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LANDFILL SITE
Lot 11 CHITTY ROAD, TOODYAY

ENVIRONMENTAL NOISE ASSESSMENT

DECEMBER 2014

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TOODYAY

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FOR

IW PROJECTS

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APPENDIX

1. INTRODUCTION

IW Projects commissioned Herring Storer Acoustics to carry out an acoustical assessment of noise emissions from the proposed Landfill Site to be located at Lot 11 Chitty Road, Toodyay. The objectives of the study were to:

- Determine, by modelling, noise propagation from the Landfill Site, including the clay operations.
- Assess the predicted noise levels received at the closest noise sensitive premises, for compliance with the *Environmental Protection (Noise) Regulations 1997*.
- If exceedances are predicted, investigate possible noise control options that will reduce noise emissions to achieve compliance with the regulations.

For information, an area plan is attached in Appendix A.

2. SUMMARY

It is understood that it is proposed that the landfill site would only operate during the day period (i.e. between 0700 and 1800 hours Monday to Saturday) excluding public holidays. Therefore, noise received at the neighbouring residence from the landfill site needs to comply with the assigned L_{A10} noise level of 45 dB(A) for the day period. Although we believe that at the calculated noise level, noise received at the neighbouring residence would not be tonal, to be conservative, an allowance for the +5 dB(A) penalty for a tonal component has been included in the assessment.

Noise emissions from the landfill operations have been determined to be 36 dB(A) at the worst case residential location. With the inclusion of the Clay extraction operation within the same pit, noise received at the worst case residential location would be 39 dB(A). At this noise level noise received at the neighbouring would be deemed to comply with the requirements of the Environmental Protection (Noise) Regulations 1997, even with the inclusion of a +5 dB(A) penalty for tonality.

3. CRITERIA

The *Environmental Protection (Noise) Regulations 1997* stipulate the allowable noise levels that can be received at a premise from other premises. The allowable noise level when received at a residence is determined by the calculations of an influencing factor, which is then added to base noise levels. In this case the influencing factor for closest noise sensitive premises located around the quarry has been calculated at 0.

The assigned noise levels for the neighbouring noise sensitive premises are listed in Table 3.1.

TABLE 3.1 - ASSIGNED NOISE LEVEL

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise Sensitive Premises Highly sensitive area	0700 – 1900 hours Monday to Saturday	45+IF	55+IF	65+IF
	0900 - 1900 hours Sunday and Public Holidays	40+IF	50+IF	65+IF
	1900 – 2200 hours all days	40+IF	50+IF	55+IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays	35+IF	45+IF	55+IF
Noise sensitive premises Any area other than highly sensitive area	All Hours	60	75	80

Note: The L_{A10} noise level is the noise that is exceeded for 10% of the time.
The L_{A1} noise level is the noise that is exceeded for 1% of the time.
The L_{Amax} noise level is the maximum noise level recorded.

Under the Regulations, a ***highly sensitive area*** means that area (if any) of noise sensitive premises comprising –

(a) A building, or part of a building, on the premises that is used for a noise sensitive purpose; and
(b) Any other part of the premises within 15 metres of that building or that part of the building;

It is a requirement that noise received at another premises, be free of annoying characteristics (tonality, modulation and impulsiveness), defined below as per Regulation 9.

"impulsiveness" means a variation in the emission of a noise where the difference between L_{Apeak} and $L_{Amax\ Slow}$ is more than 15dB when determined for a single representative event;

"modulation" means a variation in the emission of noise that –

(a) is more than 3dB $L_{A\ Fast}$ or is more than 3dB $L_{A\ Fast}$ in any one-third octave band;
(b) is present for more at least 10% of the representative assessment period; and
(c) is regular, cyclic and audible;

"tonality" means the presence in the noise emission of tonal characteristics where the difference between –

(a) the A-weighted sound pressure level in any one-third octave band; and
(b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8dB at any time when the sound pressure levels are determined as $L_{A\ Slow}$ levels.

If the above characteristics exist and cannot be practicably removed, then any measured level is adjusted according to Table 3.2 below.

TABLE 3.2 - ADJUSTMENTS TO MEASURED LEVELS

Where **tonality** is present	Where **modulation** is present	Where **impulsiveness** is present
+5 dB(A)	+5 dB(A)	+10 dB(A)

Note: these adjustments are cumulative to a maximum of 15 dB.

4. OPERATIONS

We understand that the landfill site will operate between the hours of 0700 and 1800 Monday to Saturday, but excluding public holidays. Therefore, noise received at the neighbouring residence from the activities on site will need to comply with the assigned L_{A10} noise level of 45 dB(A) for the day period.

From information supplies, we understand that the equipment used on site will be a small (D7) dozer and a waste compactor. Additionally, there could be up to 3 trucks on site at any one time.

It is noted that at the northern end of the landfill operations, there is a clay extraction operation. From information provided, we understand that the equipment used with the clay pit is a dozer pushing into the pit from ground level to bottom of pit, with a Front End Loader operating within the pit to load trucks. The number of truck movements is limited and there would only be one truck moving on site at any one time.

The closest neighbouring residences of concern are located approximately 1300 metres away to the east and north east. These residences are indicated on the locality plan attached in Appendix A.

5. METHODOLOGY / MODELLING

Noise received at the neighbouring residence was determined using the noise modelling computer program "SoundPlan". SoundPlan uses the theoretical sound power levels determined from measured sound pressure levels to calculate the noise level received at a specific location.

The calculations used the following input data:

a) Ground contours.

b) Sound power levels used in the model were based on file data of similar operations. The sound power data is summarised in Table 5.2.

Weather conditions for the modelling were as stipulated within the Environmental Protection Authority's "*Draft Guidance for Assessment of Environmental Factors No. 8 - Environmental Noise"* for the day period were as listed in Table 5.1.

TABLE 5.1 - WEATHER CONDITIONS

Condition	Day Period
Temperature	20 ^{o}C
Relative Humidity	50%
Pasquill Stability Class	E
Wind Speed	4 m/s*

* From sources, towards receivers.

TABLE 5.2 - SOUND POWER LEVELS dB(A)

Item	Sound Power Level dB(A)
Dozer (D7)	109
Waste Compactor	113
Waste Truck	100
Dozer (D11)	113
Clay Truck	102
Front End Loader	108

As in this case the operational relative ground level of the equipment will increase over time, noise modelling was undertaken with the mobile equipment positioned at the final ground level (ie top of the landfill).

Based on the proposed operations, noise modelling was carried out for the following scenarios:

Landfill - Dozer and waste compactor operating on top of landfill, with 3 trucks movements on access road.

Clay - Dozer at ground level, Front end loader in pit, with 1 truck movement on access road.

6. RESULTS

Single point calculations were carried out for the residence located around the proposed pits, and the results of the single point calculations for the worst case locations for each scenario are listed in Table 6.1.

The residential locations are shown on the attached locality plan attached in Appendix A.

TABLE 6.1 - CALCULATED NOISE LEVELS AT CLOSEST RESIDENCES

Scenario	Receiver/Calculated Noise Level dB(A)	
	Residence to North East	Residence to East
Landfill	36	32
Clay	35	28
TOTAL	39	33

The residential locations are shown on the attached locality plan attached in Appendix A.

7. DISCUSSION

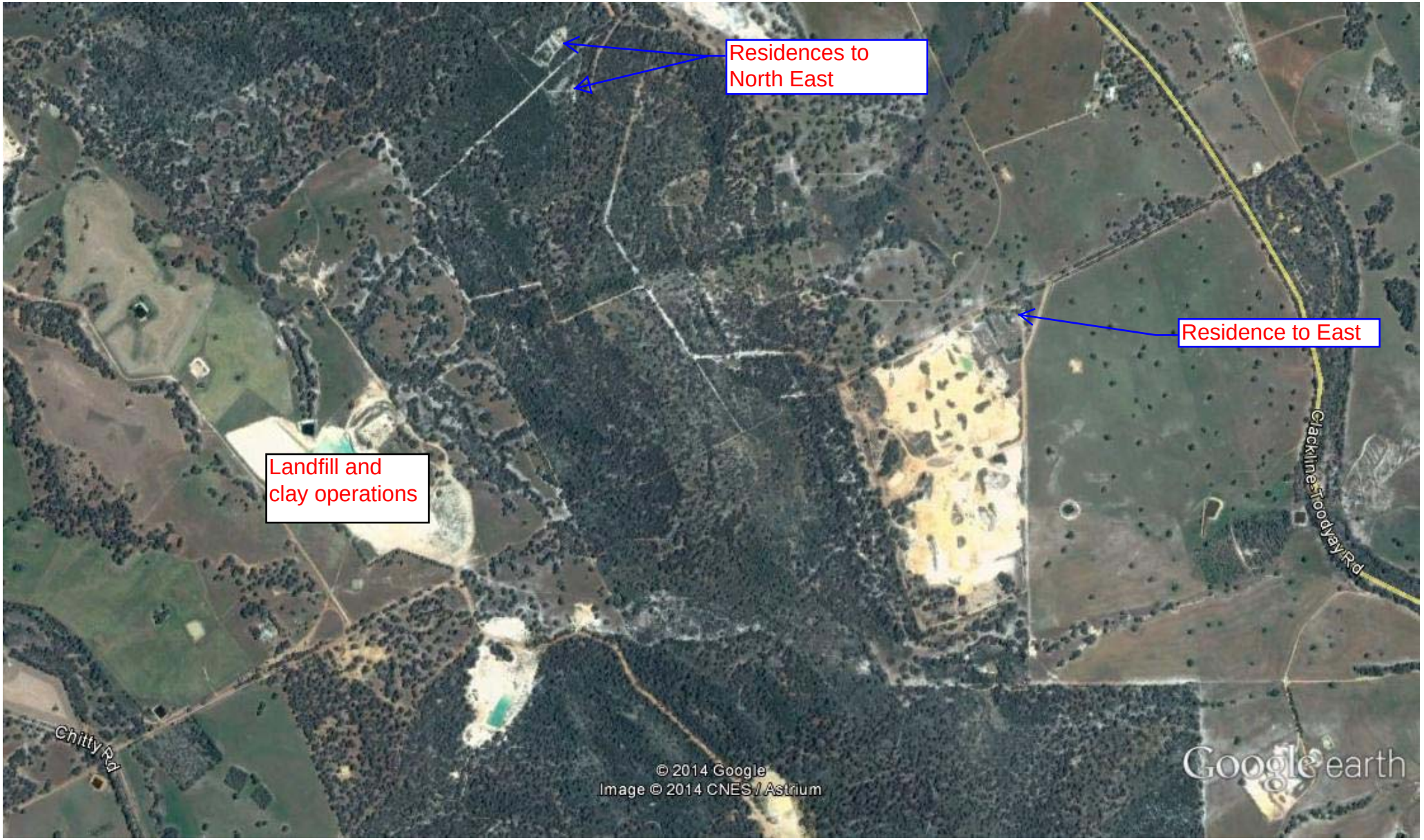
We understand that it is proposed that the proposed landfill site will operate between 0700 and 1800 hours Monday to Saturday (excluding public holidays). As the landfill will only operate during the day period, noise received at the neighbouring residence from the site needs to comply with the assigned L_{A10} noise level of 45 dB(A) for the day period.

Although we believe that at the calculated noise level, noise received at the neighbouring residence would not be tonal, to be conservative, an allowance for the +5 dB(A) penalty for a tonal component has been included in the assessment.

Noise received at the neighbouring residence from the landfill operations and including the clay operations would comply with the requirements of the *Environmental Protection (Noise) Regulations 1997*, even with the addition of a +5 dB(A) penalty for tonality.

APPENDIX A

Locality Plan



Google earth

miles 1
km 2

Aerial
Toodyay Landfill / Clay Site