

**Proposed Commercial Development
103-119 Compton Road, Underwood**

Environmental Noise Assessment Report

Hydrox Nominees Pty Ltd

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1. Introduction

1.1. Background

TTM Soundmatters has been engaged by Hydrox Nominees Pty Ltd to undertake an environmental noise assessment of a proposed commercial development located at 103 – 119 Compton Road, Underwood. This report forms part of the information request response for consideration by Logan City Council.

The assessment is based on and considers the following:

- a. Information Request from *Logan City Council* (LCC) specifically item *Environment - Acoustics* (Ref: 917397-1).
- b. Noise criteria outlined in the Logan City Council's *Draft Logan Planning Scheme 2006 Policy 3 – Environment Management* (SC6.2.3).
- c. Development plans by *Leffler Simes Architects* dated December, 2014 (samples shown in Appendix A).
- d. Site inspection, noise measurements, analysis and calculations conducted by TTM soundmatters.

1.2. Scope

The assessment includes the following:

- i. Description of the site.
- ii. Statement of assessment criteria relating to environmental on-site noise emissions.
- iii. Measurement of existing ambient noise levels.
- iv. Prediction of noise produced by the development onto nearby sensitive receivers.
- v. Analysis of predicted noise levels.
- vi. Details of recommendations to be incorporated to achieve predicted compliance.

2. Site Description

2.1. Site Location

The site is described by the following:

- Lot 2 on SP145157
- 103-119 Compton Road, Underwood

The site locality is shown in Figure 1.

Figure 1: Site Locality (Source: Google)



2.2. Current Conditions Surrounding the Site

Currently the site is relatively flat vacant land, bounded by Compton Road to the south. Single and 2 storey residential premises are located north of the site across an existing green area (Lot 53 SP156454). Commercial and light industrial premises are located east and south of the site, with vacant land to the west (Lot 1 SP 107517).

2.3. Current Acoustic Environment

The acoustic environment at the site is comprised of road traffic noise from Compton Road and noise from existing commercial premises.

Noise sensitive receivers are located to the south across Compton Road and north across a reserve. These receivers are likely to experience different ambient noise conditions. Existing sensitive receivers south of the site are affected by both road traffic noise and noise from existing commercial premises. The acoustic environment at the northern receivers is comprised of noise created by the natural environment and existing commercial premises.

3. The Proposed Development

3.1. Development Description

The proposal is to develop the site into a home improvement warehouse. The proposal includes the following:

- Main floor with admin/staff amenities and GFA of 8,944m²
- 398 parking spaces.
- Service driveway to the north of the proposed building.
- Café retail with GFA of 54m².
- Total retail GFA of 13,444m².

A sample of the development plans is shown in Appendix A.

3.2. Hours of Operation

This assessment has assumed operating times of 6:30am to 9pm, 7days. Recommendations shall provide time restrictions on activities that may require it.

3.3. Access

The development plan proposes access to the customer parking by driveways off Compton Road. Delivery vehicles are proposed to use the driveway of Perrin Drive to the north of the proposed building.

4. Noise Sensitive Receivers and Off-Site Premises

4.1. Residential and Sensitive Receivers

The area surrounding the site consists of residential and commercial land uses. This assessment will focus on the receivers outlined below, in accordance with the Information Request from Logan City Council (LCC) specifically item *Environment Acoustics* (Ref: 917397-1):

- Receiver 1: 81 - 87 Brookvale Drive, approximately 100m from site (2 storey).
- Receiver 2: Compton Business Park, approximately 300m from site.
- Receiver 3: 138 Compton Road, approximately 200m from site (single storey).

The receiver locations are shown in Figure 2.

Figure 2: Noise Sensitive Receivers (source: Google)



If compliance can be achieved at receivers 1 and 2, compliance is predicted at all remaining noise sensitive locations surrounding site.

Compton Business Park shares a boundary with the site, but Receiver 2 was located at the most used and sensitive area of the park. With existing children playground area and BBQ facilities at this location it is expected that visitors of the park would stay within proximity of these areas.

Dwellings in proximity to receiver 3 across Compton Road are considered to be impacted more heavily by road traffic noise and other commercial noise sources located closer than the proposed development site. Impacts from the proposed development site are considered to be negligible at Receiver 3.

5. Equipment

All equipment is calibrated by a NATA accredited laboratory. Certification is held and available on request. Calibration was checked before and after the monitoring sessions with no significant drift from the reference signal.

5.1. Noise Monitoring Equipment

The following equipment was used to measure ambient noise levels:

- 2x ARL EL316 Environmental Noise Monitors (Serial# 16-306-006 and 16-302-489).
- Norsonic Nor131 Sound Level Meter (Serial# 1313158).
- SVAN SV31 Sound Level Calibrator (Serial # 38174).

6. Measurement Methodology

6.1. Unattended Ambient Noise Monitoring

An ARL EL316 noise monitor was placed 25m from Perrin Drive at the north-east of the site (Location A), and 30m from Compton Road on the south-west of site (Location B) to measure existing ambient noise levels. The microphones were in free-field positions approximately 1.5 metres above ground level. Noise monitoring was conducted from the 17th to the 25th of November, 2014.

The monitor was set to measure statistical noise levels in "A" weighting, "Fast" response, and over 15 minute intervals. Noise levels were measured in accordance with Australian Standard *AS1055:1997 Acoustics – Description and Measurement of Environmental Noise (AS1055)*.

Rainfall was experienced on Wednesday 19th of November for a short period in the afternoon. This data was not taken into account for the environmental noise analysis. Weather conditions for the remaining logging days were suitable for use in this assessment.

Figure 3: Noise Monitoring Locations (Source: Nearmap)



6.2. On-site Transient Activity Noise Measurements

Noise levels associated with typical commercial activities were taken from similar investigations by Soundmatters. All measurements were conducted in accordance with *AS1055*.

6.3. Results of Measurements

6.3.1. Measured Ambient Noise Levels

Table 1 presents a summary of the measured ambient noise levels relevant to the development for determination of the criteria. The measurements are based on the unattended noise monitoring data shown graphically in Appendix B and are the arithmetic average of all non-weather affected periods.

Table 1: Measured Ambient Noise Levels

Measurement Location	Time Period ¹	Measured Noise Levels, dB(A) Monday to Saturday		Measured Noise Levels, dB(A) Sunday	
		L _{Aeq}	L _{A90}	L _{Aeq}	L _{A90}
25m from Perrin Drive (Location A)	Day	49	44	49	43
	Evening	44	42	43	39
	Night	38	35	37	34
	Early morning*	47	42	46	39
30m from Compton Road (Location B)	Day	55	49	52	45
	Evening	54	48	53	47
	Night	49	38	46	38
	Early morning*	57	48	51	42

*The site proposes opening hours of 6:30am to 9pm with some minor activity expected to occur just prior to opening and closing. Therefore the development will operate in the early morning period of 6am to 7am. Subsequently ambient noise levels have been identified to determine the noise criteria for this period.

The data presented above was used to determine the assessment criteria for the development.

¹ Day:	7am – 6pm
Evening:	6pm – 10pm
Night:	10pm – 7am
Early morning*:	6am – 7am

7. Noise Criteria

The assessment criterion for the development is presented below and it will be used to determine compliance with onsite activity noise in accordance with the requirements of *Logan City Council Planning Scheme Policy 3 – Environment Management (SC6.2.3)*.

7.1. On-site Activity Noise

Noise criteria associated with the proposed commercial activities are pursuant to the SC6.2.3. In essence, the policy requires an assessment of noise emission impact from the proposed development onto the boundary of the sensitive receivers to verify compliance with residential and general amenity. SC6.2.3 requires the following information to be included in the assessment:

- Detail location, extent and construction specifications for proposed attenuation measures.
- State all assumptions and methodologies used.

Table 2 and Table 3 outline the criteria from SC6.2.3 regarding the permissible noise level at the boundary of the noise sensitive receiver.

Table 2: Noise Emission Standards for the Protection of Residential Amenity

Noise Type	Time Period	Monday to Saturday	Sunday and Public Holidays
Non-steady sound ² e.g. Transient activities	Day	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 5 \text{ dB(A)}$	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 5 \text{ dB(A)}$
	Evening	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 5 \text{ dB(A)}$	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 5 \text{ dB(A)}$
	Night	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 0 \text{ dB(A)}$ And $L_{Amax} \leq 60 \text{ dB(A)}$	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 0 \text{ dB(A)}$ And $L_{Amax} \leq 60 \text{ dB(A)}$
Continuous sound ³ e.g. mechanical plant	Anytime	$L_{A90,T} \text{ plus } 0 \text{ dB(A)}$	$L_{A90,T} \text{ plus } 0 \text{ dB(A)}$

Table 3: Noise Emission Standards for the Protection of General Amenity

Noise Type	Time Period	Monday to Saturday	Sunday and Public Holidays
Non-steady sound e.g. Transient activities	Day	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 10 \text{ dB(A)}$	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 5 \text{ dB(A)}$
	Evening	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 10 \text{ dB(A)}$	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 5 \text{ dB(A)}$
	Night	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 5 \text{ dB(A)}$ And $L_{Amax} \leq 80 \text{ dB(A)}$	$L_{Aeq,adj,T} \leq L_{A90} \text{ plus } 5 \text{ dB(A)}$ And $L_{Amax} \leq 80 \text{ dB(A)}$
Continuous sound e.g. mechanical plant	Anytime	$L_{A90,T} \text{ plus } 5 \text{ dB(A)}$	$L_{A90,T} \text{ plus } 5 \text{ dB(A)}$

² as defined in AS1055.1-1997 Acoustics – Description and measurement of environmental noise.

³ as defined in AS1055.1-1997 Acoustics – Description and measurement of environmental noise.

8. On-site Activity Noise Assessment

8.1. Development Criteria

The ambient noise levels measured at Location A were used to determine the assessment requirements outlined in Section 7 as they are considered representative of ambient noise levels experienced at the northern receivers. The specific project criteria are presented in Table 4 and Table 5.

Table 4: Site Specific Criteria for Protection of Residential Amenity

Noise Type	Time Period	Monday to Saturday	Sunday and Public Holidays
Non-steady sound	Day	$L_{Aeq,adj,T} \leq 49 \text{ dB(A)}$	$L_{Aeq,adj,T} \leq 48 \text{ dB(A)}$
	Evening	$L_{Aeq,adj,T} \leq 47 \text{ dB(A)}$	$L_{Aeq,adj,T} \leq 44 \text{ dB(A)}$
	Night	$L_{Aeq,adj,T} \leq 35 \text{ dB(A)}$ And $L_{Amax} \leq 60 \text{ dB(A)}$	$L_{Aeq,adj,T} \leq 34 \text{ dB(A)}$ And $L_{Amax} \leq 60 \text{ dB(A)}$
	Early Morning	$L_{Aeq,adj,T} \leq 42 \text{ dB(A)}$ And $L_{Amax} \leq 60 \text{ dB(A)}$	$L_{Aeq,adj,T} \leq 39 \text{ dB(A)}$ And $L_{Amax} \leq 60 \text{ dB(A)}$
Continuous sound	6am to 10pm	42 dB(A)	39 dB(A)

Table 5: Site Specific Criteria for Protection of General Amenity

Noise Type	Time Period	Monday to Saturday	Sunday and Public Holidays
Non-steady sound	Day	$L_{Aeq,adj,T} \leq 54 \text{ dB(A)}$	$L_{Aeq,adj,T} \leq 48 \text{ dB(A)}$
	Evening	$L_{Aeq,adj,T} \leq 52 \text{ dB(A)}$	$L_{Aeq,adj,T} \leq 44 \text{ dB(A)}$
	Night	$L_{Aeq,adj,T} \leq 40 \text{ dB(A)}$ And $L_{Amax} \leq 80 \text{ dB(A)}$	$L_{Aeq,adj,T} \leq 39 \text{ dB(A)}$ And $L_{Amax} \leq 80 \text{ dB(A)}$
	Early Morning	$L_{Aeq,adj,T} \leq 47 \text{ dB(A)}$ And $L_{Amax} \leq 80 \text{ dB(A)}$	$L_{Aeq,adj,T} \leq 44 \text{ dB(A)}$ And $L_{Amax} \leq 80 \text{ dB(A)}$
Continuous sound	6am to 10pm	47 dB(A)	44 dB(A)

8.2. Noise Source Levels

Table 6 presents the typical activities and respective noise levels in L_{Aeq} and L_{Amax} . The noise sources used were selected as they represent the likely activities onsite that have the potential to adversely impact noise sensitive receivers located in the vicinity of the development. Noise source levels were calculated to the specified distance showed in Table 6 and include corrections for tonality and impulsiveness as per *AS1055*.

Table 6: Typical Noise Sources Associated with the Development

Noise Source Description	Distance from Measured Noise Level	Measured Noise Level, dB(A)	
		L _{Aeq}	L _{Amax}
Car door closure	1m	75*	83*
Single event car bypass @ 5km/h	1m	69	77
Single event car engine ignition	1m	72	75
Gas Forklift 7T	3m	75	82
Gas Forklift Horn 3T	2m	89	92
Truck Pass by	1m	80	83
Truck Reverse	1m	87	92
Pallet Jack	1m	91	102
Waste collection	1m	93	105
Deliveries	1m	85*	97*

* Includes adjustment to account for impulsiveness characteristics in accordance with AS1055.

Table 7 present the estimated number of noise events occurring over a 1 hour period to represent a “worst case” scenario.

Table 7: Typical Transient Noise Sources Events and Duration

Noise Source Description	Measured Duration (s)	“Worst Case” Estimated number of events in one hour
Car door closure	2	500
Single event car bypass @ 5km/h	6	500
Single event car engine ignition	3	250
Gas Forklift 7T	15	40
Gas Forklift Horn 3T	3	40
Truck Pass by	20	4
Truck Reverse	30	4
Pallet Jack	20	45
Waste collection	40	1
Deliveries	60	4

8.2.1. Calculation Assumptions

The following assumptions were made to calculate the predicted noise impacts at the nearest noise sensitive receivers:

- Car park movements and activities predicted from the nearest parking space in the customer parking area;
- Goods deliveries, waste collection and forklift movements predicted from the loading area on the north façade of the proposed building.

- Conversations from the café area are not expected to have an impact on the sensitive receivers due to separation distance and shielding from the main building.
- The proposed opening hours are 6:30am to 9pm. It is expected that most of the activities in Table 7 will occur during the day and evening period however compliance was also checked against the most stringent early morning period criteria (39 dB(A)).
- Calculations consider screening from the recommended 1.8 metre high acoustic barrier detailed in Section 9.

8.2.2. Predicted Noise Levels

Table 8 presents predicted noise levels from the development onto the nearest noise sensitive receivers as identified in Section 4.1. Predicted levels are based upon the noise source levels in Table 6 and consider screening from the building envelope where appropriate.

If the noise sources comply with the selected criteria it is assumed they will also comply with the site specific criteria at all times.

Table 8: Predicted Noise Levels at Sensitive Receivers

Receiver	Noise Source	Predicted External Noise Level, dB(A)		Complies with Assessment Criteria (Yes/No)	
		LAeq	LAmax	LAeq	LAmax
				39 dB(A)	60 dB(A)
1	Car door closure	25	34	✓	✓
	Car bypass @ 5km/h	25	33	✓	✓
	Car engine ignition	22	25	✓	✓
	Gas Forklift 7T	23	30	✓	✓
	Gas Forklift Horn 3T	30	33	✓	✓
	Truck Pass by	21	24	✓	✓
	Truck Reverse	30	35	✓	✓
	Pallet Jack	39	50	Yes*	✓
	Waste collection	32	44	✓	✓
	Deliveries	29	41	✓	✓
2	Car door closure	20	28	✓	✓
	Car bypass @ 5km/h	19	27	✓	✓
	Car engine ignition	16	19	✓	✓
	Gas Forklift 7T	15	22	✓	✓
	Gas Forklift Horn 3T	22	25	✓	✓
	Truck Pass by	11	14	✓	✓
	Truck Reverse	20	25	✓	✓
	Pallet Jack	33	44	✓	✓
	Waste collection	22	34	✓	✓

Receiver	Noise Source	Predicted External Noise Level, dB(A)		Complies with Assessment Criteria (Yes/No)	
		L _{Aeq}	L _{Amax}	L _{Aeq}	L _{Amax}
				39 dB(A)	60 dB(A)
	Deliveries	18	31	✓	✓
3	Car door closure	24	33	✓	✓
	Car bypass @ 5km/h	23	31	✓	✓
	Car engine ignition	20	23	✓	✓
	Gas Forklift 7T	18	25	✓	✓
	Gas Forklift Horn 3T	25	28	✓	✓
	Truck Pass by	11	14	✓	✓
	Truck Reverse	20	25	✓	✓
	Pallet Jack	35	46	✓	✓
	Waste collection	24	36	✓	✓
	Deliveries	20	33	✓	✓

*the majority of activities are predicted to comply with the criteria without additional treatments. Forklift and pallet jack movements are predicted to comply with the inclusion of an acoustic barrier described in Section 9.

9. Recommendations

To ensure compliance with the relevant Logan City Council assessment criteria for on-site activities and mechanical plant noise, the following acoustic treatments are recommended and presented in Sections 9.1 and 9.2.

9.1. On-Site Transient Activity Noise

This assessment has investigated the 'worst case scenario', by considering potential noise impacts from onsite activities at the nearest location to the sensitive receivers and by applying the criteria described in Section 7.

Based on the results of the calculations and to minimise noise annoyance, we recommend the following management controls:

- Construct an acoustic barrier 1.8metres in height relative to the "Receiving Area" and the "Garden" Area finished floor levels, as per Leffler Simes Architects drawing attached in Appendix A.
 - The acoustic barrier should have no gaps or holes and a minimum surface mass of 12kg/m².
 - The acoustic barrier may be built from a number of materials. As guide, we recommend the following (but not limited to) materials: lapped timber; masonry or fibre cement sheeting.
- Any grates or other protective covers in the car parks and access driveways must be rigidly fixed in position to eliminate clanging, and be maintained.

9.2. Mechanical Plant Noise

Because detailed plant selections are not available at this stage, it is not possible to carry out a detailed examination of the ameliorative measures that may be required to achieve the noise targets.

Plant should be acoustically treated to achieve the criteria detailed in Section 7 to prevent noise emissions from adversely impacting the surrounding properties. This may include selecting the quietest plant possible, or treating the plant equipment with enclosures, barriers, duct lining and silencers, etc.

A mechanical plant noise assessment should be conducted by a suitably qualified acoustic consultant once plant selections are finalised. Noise criteria compliance measurements should then be conducted after the equipment is installed. Such measures should also be conditioned in the Development Approval.

10. Conclusion

An environmental noise assessment was conducted for the proposed development at 103-119 Compton Road, Underwood.

Provided the treatment recommendations presented in Section 9 are implemented, the development is predicted to comply with the Logan City Council assessment criteria.

Note, this assessment does imply that site activities will be inaudible at the receiver locations.

We trust this information meets your current requirements. Should you have any queries please do not hesitate to contact TTM.

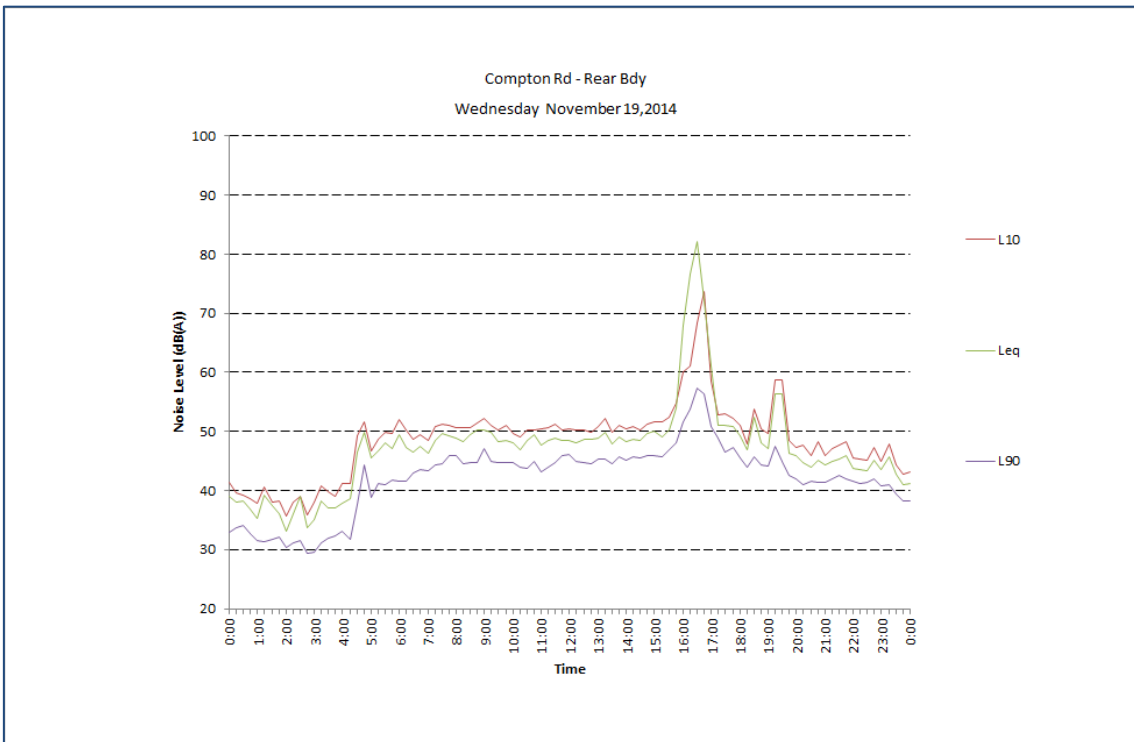
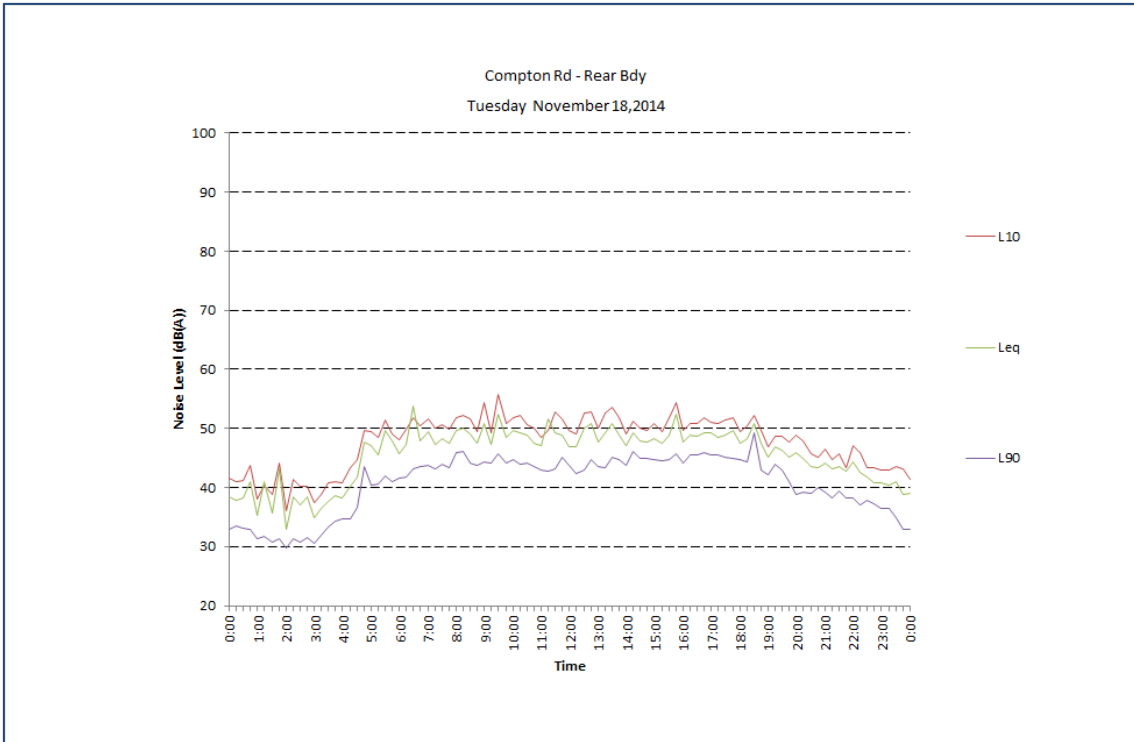
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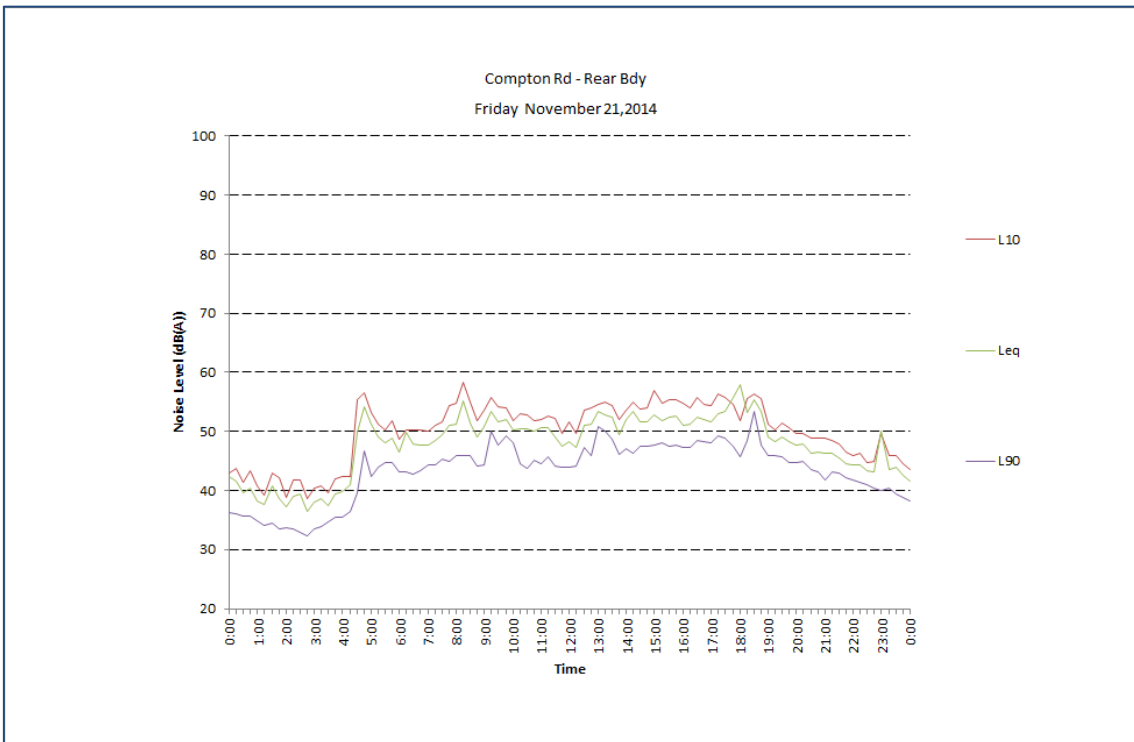
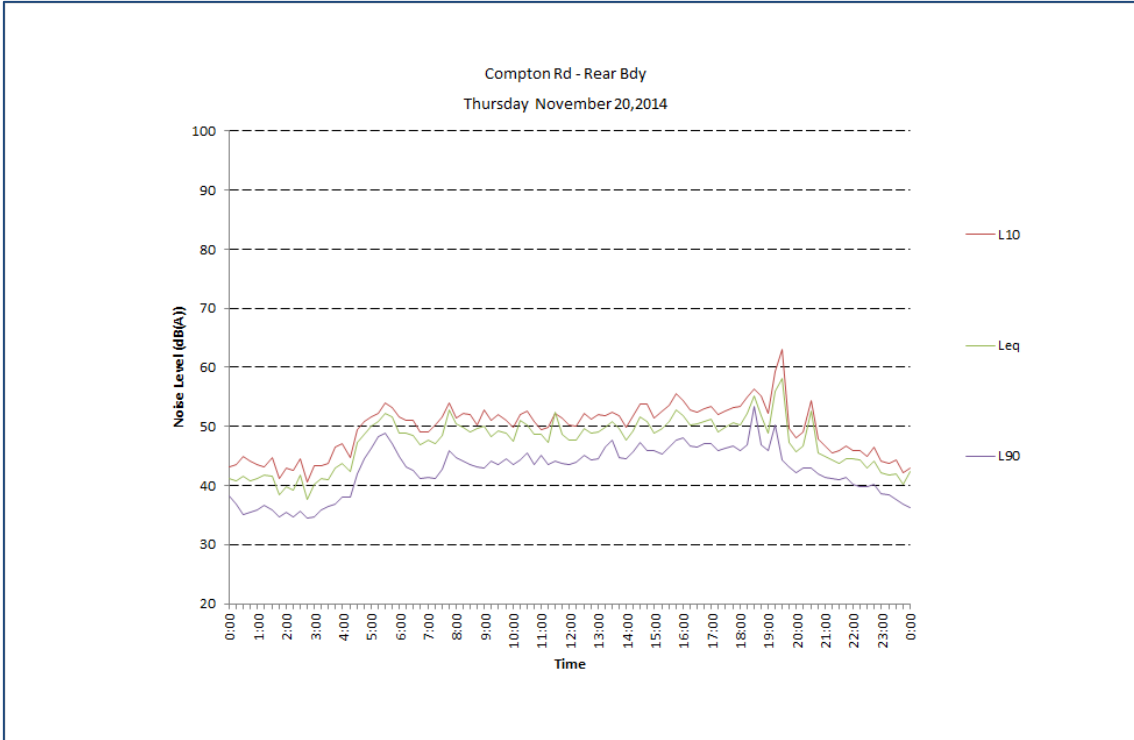


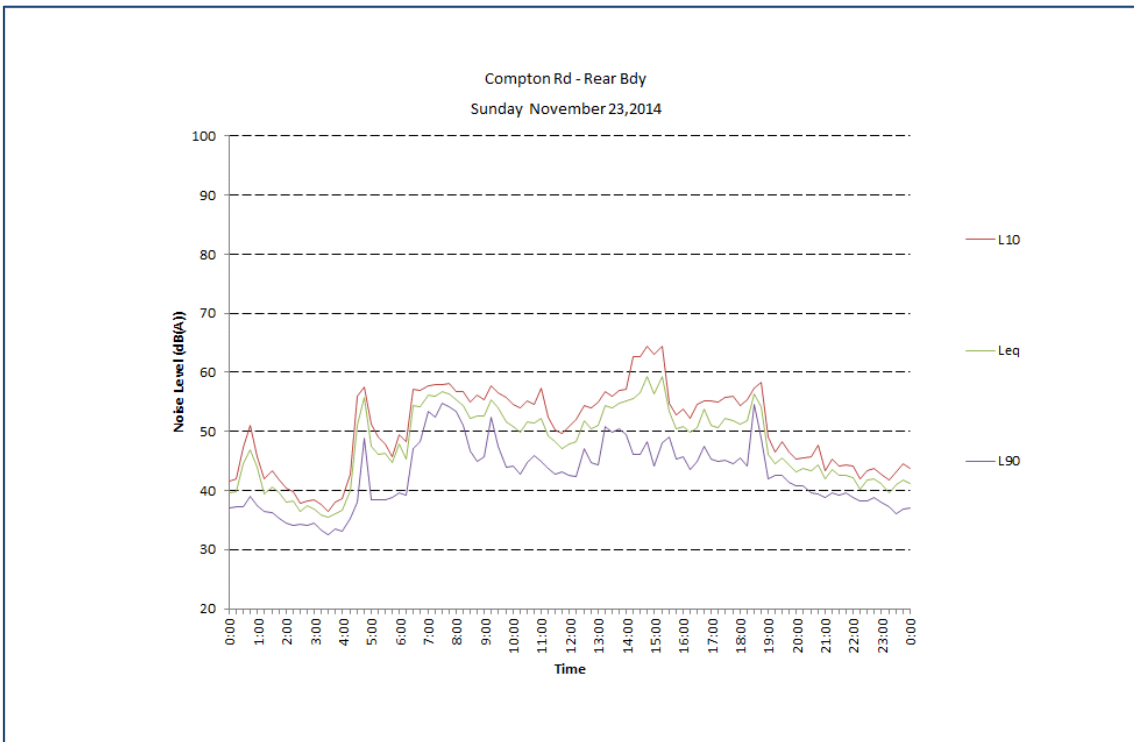
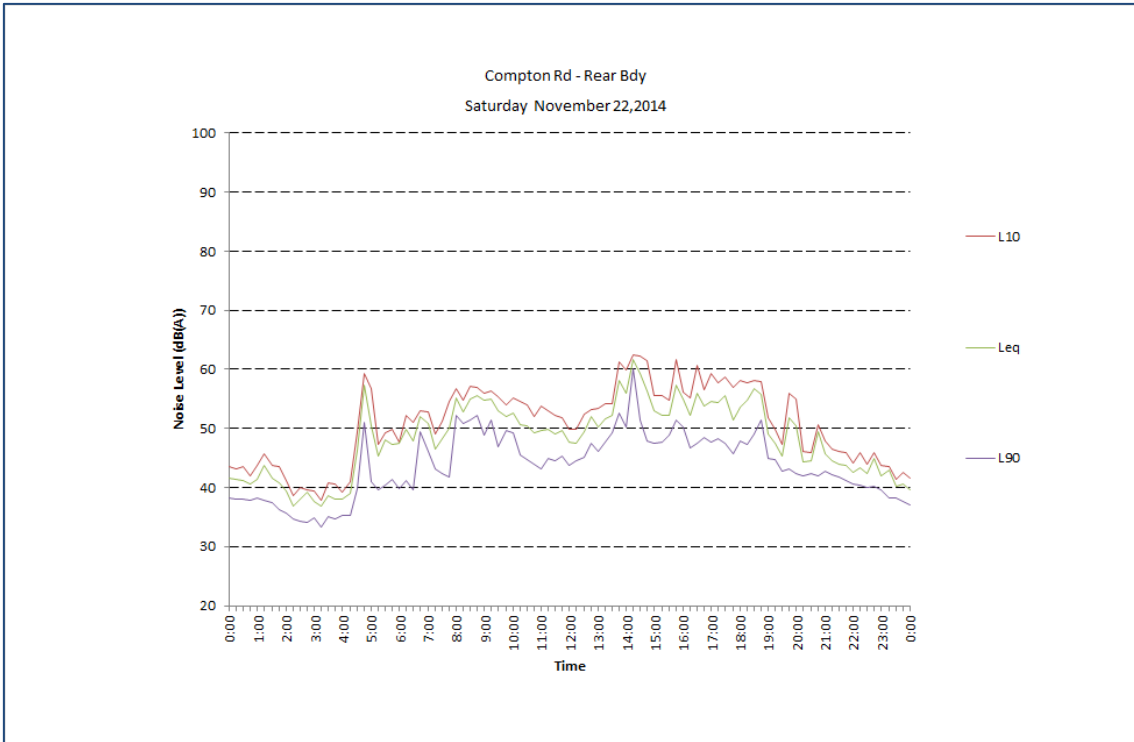
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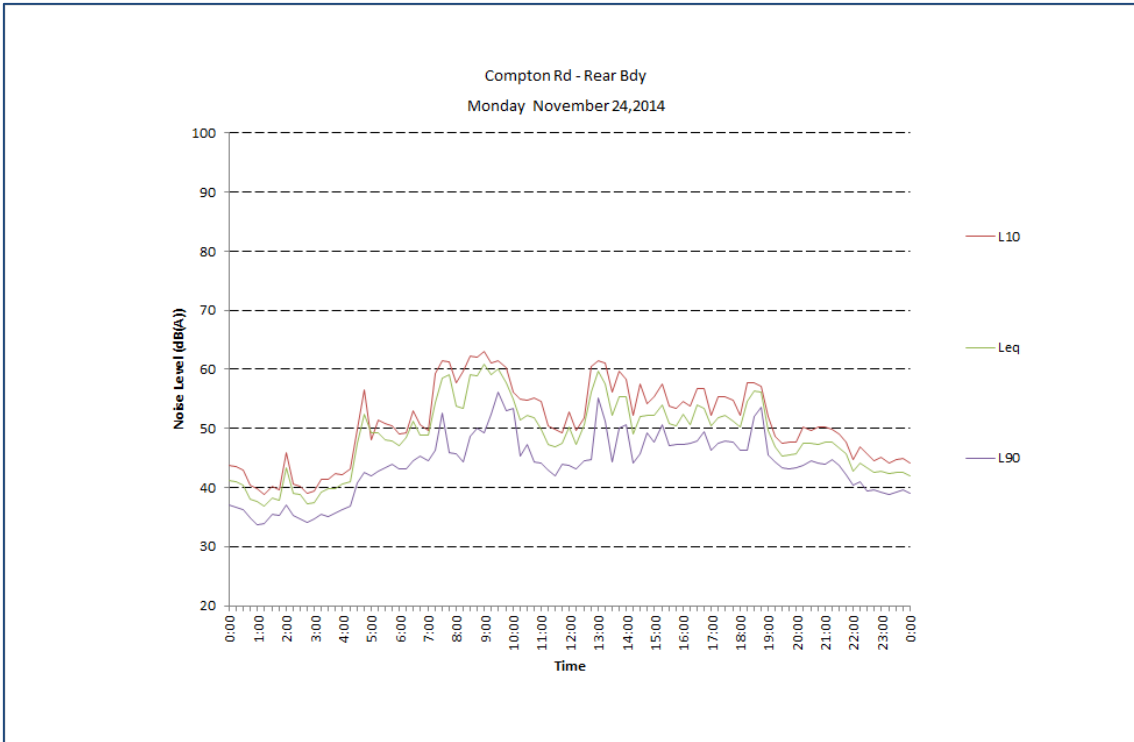
Appendix A Development Plans

Appendix B Unattended Noise Monitoring Graphs









Appendix C Sample Calculations

