ACOUSTIC CONSULTING

Preliminary Acoustic Assessment

Eastern Creek Business Hub
Rooty Hill

Project 212 061

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File : *212 061 R01 v2-1 Preliminary Acoustic Assessment*

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Contents

1 INTRODUCTION

The purpose of this report is to present the results and recommendations of the preliminary acoustic assessment of the proposed Eastern Creek Business Hub located on Rooty Hill Road South, Rooty Hill.

The future development includes a number of retail and bulky goods outlets as well as a children's playground. On the eastern side of the site is open space which is part of the Cumberland Plain Woodland regeneration lands. The current application relates only to the subdivision of the site and an early works package.

The site is on the southern side of Church Street and bounded by the M7 Motorway, Great Western Highway and Rooty Hill Road South.

A State Significant Development Application is proposed which will seek consent for:

- A concept proposal providing a development structure for the proposed Eastern Creek Business Hub including site layout, activities, building envelopes, design guidelines.
- First stage approval for super lot subdivision and early works to accommodate future development.

Section 7 of the Director General's Environmental Assessment Requirements (application SSD 5175) relate to noise:

- *Identify the main noise generating sources and activities at all stages of construction, and any noise sources during operation. Outline measures to minimise and mitigate the potential noise impacts on surrounding occupiers of land.*
- *Outline measures to minimise and mitigate the potential noise impacts on future occupants of the site from identifies noise generating sources, including the M7 Motorway and Great Western Highway.*
- *Relevant Policies and Guidelines:*
    - *NSW Industrial Noise Policy (EPA)*
    - *Interim Construction Noise Guideline (DECC)*

This report addresses the above requirements Director General's requirements in relation to the current application. We note that further acoustic assessments will be required for future stages as more detailed proposals are put forward and the site developed.

This report is based on site inspections and surveys carried out by PKA, site layout plans prepared by Architectus (reproduced in this report) and the Transport Management and Accessibility Plan prepared by Traffix (ref 12.108r01v1 TRAFFX Draft TMAP).

2 SUMMARY

An assessment of potential noise generation has been carried out.

- Operation noise from on-site car parks and loading docks has the potential to comply with the EPA Industrial Noise Policy.
- Noise from additional vehicle movements on public roads due to the development have the potential to comply with the EPA Road Noise Policy.
- Construction noise levels from the site will vary significantly during the development of the business hub. Planning guidelines to minimise and manage potential noise generation are set out in Section 6 of this report.
- We consider that subject to future assessment, noise impacts generated by the future operation of the site can be made satisfactory.
- Noise impacts on the site from existing roads can be made satisfactory for the future developments. Some architectural acoustic upgrades may be required.
- Noise levels from road traffic to the children's playground will comply with the criteria from the EPA NSW Road Noise Policy.
- Further acoustic assessment works will be required at later stages of the project as subsequent development stages are detailed.

3 SITE

The development will include a number of retail and bulky goods outlets as well as a children's playground. On the eastern side of the site is open space which is part of the Cumberland Plain Woodland regeneration lands. There are no plans to provide public access to the regeneration lands.

The site is on the southern side of Church Street and bounded by the M7 Motorway, Great Western Highway and Rooty Hill Road South.

The acoustic environment on site is dominated by road traffic noise from the M7 Motorway, the Great Western Highway and Rooty Hill Road South. No existing industrial noise is present in the area.

The current application is for subdivision of the site and some early works (access road etc.). In order to assess the long term noise impacts however we have considered the two available indicative plans. We note that these are indicative only at this stage and subject to change.

The two indicative layout plans are shown below. From an acoustic perspective the main difference is that the Preferred Indicative Plan includes an additional bulky goods site at the southern end of the site.

Diagram 1: Preferred Indicative Plan

Diagram 2: Alternative indicative plan

4 SITE MEASUREMENTS

In order to quantify the existing noise levels on site a series of both attended measurements and unattended noise logging was carried out.

The noise monitoring locations used are shown below. The logger locations are identifies as L1 and L2. The attended measurement locations are identified as MA to MG.

Diagram 3: Measurement Locations

4.1 Unattended Noise Logging

Two noise loggers were deployed on site between Monday 30th April and Monday 7th May 2012. The loggers are of ARL manufacture Type EL-316. The loggers were calibrated prior to and following measurements with a Bruel & Kjaer sound level calibrator Type 4230 and exhibited no significant drift. The loggers sampled in 15 minute periods, using an A-weighting curve before converting the information to statistical quantities and commencing a new period.

The results from the loggers are as shown below:

Noise descriptor	Logger 1	Logger 2
RBL Day	52	52
RBL Evening	52	54
RBL Night	47	50
Leq Day	57	71
Leq Evening	57	70
Leq Night	57	68

Table 1: Noise logger results – Industrial Noise Policy descriptors – dB(A)

RBL refers to the Rating Background Level as defined in the EPA Industrial Noise Policy (INP)

Noise descriptor	Logger 1	Logger 2
Leq Day	57	71
Leq Night	56	68

Table 2: Noise logger results – Road Noise Policy descriptors

Logger 1 was located towards the centre of the site as shown above and was most affected by traffic noise on the M7 Motorway.

Logger 2 was located at the approximate midpoint of the western boundary, set in 3m from the curb edge. This location was most affected by traffic noise on Rooty Hill Road. The Assessment Background Level on Sunday 6th May was 51dB(A).

4.2 Attended Measurements

To establish noise levels at other locations around the site a series of attended measurements were carried out on the afternoon of Friday 4th May 2012. Seven fifteen minute samples were carried out at the locations shown above, whilst the loggers were also recording. The measurement samples were synchronised with the logger sampling periods to allow direct comparison. The difference in levels between the logger locations and the other locations were then applied to the weekly logger data to determine expected Day/Evening/Night levels at these locations.

The measured $L_{eq(15min)}$ levels are shown below, along with the corresponding $L_{eq(15min)}$ level at the relevant logger location.

Location	$L_{eq(15min)}$ at location	$L_{eq(15min)}$ at logger (1 or 2)	Level difference
A	58	55.6 (A)	+2.4
B	70.6	71.3 (B)	-0.7
C	59.7	70.9 (B)	-11.2
D	70.3	70.9 (B)	-0.6
E	52.4	55.2 (A)	-2.8
F	57.6	56.4 (A)	+1.2
G	67.1	56.4 (A)	+10.7

Table 3: Measured $L_{eq(15min)}$ levels – dB(A)

The calculated Day/Evening/Night levels are shown below.

Location	INP Descriptors			RNP Descriptors	
	L_{eq} Day	L_{eq} Evening	L_{eq} Night	L_{eq} Day	L_{eq} Night
A	60	59	59	59	59
B	70	69	68	70	67
C	60	59	57	60	57
D	70	69	68	70	68
E	54	54	54	54	53
F	58	58	58	58	57
G	68	67	67	68	67

Table 4: Day/Evening/Night noise levels (no façade reflection) – dB(A)

The levels in Table 4 are based on levels measured in the free field. For comparison to the RNP external noise criteria which include façade reflection a 2.5dB correction must be added to the levels in the last two columns. The resultant levels are shown below.

Location	Leq 15hr Day	Leq 9hr Night
A	59	59
B	73	71
C	62	61
D	72	70
E	62	60
F	73	70
G	57	56

Table 5: RNP Day/Night Leq noise levels (with +2.5dB façade reflection) – dB(A)

5 CRITERIA

5.1 EPA Industrial Noise Policy (INP)

Operational noise from the site must be assessed against the EPA Industrial Noise Policy (INP). This includes noise from within tenancies, loading docks and vehicle movements on site (in car parks etc).

In summary, the INP criteria require that the potential noise be investigated and assessed in relation to intrusiveness and amenity:

Intrusiveness Criterion

The intrusiveness of a stationary noise source may be considered acceptable if the average of the maximum A-weighted levels of noise, $L_{Aeq\ 15\ minute}$ from the source do not exceed by more than 5dB the Rating Background Level (RBL) measured in the absence of the source. This applies during all times of the day and night. There also exists an adjustment factor K_i to be applied according to the character of the noise. This includes factors such as tonal, fluctuating, low frequency, impulsive, intermittent etc qualities of noise.

The RBL is determined in accordance with Section 3 - *Determining existing noise levels* of the policy.

The intrusiveness criterion is;

$$L_{Aeq\ 15\ minute} + K_i < RBL+5$$

Logger B was used to determine RBL's for residences on Rooty Hill Road South.

Amenity Criterion

To limit continuing increases in noise levels, the maximum ambient noise level within an area from stationary noise sources should not normally exceed the levels as specified in Section 2.2 of the policy. This protects against impacts such as speech interference and community annoyance. As for the intrusiveness criterion, a modifying factor should be applied to account for the characteristics of the noise source.

The recommended Acceptable Noise Level (ANL) for the amenity criterion is determined in accordance with Table 2.1 and Table 2.2 of the policy.

The residential receivers are in an Urban area (as defined in Chapter 2 of the INP), which has a recommended Acceptable Noise Level (ANL) of 60dB(A) during the Daytime, 50dB(A) during the Evening, and 45dB(A) during the Nighttime.

No other industrial noise sources are present and therefore no adjustment to the Amenity levels in accordance with Table 2.2 of the INP is required.

Adjustment to the Amenity levels is however required due to the high levels of traffic noise in the area, in accordance with Section 2.2.3 of the INP.

The existing traffic noise levels must be compared with the Amenity Criteria. The residential facades are generally set back at least 11m from the roadway. Logger 2 is nearest measurement location to the residences but was only set back 3m from Rooty Hill Road South. Location C was set back 25m from the

roadway and has been used for traffic noise levels equivalent to those at the residential facades. This is a conservative approach.

The existing traffic noise levels at Location C were 60dB(A) Day, 59dB(A) Evening and 57dB(A) Night. In accordance with Section 2.2.3 of the INP only the Nighttime Amenity goal requires adjustment (as the existing traffic noise levels during the Day and Evening are less than 10dB(A) above the Amenity goals).

The adjusted Nighttime Amenity goal is 47dB(A).

Period	Amenity Criterion Limit $L_{Aeq\ period}$*	Intrusiveness Criterion Limit $L_{Aeq\ 15\ minute}$
Daytime	60	57
Evening	50	57**
Nighttime	47	55

Table 6: Site Specific Limiting Criteria

* The time periods refer to daytime as 7:00am to 6:00pm, evening as 6:00pm to 10:00pm, and night time as 10:00pm to 7:00am. Therefore, the amenity criterion limit is described as $L_{Aeq\ 11\ hour}$ for the daytime, $L_{Aeq\ 4\ hour}$ for the evening, and $L_{Aeq\ 9\ hour}$ for the night time period.

** The Evening RBL was 54dB(A) which would lead to an Intrusiveness criterion of 59dB(A), however a criterion no greater than the Daytime criterion is required in accordance with the *Application Notes – NSW Industrial Noise Policy* (updated June 2011)

5.2 EPA Road Noise Policy

The EPA NSW Road Noise Policy (RNP) aims to identify strategies that address the issue of road traffic noise from vehicles on public roads, including new traffic-generating developments.

For existing residences affected by additional traffic on existing sub-arterial roads generated by land use developments Table 3 of the RNP specifies the following external criteria:

Period	Assessment criteria – dB(A)
Day – $L_{eq(15hr)}$	60
Night – $L_{eq(9hr)}$	55

Table 7: Road Noise Policy criteria for residential receivers

The above levels would apply at the existing residences on Rooty Hill Road South.

For Eastern Creek Public School Table 4 of the RNP specifies the following criteria. Note that the criterion for classrooms is an internal criterion, whilst the criteria for open space are external criteria.

Land use	Assessment criteria – dB(A)
School classrooms (internal criteria)	40dB(A) Leq(1hr) when in use
Open space (active use) (external criteria)	60 dB(A) Leq(15hr) Day when in use
Open space (passive use) (external criteria)	55 dB(A) Leq(15hr) Day when in use

Table 8: Road Noise Policy criteria for other receivers

The above criteria for open space (active use) may also be referenced with regards to noise impacts from the M7 on the children's playground area on the site.

Section 3.4 of the RNP notes that where the existing traffic noise levels from a road are already above the noise assessment criteria (in the tables above) an increase of up to 2dB represents a minor impact that is considered barely perceptible to the average person.

The RNP does not provide criteria for traffic noise impacts from existing roads onto new retail developments. Internal acoustic criteria for specific retail developments will need to be determined at a later stage when detailed designs and usages for such tenancies are established.

To provide some indication of the required internal design levels reference can be made to Australian Standard 2107:2000 *Acoustics – Recommended design sound levels and reverberation times for building interiors*.

AS2107 specifies noise goals for retail spaces in the order of 45-55dB(A), depending on the type of store..

5.3 EPA Interim Construction Noise Guideline

The Interim Construction Noise Guideline (ICNG) is aimed at managing noise from construction works regulated by the EPA.

The ICNG recommends the following standard hours for construction work. Note that these hours are non-mandatory and the relevant authority may impose more or less stringent construction hours.

Day	Recommended standard hours of work
Monday to Friday	7am to 6pm
Saturday	8am to 1pm
Sundays and public holidays	No work

Table 9: ICNG standard work hours

Table 2 from the ICNG is reproduced below and specifies management levels for noise at residences:

Time of day	Management level $L_{Aeq\ (15\ min)}$ *	How to apply
Recommended standard hours: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm No work on Sundays or public holidays	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured $L_{Aeq\ (15\ min)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences 2. if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected RBL + 5 dB	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community. • For guidance on negotiating agreements see section 7.2.2.

The Daytime RBL on the western side of the site is 52dB(A). The Noise affected criteria for standard hours is therefore 52+10 = 62dB(A). The noise affected criteria for work outside standard hours is 56dB(A) for Sundays, 57dB(A) for Evenings and 55dB(A) for Nights.

For schools the ICNG specifies the following management levels to be applied when the school is in use.

Land use	Assessment criteria – dB(A)
School classrooms (internal criteria)	45dB(A) Leq(1hr) when in use
Open space (active use) (external criteria)	65 dB(A) Leq(15hr) Day when in use
Open space (passive use) (external criteria)	60 dB(A) Leq(15hr) Day when in use

Table 10: ICNG criteria for schools

If construction work is to occur during the night time period the potential for sleep disturbance to residents must also be considered. The appropriate assessment of potential noise disturbance to sleep is currently under review. As a guideline the EPA have in the past sought to protect sleep arousal by ensuring that the $L_{1(60sec)}$ noise level of any specific source does not exceed the background L_{90} level by more than 15dB(A) outside a resident's bedroom window between 10pm and 7am. For the subject site this is a level of 50+15 = 65dB(A).

The most recent EPA advice (from the RNP 2009) indicates the following:

- Maximum internal noise levels below 50-55dB(A) are unlikely to awaken people from sleep
- One or two noise events per night, with maximum internal noise levels of 65-70dB(A), are not likely to affect health and wellbeing significantly.

6 DISCUSSION

6.1 Operational Noise

6.1.1 Loading Docks

The specific details of the loading docks proposed are unknown at this time. Prior to construction of individual premises within the development a more detailed assessment of loading dock noise will be appropriate.

Some loading docks for premises facing Rooty Hill Road are shown on the eastern side of the buildings, facing away from the residential area. This layout will result in distances in excess of 80m between the loading docks and the residents. Additional acoustic shielding will be provided by the proposed buildings (as the loading docks are on the far side of the buildings).

Previous measurements by PKA have found noise levels from supermarket loading docks to be in the order of 70dB(A) inside the dock (during deliveries). Assuming an Leq(15min) noise level inside the loading lock of 70dB(A) the noise level at the nearest residence would be below 45dB(A).

Based on the above these loading docks should have the potential to comply with the INP noise criteria.

Two loading docks for premises facing Rooty Hill Road are shown on the northern side of the buildings. The residents on the western side of Rooty Hill Road will be more exposed to noise from the operation of these docks. A detailed acoustic assessment of these docks will be required when an application is made to construct these premises.

These docks should have the potential to comply with the INP noise criteria however some noise control measures or operational restrictions (e.g. hours of use) may need to applied to these docks.

6.1.2 Vehicle movements in car parks

Noise levels generated by the vehicles within the site have been calculated using the *Bavarian Parking Area Noise (2007)* method. Traffic flow data and usage characteristics have been taken from the Traffix report.

The Leq(1hour) levels have been calculated to the residential receivers nearest to each carpark. Note that these calculations are preliminary only, based on the indicative usage areas shown on the Preferred Indicative Plan. More detailed calculations will be required for future applications relating to specific developments.

Unit	Area category	Leq(1hr) dB(A)
1	Large format retailer	44
2	Convenience retail	28
3	Convenience retail	48
4	Bulky goods	29
5, 6 & 7	Bulky Goods	31

Table 11: Leq(1hr) noise levels from on-site car parks

The above noise levels comply with the Daytime criteria of 60dB(A) and the Evening criteria of 50dB(A) in all cases. All but Unit 3 also comply with the Nightime criteria of 47dB(A).

If Unit 3 (a potential liquor outlet) was to trade during the Nighttime period (10pm-7am) some noise controls would be required. The required additional attenuation would be in the order of 1dB and could easily be achieved. However a more detailed study of this car park would be required prior to construction if operation during the Nighttime period was required.

6.2 Road Noise

6.2.1 Noise generated by the development on existing public roads

The following traffic volumes are based on data provided by Piran Trethewey of Traffix.

The predicted trip generation for the business hub is 382 vehicles per hour in the AM peak period and 1312 vehicles per hour in the PM peak period.

At the intersection with the Great Western Highway Rooty Hill Road South has an existing AM peak traffic flow of 1,481 vehicles per hour and a PM peak traffic flow of 1,705 vehicles per hour. The report predicts a 10.5% base traffic growth to the year 2022. This gives a predicted year 2022 base traffic flow during the AM peak of 1,636 vehicles per hour and a PM peak of 1,882 vehicles per hour.

The site will give a year 2022 AM peak increase from 1,636 to 1,922 vehicles per hour. The site will give a 2022 PM peak increase from 1,882 to 2,866 vehicles per hour.

Using a CORTN (Calculation of Road Traffic Noise) calculation of noise levels based on traffic flow the above traffic flow increase will give rise to an increase of 0.7dB during the AM peak and 1.8dB during the PM peak.

When averaged over a 15 hour Daytime period (7am-10pm) the increase will likely fall within the range of 0.7-2.0dB. During the 9 hour Nighttime period (10pm-7am) the increase in noise level will likely be well below this range as the majority of the site will be inactive during this period.

The noise levels received by residences fronting Rooty Hill Road South are currently above the recommended RNP goals of 60dB(A) Leq(15hr) Daytime and 55dB(A) Leq(9hr) Night.

Section 3.4 of the RNP notes that where the existing traffic noise levels from a road are already above the noise assessment criteria an increase of up to 2dB represents a minor impact that is considered barely perceptible to the average person.

The traffic noise level increases due to the site are less than a 2dB increase and therefore would be considered barely perceptible.

As such no further noise control works are required to address additional traffic flows on Rooty Hill Road South due to the development.

6.2.2 Traffic noise impacts on the development from public roads

From site measurements and calculations the following typical Leq(15hr) Daytime noise levels have been calculated at the building footprints on the indicative development plans. These levels are for the most affected (noisiest) point of the building footprint. Noise levels on facades not facing the roadways will be lower. These levels are based on the currently shown building outlines and setbacks. Actual noise levels, particularly for developments near the roadways, will vary depending on the actual positioning and shape of buildings.

Usage/Area	Minimum setback from roadway (m)	Leq(15hr) Day – dB(A)
Large format retailer (1)	20m to Rooty Hill Rd	62
Village Centre (2)	10m to Rooty Hill Rd	65
Liquor Outlet (3)	20m to Rooty Hill Rd	62
Developments facing internal road or Church St (i.e. not fronting Rooty Hill Road). Bulky Goods.	55m to Rooty Hill Rd 180m to M7	58
Bulky Goods on cnr Rooty Hill Road and Great Western Highway (Preferred Indicative Plan only)	20m to Rooty Hill Rd 25m to Great Western Hwy (approx.)	67
Bulky Goods on cnr Rooty Hill Rd and Church St	20m to Rooty Hill Rd (approx.)	62
Children's playground	100m to Rooty Hill Rd 200m to M7	58

Table 12: Approximate Leq(15hr) Day noise levels at building facades

Typically for retail stores at a development such as this we would expect internal noise levels due to traffic to be at least 20dB(A) below the corresponding external noise level. This assumes closed windows which is typical for bulky goods retailers etc. If windows to the spaces were open attenuation from outside to inside may be in the order of 10dB(A).

For retail areas in the table above which have external noise levels up to 67dB(A) we would expect internal noise levels to be less than 47dB(A) with windows closed. Compliance with the internal design goals from AS2107:2000 of 45-55dB(A) should be achievable. These developments will need to be assessed in more detail once the building usage, design and layout are finalised.

Noise levels to the children's playground will be in the order of 58dB(A). The EPA NSW Road Noise Policy specifies design goals of 60dB(A) for Active Use Open Space Areas. The playground will therefore comply with the 60dB(A) goal for Active Use.

6.3 Construction Noise

The current application is for the construction of the access road, infrastructure services, stormwater and woodland planting. Construction access is likely to be off Church Street. Subsequent development of leased lots will be subject to further development applications.

The level of noise from construction will vary considerably during the development of the site. For example the level and nature of noise sources will be very different during site clearance, super lot subdivision and construction of tenancies. The potential for noise impacts to residential receivers will also be increased for works on the western side of the site, compared to works on the central or eastern portions of the site.

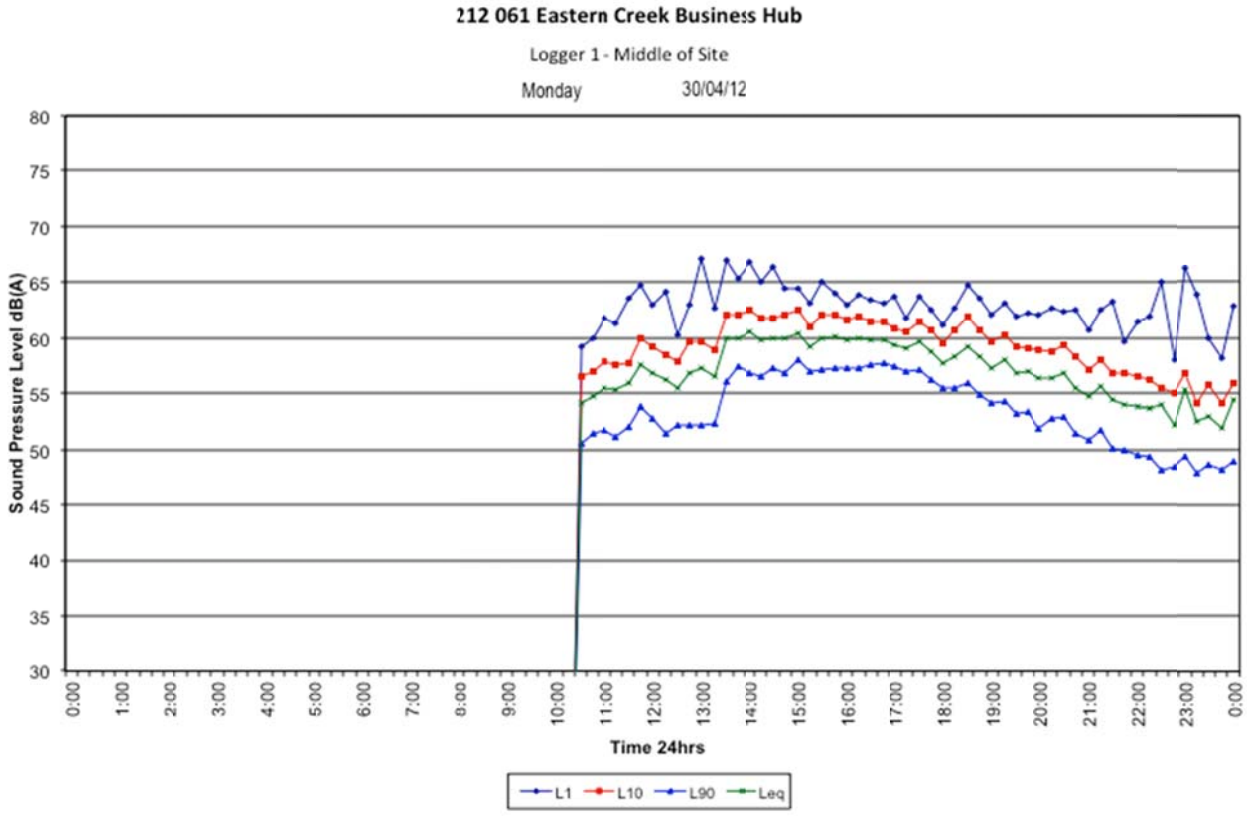
Detailed construction timelines and methodologies are not available at this time. Typically detailed construction plans are only prepared once a main contractor has been appointed and specific details of work for the next stage of works are finalised.

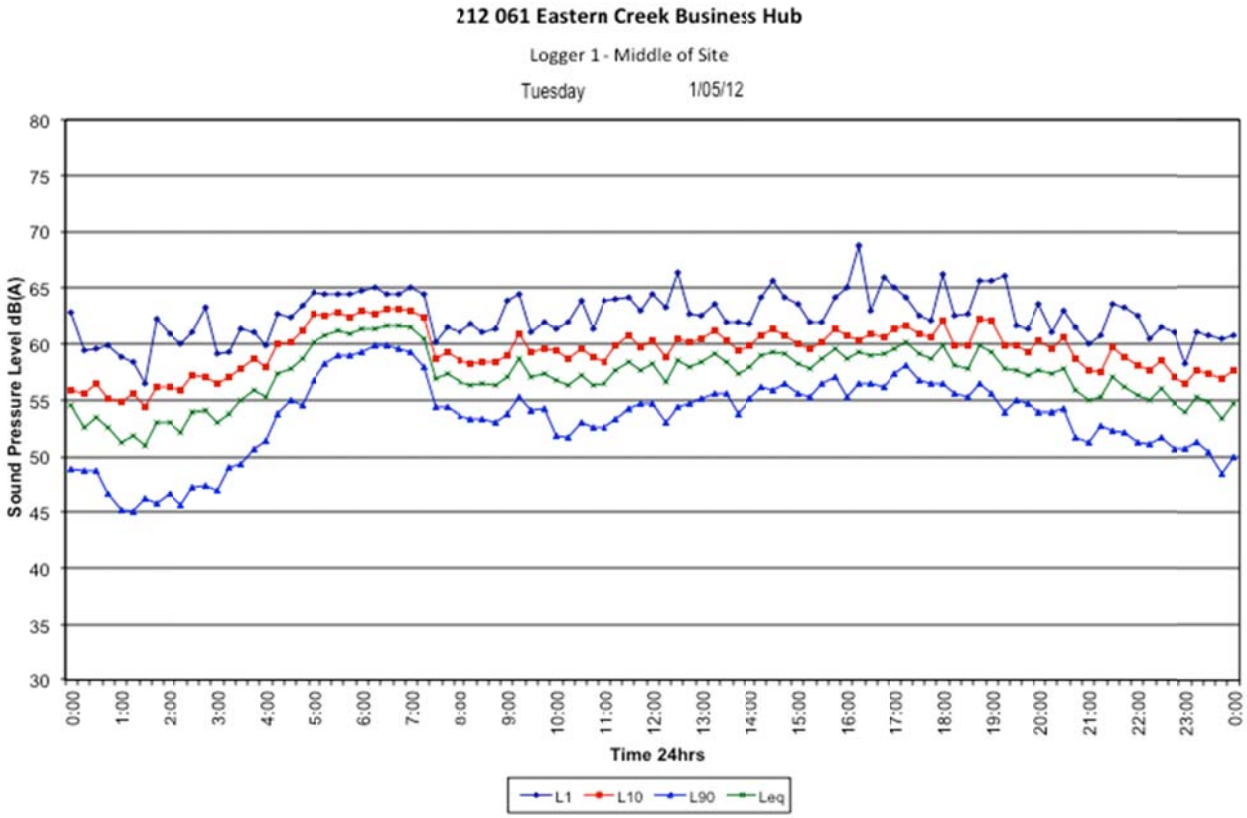
Further work regarding acoustic impacts of construction noise will need to be carried out prior to each major stage of construction.

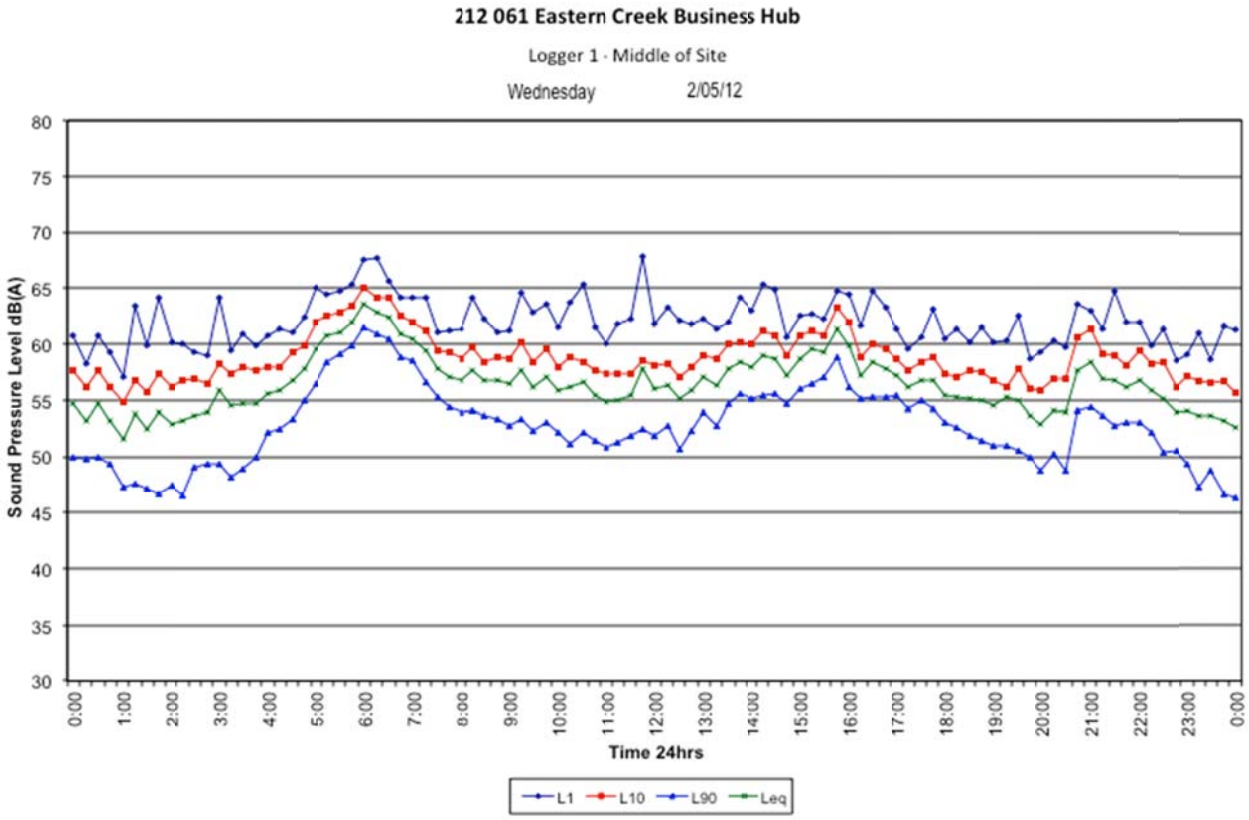
In order to minimise potential construction noise impacts to residential receivers the following work practices may be adopted during the planning process. These suggestions are based on guidance in the EPA Interim Construction Noise Guideline.

- Community consultation and notification should be carried out keep affected receivers informed of upcoming works and construction times.
- A complaints handling procedure should be established. This should include a readily accessible contact point for residents to contact the site staff in charge of noise management, a clear complaints (and reporting) process and establishment of a complaints register.
- Preparation of a Noise Management Plan. This would include as a minimum an identification of sensitive receiver locations, a description of works and approved work hours, details of noise minimisation practices and details of complaints handling procedures.
- Use quiet work methods. For example this may include using quieter construction techniques where possible for rock breaking etc.
- Use quiet equipment where possible. Specified noise levels can be taken into account when selecting individual plant items.
- Operate plant in a quiet and efficient manner. For example reduce throttle setting and turn of equipment when not being used.
- Maintain equipment to ensure manufacturers design noise levels are achieved.
- Locate noisy plant away from sensitive receivers where possible. This may include locating construction vehicle entrances away from the residential area.
- Maximise noise shielding on site. This may include using site sheds, materials stockpiles or natural landforms to provide acoustic shielding.
- Provide respite periods. For example works adjacent the school may be scheduled to avoid conflict with exam periods etc.
- Schedule activities to minimise noise impacts. Consultation should be undertaken with affected neighbours to minimise impacts. For example noisier works near the school may be scheduled during school holiday periods.
- Organise deliveries and access to minimise noise impacts. This may include nomination of off-site truck parking areas away from residents, provision of on-site parking for trucks and staff and amalgamation of loads to minimise truck movement numbers.
- Consideration of temporary noise barriers where required for extended high noise level works in fixed locations.

7 Appendix A: Noise Logger 1 Results



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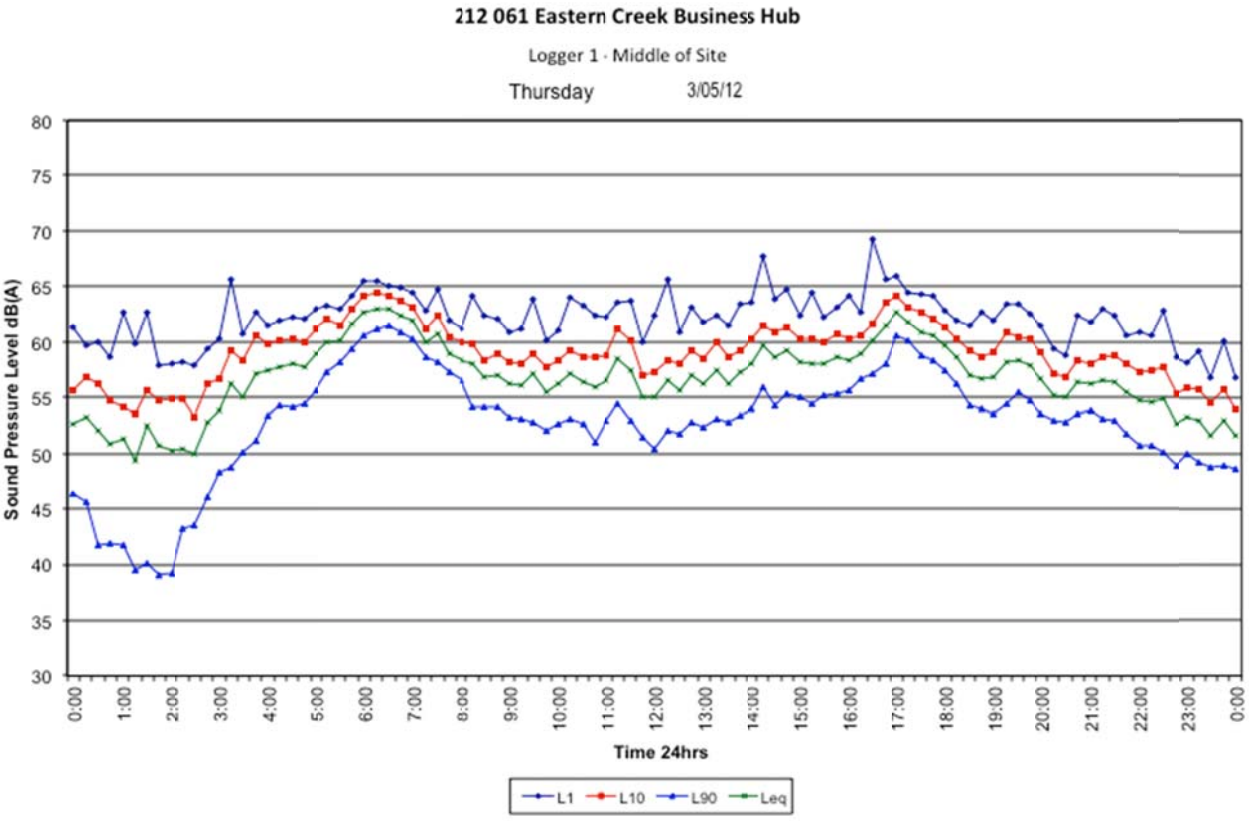
Logger 1 - Middle of Site
Wednesday 2/05/12
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
L90
Leq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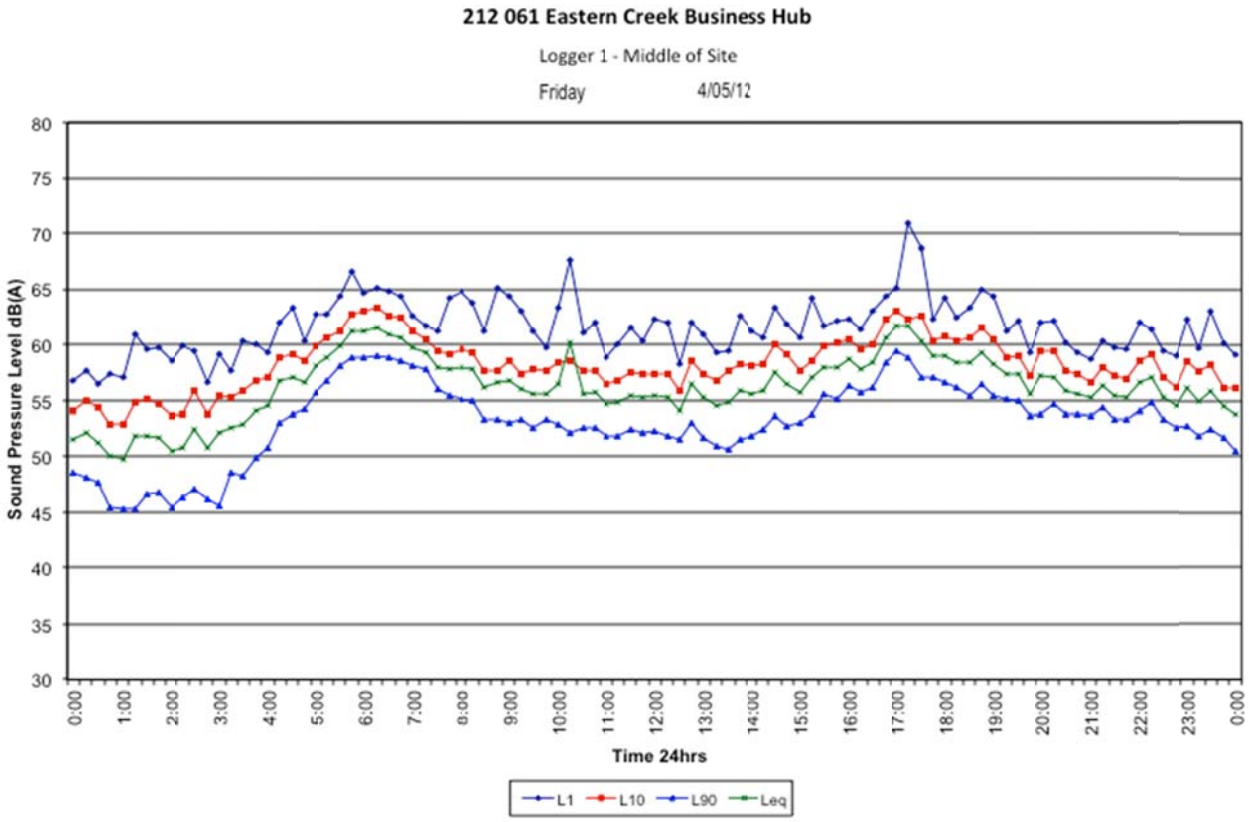
Logger 1 - Middle of Site
Thursday 3/05/12
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
L90
Leq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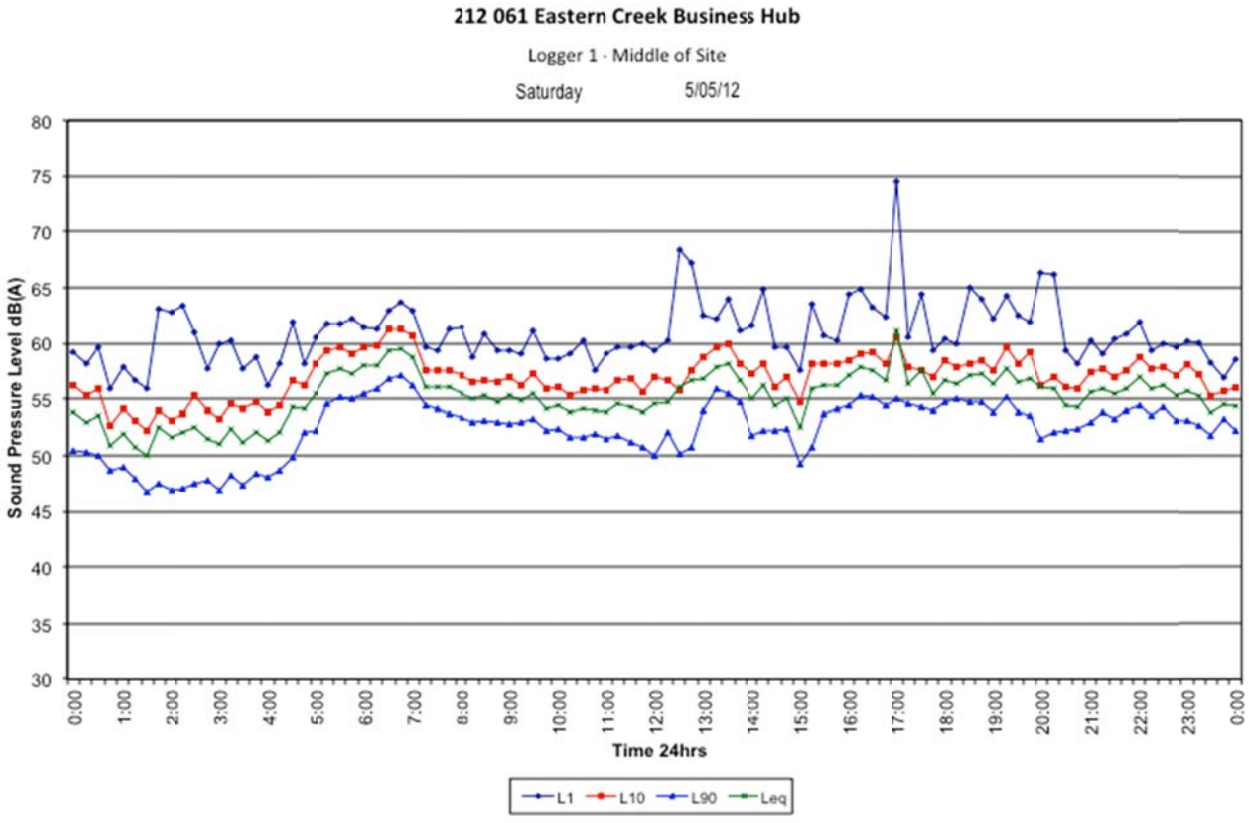
Logger 1 - Middle of Site
Friday 4/05/12
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
L90
Leq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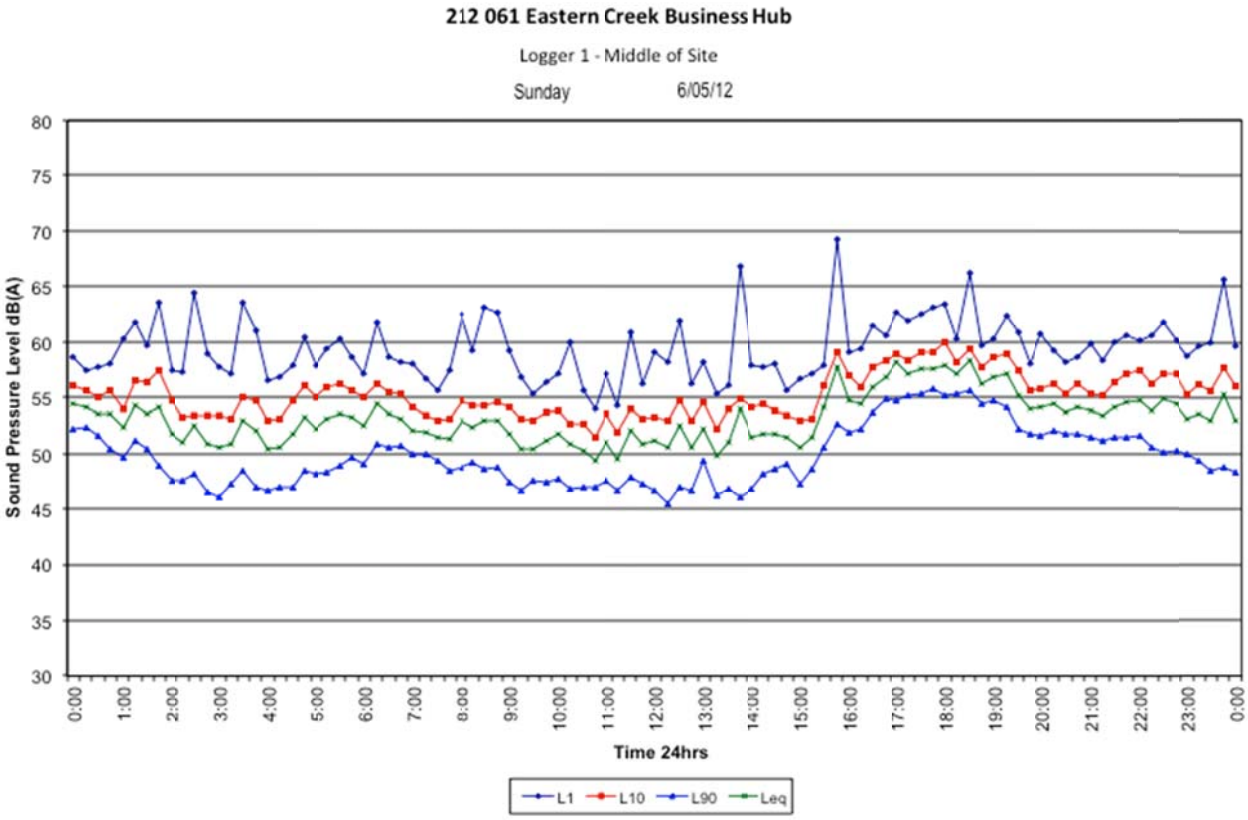
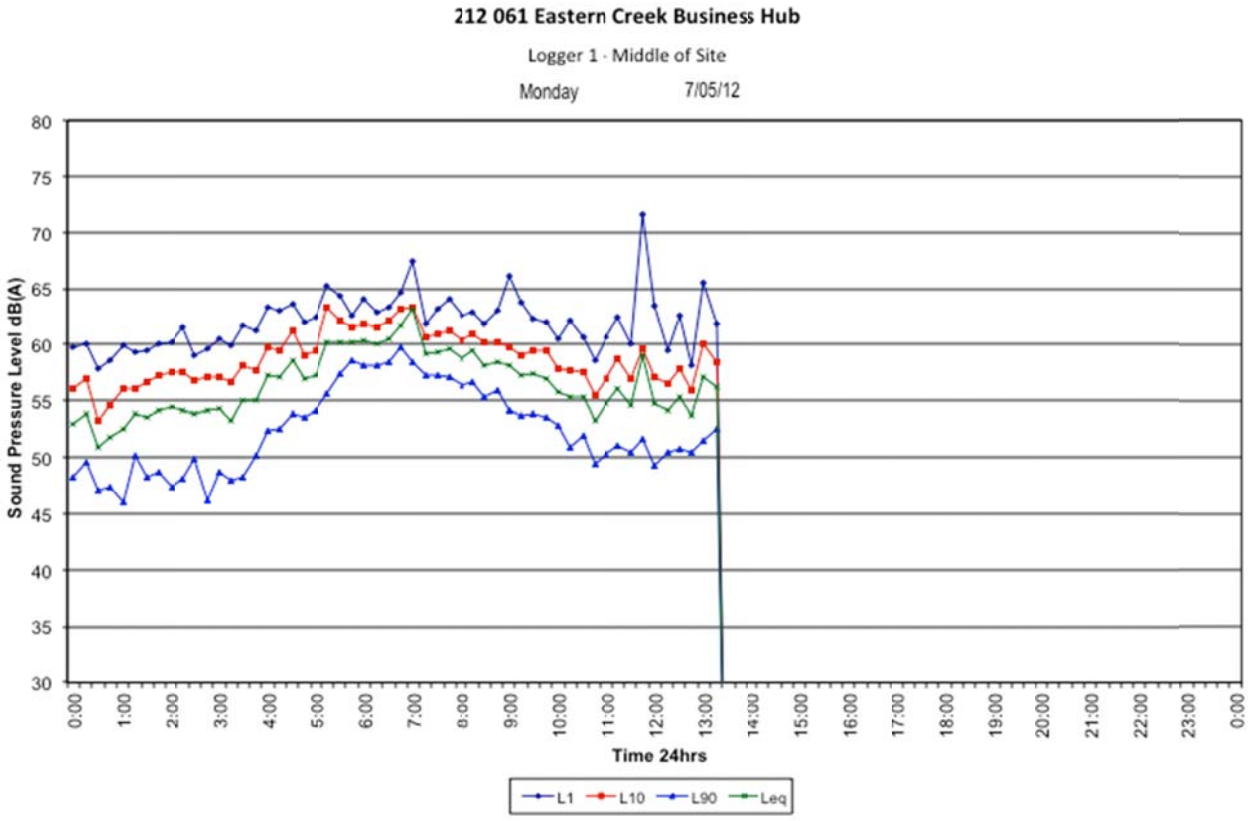
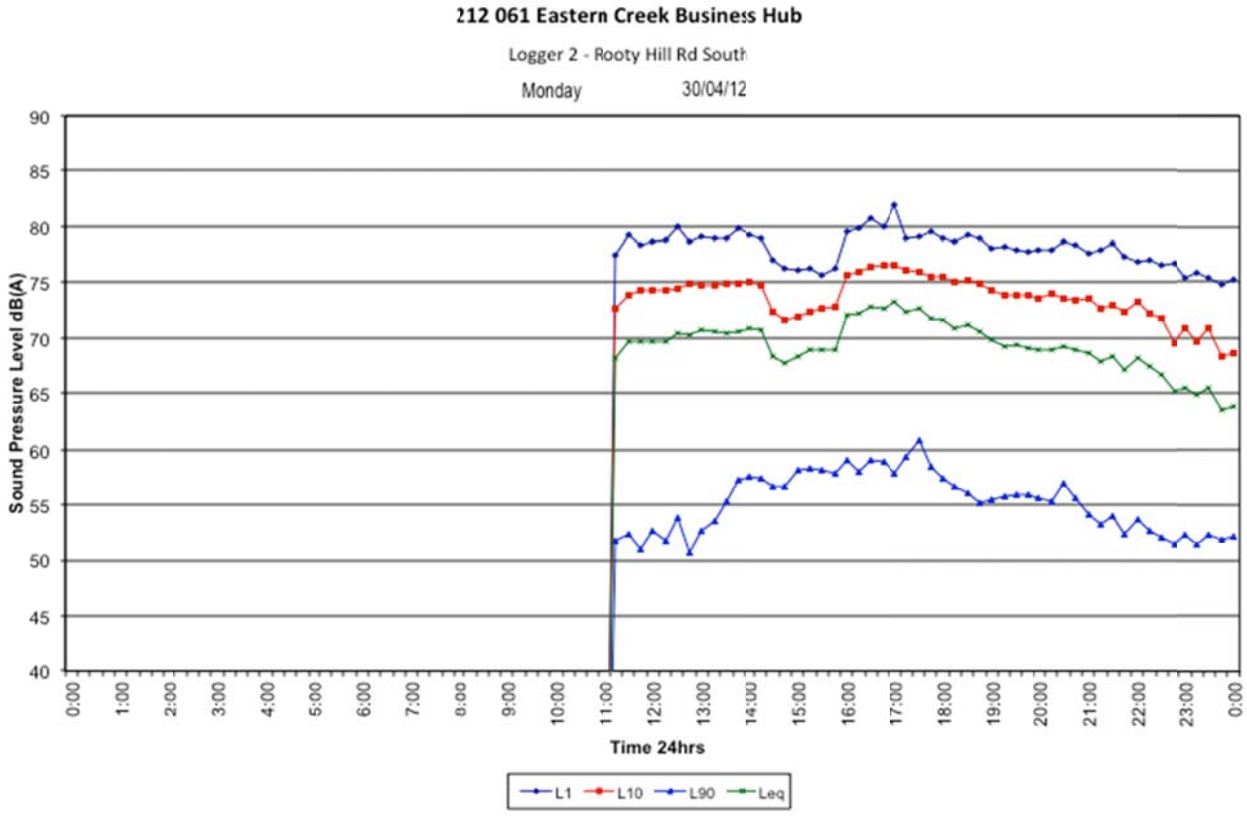
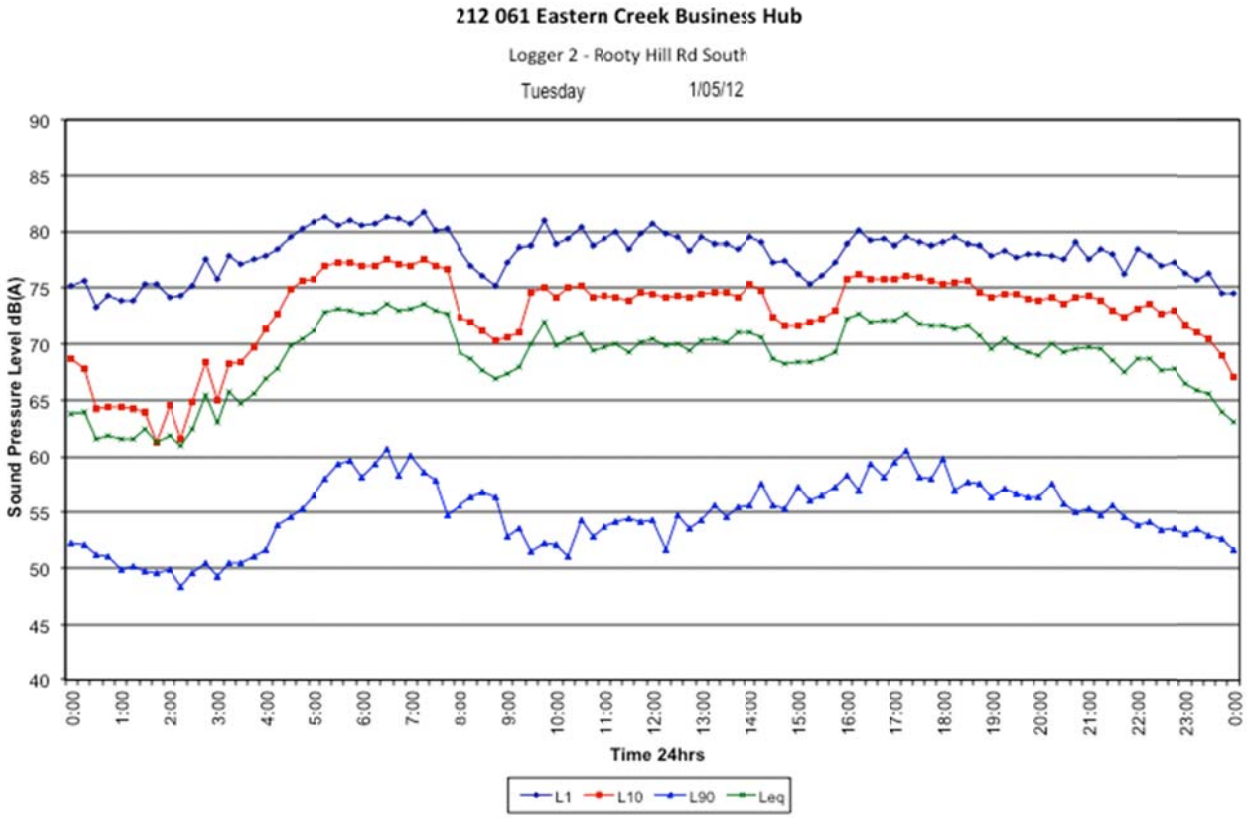
Logger 1 - Middle of Site
Saturday 5/05/12
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
L90
Leq

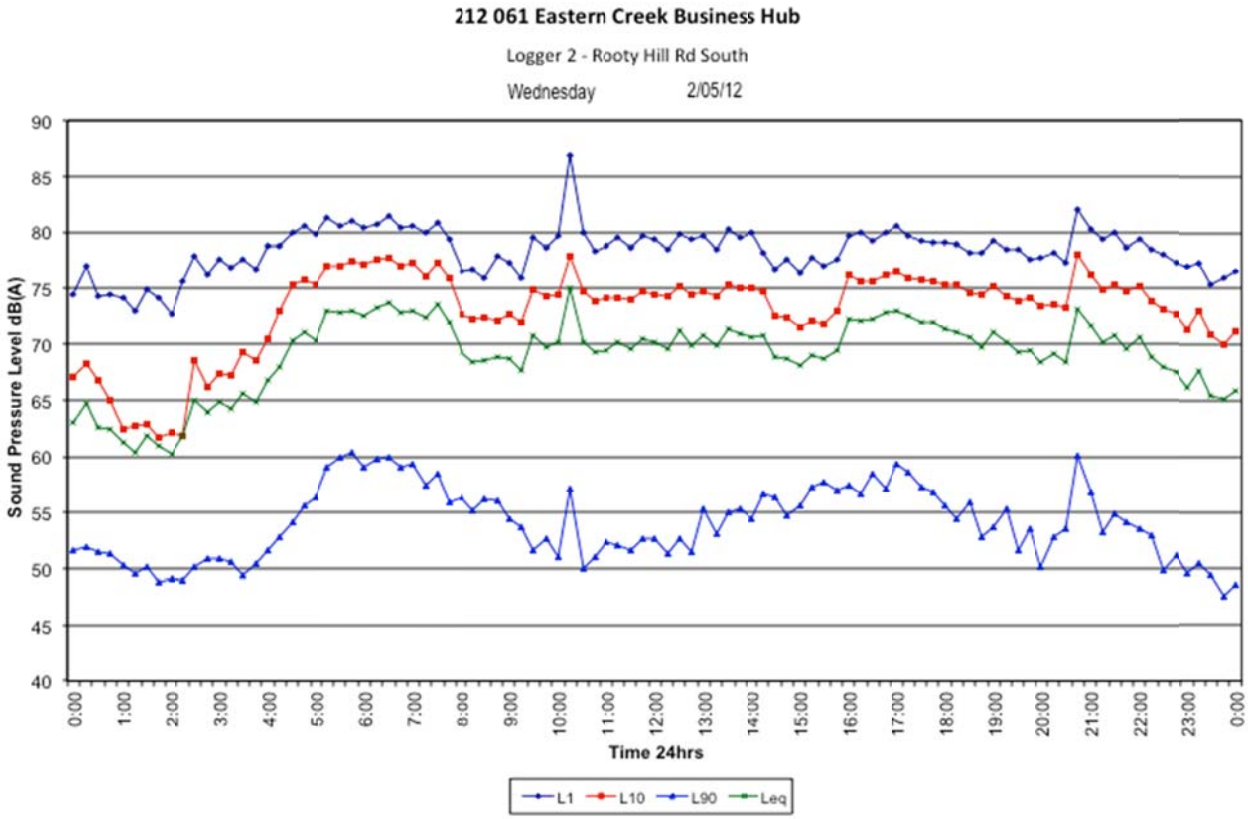

212 061 Eastern Creek Business Hub
Logger 1 - Middle of Site
Sunday 6/05/12
Sound Pressure Level dB(A)
80
75
70
65
60
55
50
45
40
35
30
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
0:00
Time 24hrs
L1
L10
L90
Leq

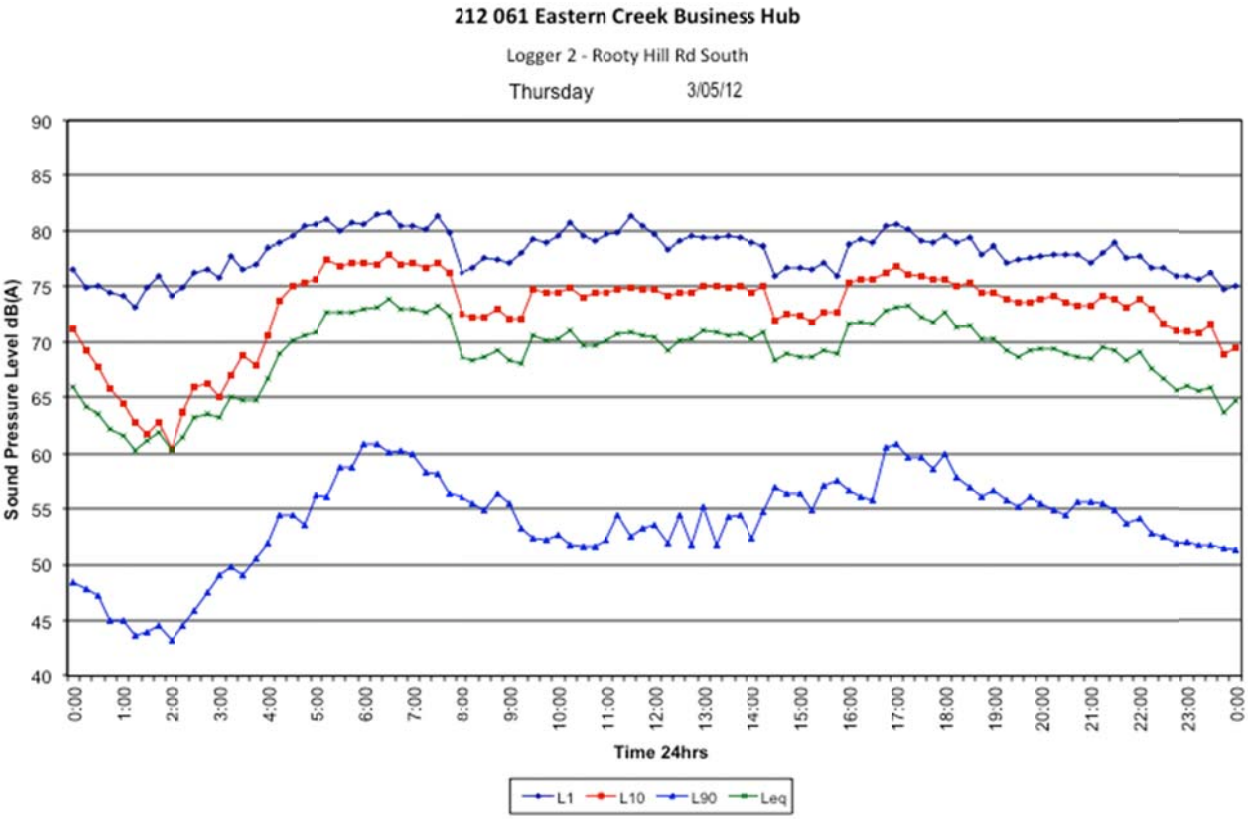

212 061 Eastern Creek Business Hub
Logger 1 - Middle of Site
Monday 7/05/12
Sound Pressure Level dB(A)
80
75
70
65
60
55
50
45
40
35
30
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
0:00
Time 24hrs
L1
L10
L90
Leq

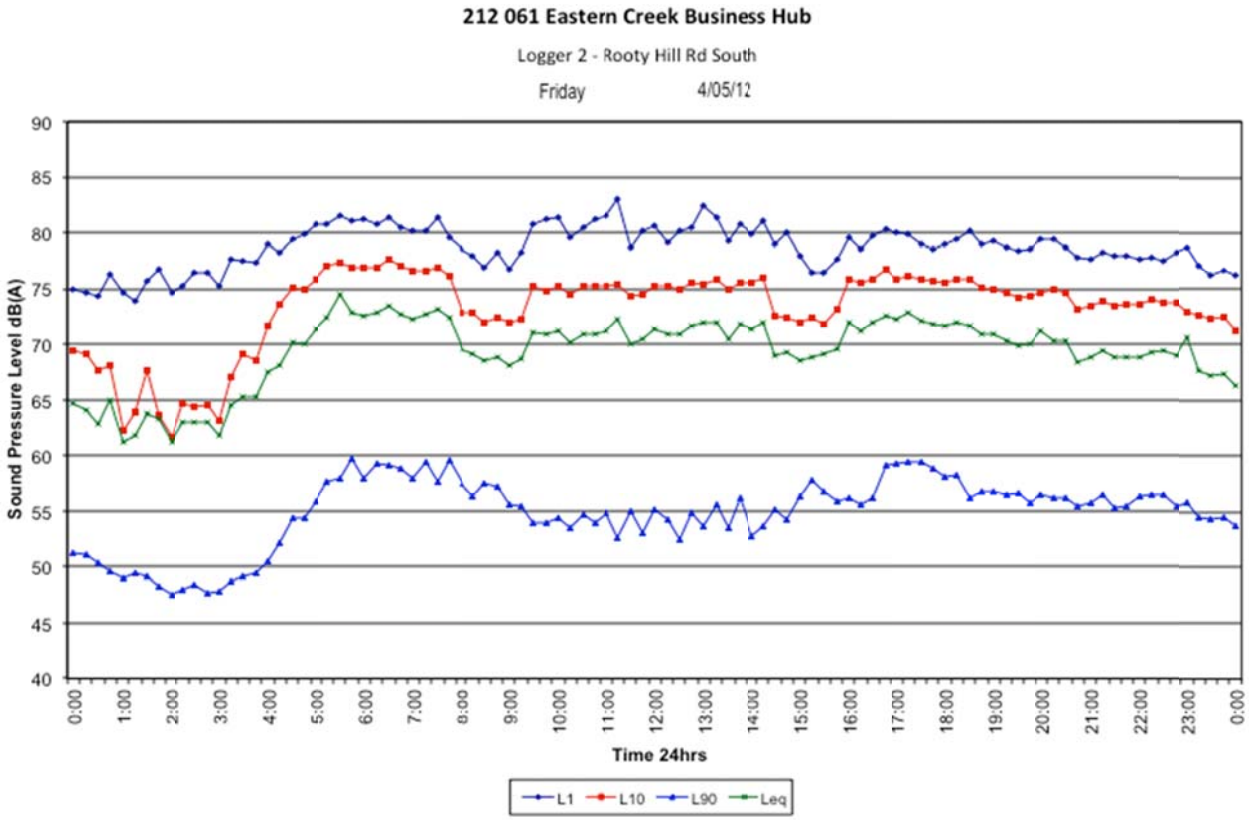
8 Appendix 2: Noise Logger 2 Results

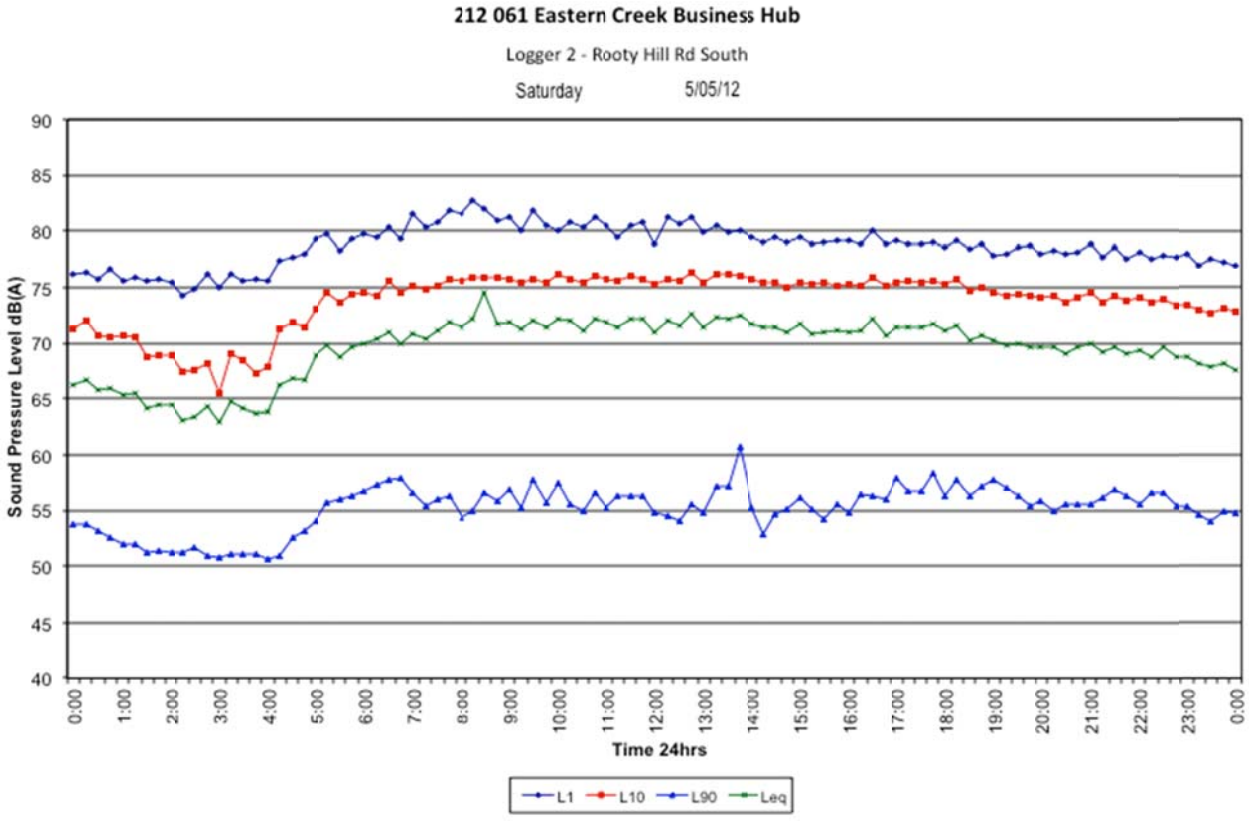


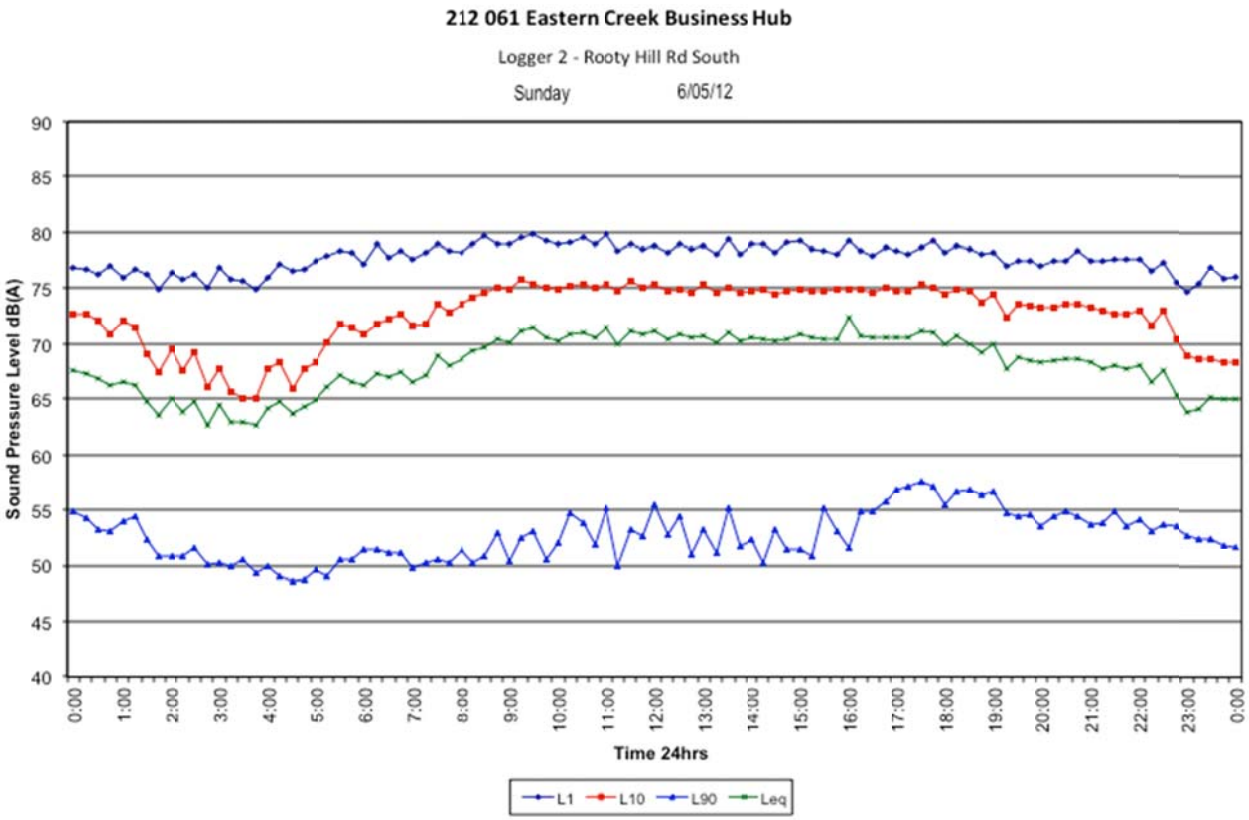


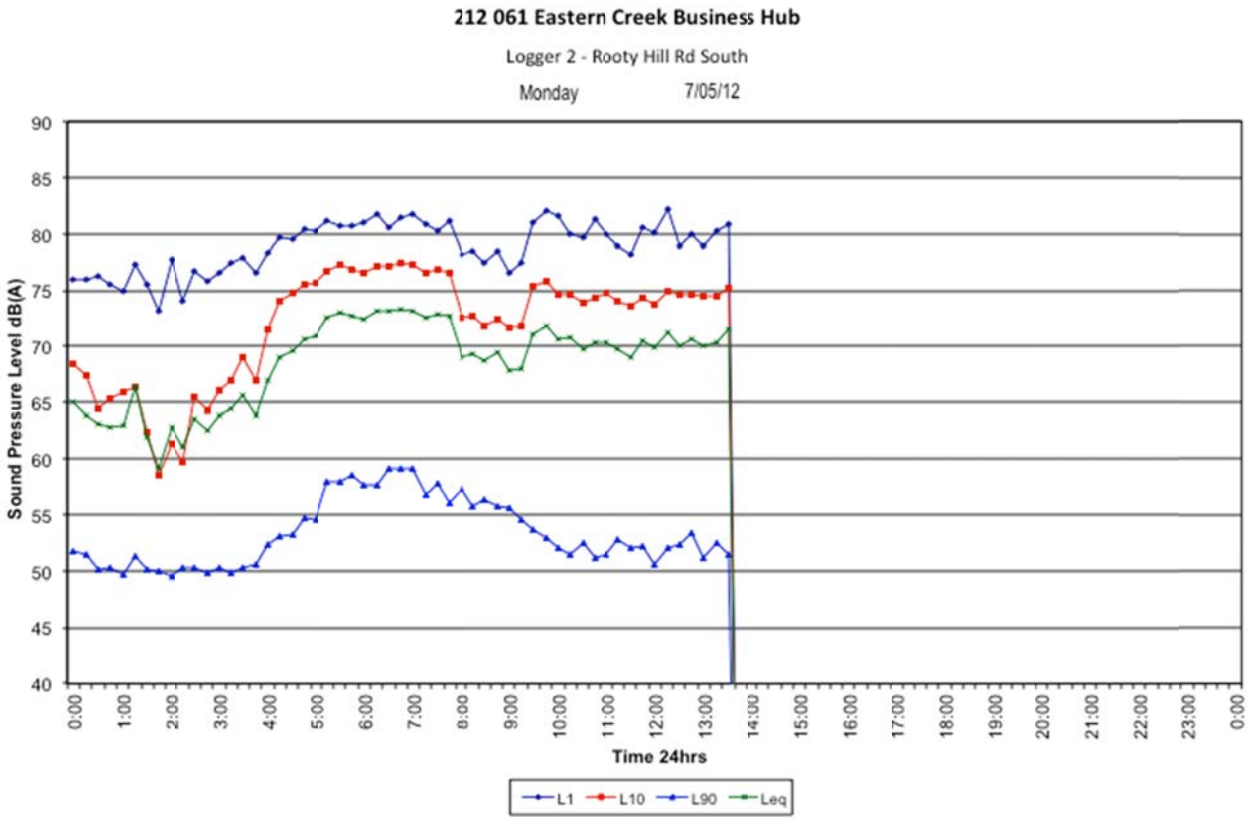

212 061 Eastern Creek Business Hub
Logger 2 - Rooty Hill Rd South
Wednesday 2/05/12
Sound Pressure Level dB(A)
90
85
80
75
70
65
60
55
50
45
40
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
0:00
Time 24hrs
L1
L10
L90
Leq


212 061 Eastern Creek Business Hub
Logger 2 - Rooty Hill Rd South
Thursday 3/05/12
Sound Pressure Level dB(A)
90
85
80
75
70
65
60
55
50
45
40
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
0:00
Time 24hrs
L1
L10
L90
Leq


212 061 Eastern Creek Business Hub
Logger 2 - Rooty Hill Rd South
Friday 4/05/12
Sound Pressure Level dB(A)
90
85
80
75
70
65
60
55
50
45
40
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
0:00
Time 24hrs
L1
L10
L90
Leq


212 061 Eastern Creek Business Hub
Logger 2 - Rooty Hill Rd South
Saturday 5/05/12
Sound Pressure Level dB(A)
90
85
80
75
70
65
60
55
50
45
40
0:00
1:00
2:00
3:00
4:00
5:00
6:00
7:00
8:00
9:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00
0:00
Time 24hrs
L1
L10
L90
Leq


212 061 Eastern Creek Business Hub
Logger 2 - Rooty Hill Rd South
Sunday 6/05/12
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
L90
Leq


212 061 Eastern Creek Business Hub
Logger 2 - Rooty Hill Rd South
Monday 7/05/12
Sound Pressure Level dB(A)
Time 24hrs
L1
L10
L90
Leq

PKA ACOUSTIC CONSULTING

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