

Environmental Noise Survey

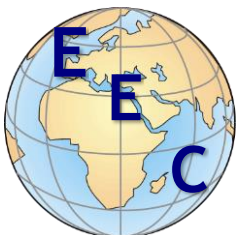
Prepared for:

Cape Lime Vredendal

**Strictly
Confidential**

May 2020

Compiled by:



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Executive Summary

Cape Lime Vredendal Operation commissioned Ebenaeser Environmental Consultants to conduct an Environmental Noise survey.

The survey was conducted on 5th May 2020

The noise measurements were performed on the boundary at different positions to determine the extent of the noise levels emitted from the plant.

The purpose of the study was to determine baseline noise levels for comparison during future mining operations. The sampling results indicates that no to little effect of noise pollution was measured at the boundaries of the mine, or along the access road to the new quarry site.

The following was concluded from the survey:

- Noise energy will be influence by the Meteorological conditions such as barometric pressure, wind speed and direction as well as clouds density.

2. Definitions

"ambient sound level" means the reading on an integrating impulse sound level meter taken at a measuring point in the absence of any alleged disturbing noise at the end of a total period of at least 10 minutes, after such meter had been put into operation;

"controlled area" means a piece of land designated by a local authority where, in the case of -

- (a) road transport noise in the vicinity of a road -
 - (i) the reading on an integrating impulse sound level meter, taken outdoors at the end of a period extending from 06:00 to 24:00 while such meter is in operation, exceeds 65 dBA; or
 - (ii) the equivalent continuous 'A'-weighted sound pressure level at a height of at least 1,2 metres, but not more than 1,4 metres, above the ground for a period extending from 06:00 to 24:00 as calculated in accordance with SABS 0210-1986, titled: 'Code of Practice for calculating and predicting road traffic noise', published under Government Notice No. 358 of 20 February 1987, and projected for a period of 15 years following the date on which the local authority has made such designation, exceeds 65 dBA;
- (c) industrial noise in the vicinity of an industry -
 - (i) the reading on an integrating impulse sound level meter, taken outdoors at the end of a period of 24 hours while such meter is in operation, exceeds 61 dBA; or
 - (ii) the calculated outdoor equivalent continuous 'A'-weighted sound pressure level at a height of at least 1,2 metres, but not more than 1,4 metres, above the ground for a period of 24 hours, exceeds 61 dBA;

"disturbing noise" means a noise level which exceeds the zone sound level or, if no zone sound level has been designated, a noise level which exceeds the ambient sound level at the same measuring point by 7 dBA or more;

"integrating impulse sound level meter" means a device which integrates a function of the root mean square value of sound pressure over a period of time while it is set on '1'-time weighting and Indicates the result in dBA;



"noise level" means the reading on a sound level meter taken at a measuring point in the presence of any alleged disturbing noise at the end of a total period of at least 10 minutes, after such meter had been put into operation, and, if the alleged disturbing noise has a discernible pitch, to which 5 dBA has been added;

"noise nuisance" means any sound which disturbs or impairs or may disturb or impair the convenience or peace of any person;

"sound level" means the reading on a sound level meter taken at a measuring point;

"sound level meter" means a device measuring sound pressure while it is set on 'F'-time weighting and indicates the result in dBA;

3. Surveyor

J kritzinger - Ebenaeser Environmental Consultants cc.

4. Reason for Survey

Atmospheric Pollution Prevention Act and Regulations (45/1965)

27. Control of noise and vibration

The Minister or the MEC responsible for air quality in a province may, by regulation in terms of section 46 or 47, prescribe measures for the control of noise and vibration, either in general or by specified machinery or in specified instances or in specified places or areas, including for determining

- (a) definitions for noise and vibration;
- (b) the maximum levels of noise and vibration.

Environmental Conservation Act and Regulations (73/1989)

5. Prohibition of disturbing noise

No person shall make, produce or cause a disturbing noise, or allow it to be made, produced or caused by any person, machine, device or apparatus or any combination thereof.

Legislation requires employers to determine ambient noise levels and disturbance noise levels.

6. Method Used

In accordance with SANS 10103:2008 Edition 6. "The measurement and rating of environmental noise with respect to annoyance and to speech communication".

7. Use of measuring instruments

(1) The measurement of dBA values in respect of controlled areas, ambient sound levels or noise levels in terms of these Regulations shall be done as follows:

- (a) Outdoor measurements on a piece of land: By placing the microphone of an integrating impulse sound level meter at least 1,2 metres, but not more than 1,4 metres, above the ground and at least 3,5 metres away from walls, buildings or other sound reflecting surfaces; and



- (b) indoor measurements in a room or enclosed space, which is not ventilated mechanically: By placing the microphone of an integrating impulse sound level meter at least 1, 2 metres, but not more than 1, 4 metres, above the floor and at least 1, 2 metres away from the wall, with all the windows and outer doors of the room or enclosed space entirely open: Provided that the windows and doors are closed for indoor measurements in rooms or enclosed spaces which are mechanically ventilated.
- (2) Any person taking readings, shall ensure that -
- (a) the microphone of an integrating impulse sound level meter is at all times provided with a windshield;
 - (b) the measuring instruments are operated strictly in accordance with the manufacturer's instructions; and
 - (c) sound measuring instruments are checked annually by the South African Bureau of Standards or a calibration laboratory approved by the Minister in order to comply with the appropriate specifications for accuracy.

8. Instrumentation Used

A SVANTEK Sound Level Meter, Serial No - 15824, 47560 and 10570, that complies with the requirements for accuracy of a Type 1 instrument was used to determine the noise levels emanating by machinery in the workplace. The instrument was calibrated at a SANAS accredited laboratory on 10th to 11th October 2019. A sound calibrator ser. No U2010251 calibrated on 22nd July 2020 was used to verify accuracy of the sound level meter, before and after measurements were taken.

9. Meteorological Conditions

Meteorological conditions were monitored throughout the survey and will be listed under "Results".

10. Acceptable Noise in Various Districts for Land use Purposes

Acceptable rating levels ($L_{Req,T}$) for ambient noise in different districts are given in Table 1.

NOTE These levels are essentially in line with the recommendations of the World Health Organization for community exposures.

11. Establishment of Noise Zones for Land Use Purposes

For town and regional planning purposes, it is recommended that land areas be zoned with respect to acceptable noise levels in order to avoid the long-term problems of noise control in the presence of an accumulating ambient noise level. The values given in table 1 may be used as a guide in establishing such zones, but do not should be taken of the fact that specific acoustic isolation procedures could affect outdoor noise zone levels, e.g. barriers, sound insulation in buildings (see SANS 10218-1 and SANS 10218-2) etc.



Table 1 - Acceptable Rating Levels for Noise in Districts

1	2	3	4	5	6	7
Type of district	Equivalent continuous rating level ($L_{Reg,T}$) for noise dB(A)					
	Outdoors			Indoors, with open windows		
	Day-night $L_{R,dn}$	Day-time $L_{Reg,d}^b$	Night-time $L_{Reg,n}^b$	Day-night $L_{R,dn}$	Day-time $L_{Reg,d}^b$	Night-time $L_{Reg,n}^b$
RESIDENTIAL DISTRICTS						
a) Rural district	45	45	35	35	35	25
b) Suburban district with little road traffic	50	50	40	40	40	30
c) Urban districts	55	55	45	45	45	35
NON RESIDENTIAL DISTRICTS						
d) Urban districts with some workshops, with business premises, and with main roads	60	60	50	50	50	40
e) Central business districts	65	65	55	55	55	45
f) Industrial districts	70	70	60	60	60	50
<p>NOTE 1 If the measurements or calculation time interval is considerably shorter than the reference time intervals, significant deviations from the values given in the table may result.</p> <p>NOTE 2 If the spectrum of the sound contains significant low frequency components, or when unbalanced spectrum towards the low frequencies is suspected, special precautions should be taken and specialist advice should be obtained. In this case the indoor sound levels may significantly differ from the values given in columns 5 to 7.</p> <p>NOTE 3 Residential buildings e.g. dormitories, hotel accommodation, residences etc. should only be allowed in non-residential districts on condition that the calculated or anticipated indoor $L_{Reg,T}$ values.</p> <p>a The values given in columns 2 and 5 are equivalent continuous rating levels and include corrections for tonal character, impulsiveness of the noise and the time of day.</p> <p>b The values given in columns 3, 4, 6 and 7 are equivalent continuous rating levels and include corrections for tonal character and impulsiveness of the noise.</p>						



Table 2 - Categories of Community / Group Response

1	2	3
Excess $L_{Reg.T}$ dB(A)	Estimated community / group response	
	Category	Description
0 - 10	Little	Sporadic complaints
5 - 10	Medium	Widespread complaints
10 - 20	Strong	Threats of community / group action
> 15	Very strong	Vigorous community / group action
a $L_{Reg.T}$ should be calculated from the appropriate of the following:		
1) $L_{Reg.T} = L_{Reg.T}$ of ambient noise under investigation MINUS $L_{Reg.T}$ of the residual noise (determined in the absence of the specific noise under investigation).		
2) $L_{Reg.T} = L_{Reg.T}$ of ambient noise under investigation MINUS the maximum rating level for the ambient noise.		
3) $L_{Reg.T} = L_{Reg.T}$ of ambient noise under investigation MINUS the acceptable rating level for the applicable district as determined from table 1.		
4) $L_{Reg.T} =$ Expected increase in $L_{Reg.T}$ of ambient noise in an area because of a proposed development under investigation.		
NOTE Overlapping ranges for the excess values are given because a spread in the community reaction may be anticipated.		

12. Table 3: Results:

Sampling Point	Sampling Time & Date				Remarks
	Tuesday 05/05/2020				
	Ambient Noise Plant not running $L_{Reg.T}$ (dB) - 05h00	Noise from Plant running $L_{Reg.T}$ (dB) - 12h00	Noise from Plant running $L_{Reg.T}$ (dB) - 21h00	GPS	
Cape Lime Mining Perimeter					
CL-EN 1	53.6	54.3dB	54.5	31° 41'2.42"S 18° 32'32.51"E	Background noise from plant running
CL-EN 2	45.0	45.3dB	45.1	31° 40'36.53"S 18° 33'42.02"E	Background noise from Crushing plant running
CL-EN 3	44.1	44.4dB	45.0	31° 40'12.32"S 18° 33'15.31"E	Background noise from farming activity
CL-EN 4	38.5	38.7dB	39.1	31° 40'5.57"S 18° 33'43.96"E	Background noise from Crushing plant running
CL-EN 5	34.2	35.0dB	34.5	31° 40'19.22"S 18° 34'21.19"E	Background noise from Quarry Area
CL-EN 6	32.2	32.3dB	31.8	31° 39'56.75"S 18° 34'36.87"E	Quiet Background Noise
CL-EN 7	33.8	34.1dB	33.2	31° 39'10.42"S 18° 35'42.59"E	Background Noise main road between Vredendal and Vanrhynsdorp
CL-EN 8	30.2	30.1dB	30.3	31° 38'37.91"S 18° 36'49.70"E	

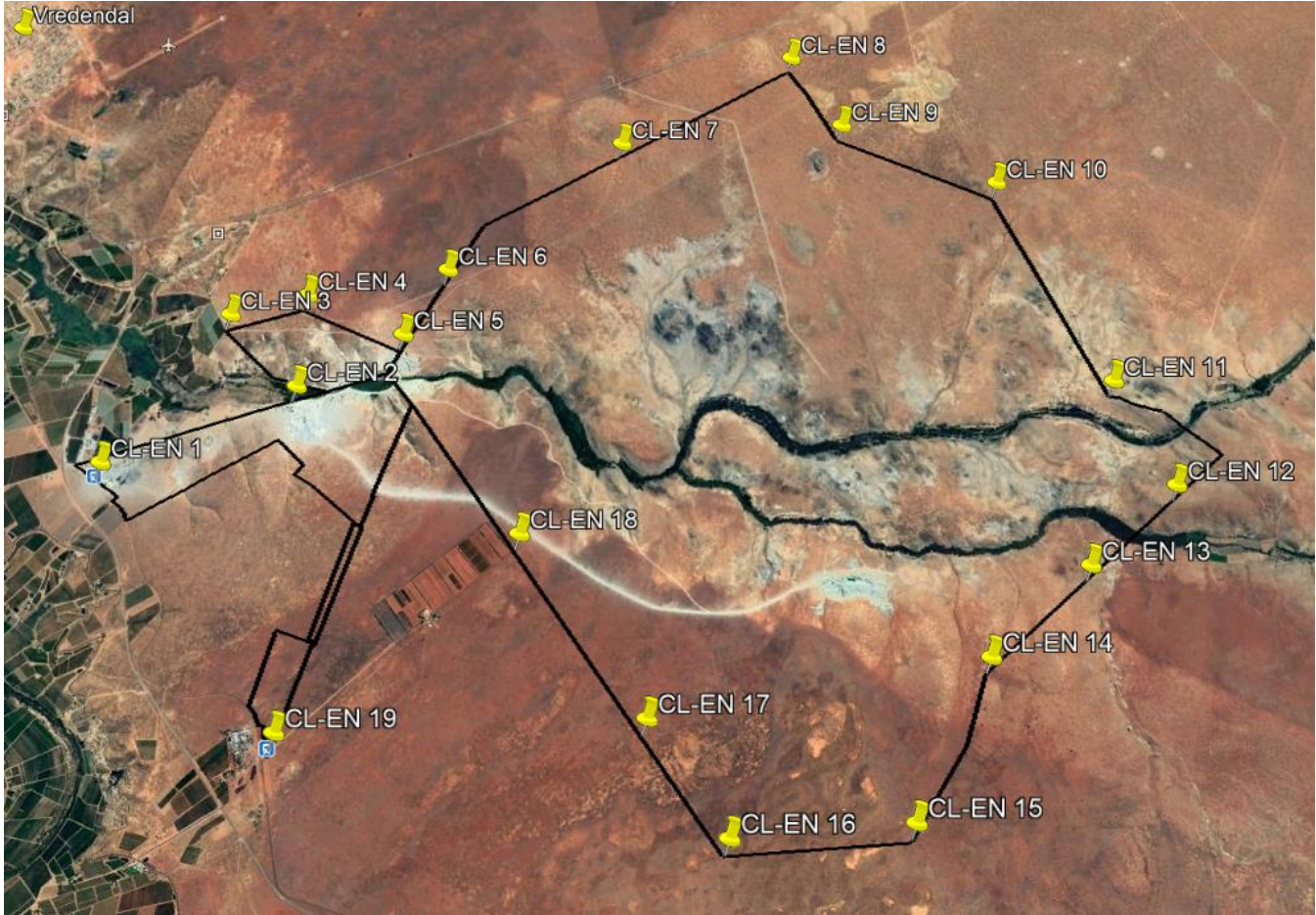


Sampling Point	Sampling Time & Date				Remarks
	Tuesday 05/05/2020				
	Ambient Noise Plant not running L _{Reg,T} (dB) - 05h00	Noise from Plant running L _{Reg,T} (dB) - 12h00	Noise from Plant running L _{Reg,T} (dB) - 21h00	GPS	
CL-EN 9	32.7	33.3dB	33.5	31° 39'3.76"S 18° 37'9.05"E	Quiet Background Noise
CL-EN 10	38.3	40.2dB	40.6	31° 39'25.21"S 18° 38'8.53"E	
CL-EN 11	37.2	37.4dB	37.6	31° 40'35.23"S 18° 38'47.71"E	Quiet Background Noise
CL-EN 12	36.5	36.8dB	37.0	31° 41'10.30"S 18° 39'7.15"E	
CL-EN 13	33.5	33.6dB	33.9	31° 41'36.02"S 18° 38'33.56"E	Quiet Background Noise
CL-EN 14	31.1	30.4dB	30.7	31° 42'4.61"S 18° 37'55.64"E	
CL-EN 15	31.5	30.1dB	30.3	31° 42'53.48"S 18° 37'26.74"E	Quiet Background Noise
CL-EN 16	30.6	31.5dB	31.7	31° 42'57.92"S 18° 36'22.96"E	
CL-EN 17	30.0	29.9dB	30.5	31° 42'23.17"S 18° 35'54.48"E	Quiet Background Noise
CL-EN 18	30.3	30.5dB	30.8	31° 41'26.13"S 18° 35'7.75"E	
CL-EN 19	41.9	42.3dB	42.1	31° 42'27.12"S 18° 33'44.56"E	Quiet Background Noise
Cape Lime Access Road					
CL-EN 20	40.8	41.0dB	41.6	31° 41'31.56"S 18° 37'13.73"E	Quiet Background Noise
CL-EN 21	35.6	35.9dB	36.3	31° 41'16.27"S 18° 38'55.44"E	
CL-EN 22	33.5	33.7dB	34.4	31° 40'51.79"S 18° 40'9.18"E	
CL-EN 23	33.1	33.7dB	34.2	31° 40'19.05"S 18° 42'9.87"E	58.1dB with traffic of Highway passing main entrance
Cape Lime New Quarry					
CL-EN 24	41.1	41.5dB	42.0	31° 41'26.35"S 18° 42'31.68"E	Background Noise Highway between Klawer and Vanrhynsdorp
CL-EN 25	41.3	41.4dB	41.9	31° 41'16.78"S 18° 43'0.33"E	

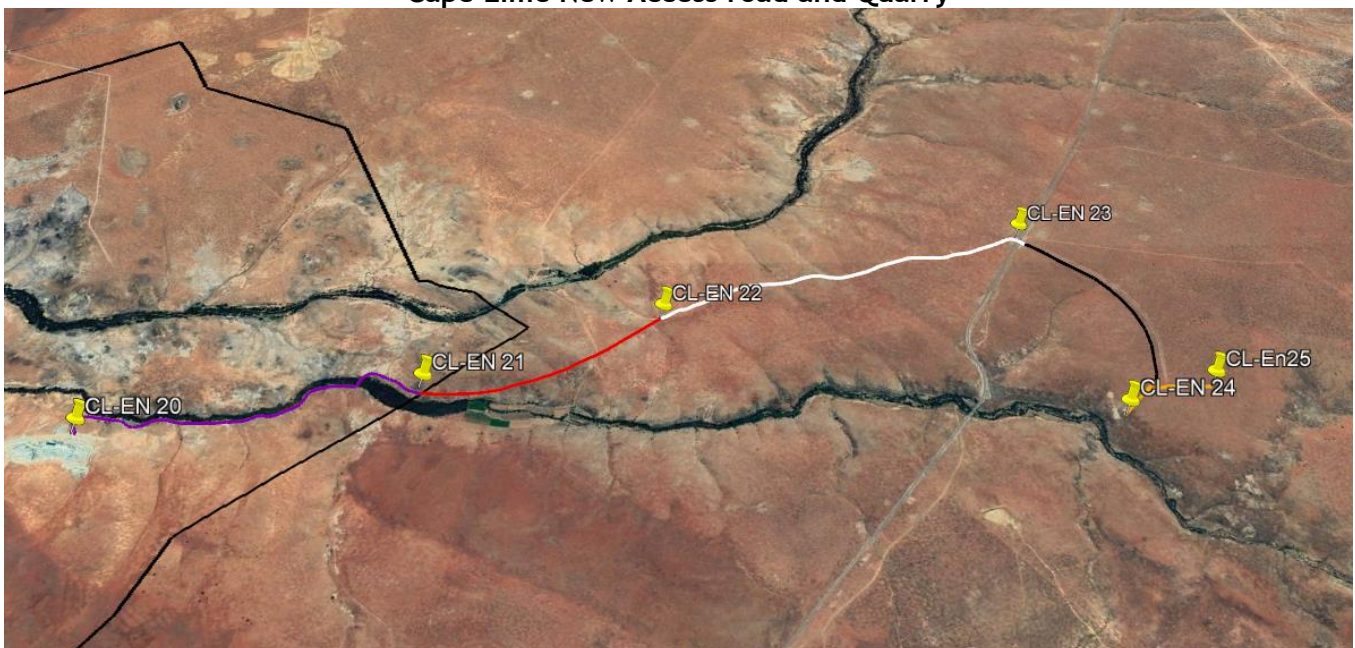


13. Table 4: Perimeter Area View:

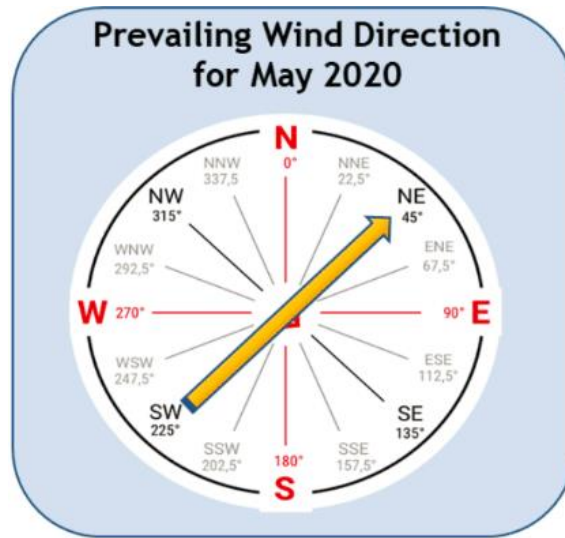
Cape Lime Mining Perimeter



Cape Lime New Access road and Quarry



14. Environmental Conditions



Pos No.	Locality	Relative Humidity %	t _d Temp °C	Wind Velocity m/s	Remarks
1	Office - Ambient	21%	25 °C	3.211 m/s	
2	Office - Day Readings	21%	29 °C	3.611 m/s	
3	Office - Night Readings	21%	15 °C	1.611 m/s	

15. Remarks

14.1 The sampling results was influenced by low wind flows during the time of the survey.

14.2 No significant noise levels were measured.

Yours Faithfully

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