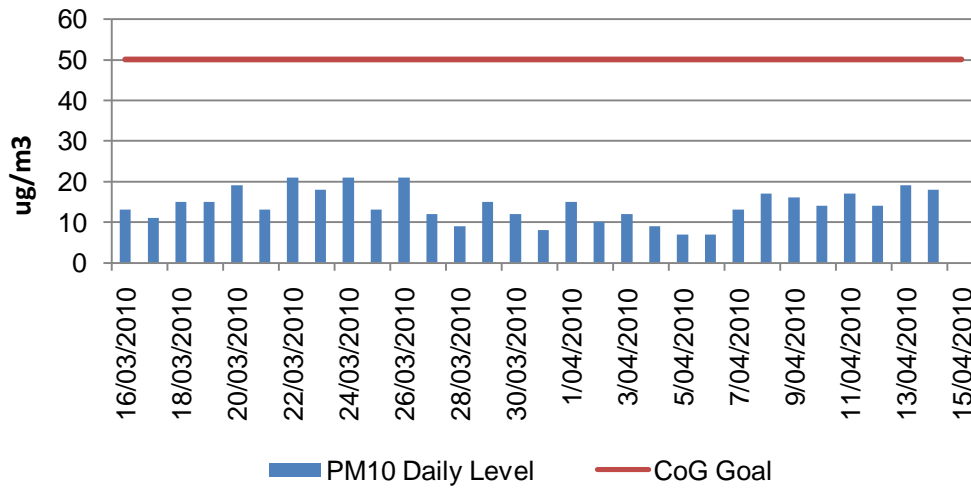


Figure 4.7 Erskine Avenue, Kedron PM10 Results (for monitor location see figure 2.4 – A1)

73 Park Rd, Woolloowin - PM10 Results

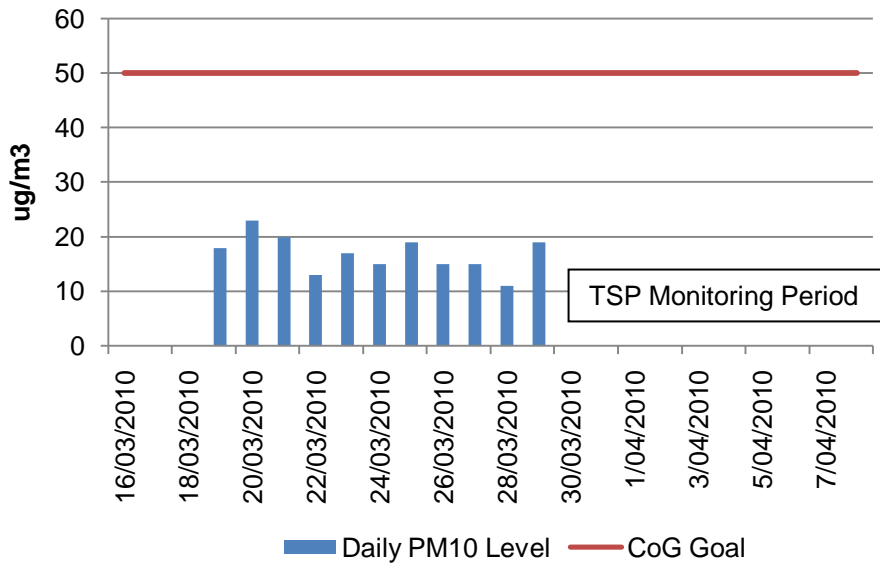


Figure 4.8 73 Park Road, Woolloowin PM10 Results (for monitor location see figure 2.5 – A1)

73 Park Road, Woolloowin TSP Results

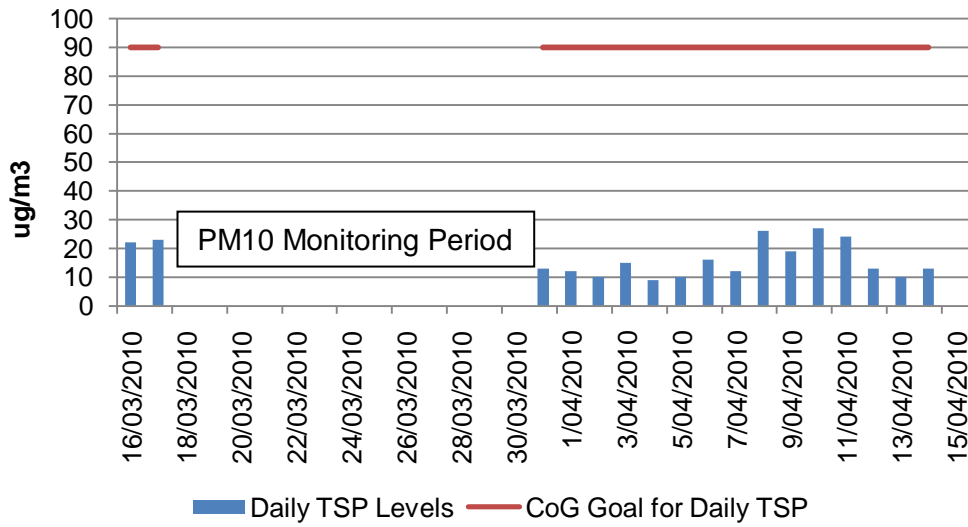


Figure 4.9 73 Park Road, Woolloowin TSP Results (for monitor location see figure 2.5 – A1)

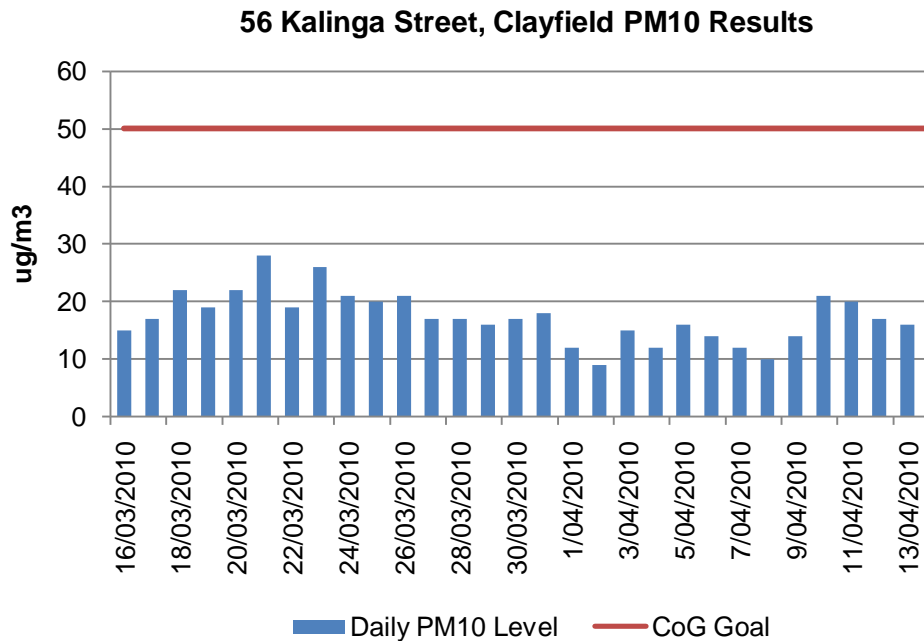


Figure 4.10 56 Kalinga Street, Toombul PM10 Results (for monitor location see figure 2.6 – A1)

4.3 Air Quality Monitoring Results – Dust Deposition

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 above mentioned standard due to access and security difficulties.

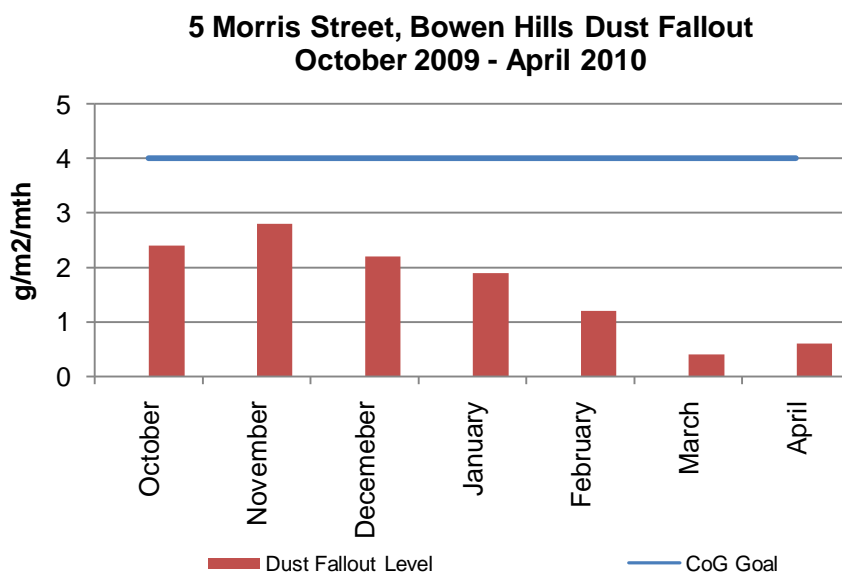


Figure 4.12 5 Morris Street, Bowen Hills Dust Fallout October 2009 – April 2010 (location refer to figure 2.1 – D1)

Site Office, Bowen Hills Dust Fallout October 2009 - April 2010

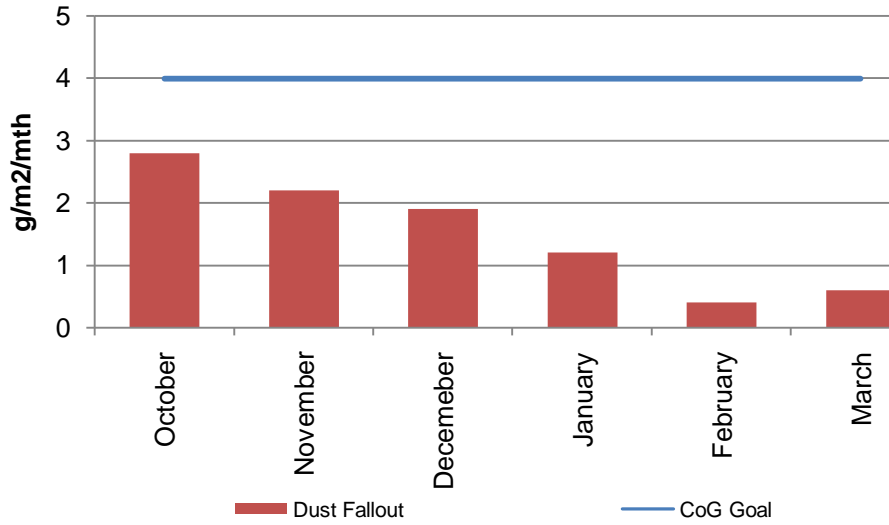


Figure 4.13 Site Office, Bowen Hills Dust Fallout October 2009 – April 2010 (location refer to figure 2.1 – D2)

QLD Newspapers, Bowen Hills Dust Fallout November 2009 - April 2010

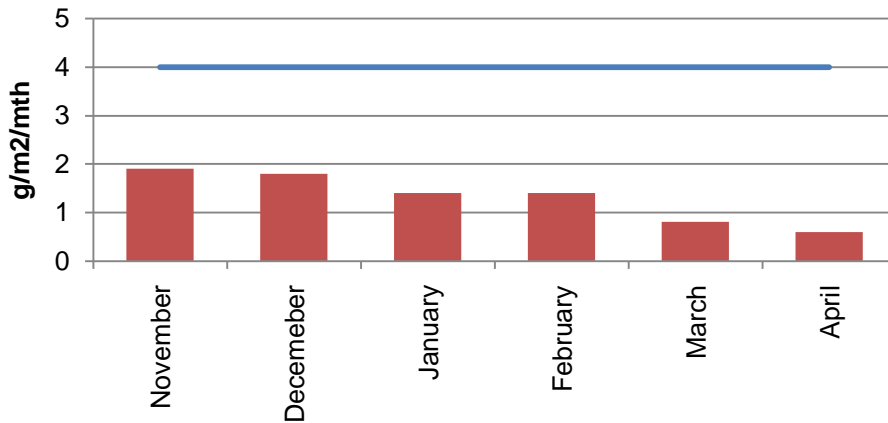


Figure 4.14 QLD Newspapers, Bowen Hills Dust Fallout November 2009 – April 2010 (location refer to figure 2.1)

Cnr of Thistle & Lucas Street, Lutwyche Dust Fallout January - April 2010

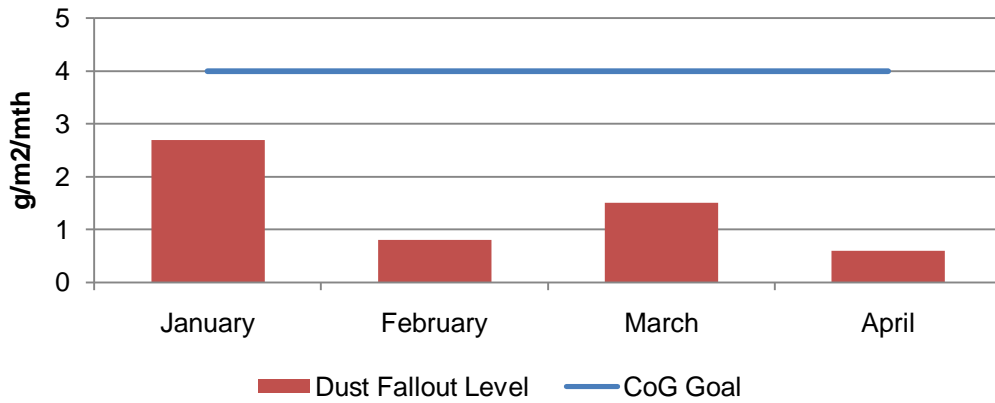


Figure 4.15 Cnr of Thistle & Lucas Street, Lutwyche Dust Fallout January – April 2010 (location refer to figure 2.3 – D1)

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

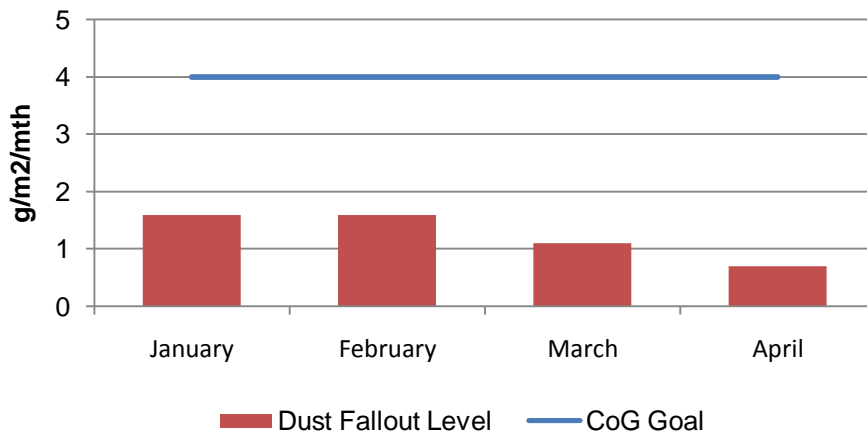


Figure 4.16 Kedron Brook Reserve, Northern Busway Dust Fallout January – April 2010 (location refer to figure 2.3 – D2)

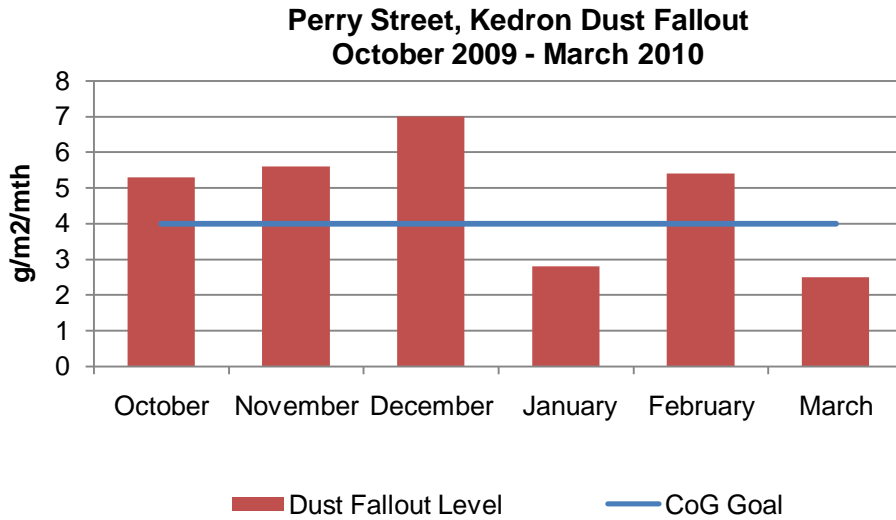


Figure 4.17 Perry Street, Kedron Dust Fallout October 2009 – March 2010 (location refer to figure 2.4 – D3)

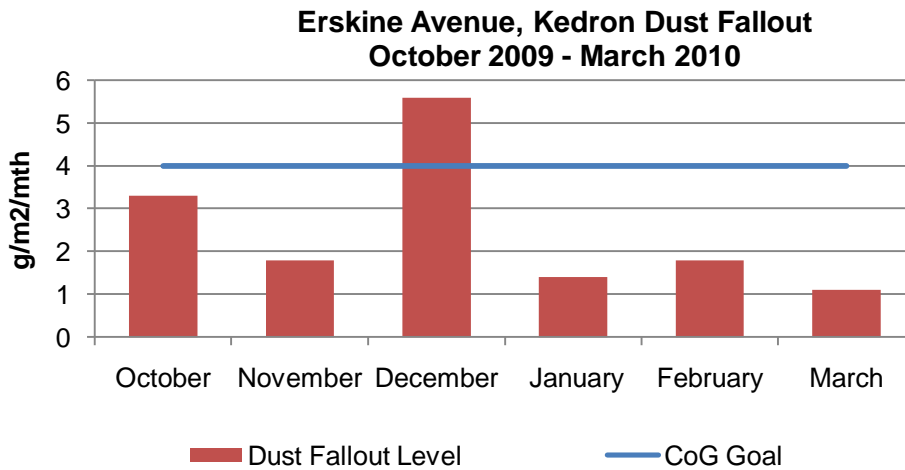


Figure 4.18 Erskine Avenue, Kedron Dust Fallout October 2009 – March 2010 (location refer to figure 2.4 – D1)

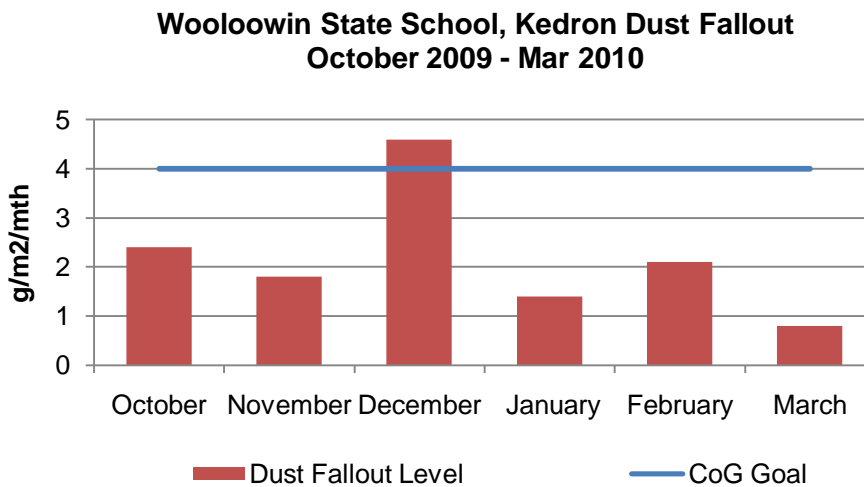


Figure 4.19 Woolloowin State School, Dust Fallout October 2009 – March 2010 (location refer to figure 2.4 – D4)

Kedron High School (Adj), Kedron Dust Fallout October 2009 - March 2010

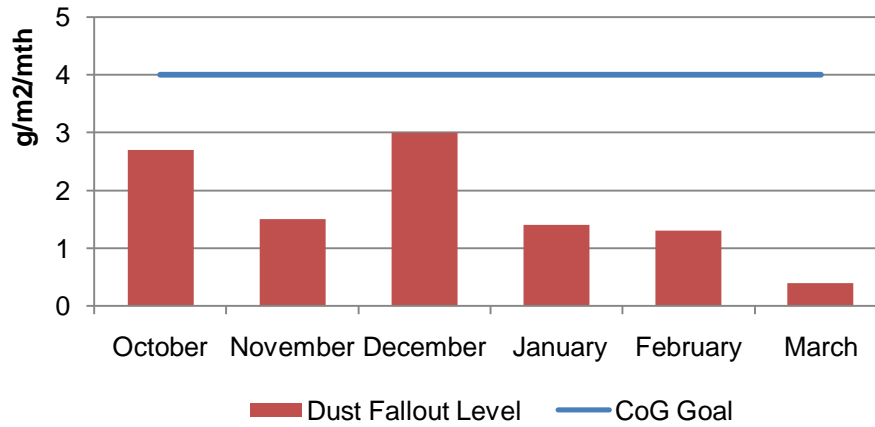


Figure 4.20 Kedron State High School (Adj), Dust Fallout October 2009 – March 2010 (location refer to figure 2.4 – D2)

68 Park Rd, Woolloowin Dust Fall Out January - April 2010

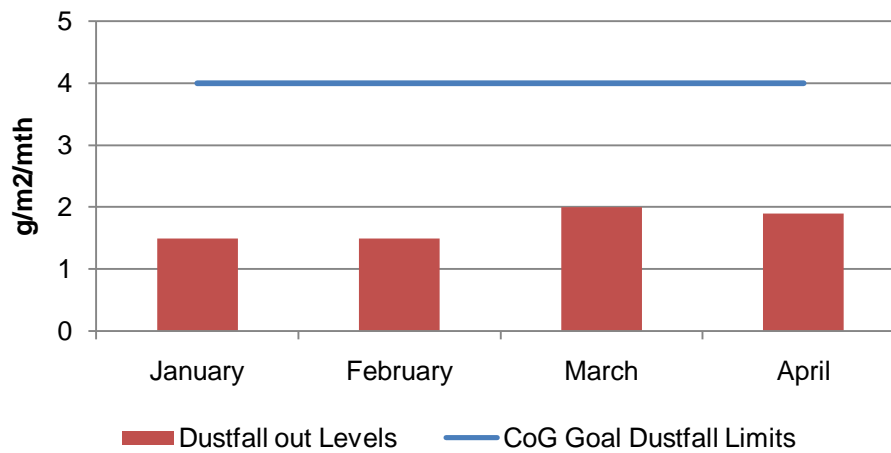


Figure 4.21 68 Park Road Woolloowin, Dust Fallout October 2009 – April 2010 (location refer to figure 2.5 - D1)

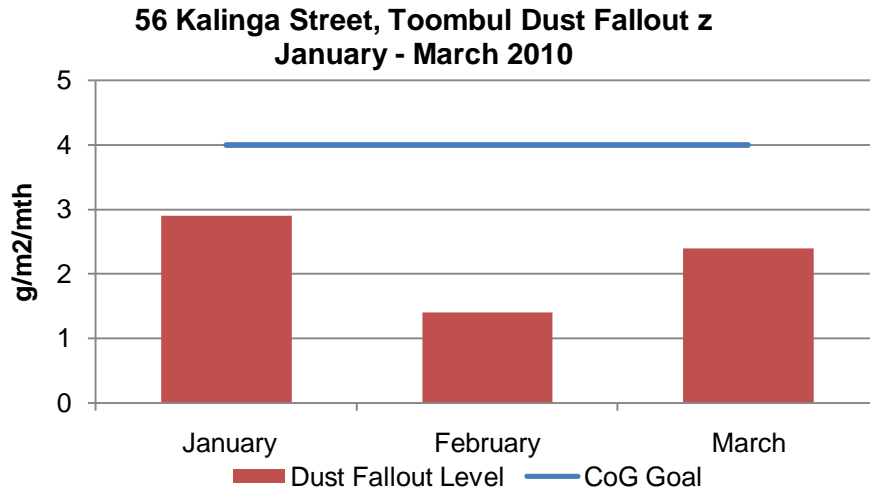


Figure 4.22 56 Kalinga Street Toombul, Dust Fallout October 2009 – March 2010 (location refer to figure 2.6 – D1)

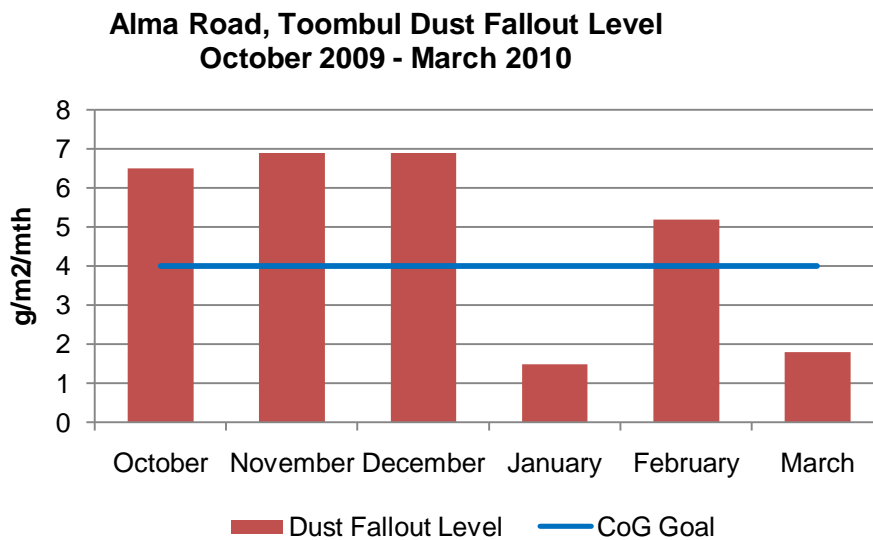


Figure 4.23 Alma Road, Clayfield, Dust Fallout October 2009 – March 2010 (location refer to figure 2.6 – D2)

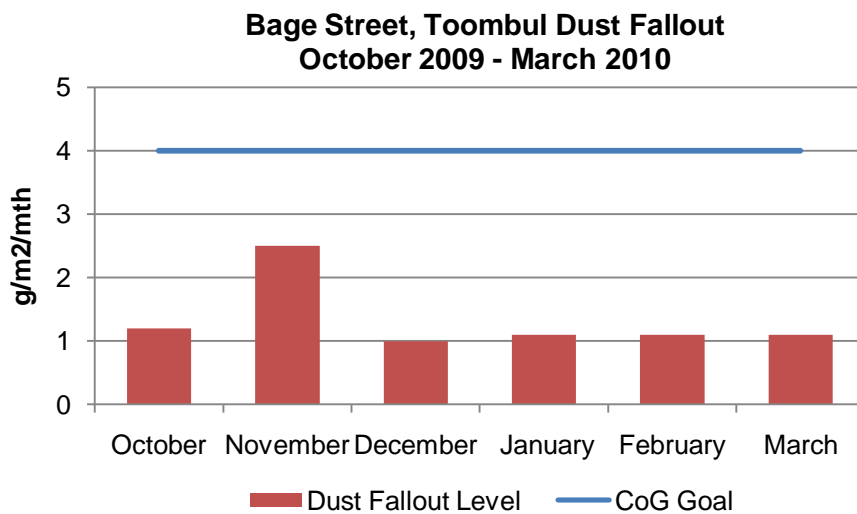


Figure 4.24 Bage Street Toombul, Dust Fallout October 2009 – March 2010 (location refer to fig 2.6 – D3)

4.4 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 nominated by the Coordinator General (Change Report October 2008) for the Airport Link and Northern Busway projects.

5.1 Overview of Vibration Mitigation Measures

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

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

Table 5a: Vibration Monitoring Results Summary – Bowen Hills

Location	Monitoring Period	Peak Particle Velocity (mm/s)	Adopted Limit (mm/s)	Comments
14 Gallway Street	16/03/10-15/04/10	3.19	5	Results are within limits
15 Bryden Street	22/03/10-15/04/10	6.61	5	The recorded vibration level is above the limit. This is due to the low cover between the surface and the tunnel and also the hardness of the excavated material. The community team have been in contact with affected residents and they have been re-located until the works are completed or vibration levels drop below guidelines
Muruk Haus (230 Lutwyche Road)	13/04/10-15/04/10	0.31	5	Results are within limits

Table 5b: Vibration Monitoring Results Summary – Northern Busway (Wallace Park)

Location	Monitoring Period	Peak Particle Velocity (mm/s)	Adopted Limit (mm/s)	Comments
Wallace Park (Heritage listed bomb shelter)	15/03/10-15/04/10	0.60	2	Results are within limits

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

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

Table 5d: Blast Monitoring Results Summary – Bowen Hills Tunnels XP3 and XP4

Location	Monitoring Period	Peak Particle Velocity (mm/s)	Adopted Limit (mm/s)	Comments
16th March (Cross Passage 4)				
Skilmorlie	10 seconds	6.62	25	Results are within limits
Rosemount (QSMA)	10 seconds	21.1	25	Results are within limits
Rosemount (Arthritis Qld)	10 seconds	13.5	25	Results are within limits
195 Lutwyche Road (AAMI Building)	10 seconds	4.81	25	Results are within limits
17th March (Cross Passage 4)				
Skilmorlie	10 seconds	6.48	25	Results are within limits
Rosemount (QSMA)	10 seconds	24.8	25	Results are within limits
Rosemount (Arthritis Qld)	10 seconds	14.8	25	Results are within limits
195 Lutwyche Road (AAMI Building)	10 seconds	6.35	25	Results are within limits
18th March (Cross Passage 4)				
Skilmorlie	10 seconds	8.18	25	Results are within limits
Rosemount (QSMA)	10 seconds	31.8	25	The level recorded was above the adopted limit of 25mm/s. As per protocol 8 of the Conservation Heritage Management Plan (CHMP) we reviewed our procedures and reduced the load of explosives. The

Location	Monitoring Period	Peak Particle Velocity (mm/s)	Adopted Limit (mm/s)	Comments
				review and measures adopted from this review resulted in a reduction of vibration in the following blast to below 25mm/s.
Rosemount (Arthritis Qld)	10 seconds	13.4	25	Results are within limits
195 Lutwyche Road (AAMI Building)	10 seconds	9.26	25	Results are within limits
19th March (Cross Passage 4)				
Skilmorlie	10 seconds	4.68	25	Results are within limits
Rosemount (QSMA)	10 seconds	7.62	25	Results are within limits
Rosemount (Arthritis Qld)	10 seconds	15.4	25	Results are within limits
195 Lutwyche Road (AAMI Building)	10 seconds	4.41	25	Results are within limits

Table 5e: Vibration Monitoring Results Summary - Kedron

Location	Monitoring Period	Peak Particle Velocity (mm/s)	Adopted Limit (mm/s)	Comments
9 5 th Avenue, Kedron	24/03/2010 – 31/03/2010	0.25	5	Results are within limits
Wooloowin State School	31/03/2010 – 9/04/2010	0.25	2	Results are within limits
Substation 8	15/3/2010 – 15/04/2010	0.47	2	Results are within limits

Table 5f: Vibration Monitoring Results Summary - Wooloowin

Location	Monitoring Period	Peak Particle Velocity (mm/s)	Adopted Limit (mm/s)	Comments
Wooloowin Animal Hospital	13/04/2010 -15/04/2010	0.635	5	Results are within limits

5.3 Compliance with Vibration Goals

The monthly averages shown in Tables 5a-f identify the following exceedences of Vibration Goals:

- 15 Bryden St, Bowen Hills – continuous road heading operations caused an exceedance of the vibration guide level for minimal risk of cosmetic damage. This property has received a pre-works building inspection and will be re-inspected once works have been completed. It should also be noted that the resident had been moved out during the works
- Rosemount (QSMA), Bowen Hills – During blasting works the level recorded was above the adopted goal of 25mm/s. As per protocol 8 of the Conservation Heritage Management Plan (CHMP) we reviewed our procedures and reduced the load of explosives. The review and measures adopted from this review resulted in a reduction of vibration in the following blast to below 25mm/s

6.0 Community Enquiries and Complaints

A total of 314 community complaints were reported to the project between 15 March and 15 April 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 Mar 2010 - 15 Apr 2010		
Category	No.	No. of stakeholders
Site noise	113	59
Site out-of-hours	103	54
Parking	37	21
PUPs noise	25	21
Truck noise	20	14
Site dust	18	13
PUPs out-of-hours	17	15
Worker Behaviour	14	13
Construction vehicle movements	13	13
General Construction	13	8
Roadheader noise	13	3
Driver Behaviour	12	11
Site lighting	8	7
PUPs reinstatement	7	5
PUPs service outage	7	7
Traffic Management	7	7
Mitigation	5	5
Road condition	5	3
Roadheader vibration	5	2
Pedestrian/Cyclists	5	5
Truck dust	4	4
Site un-notified work	4	3
Site vibration	4	4
Property Impacts	4	3
PUPs property access	4	4
Total complaints	314	151

6.1 Top 5 issues raised

