

**PROFESSIONAL OPINION ON THE NOISE IMPACT
OF THE PROPOSED NEW LANDFILL SITE AT
TUTUKA**

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1. INTRODUCTION

The current waste disposal site within the Tutuka Power Station premises provides domestic waste disposal services to New Denmark Colliery, Thuthukani Township, Tutuka Power Station, selected contractors and some neighbouring farmers.

This particular disposal site has already reached its capacity. Therefore, the establishment of a new waste disposal site within close proximity to the power station property and the current site is being considered by Eskom.

The construction and operation of a waste disposal site necessarily causes noise emissions into the environment which will result in a noise impact. This noise impact will manifest itself as a rise in existing ambient noise levels in the environment.

It is the purpose of this professional opinion to identify, evaluate and assess the noise related issues of the proposed new waste disposal site.

2. METHODOLOGY

This professional opinion is based on:

- A study of the available information (1) on the proposed waste disposal site;
- The estimation of current ambient noise levels at the identified noise sensitive receptors utilizing tabulated values given in SANS 10103 (2);
- The results of sample calculations to estimate the effect of the noise emissions caused during construction and operation of the waste site under neutral and adverse meteorological conditions; and
- The assessment of the noise impact in terms of the regulations applicable in Mpumalanga (3) and the guidelines given in SANS 10103 (2).

3. RESULTS OF THE INFORMATION STUDY

3.1 GENERAL INFORMATION

The topography of the larger study area is for all practical purposes flat. Therefore, there will be no acoustical screening against the propagation of noise from source to receiver.

The vegetation of the area is that of cultivated fields and unimproved grassland. This will provide some sound absorption of propagated noise. For the purpose of calculations it is proposed that 50% soft ground conditions are assumed.

3.2 CONSTRUCTION AND OPERATION OF THE WASTE DISPOSAL SITE

The following noise related aspects were identified:

- The alternatives for the proposed waste disposal site are all in close proximity to the present site.
- During construction a bulldozer will clear the area and prepare the waste disposal site. It is further assumed that the soil on the site will be compacted by a vibrating roller and topsoil will be stacked using a front end loader (FEL) and truck.
- Construction of the new waste disposal site will only require a short period of time.
- During operation the waste is collected in skips, from source, which are then transported to the waste disposal site by tractors. At the waste dump site the waste is dumped, spread and covered with topsoil by a FEL.
- The waste collection method, i.e. the deposit of waste into skips which are then transported by tractors to the waste disposal site, already forms part of the present ambient noise climate in the area. Therefore, the operation of the new site will not be a new source of noise.
- Construction and operation activities for the proposed waste disposal site will only take place during the day and not during the night and weekend.

3.3 NOISE SENSITIVE RECEPTORS

The identified noise sensitive receptors are:

- Tutuka and Thuthukani villages at distances of approximately 2 km or more from the site; and
- The farmsteads on the farms Meyersvallei, Slagkraal and Pretoriusvlei, all at distances of approximately 2 km or more from the site.

3.4 MAJOR EXISTING SOURCES OF NOISE

Major existing sources of noise are:

- The Tutuka Power Station;
- Road traffic on the R38 and the road that leads to New Denmark;
- Localised road traffic; and
- Community generated noise in Tutuka and Thuthukani villages.

4. ESTIMATED EXISTING AMBIENT NOISE LEVEL

Despite the presence of the Tutuka Power Station, the New Denmark colliery and the R38 the general character of the area is rural. According to Table 2 of SANS 10103 (2) the typical ambient noise level during the day (06:00 to 22:00) in a rural area is 45 dBA. This was assumed to be the current ambient noise level in the general area during the day. It must be noted that this is a conservative estimate, i.e. one that will tend to overestimate rather than underestimate the noise impact caused by the construction and operation of the waste disposal site.

5. SAMPLE CALCULATIONS

The sample calculations were carried out in accordance with the procedures described in SANS 10357 (3) for a point at a distance of 2 km from the site. For this purpose the equipment sound power emission levels listed in Table 5.1, based on measurement results that are available on the consultant's data base, were assumed.

TABLE 5.1
Assumed sound power emission levels.

Equipment	Sound power level, dB re 1 pW, in octave frequency band, Hz						
	63	125	250	500	1000	2000	4000
Bulldozer D9	100.0	118.0	111.0	109.0	107.0	103.0	97.0
FEL 966	111.5	107.0	100.8	101.1	96.8	97.0	95.8
Truck	90.0	101.0	102.0	105.0	105.0	104.0	99.0
Tractor	113.9	110.2	98.5	94.4	93.7	92.3	86.0
Vibrating roller	105.0	112.1	106.0	102.5	99.9	98.9	96.0

The calculations were carried out for neutral as well as adverse, i.e. favouring the propagation of noise, meteorological and atmospheric conditions. The results are summarised in Table 5.2.

TABLE 5.2
Results of the sample calculations for a receiver at 2 km distance.

Phase	Met. condition	Noise level, dBA			Difference dB
		Site	Ambient	Sum	
Construction	Neutral	21.5	45.0	45.0	0.0
	Adverse	27.2	45.0	45.1	0.1
Operation	Neutral	13.7	45.0	45.0	0.0
	Adverse	18.7	45.0	45.0	0.0

Where: 'Site' denotes the noise contribution at the receptor caused by the equipment at the waste disposal site;

'Ambient' denotes the existing, i.e. pre-development ambient noise level assumed at the location of the receptor;

'Sum' denotes the power sum, in contrast to the algebraic sum, of the 'Site' and 'Ambient' noise levels. The power sum of two noise levels, L1 and L2, is calculated in the following manner:

$$L_{Sum} = 10 \cdot \log(10^{L1/10} + 10^{L2/10}) \quad d ; \text{ and}$$

'Difference' denotes the algebraic difference between the 'Sum' and 'Ambient' noise levels.

The results in Table 5.2 clearly indicate the noise impact, expressed as the expected increase in ambient noise level, during both construction and operation will either be nil or entirely negligible. This is true for both neutral and adverse meteorological and atmospheric conditions.

6. THE NOISE IMPACT CAUSED BY REVERSE HOOTERS

The high pitched sound emitted by reverse hooters is often perceived as particularly annoying. However, the results of the sample calculations have shown that the noise contributions of equipment on site are very far below the estimated ambient noise levels at the nearest noise sensitive receptors. Even if it is accepted that the pure tone sound emitted by a reverse hooter is comparable to the level of these noise contributions, it is highly unlikely that it will be audible at the long distances under consideration.

Furthermore, as mentioned in section 3.2, the sounding of reverse hooters will not be a new source of noise in the environment. If no complaints have been raised up to now concerning reverse hooters, it is unlikely that they will be raised in future.

7. ASSESSMENT OF THE NOISE IMPACT

According to the noise regulations that are applicable in Mpumalanga an intruding noise is defined as 'disturbing' if it exceeds the ambient noise level at a receptor by 7 dB or more. The results of this noise study have clearly shown that any possible increase in ambient noise level will be entirely negligible. Therefore, the noise caused by equipment during construction and operation of the new waste disposal cannot be classified as 'disturbing'.

Table 5 of SANS 10103 (2) provides typical community reactions to an increase in ambient noise level. According to this table there will be no community reaction at any of the nearest noise sensitive receptors.

8. CONCLUSIONS

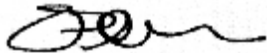
Based on the findings of this noise study the consultant is of the professional opinion that the noise emissions from the proposed new landfill site at Tutuka Power Station,

both during construction and operation will cause no impact on the existing ambient noise levels at the nearest noise sensitive receptors in the area.

9. REFERENCES

In this report reference was made to the following documentation:

- (1) Zitholele Consulting, Draft Scoping Report, Tutuka Waste Disposal Site: Proposed extension of the existing General Waste Disposal Site (and associated infrastructure) at the Tutuka Power Station, November 2009.
- (2) SANS 10103:2008 'The measurement and rating of environmental noise with respect to annoyance and to speech communication', Edition 6.
- (3) Model noise regulations published under the Environment Conservation Act, Act 73 of 1989, by the Minister of the Environment in 1997.
- (4) SANS 10357:2004 'The calculation of sound propagation by the Concawe method'. Edition 1.2.



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