

26th March 2008

Report Ref. 9015

Title: Noise Levels of Typical Pro-Wash Car Wash Operations

Brief: Determine Noise Levels of Melton Car Wash Operations and Compile Data for Assistance for Proposed New Car Washes Elsewhere

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1.0 Introduction

This firm has been requested to assess the noise levels associated with the Melton, Victoria, Car Wash to determine the prevailing noise levels. In addition we have been requested to compile the data so that it will be of assistance to proposed new installations of manual, automatic and vacuum units.

The data was acquired on the night of Monday 23rd March, 2009. The weather conditions that prevailed were neutral.

2.0 Measured Noise Levels

Measurements were taken at relevant positions from each vacuuming or washing procedure. Two sound level meters were used to obtain matching data wherever possible. This includes the Leq (the average" noise level in layman's terms), the minimums and maximums plus the L₁₀ data. The L₁₀ data is used in some states as a reasonable limit rather than the maximum.

Note that the data in italics is estimates for the sound level at a distance. This assumes free field conditions without walls, fences and the like. Note that the addition of several sources operating simultaneously cannot be undertaken by simple addition. Refer back to the originator of the report for further assistance.

Vacuum Measurements

Vehicle – Ford Territory, including vacuuming boot area

Pro Wash Power Vac



Measurement Posn	Leq	Minimum	Maximum	L ₁₀	Comment
At 5m from rear	69	67	75	71	3 minutes incl boot vacuum
<i>Estimate at 15m from rear</i>	62	60	68	64	
At 5m from side	76	73	82	77	3 minutes incl boot vacuum
<i>Estimate at 15m from side</i>	69	66	75	70	

IVS Mega Combo

Vehicle – Ford Territory, including vacuuming boot area



Measurement Position	Leq	Minimum	Maximum	L ₁₀	Comment
At 5m from rear	76	62	80	77	3.7 mins incl boot vacuum
<i>Estimate at 15m from rear</i>	69	55	73	70	<i>Ditto</i>
At 5m from side	83	81	87	84	3.7 mins incl boot vacuum
<i>Estimate at 15m from side</i>	76	74	80	77	<i>Ditto</i>

Manual Wash

Vehicle – small car



Measurement Position	Leq	Minimum	Maximum	L ₁₀	Comment
At 5m from front	68	50	69 (rear) 74 (front)	72	Full wash cycle
At 15m from front	62	47 (min background)	62 (rear) 68 (front)	-	Full wash cycle
<i>Estimate at 30m from front</i>	57	<i>Prevailing background level</i>	56 (rear) 63 (front)	61	<i>Ditto</i>

M5 Automatic Wash with Roller Door (no blower)**Vehicle - Ford Territory**

Measurement Position	Leq	Minimum	Maximum	L ₁₀	Comment
At 5m from front of building	68	49	80 (underwash) 54 (light spray) 69 (heavy spray)	72	Door still open for underwash, then closed
At 15m from front of building	62	49	73 (underwash) 50 (light spray) 63 (heavy spray)	64	Door still open for underwash, then closed
<i>Estimate at 30m from front</i>	<i>57</i>	<i>44</i>	<i>68 (underwash) 45 (light spray) 58 (heavy spray)</i>	<i>59</i>	<i>Ditto</i>

Automatic Wash with Roller Door and Max Air Blower

Extreme Wash of Ford Territory 6 mins 14 secs



Measurement Position	Leq	Minimum	Maximum	L ₁₀	Comment
At 5m from front of building	77	53	83 (underwash) 82 (heavy spray) 66 (light spray)	82	Door still open for underwash – excluding blower
At 15m from front of building	67	43	72 (underwash) 59 (light spray) 72 (heavy spray)	72	Door still open for underwash – excluding blower
<i>Estimate at 30m from front</i>	62	38	67 (underwash) 54 (light spray) 67 (heavy spray)	67	Ditto

Automatic Wash Max Air Blower Only

2 minute sequence

Measurement Position	Leq	Minimum	Maximum	L ₁₀	Comment
At 5m from front of building	83	71	85	84	Blower Only
At 15m from front of building	76	74	80	77	Blower Only
<i>Estimate at 30m from front</i>	71	69	75	72	Blower Only

3.0 Permissible Noise Limits

The determination of the Permissible Noise Limits (PNL) varies from state to state in Australia. Usually the prevailing background noise is a determinant of the Permissible Noise Level, which is usually expressed as an Leq (the “average” noise level). Some states also have adjustments for significant changes in sound level during the process whilst some states have an Leq and an L₁₀ specification to accommodate this. To the best of our knowledge all states use a system of Day, Evening and Night Levels, though in New Zealand there is only a Day and Night specification. Usually these operate as follows:

Day	0700 to 1800hrs
Evening	1800 to 2200hrs
Night	2200 to 0700hrs

Some states use the evening limits for Saturday afternoon from 1300hrs and also for the Sunday Day period.

In Victoria the PNL is determined by one of two methods specified in the State Environmental Protection Policy N-1 (SEPP N-1).

The Permissible Noise Limits are set by 2 criteria specified in SEPP N-1. One is the Zoning Method and the other is dependant upon the prevailing background noise level. In short the Zoning method prevails unless the natural background noise is particularly high or low.

For illustrative purposes the following scenarios are specified for 2 scenarios for the Zoning Method in Victoria.

	Day Limit - dBA	Evening Limit - dBA	Night Limit - dBA
Car Wash surrounded by residential premises	51	45	40
Car Wash surrounded by commercial premises by at least 70m	55	49	44

It is quite possible a car surrounded by commercial premises is likely to have higher than average background noise levels, which might raise the Permissible Noise Limits above the Zoning Limits stated above. The prevailing background noise is determined by the use of a noise logger, normally left at the most likely affected premises for at least 3 week days. However if weekend activity is elevated then additional logging at that time is recommended. However in NSW, and possibly elsewhere, the logging period should also cover the weekend period as the Permissible Noise Limits are normally determined by the background noise plus a margin.

Some states such as Queensland also specify their limits in terms of an L₁₀, which is why that data is provided.

In Victoria there are technically no limits for noise in nearby commercial or industrial premises. In NSW the limit is 70dBA within these premises.

7.0 Summary

The operation of the proposed facility during day or evening periods should not be of concern if doors or some other attenuation method is not implemented on the Automatic Wash Bay. However if suitable entry doors are installed it will have a positive effect and ensure that the site should be compliant provided the fence changes are also incorporated.

Please feel free to contact the undersigned if there is further detail that we may be able to provide. This also applies to any other parties that have legitimate access to this report.

Richard Unkles
Engineer

Attachment Technical Appendix I
 Technical Appendix II

TECHNICAL APPENDIX I

Definition of Terminology

Sound Pressure Level:

The root-mean-square values of the pressure fluctuations above and below atmospheric pressure caused by the passage of a sound wave, usually expressed in deci Bels (re 20 μ Pa)

deci Bel:

Unit usually used to define sound pressure level relative to a reference pressure.

$$DB = 20 \log_{10} \left(\frac{P}{P_{ref}} \right)$$

(A):

Reference to particular weighting network within a Sound Level Meter which modifies the linear response. 'A' weighting is designed to approximate the response of the human ear.

Leq:

Equivalent Continuous Sound Level. This is calculated on the basis of average of the Sound Pressure Level (acoustic energy) over a period of time and is expressed in deci Bels.

LAeq:

The 'A' weighted Equivalent Continuous Sound Level.

L10

The noise level exceeded for 10% of a measurement period. Often used as a measurement of occasional interruptive noise, such as traffic.

L90

The noise level exceeded for 90% of a measurement period. Commonly accepted as the natural Background Noise Level.

Slow:

Dynamic characteristics of a Sound Level Meter which employs a time saving averaging constant of 1 second.

Fast:

Dynamic characteristic – time averaging constant is 125m sec.

Peak:

Dynamic characteristic – time averaging constant is 1m sec.

TECHNICAL APPENDIX II

Equipment Used

SVAN 945	Type 1 Sound Analyser Serial No. 3590
Rion	Type UC-53A Microphone Serial No. 313635
Svan	Windshield

NATA Laboratory calibration due 25th January, 2010

Quest CA22	Acoustic Calibrator Serial No. J1060008
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NATA Laboratory calibration due 25th January 2010

The sound level analyser was calibrated before and after the measurements. No significant change was found to have occurred.