NOISE COMPLIANCE STATEMENT AND SCREENING NOISE REPORT

for the Proposed Prospecting Right Application on Farm Mareesburg 8 JT South of Steelpoort, Limpopo Province

Statement done for:

Prepared by:

EARES
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EXECUTIVE SUMMARY

INTRODUCTION

Enviro-Acoustic Research cc was commissioned to compile a Noise Compliance Statement as part of the application to prospect for Platinum Group Metals (PGM) on the farm Mareesburg 8 JT. This PGM Project is proposed adjacent to the existing Der Brochen mine.

The Terms of Reference for this study is the guideline set by SANS 10103:2008, also considering the requirements of Government Notice Regulation ("GNR") 320 of 2020. The National Web based Environmental Screening Tool[1] was used to screen the proposed site for the noise sensitivity as per the requirements of GNR320 (20 March 2020).

BRIEF PROJECT DESCRIPTION

Nomamix (Pty) Ltd (the applicant) is applying for the right to prospect Platinum Group Metals on the Farm Mareesburg 8 JT, in the magisterial district of Fetagoma Tubatse, Limpopo. The proposed prospecting will be non-invasive and include the following main techniques:

- Data search, field mapping and desktop studies;
- Logging and sampling historical core; and
- Scoping and (pre) feasibility studies.

Due to the large amount of previous diamond core drilling conducted in the area, new drilling locations will only be considered after completion of all the sourced historic exploration results.

EXISTING AMBIENT SOUND LEVELS

Ambient sound levels were measured by the Author (de Jager, 2021) over a three-night period at one location in the Vygenhoek community, located to the south-east of the farm Mareesburg. The project area was also visited a few times for other projects in the area.

Based on the sound measurements:

- Considering the arithmetic average based on the 10-minute L_{Aeq} values (38.5 dBA) as well as the equivalent L_{Aeq} values based on the 16-hour daytime periods (43.1 dBA), ambient sound levels are typical of a rural noise district. This is in agreement considering the developmental character of the area;
- Considering the arithmetic average based on the 10-minute L_{Aeq} values (27.4 dBA) as well as the equivalent L_{Aeq} values based on the 8-hour night-time periods (27.4 dBA),

[1] https://screening.environment.gov.za/screeningtool/#/pages/welcome

ambient sound levels are typical of an undeveloped rural noise district. This is in agreement considering the developmental character of the area;

- The statistical L_{A90} levels are very low both day and night, indicating little constant sounds that could raise this statistical indicator; and,
- Spectral data indicate that while community noises does influence the daytime sound levels, nights are quiet with mainly natural noises dominating.

Considering the results of the measurements, the developmental character of the area as well as audible observations, the recommended noise limits would be typical of a rural noise district. This is quieter than the WHO and IFC guidelines yet in line with the character of the area. The acceptable rating level for the area would be;

- **45 dBA for the daytime period;** and,
- **35 dBA for the night-time period**.

SUMMARY FINDINGS OF THE DESKTOP VERIFICATION

An initial desktop verification was done considering the noise layer as available from the National Web based Environmental Screening Tool[2] as well as aerial imagery available on from Google Earth© (dated 3 March 2021). These images are recent and of sufficient resolution to identify and verify potential noise sensitive areas. The online screening tool define most of the Project Focus area to have a "Very High" sensitivity to noise, with this desktop assessment confirming the "Very High" sensitivity.

As such a noise specialist study must be appended to any environmental impact assessment. However, considering that the proposed prospecting will be non-invasive and will not change the ambient sound levels in the proposed prospecting area, a Screening Noise Report in terms of SANS 10328:2008 will be sufficient.

FINDINGS, SUMMARY AND RECOMMENDATION

This Screening report assess the potential noise impact due to proposed non-invasive prospecting activities within the PFA of the Mareesburg PGM Prospecting Project.

While there are numerous potential NSR staying within the PFA, the proposed prospecting will be non-invasive and the proposed activities will not change ambient sound levels within the PFA, nor result in any unreasonable or annoying noises. The risk of a noise impact (for non-invasive prospecting) is of a low significance.

[2] https://screening.environment.gov.za/screeningtool/#/pages/welcome

As such it is recommended that the proposed prospecting activities be authorized from an acoustic perspective.

The recommendation of this report is conditional that the prospecting activities are non-invasive as reported by the applicant. For non-invasive prospecting, no additional impact management or any noise monitoring are required for inclusion in the EMPr, nor are any further Noise Scoping or other acoustical studies required.

However, if any additional diamond drilling activities are planned or anticipated it is recommended that this be investigated in a full noise specialist assessment.

This report should be sited as:
De Jager, M. (2022): "*Noise Compliance Statement and Screening Noise Report for the Proposed Prospecting Right Application on Farm Mareesburg 8 JT South of Steelpoort, Limpopo Province*". Enviro-Acoustic Research cc, Pretoria

Client:
Environmental Management Assistance (Pty) Ltd for
Nomamix (Pty) Ltd

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Rietvlei Heights Country Estate
Calopsis Close
Pretoria

Report no:
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Date:
August 2022

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GLOSSARY OF ABBREVIATIONS

AZSL	Acceptable Zone Sound Level (Rating Level)
dB	Decibel

DACE	Department of Agriculture, Conservation and Environment
DEAT	Department of Environmental Affairs and Tourism
EARES	Enviro-Acoustic Research cc
ECA	Environment Conservation Act, 1989 (Act No 78 of 1989)
EIA	Environmental Impact Assessment
ENIA	Environmental Noise Impact Assessment
ENPAT	Environmental Potential Atlas
EP	Equator Principle
EPFI	Equator Principle Financial Institutions
Etc.	etcetera / and so forth
f	fast setting, see **Appendix A**
GG	Government Gazette
GNR	Government Notice Regulation
Hz	Hertz
i	Impulse setting, see **Appendix A**
I&AP(s)	Interested and Affected Party(ies)
i.e.	that is
IFC	International Finance Corporation
In/sec	inches per second
Kg/m^2	kilogram per square metres
km/h	kilometres per hour
L_{A10}	See **Appendix A**
L_{A90}	See **Appendix A**
L_{Aeq}	See **Appendix A**
L_{Amax}	See **Appendix A**
L_{Amin}	See **Appendix A**
m	Metres
m/s	Metres per second
m^2	Square metre
m^3	Cubic metre
mamsl	Metre above mean sea level
mm	millimetre
NCR	Noise Control Regulations (under Section 25 of the ECA)
NEMA	National Environmental Management Act, 1998 (Act No 107 of 1998)
NGO	Non-government Organisation
NR	Noise Reduction
NSD	Noise-Sensitive Development

NSR	Noise-Sensitive Receptors
p/d	per day
PPE	Personal Protective Equipment
PPP	Public Participation Process
Rpm	Revolutions per minute
RSA	Republic of South Africa
SABS	South African Bureau of Standards
SANS	South African National Standards
t	Time
TOR	Terms of Reference
WHO	World Health Organisation

1 CHECKLIST: GG43110 MINIMUM REQUIREMENTS

The National Web based Environmental Screening Tool[3] was used to screen the proposed site for the noise environmental sensitivity as per the requirements of GNR320 (20 March 2020), considering the site location illustrated in **Figure 4-1**.

The site report generated by the Screening Tool highlighted that a Noise Impact Assessment must be completed and appended to the Environmental Authorization (EA) documentation.

The screening report was developed for *Mining => Prospecting Rights*, though this application category does not have illustrate potential areas having a "very high" sensitivity to noise. As such the noise layer was obtained for the *Utilities Infrastructure => Electricity => Generation => Renewable => Wind* application category, with the noise sensitive areas illustrated on **Figure 4-2**.

In terms of GNR320 (20 March 2020), a Noise Compliance Statement must contain, as a minimum, the following information:

Clause	Requirement	Comment / Reference
2.3.1	contact details of the environmental assessment practitioner or noise specialist, their relevant qualifications and expertise in preparing the statement, and a curriculum vitae	Section 2
2.3.2	a signed statement of independence by the environmental assessment practitioner or noise specialist	Section 3 and separate declaration
2.3.3	a map showing the proposed development footprint (including supporting infrastructure) overlaid on the noise sensitivity map generated by the screening tool	Figure 4-2
2.3.4	confirmation that all reasonable measures have been taken through micro-siting to minimize disturbance to receptors	Not relevant
2.4.1	a substantiated statement from the environmental assessment practitioner or noise specialist on the acceptability, or not, of the proposed development and a recommendation on the approval, or not, of the proposed development	Section 8
2.4.2	any conditions to which this statement is subjected	Section 8

[3] https://screening.environment.gov.za/screeningtool/#/pages/welcome

2.5.1	where required, proposed impact management outcomes or any monitoring requirements for inclusion in the EMPr	Section 8
2.5.2	a description of the assumptions made and any uncertainties or gaps in knowledge or data as well as a statement of the timing and intensity of site inspection observations	Section 6

2 THE AUTHOR

The Author, Morné de Jager, started his career in the mining industry as a bursar Learner Official (JCI, Randfontein), working in the mining industry, doing various mining related courses (Rock Mechanics, Surveying, Sampling, Safety and Health [Ventilation, noise, illumination etc] and Metallurgy. He did work in both underground (Coal, Gold and Platinum) as well as opencast (Coal) for 4 years. He changed course from Mining Engineering to Chemical Engineering after his second year of his studies at the University of Pretoria.

After graduation he worked as a Water Pollution Control Officer at the Department of Water Affairs and Forestry for two years (first year seconded from Wates, Meiring and Barnard), where duties included the perusal (evaluation, commenting and recommendation) of various regulatory required documents (such as EMPR's, Water Licence Applications and EIA's), auditing of licence conditions as well as the compilation of Technical Documents.

Since leaving the Department of Water Affairs, Morné has been in private consulting for the last 20 years, managing various projects for the mining and industrial sector, private developers, business, other environmental consulting firms as well as the Department of Water Affairs. During that period he has been involved in various projects, either as specialist, consultant, trainer or project manager, successfully completing these projects within budget and timeframe. During that period he gradually moved towards environmental acoustics, focusing on this field exclusively since 2007.

He has been interested in acoustics as from school days, doing projects mainly related to loudspeaker design. Interest in the matter brought him into the field of Environmental Noise Measurement, Prediction and Control. He has been doing work in this field for the past 13 years, and was involved with the following projects in the last few years:

Wind Energy Facilities	*Full Environmental Noise Impact Assessments for - Bannf (Vidigenix), iNCa Gouda (Aurecon SA), Kangnas (Aurecon), Plateau East and West (Aurecon), Wolf (Aurecon), Outeniqwa (Aurecon), Umsinde Emoyeni (ARCUS) , Komsberg (ARCUS), Karee and Kolkies Wind Farms (ARCUS), Canyon Springs (Canyon Springs), Perdekraal (ERM), Zen (Savannah Environmental – SE), Goereesoe (SE), Springfontein (SE), Garob (SE), Project Blue (SE), ESKOM Kleinzee (SE), Walker Bay (SE), Oyster Bay (SE), Hidden Valley (SE), Happy Valley (SE), Deep River (SE), Tsitsikamma (SE), AB (SE), West Coast One (SE), Hopefield II (SE), Namakwa Sands (SE), VentuSA Gouda (SE), Dorper (SE), Amakhala Emoyeni (SE), Klipheuwel (SE), Cookhouse (SE), Cookhouse II (SE), Rheboksfontein (SE), Suurplaat (SE), Karoo Renewables (SE), Koningaas (SE), Eskom Aberdene (SE), Spitskop (SE), Castle (SE), Khai Ma (SE), Poortjies (SE), Korana (SE), IE Moorreesburg (SE), Gunstfontein (SE), Vredenburg (Terramanzi), Loeriesfontein (SiVEST), Rhenosterberg (SiVEST), Noupoort (SiVEST), Prieska (SiVEST), Dwarsrug (SiVEST), Msenge Emoyeni (Windlab), Isivunguvungu Wind Farm (Aurecon), Graskoppies (SiVEST), Hartebeest Leegte (SiVEST), Ithemba (SiVEST), !Xha Boom (SiVEST), Kokerboom 1 (Aurecon), Kokerboom 2 (Aurecon), Teekloof (Mainstream), Sutherland (CSIR), Rietrug (CSIR), Sutherland 2 (CSIR), Spitskop West (Terramanzi)*

Mining and Industry	*Full Environmental Noise Impact Assessments for – Delft Sand (AGES), BECSA – Middelburg (Golder Associates), Kromkrans Colliery (Geovicon Environmental), SASOL Borrow Pits Project (JMA Consulting), Lesego Platinum (AGES), Tweefontein Colliery (Cleanstream Environmental), Evraz Vametco Mine and Plant (JMA), Goedehoop Colliery (Geovicon), Hacra Project (Prescali Environmental), Der Brochen Platinum Project (J9 Environment), Brandbach Sand (AGES), Verkeerdepan Extension (CleanStream Environmental), Dwaalboom Limestone (AGES), Jagdlust Chrome (MENCO), WPB Coal (MENCO), Landau Expansion (CleanStream Environmental), Otjikoto Gold (AurexGold), Klipfontein Colliery (MENCO), Imbabala Coal (MENCO), ATCOM East Expansion (Jones and Wagner), IPP Waterberg Power Station (SE), Kangra Coal (ERM), Schoongesicht (CleanStream Environmental), EastPlats (CleanStream Environmental), Chapudi Coal (Jacana Environmental), Generaal Coal (JE), Mopane Coal (JE), Glencore Boshoek Chrome (JMA), Langpan Chrome (PE), Vlakpoort Chrome (PE), Sekoko Coal (SE), Frankford Power (REMIG), Strahrae Coal (Ferret Mining), Transalloys Power Station (Savannah), Pan Palladum Smelter, Iron and PGM Complex (Prescali Environmental), Fumani Gold (AGES), Leiden Coal (EIMS), Colenso Coal and Power Station (SiVEST/EcoPartners), Klippoortjie Coal (Gudani), Rietspruit Crushers (MENCO), Assen Iron (Tshikovha), Transalloys (SE), ESKOM Ankerlig (SE), Pofadder CSP (SE), Nooitgedacht Titano Project (EcoPartners), Algoa Oil Well (EIMS), Spitskop Chrome (EMAssistance), Vlakfontein South (Gudani), Leandra Coal (Jacana), Grazvalley and Zoetveld (Prescali), Tjate Chrome (Prescali), Langpan Chromite (Prescali), Vereeniging Recycling (Pro Roof), Meyerton Recycling (Pro Roof), Hammanskraal Billeting Plant 1 and 2 (Unica), Development of Altona Furnace, Limpopo Province (Prescali Environmental), Haakdoorndrift Opencast at Amandelbult Platinum (Aurecon), Landau Dragline relocation (Aurecon), Stuart Coal Opencast (CleanStream Environmental), Tetra4 Gas Field Development (EIMS), Kao Diamonds – Tiping Village Relocation (EIMS), Kao Diamonds – West Valley Tailings Deposit (EIMS), Upington Special Economic Zone (EOH), Arcellor Mittal CCGT Project near Saldanha (ERM), Malawi Sugar Mill Project (ERM), Proposed Mooifontein Colliery (Geovicon Environmental), Goedehoop North Residue Deposit Expansion (Geovicon Environmental), Mutsho 600MW Coal-Fired Power Plant (Jacana Environmentals), Tshivhaso Coal-Fired Power Plant (Savannah Environmental), Doornhoek Fluorspar Project (Exigo)*
Road and Railway	*K220 Road Extension (Urbansmart), Boskop Road (MTO), Sekoko Mining (AGES), Davel-Swaziland-Richards Bay Rail Link (Aurecon), Moloto Transport Corridor Status Quo Report and Pre-Feasibility (SiVEST), Postmasburg Housing Development (SE), Tshwane Rapid Transport Project, Phase 1 and 2 (NRM Consulting/City of Tshwane), Transnet Apies-river Bridge Upgrade (Transnet), Gautrain Due-diligence (SiVest), N2 Piet Retief (SANRAL), Atterbury Extension, CoT (Bokomoso Environmental)*
Airport	*Oudtshoorn Noise Monitoring (AGES), Sandton Heliport (Alpine Aviation), Tete Airport Scoping (Aurecon)*
Noise monitoring and Audit Reports	*Peerboom Colliery (EcoPartners), Thabametsi (Digby Wells), Doxa Deo (Doxa Deo), Harties Dredging (Rand Water), Xstrata Coal – Witbank Regional (Xstrata), Sephaku Delmas (AGES), Amakhala Emoyeni WEF (Windlab Developments), Oyster Bay WEF (Renewable Energy Systems), Tsitsikamma WEF Ambient Sound Level study (Cennergi and SE), Hopefield WEF (Umoya), Wesley WEF (Innowind), Ncora WEF (Innowind), Boschmanspoort (Jones and Wagner), Nqamakwe WEF (Innowind), Hopefield WEF Noise Analysis (Umoya), Dassiesfontein WEF Noise Analysis (BioTherm), Transnet Noise Analysis (Aurecon), Jeffries Bay Wind Farm (Globeleq), Sephaku Aganang (Exigo), Sephaku Delmas (Exigo), Beira Audit (BP/GPT), Nacala Audit (BP/GPT), NATREF (Nemai), Rappa Resources (Rayten), Measurement Report for Sephaku Delmas (Ages), Measurement Report for Sephaku Aganang (Ages), Development noise measurement protocol for Mamba Cement (Exigo), Measurement Report for Mamba Cement (Exigo), Measurement Report for Nokeng Fluorspar (Exigo), Tsitsikamma Community Wind Farm Pre-operation sound measurements (Cennergi), Waainek WEF Operational Noise Measurements (Innowind), Sedibeng Brewery Noise Measurements (MENCO), Tsitsikamma Community Wind Farm Operational noise measurements (Cennergi), Noupoort Wind Farm Operational noise measurements (Mainstream),*
Small Noise Impact Assessments	*TCTA AMD Project Baseline (AECOM), NATREF (Nemai Consulting), Christian Life Church (UrbanSmart), Kosmosdale (UrbanSmart), Louwlardia K220 (UrbanSmart), Richards Bay Port Expansion (AECOM), Babalegi Steel Recycling (AGES), Safika Slag Milling Plant (AGES), Arcelor Mittal WEF (Aurecon), RVM Hydroplant (Aurecon), Grootvlei PS Oil Storage (SiVEST),*

	Rhenosterberg WEF, (SiVEST), Concerto Estate (BPTrust), Ekuseni Youth Centre (MENCO), Kranskop Industrial Park (Cape South Developments), Pretoria Central Mosque (Noman Shaikh), Soshanguve Development (Maluleke Investments), Seshego-D Waste Disposal (Enviroxcellence), Zambesi Safari Equipment (Owner), Noise Annoyance Assessment due to the Operation of the Gautrain (Thornhill and Lakeside Residential Estate), Upington Solar (SE), Ilangalethu Solar (SE), Pofadder Solar (SE), Flagging Trees WEF (SE), Uyekraal WEF (SE), Ruuki Power Station (SE), Richards Bay Port Expansion 2 (AECOM), Babalegi Steel Recycling (AGES), Safika Ladium (AGES), Safika Cement Isando (AGES), RareCo (SE), Struisbaai WEF (SE), Perdekraal WEF (ERM), Kotula Tsatsi Energy (SE), Olievenhoutbosch Township (Nali), , HDMS Project (AECOM), Quarry extensions near Ermelo (Rietspruit Crushers), Proposed uMzimkhulu Landfill in KZN (nZingwe Consultancy), Linksfield Residential Development (Bokomoso Environmental), Rooihuiskraal Ext. Residential Development, CoT (Plandev Town Planners), Floating Power Plant and LNG Import Facility, Richards Bay (ERM), Floating Power Plant project, Saldanha (ERM), Vopak Growth 4 project (ERM), Elandspoort Ext 3 Residential Development (Gibb Engineering)
Project reviews and amendment reports	*Loperberg (Savannah), Dorper (Savannah), Penhoek Pass (Savannah), Oyster Bay (RES), Tsitsikamma Community Wind Farm Noise Simulation project (Cennergi), Amakhala Emoyeni (Windlab), Spreeukloof (Savannah), Spinning Head (SE), Kangra Coal (ERM), West Coast One (Moyeng Energy), Rheboksfontein (Moyeng Energy), De Aar WEF (Holland), Quarterly Measurement Reports – Dangote Delmas (Exigo), Quarterly Measurement Reports – Dangote Lichtenburg (Exigo), Quarterly Measurement Reports – Mamba Cement (Exigo), Quarterly Measurement Reports – Dangote Delmas (Exigo) Quarterly Measurement Reports – Nokeng Exigo), Proton Energy Limited Nigeria (ERM), Hartebeest WEF Update (Moorreesburg) (Savannah Environmental), Modderfontein WEF Opinion (Terramanzi), IPD Vredenburg WEF (IPD Power Vredenburg)*

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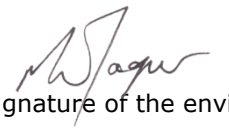
3 DECLARATION OF INDEPENDENCE

I, Morné de Jager declare that:

- I act as the specialist in this application;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting noise measurement reports, environmental noise impact assessments, including knowledge of the National Environmental Management Act (107 of 1998), the Environmental Impact Assessment Regulations of 2010, and any regulations and guidelines that have relevance to the proposed activity or work;
- I will comply with the Act, regulations and all other applicable legislation;
- I will take into account, to the extent possible, the matters listed in regulation 8 of the regulations when preparing the application and any report relating to the application;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the project or application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- I will provide the competent authority with access to all information at my disposal regarding the project or application, whether such information is favourable to the applicant or not
- all the particulars furnished by me in this report are true and correct;
- will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I realise that a false declaration is an offence in terms of regulation 71 and is punishable in terms of section 24F of the Act.

Disclosure of Vested Interest

I do not have and will not have any vested interest (either business, financial, personal or other) in the proposed activity proceeding other than remuneration for work performed.



Signature of the environmental practitioner:

Enviro-Acoustic Research cc
Name of company:

2022 / 08 / 23
Date:

4 INTRODUCTION

4.1 INTRODUCTION AND PURPOSE

Enviro-Acoustic Research cc was commissioned to compile a Noise Compliance Statement as part of the application to prospect for Platinum Group Metals (PGM) on the farm Mareesburg 8 JT. This PGM Project is proposed adjacent to the existing Der Brochen mine.

Proponents intending to submit an application for a prospecting right must screen their proposed site for any environmental sensitivity. The Screening Tool also provides site specific EIA process and review information, identifies related exclusions and/or specific requirements including specialist studies applicable to the proposed site and/or development. The Screening Tool considers the national sector classification and the environmental sensitivity of the site.

An initial desktop verification was done in terms of GNR 320 of March 2020, considering the noise layer as available from the National Web based Environmental Screening Tool[4]. This information is sufficient to advice on the way forward in terms of acoustics.

This report also considers the requirements of SANS 10328:2008 to assess whether noise is a potential issue of concern. The SANS 10328:2008 guideline allows for the assessment of noise impacts on the environment due to a proposed activity that might impact on the environment using an administrative screening questionnaire. If the outcome of all the questions is negative, the planned development or activity is not likely to present a noise disturbance and a Screening report may be submitted to the relevant authorities as part of the Application for a Prospecting Right.

4.2 BRIEF PROJECT DESCRIPTION

Nomamix (Pty) Ltd (the applicant) is applying for the right to prospect Platinum Group Metals on the Farm Mareesburg 8 JT, in the magisterial district of Fetagoma Tubatse, Limpopo. The regional location of the proposed project is indicated in **Figure 4-1**.

The proposed non-invasive prospecting activities will include the following main techniques:

- Data search, field mapping and desktop studies;
- Logging and sampling historical core; and
- Scoping and (pre) feasibility studies.

Due to the large amount of previous diamond core drilling conducted in the area, new drilling locations will only be considered after completion of all the sourced historic exploration results.

[4] https://screening.environment.gov.za/screeningtool/#/pages/welcome

4.3 POTENTIAL NOISE SOURCES

4.3.1 Noises from non-invasive prospecting

The applicant indicated that prospecting would be non-invasive, and mainly consist of laboratory and desktop analysis of available diamond cores. At worst, the site may be visited using light delivery vehicles (LDV) that does not generate significant noise levels.

4.3.2 Diamond Core Drilling activities

While not anticipated that any drilling will be required for this non-invasive prospecting, additional diamond core drilling may be required in the future to augment available data. Diamond core drilling generate significant noises (drills have sound power emission levels ranging from 112 – 125 dBA re 1 pW) and these noises may be disturbing to surrounding noise-sensitive receptors. As such it is recommended that if any additional diamond core drilling is planned, that the applicant cover the potential noise impact in a full Noise Specialist study, where the potential noise emission activities, the location of these activities as well as the location of potential noise-sensitive receptors may be considered.

4.4 PROJECT LOCATION

The proposed prospecting will take place in the Fetagoma Tubatse magisterial district. The project focus area ("PFA") is an area selected to enclose all potential project infrastructure up to 2,000 m from activities or equipment that may generate significant noise. The regional location of the PFA is illustrated in **Figure 4-1**. The PFA is further described in terms of environmental components that may contribute to or change the sound character in the area.

4.4.1 Topography

The Environmental Potential Atlas of South Africa (ENPAT) (Van Riet *et al*, 1998) describes the topography as *"low mountains".* The locality of the proposed activities and infrastructure is within a mountainous region that will complicate noise propagation (partly blocking the noise propagation in certain directions) from potential noise-generating activities.

4.4.2 Surrounding Land Use

The area in the direct vicinity of the project focus area (PFA) is mainly wilderness and mining, with some informal agricultural activities (animal husbandry) associated with the communities in the area.

4.4.3 Ground conditions and vegetation

The area falls within the savanna biome, with the vegetation type being north-eastern mountain grassland[5]. While anthropogenic activities (especially agricultural and mining activities) did influence natural vegetation, the veldt is well vegetated.

4.4.4 Roads and Railway Lines

There are no roads or railway lines located within, or close to the project focus area. The only access road leading to the project focus area currently carries very little traffic, mainly servicing the local community.

4.4.5 Existing Ambient Sound Levels

Ambient sound levels were measured by the Author (de Jager, 2021) over a three-night period at one location in the Vygenhoek community, located to the south-east of the farm Mareesburg. The project area was also visited a few times for other projects in the area.

Based on the sound measurements:

- Considering the arithmetic average based on the 10-minute L_{Aeq} values (38.5 dBA) as well as the equivalent L_{Aeq} values based on the 16-hour daytime periods (43.1 dBA), ambient sound levels are typical of a rural noise district. This is in agreement considering the developmental character of the area;
- Considering the arithmetic average based on the 10-minute L_{Aeq} values (27.4 dBA) as well as the equivalent L_{Aeq} values based on the 8-hour night-time periods (27.4 dBA), ambient sound levels are typical of an undeveloped rural noise district. This is in agreement considering the developmental character of the area;
- The statistical L_{A90} levels are very low both day and night, indicating little constant sounds that could raise this statistical indicator; and,
- Spectral data indicate that while community noises does influence the daytime sound levels, nights are quiet with mainly natural noises dominating.

Considering the results of the measurements, the developmental character of the area as well as audible observations, the recommended noise limits would be typical of a rural noise district. This is quieter than the WHO and IFC guidelines yet in line with the character of the area. The acceptable rating level for the area would be;

- **45 dBA for the daytime period;** and,
- **35 dBA for the night-time period**.

[5] Van Riet, W. Claassen, P. van Rensburg, J. van Viegen & L. du Plessis, "*Environmental Potential Atlas for South Africa"*, Pretoria, 1998.

4.4.6 Potential Sensitive Receptors (NSR)

Residential areas and potential noise-sensitive developments/receptors (NSR) were initially identified using tools such as Google Earth®, with the status of the NSR confirmed during the November 2020 site visit. It is assumed that these locations are still noise-sensitive. The closest potential NSR (receptors identified within 2,000m from the PFA) is highlighted in **Figure 4-3**. Also indicated on this figure are the 500, 1,000 and 2,000 m buffer zones.

Generally, noise from prospecting activities:

- Could be significant within 500m from drilling activities (precautious approach, drilling not anticipated with only non-invasive prospecting anticipated);
- may be clearly audible and potentially annoying during quiet periods up to 1000m from drilling activities (precautious approach, drilling not anticipated with only non-invasive prospecting anticipated); and
- audible up to 2,000m from drilling activities (precautious approach, drilling not anticipated with only non-invasive prospecting anticipated). Noise from any drilling activities should be of a low concern further than 2,000m from such activities.
- are audible up to a distance of 2,000 m at night, though the noises may be audible up to 4,000 m during very quiet periods at night with certain meteorological conditions. These noises are normally of a low concern at distances greater than 2,000 m from noise-generating activities.

Based on information gained during the site visit, the NSR 1 represents a number of residential dwellings used by employees of the nearby Der Brochen Anglo-American mine in the area. NSRs 2 to 16 represent a number of structures used for residential purposes by the Vygenhoek community.

4.4.7 Desktop Verification – Findings

An initial desktop verification was done, considering the noise layer as available from the National Web based Environmental Screening Tool[6] as well as aerial imagery available on from Google Earth ©. Aerial images available on Google Earth © is recent (dated 3 March 2021) and of sufficient resolution to identify and verify potential noise sensitive areas as illustrated on **Figure 4-2**.

This screening report will be sufficient for non-invasive (desktop analysis of data) prospecting and the available information is sufficient to advice on the way forward in terms of acoustics.

[6] https://screening.environment.gov.za/screeningtool/#/pages/welcome

Table 4-1: Summary of findings of Desktop Verification

SCREENING TOOL SENSITIVITY	VERIFIED SENSITIVITY	OUTCOME STATEMENT/PLAN OF STUDY	RELEVANT SECTION MOTIVATING VERIFICATION
NOISE IMPACT ASSESSMENT			
Very High	**Very High**	Screening report in terms of SANS 10328:2998 for non-invasive prospecting.	Figure 4-2 and sections 7 and 8

4.5 TERMS OF REFERENCE

A noise impact assessment must be completed for the following reasons:

- A change in land use as highlighted in SANS 10328:2008, section 5.3;
- If a road or railway line is to be established, or an existing road upgraded within 500 m (or, in the case of a busy throughway, 1 000 m) of a noise-sensitive development (SANS 10328:2008 [5.4 (c)]) *or visa versa*;
- If an industry is to be established within 1,000 m from a potential noise sensitive development (SANS 10328:2008 [5.4 (h)]) *or visa versa*;
- It may be a controlled activity in terms of the NEMA regulations and an ENIA is required, because it may cause a disturbing noise that is prohibited in terms of section 18(1) of the Government Notice 579 of 2010;
- It is generally required by the local or district authority as part of the environmental authorization or planning approval in terms of Regulation 2(d) or GN R154 of 1992.

SANS 10328:2008 (Edition 3) specifies the methodology to assess the noise impacts on the environment due to a proposed activity that might impact on the environment. The standard also stipulates the minimum requirements to be investigated for screening purposes. These minimum requirements are:

a) Identification and description of the noise sources and noise-sensitive developments associated with the development that has to be investigated;
b) Identification and description of the noise sources and noise-sensitive developments in the target area that could affect the development (or that could be affected by the development) that has to be investigated;
c) Identification, with the assistance of all interested or affected parties, and description of all the noise sources and noise-sensitive developments associated with the development, or located within the target area, that are to be excluded from the investigation. The reason(s) for the exclusion shall be stated; and
d) A reference to this standard regarding the method of investigation.

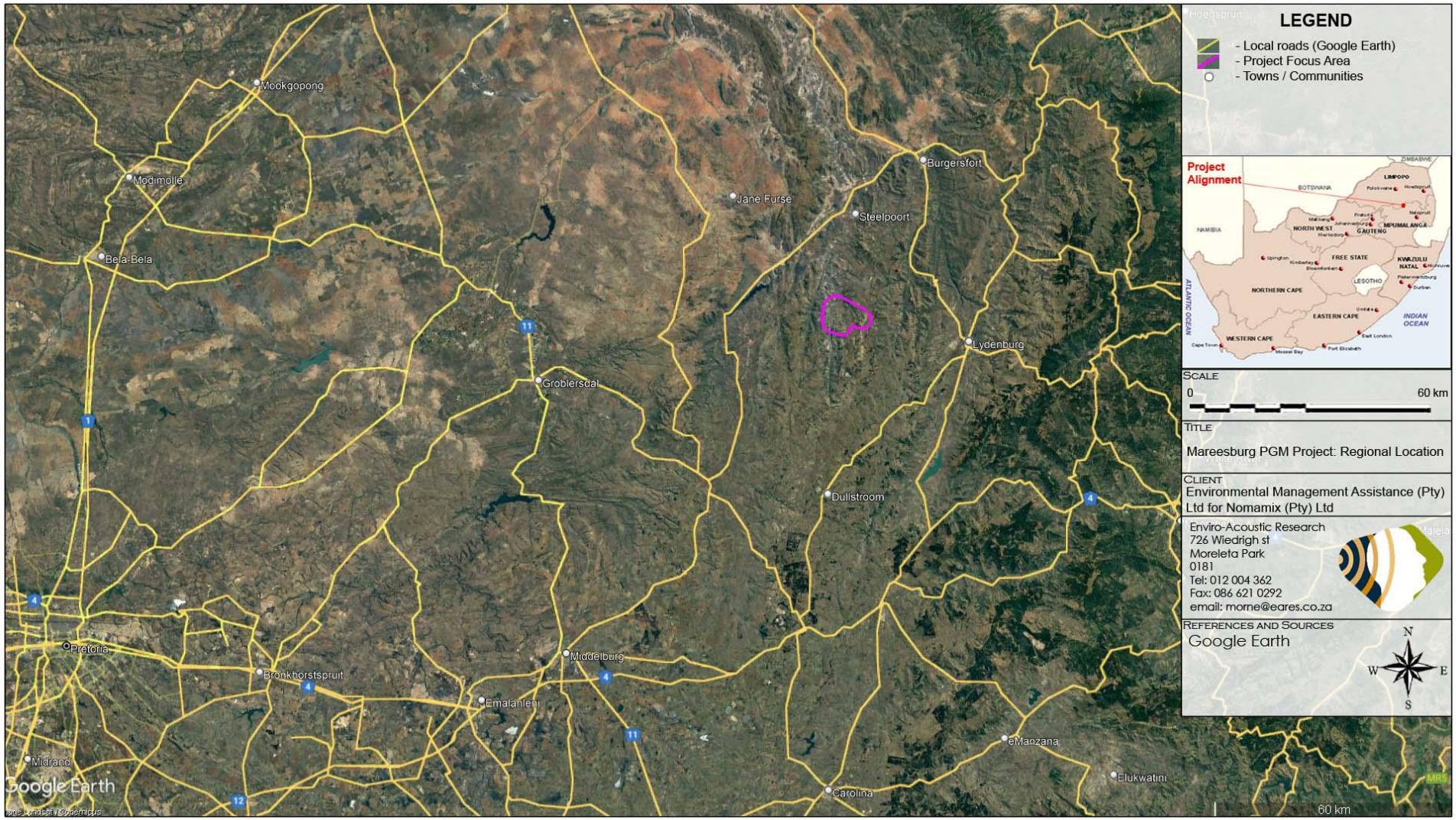


Figure 4-1: Location of proposed Mareesburg PGM Project

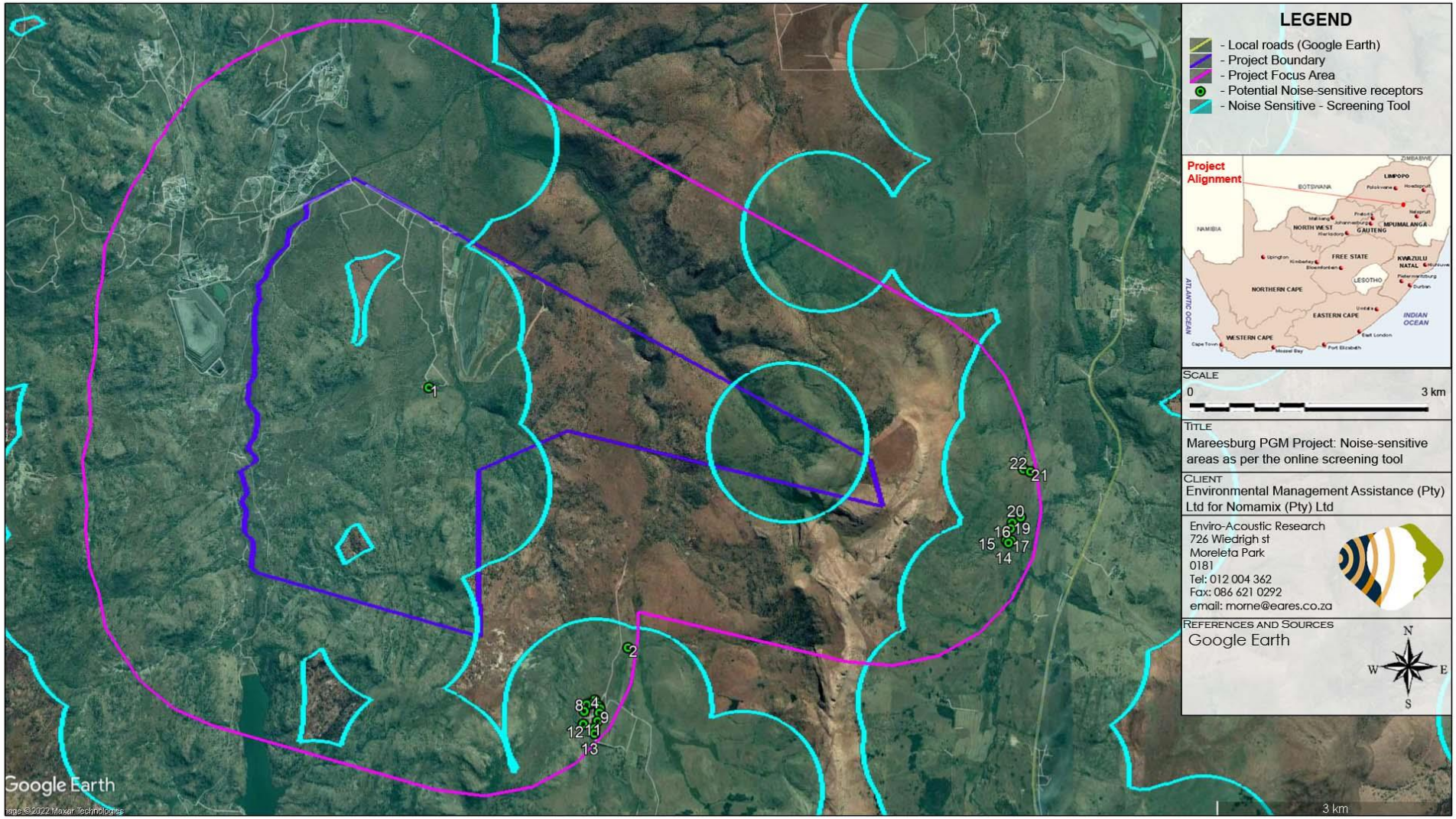


Figure 4-2: Image indicating Noise-sensitive areas identified by the online screening tool

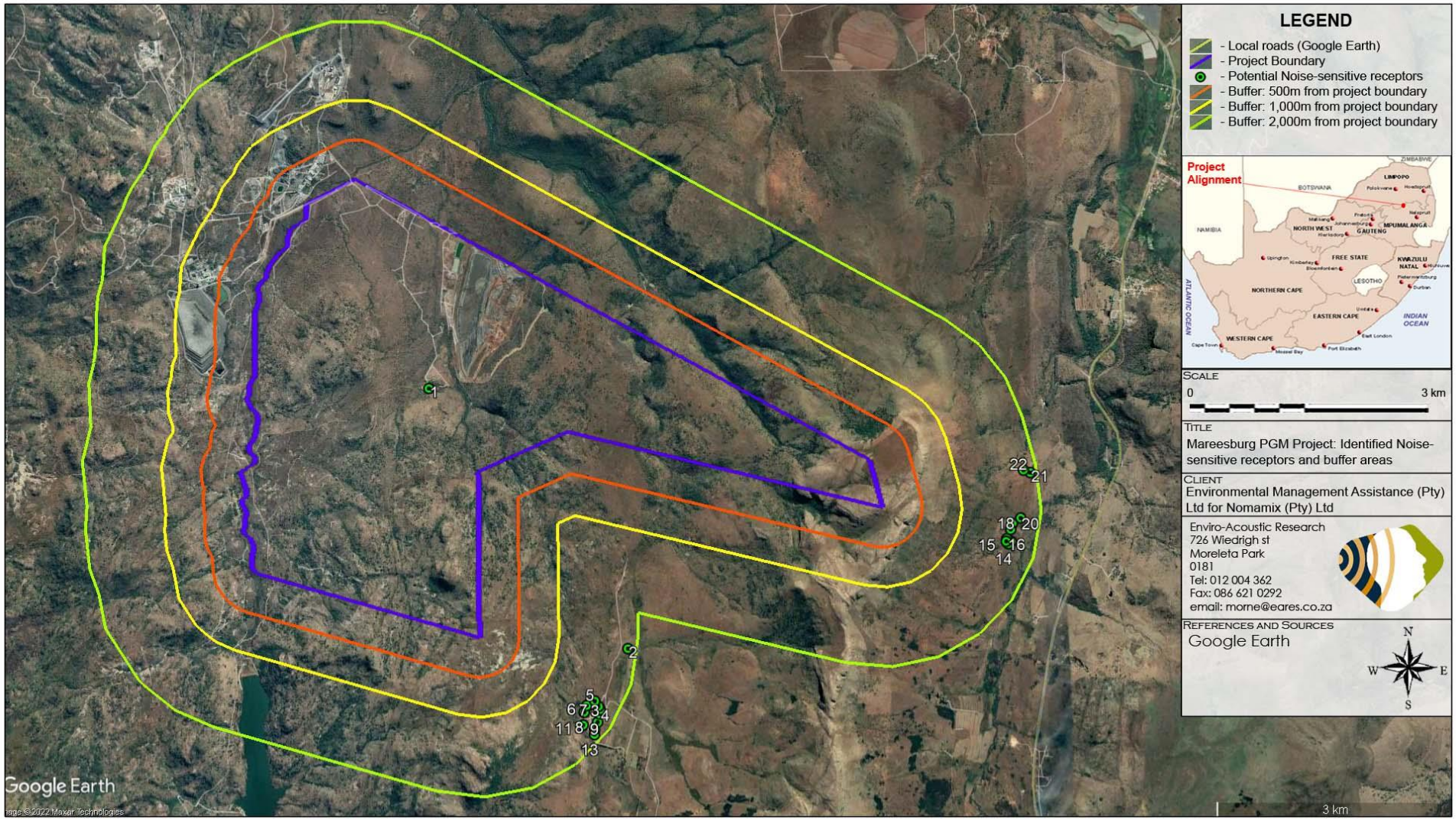


Figure 4-3: Image indicating Noise-sensitive Areas and Receptors close to PFA of the Proposed PGM Project

5 LEGAL CONTEXT, POLICIES AND GUIDELINES

Legal policies, guidelines (National and International) are provided in this section for reference purpose.

5.1 THE REPUBLIC OF SOUTH AFRICA CONSTITUTION ACT ("THE CONSTITUTION")

The environmental rights contained in section 24 of the Constitution provide that everyone is entitled to an environment that is not harmful to his or her well-being. In the context of noise, this requires a determination of what level of noise is harmful to well-being. The general approach of the common law is to define an acceptable level of noise as that which the reasonable person can be expected to tolerate in the particular circumstances. The subjectivity of this approach can be problematic which has led to the development of noise standards (see **Section 5.4**).

"Noise pollution" is specifically included in Part B of Schedule 5 of the Constitution, which means that noise pollution control is a local authority competence, provided that the local authority concerned has the capacity to carry out this function.

5.2 THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT (ACT 107 OF 1998)

The National Environmental Management Act ("NEMA") defines "pollution" to include any change in the environment, including noise. A duty therefore arises under section 28 of NEMA to take reasonable measures while establishing and operating any facility to prevent noise pollution occurring. NEMA sets out measures which may be regarded as reasonable. They include the following measures:

1. to investigate, assess and evaluate the impact on the environment;
2. to inform and educate employees about the environmental risks of their work and the manner in which their tasks must be performed in order to avoid causing significant pollution or degradation of the environment;
3. to cease, modify or control any act, activity or process causing the pollution or degradation;
4. to contain or prevent the movement of the pollution or degradation;
5. to eliminate any source of the pollution or degradation; and
6. to remedy the effects of the pollution or degradation.

In addition, a number of regulations have been promulgated as Regulation 982 of December 2014 (Government Notice 38282) in terms of this Act. It defines minimum information requirements for specialist reports, with Government Notice 43110 (known as GNR 320 of 20 March 2020) updating the minimum requirements for reporting.

5.3 THE ENVIRONMENT CONSERVATION ACT (ACT 73 OF 1989)

The Environment Conservation Act ("ECA") allows the Minister of Environmental Affairs and Tourism ("now the Ministry of Water and Environmental Affairs") to make regulations regarding noise, among other concerns. See also section **5.3.1**. While most sections of this Acts has been repealed with the promulgation of the NEMA, Section 25 of this Act is still in effect.

5.3.1 National Noise Control Regulations (GN R154 of 1992)

The National Noise Control Regulations (GN R154 in *Government Gazette* No. 13717 dated 10 January 1992) were promulgated in terms of section 25 of the ECA. The NCRs were revised under Government Notice Number R. 55 of 14 January 1994 to make it obligatory for all authorities to apply the regulations.

Subsequently, in terms of Schedule 5 of the Constitution of South Africa of 1996 legislative responsibility for administering the noise control regulations was devolved to provincial and local authorities. The National Regulations will be in effect in the Northern Cape Province.

The National Noise Control Regulations (GN R154 1992) defines:
"**Controlled area**" as:
A piece of land designated by a local authority where, in the case of--

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 meters, but not more than 1,4 meters, above the ground for a period of 24 hours, exceeds 61 dBA;

"**disturbing noise**" as:
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.

"**zone sound level**" as:
A derived dBA value determined indirectly by means of a series of measurements, calculations or table readings and designated by a local authority for an area. *This is the same as the Rating Level as defined in SANS 10103:2008.*

In addition:

In terms of Regulation 2 -

"A local authority may –

(c): if a noise emanating from a building, premises, vehicle, recreational vehicle or street is a disturbing noise or noise nuisance, or may in the opinion of the local authority concerned be a disturbing noise or noise nuisance, instruct in writing the person causing such noise or who is responsible therefor, or the owner or occupant of such building or premises from which or from where such noise emanates or may emanate, or all such persons, to discontinue or cause to be discontinued such noise, or to take steps to lower the lever of the noise to a level conforming to the requirements of these Regulations within the period stipulated in the instruction: Provided that the provisions of this paragraph shall not apply in respect of a disturbing noise or noise nuisance caused by rail vehicles or aircraft which are not used as recreational vehicles;

(d): before changes are made to existing facilities or existing uses of land or buildings, or before new buildings are erected, in writing require that noise impact assessments or tests are conducted to the satisfaction of that local authority by the owner, developer, tenant or occupant of the facilities, land or buildings or that, for the purposes of regulation 3(b) or (c), reports or certificates in relation to the noise impact to the satisfaction of that local authority are submitted by the owner, developer, tenant or occupant to the local authority on written demand";

In terms of Regulation 4 of the Noise Control Regulations:

"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".

5.4 NOISE STANDARDS

There are a few South African scientific standards (SABS) relevant to noise from developments, industry and roads. They are:

- SANS 10103:2008. 'The measurement and rating of environmental noise with respect to annoyance and to speech communication'.
- SANS 10210:2004. 'Calculating and predicting road traffic noise'.
- SANS 10328:2008. 'Methods for environmental noise impact assessments'.
- SANS 10357:2004. 'The calculation of sound propagation by the Concave method'.
- SANS 10181:2003. 'The Measurement of Noise Emitted by Road Vehicles when Stationary'.
- SANS 10205:2003. 'The Measurement of Noise Emitted by Motor Vehicles in Motion'.

The relevant standards use the equivalent continuous rating level as a basis for determining what is acceptable. The levels may take single event noise into account, but single event noise by itself does not determine whether noise levels are acceptable for land use purposes. With regards to SANS 10103:2008, the recommendations are likely to inform decisions by authorities, but non-compliance with the standard will not necessarily render an activity unlawful *per se.*

It must be noted that SANS 10103:2008 does stipulate *"for industries legitimately operating in an industrial district during the entire 24 h day/night cycle, $L_{Req,d} = L_{Req,n} = 70$ dBA can be considered as typical and normal".*

The SANS 10328:2008 guideline also recommends that the procedures provided in clause 6 to clause 8 in this guideline be followed if:

a) An application, in respect of any if the activities identified in terms of the current relevant national legislation and noise sources (defined in clauses 3.17 and 3.18), or the issues listed in clause 5, is made to the relevant authority;
b) An application for a noise-sensitive development (in terms of clause 3.16) is made to the relevant authority;
c) An application for a change in land use is made to the relevant authority; or
d) And environmental noise impact investigation is requested by an applicant or any interested or affected party.

The SANS 10328:2008 guideline also sets recommended procedures and minimum requirements for:

a) an administrative screening procedure and report;
b) a scoping report;
c) an environmental noise impact report; or
d) a review of the environmental investigation report.

5.5 INTERNATIONAL GUIDELINES

While a number of international guidelines and standards exists, those selected below are used by numerous countries for environmental noise management. **It should be noted that these guidelines remain in this report only for reference purposes.**

5.5.1 Night Noise Guidelines for Europe (WHO, 2009)

Refining previous Community Noise Guidelines issued in 1999, and incorporating more recent research, the World Health Organization has released a comprehensive report on the health effects of night time noise, along with new (non-mandatory) guidelines for use in

Europe. Rather than a maximum of 30 dB inside at night (which equals 45-50 dB max outside), the WHO now recommends a maximum year-round outside night-time noise average of 40 dBA to avoid sleep disturbance and its related health effects.

5.5.2 Guidelines for Community Noise (WHO, 1999)

The World Health Organization's (WHO) document on the *Guidelines for Community Noise* is the outcome of the WHO expert task force meeting held in London, United Kingdom, in April 1999. It is based on the document entitled "Community Noise" that was prepared for the World Health Organization and published in 1995 by the Stockholm University and Karolinska Institute.

The scope of WHO's effort to derive guidelines for community noise is to consolidate actual scientific knowledge on the health impacts of community noise and to provide guidance to environmental health authorities and professionals trying to protect people from the harmful effects of noise in non-industrial environments

5.5.3 IFC: General EHS Guidelines – Environmental Noise Management

These guidelines are applicable to noise created beyond the property boundaries of a development that conforms to the Equator Principles. The environmental standards of the World Bank have been integrated into the social policies of the IFC since April 2007 as the International Finance Corporation Environmental, Health and Safety (EHS) Guidelines.

It sets noise level guidelines (see **Table 5-1**) and highlights the certain monitoring requirements pre- and post-development. It adds another criterion in that the existing background ambient noise level should not rise by more than 3 dBA. This criterion will effectively sterilize large areas of any development. Therefore, it is EARES's opinion that this criterion was introduced to address cases where the existing ambient noise level is already at, or in excess of the recommended limits.

Table 5-1: IFC Table .7.1-Noise Level Guidelines

Receptor type	One hour L_{Aeq} (dBA)	
	Daytime 07:00 - 22:00	Night-time 22:00 – 07:00
Residential; institutional; educational	55	45
Industrial; commercial	70	70

The document uses the $L_{Aeq,1hr}$ noise descriptors to define noise levels. It does not determine the detection period, but refers to the IEC standards, which requires the fast detector setting on the Sound Level Meter during measurements in Europe.

6 ASSUMPTIONS AND LIMITATIONS

6.1 AMBIENT SOUND LEVELS

- Ambient sound levels are the cumulative effects of innumerable sounds generated at various instances both far and near. High measurements may not necessarily mean that noise levels in the area are high. Similarly, a low sound level measurement will not necessarily mean that the area is always quiet, as sound levels will vary over seasons, time of the day, faunal characteristics, vegetation in the area and meteorological conditions (especially wind). This is excluding the potential effect of sounds from anthropogenic origin. It is impossible to quantify and identify the numerous sources that influenced one 10-minute measurement using the reading result at the end of the measurement. Therefore trying to define ambient sound levels using the result of one 10-minute measurement will be very inaccurate (very low confidence level in the results) for the reasons mentioned above. The more measurements that can be collected at a location the higher the confidence levels in the ambient sound level determined. The more complex the sound environment, the longer the required measurement. It is assumed that the measurement locations represent other residential dwellings in the area (similar environment), yet, in practice this can be highly erroneous as there are numerous factors that can impact on ambient sound levels, including;
    - the distance to closest trees, number and type of trees as well as the height of trees;
    - available habitat and food for birds and other animals;
    - distance to residential dwelling, type of equipment used at dwelling (compressors, air-cons);
    - general maintenance condition of house (especially during windy conditions); and
    - number and type of animals kept in the vicinity of the measurement locations.
- Determination of existing road traffic and other noise sources of significance are important (traffic counts etc.) – when close to any busy or significant roads. Traffic however is highly dependent on the time of day as well as general agricultural activities taking place during the site investigation. Traffic noise is a significant noise source, especially in urban areas and could be an important source of noise during busy periods.
- Ambient sound levels are depended not only on time of day and meteorological conditions, but also change due to seasonal differences. Ambient sound levels are generally higher in summer months when faunal activity is higher and lower during

the winter due to reduced faunal activity. Winter months also coincide with lower temperatures and very stable atmospheric conditions, ideal conditions for propagation of noise. Many faunal species are more active during warmer periods than colder periods. Certain cicada species can generate noise levels up to 120 dB for mating or distress purposes, sometimes singing in synchronisation magnifying noise levels they produce from their tymbals[7];

- As an area develops, the increase of people will result in increased sounds. These are generally a combination of traffic noise, voices, animals and equipment (incl. TVs and radios). The result is that ambient sound levels will increase as an area matures; and
- Ambient sound levels are generally linked to the developmental nature of an area, with ambient sound levels changing much faster in urban environments than in highly rural areas. Ambient sound levels therefore should be measured more frequently in urban environments.

6.2 UNCERTAINTIES OF INFORMATION PROVIDED

It is assumed that prospecting will be non-invasive and that no additional diamond drilling will be required.

[7] Clyne, D. *"Cicadas: Sound of the Australian Summer, Australian Geographic"* Oct/Dec Vol 56. 1999.

7 METHODOLOGY: SCREENING QUESTIONNAIRE

As the exact noise emission of the propose activities is unknown, the potential noise impact would be evaluated as defined by SANS 10328:2008. This evaluation would be relevant for the proposed non-invasive prospecting phase.

Table 7-1: Questions for Noise Screening (SANS 10328:2008)

Question	Answer	Comment
Does the planned linear source (arterial road, planned arterial road reserve, or a main line railway line) at any position along the route pass within 1 000 m from an area which is developed or zoned for residential purposes?	*No*	***Not relevant***
Does the planned linear source (suburban road, planned suburban road reserve where only two lanes of traffic will be present at an average speed limit not exceeding 60 km/h, or a suburban electric traction railway line) at any position along the route pass within 500 m from an area which is developed or zoned for residential purposes?	*No*	***Not relevant***
Does the planned development of a residential area or a piece of land zoned for residential purposes fall within 1 000 m from a planned linear source (arterial road, planned arterial road reserve, or a main line railway line)?	*No*	***Not relevant***
Does the planned development of a residential area or a piece of land zoned for residential purposes fall within 500 m from a planned linear source (suburban road, planned suburban road reserve where only two lanes of traffic will be present at an average speed limit not exceeding 60 km/h, or a suburban electric traction railway line)?	*No*	***Not relevant***
Does a planned industrial development or a building housing a plant fall within a distance of 1 000 m from an already developed residential area or land zoned for residential purposes?	*No*	***Prospecting activities will be non-invasive and does not generate noise***
Does a piece of land to be developed for residential purposes or land to be zoned for residential purposes fall within 1 000 m from an already developed industrial area or a building housing plant?	*No*	***Not relevant***
Does planned light industrial development or a building(s) housing workshops fall within a distance of 500 m from an already developed residential area or land zoned for residential purposes?	*No*	***Prospecting activities will be non-invasive and does not generate noise***
Does a piece of land to be developed for residential purposes or land to be zoned for residential purposes fall within 500 m from an already developed light industrial development or a building(s) housing workshops?	*No*	***Not relevant***
Does a piece of land to be developed for residential purposes or land to be zoned for residential purposes fall within 2 000 m from an existing wind generator farm?	*No*	***Not relevant***

Question	Answer	Comment
Does a piece of land to be developed as a wind generator farm fall within 2 000 m from a piece of land to be developed for residential purposes or land to be zoned for residential purposes?	No	***Not relevant***
Does a piece of land to be developed for residential purposes or land to be zoned for residential purposes fall within 2 000 m from a low frequency source (e.g. low speed ventilation fans or low speed diesel engines)?	No	***Not relevant***
Does an activity containing a low frequency source (e.g. low speed ventilation fans or low speed diesel engines) to be developed fall within 2 000 m from a piece of land to be developed for residential purposes or land use to be zoned for residential purposes?	No	***Not relevant***
Will the planned repaving of a suburban street be provided with normal, non-sound absorptive bitumen or cement concrete paving?	*No*	***Not relevant***
Where an aircraft landing strip, heliport, hoverport or airport is planned, or is to be altered, will this planned activity be such that the calculated appropriate limit noise contour for the full planned use of the activity fall inside the boundaries of any residential area or any piece of land zoned for residential purposes?	*No*	***Not relevant***
Where a residential area is planned or a piece of land is to be zoned for residential purposes, will the evaluated appropriate limit noise contour for the full planned use of an aircraft landing strip, heliport, hoverport or airport fall inside the boundaries of the residential area or the piece of land zoned for residential purposes?	*No*	***Not relevant***

8 CONCLUSIONS AND RECOMMENDATIONS

This Screening report assess the potential noise impact due to proposed non-invasive prospecting activities within the PFA of the Mareesburg PGM Prospecting Project.

An initial desktop verification was done, considering the noise layer as available from the National Web based Environmental Screening Tool[8] as well as aerial imagery available on from Google Earth©. Aerial images available on Google Earth© is recent and of sufficient resolution to identify and verify potential noise sensitive areas.

The online screening tool define most of the Project Focus area to have a "Very High" sensitivity to noise, with this desktop assessment confirming the "Very High" sensitivity for a number of NSR, though large areas, identified to have a "very high" sensitivity to noise are not noise sensitive. As such a noise specialist study must be appended to any environmental impact assessment, but considering that the proposed prospecting will be non-invasive, a noise specialist study can take the form of a Screening Noise Report in terms of SANS 10328:2008.

While there are numerous potential NSR staying within the PFA, the proposed prospecting will be non-invasive and the proposed activities will not change ambient sound levels within the PFA, nor result in any unreasonable or annoying noises. The risk of a noise impact (for non-invasive prospecting) is of a low significance.

As such it is recommended that the proposed prospecting activities be authorized from an acoustic perspective.

The recommendation in this report is therefore conditional that the prospecting activities are non-invasive as reported by the applicant. For non-invasive prospecting, no additional impact management or any noise monitoring are required for inclusion in the EMPr, nor are any further Noise Scoping or other acoustical studies required.

However, if any additional diamond drilling activities are planned or anticipated it is recommended that this be investigated in a noise specialist assessment.

[8] https://screening.environment.gov.za/screeningtool/#/pages/welcome

9 REFERENCES

In this report reference was made to the following documentation:

1. Audiology Today, 2010: *Wind-Turbine Noise – What Audiologists should know*
2. *De Jager, M* (2021). "*Noise Study for Environmental Impact Assessment for the Proposed Vygenhoek Platinum Project, Limpopo Province*", Enviro-Acoustic Research cc, Pretoria
3. Minnesota Department of Health, 2009: *Public Health Impacts of Wind Farms*
4. Renewable Energy Research Laboratory, 2006: *Wind Turbine Acoustic Noise*
5. SANS 10103:2008. 'The measurement and rating of environmental noise with respect to annoyance and to speech communication'.
6. SANS 10210:2004. 'Calculating and predicting road traffic noise'.
7. SANS 10328:2008. 'Methods for environmental noise impact assessments'.
8. SANS 10357:2004 The calculation of sound propagation by the Concave method'.

APPENDIX A

Glossary of Acoustic Terms, Definitions and General Information

1/3-Octave Band	A filter with a bandwidth of one-third of an octave representing four semitones, or notes on the musical scale. This relationship is applied to both the width of the band, and the centre frequency of the band. See also definition of octave band.
A – Weighting	An internationally standardised frequency weighting that approximates the frequency response of the human ear and gives an objective reading that therefore agrees with the subjective human response to that sound.
Air Absorption	The phenomena of attenuation of sound waves with distance propagated in air, due to dissipative interaction within the gas molecules.
Alternatives	A possible course of action, in place of another, that would meet the same purpose and need (of proposal). Alternatives can refer to any of the following, but are not limited hereto: alternative sites for development, alternative site layouts, alternative designs, alternative processes and materials. In Integrated Environmental Management the so-called "no go" alternative refers to the option of not allowing the development and may also require investigation in certain circumstances.
Ambient	The conditions surrounding an organism or area.
Ambient Noise	The all-encompassing sound at a point being composed of sounds from many sources both near and far. It includes the noise from the noise source under investigation.
Ambient Sound	The all-encompassing sound at a point being composite of sounds from near and far.
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 a meter was put into operation. In this report the term Background Ambient Sound Level will be used.
Amplitude Modulated Sound	A sound that noticeably fluctuates in loudness over time.
Anthropogenic	Human impact on the environment or anthropogenic impact on the environment includes impacts on biophysical environments, biodiversity and other resources
Applicant	Any person who applies for an authorisation to undertake a listed activity or to cause such activity in terms of the relevant environmental legislation.
Assessment	The process of collecting, organising, analysing, interpreting and communicating data that is relevant to some decision.
Attenuation	Term used to indicate reduction of noise or vibration, by whatever method necessary, usually expressed in decibels.
Audible frequency Range	Generally assumed to be the range from about 20 Hz to 20,000 Hz, the range of frequencies that our ears perceive as sound.
Ambient Sound Level	The level of the ambient sound indicated on a sound level meter in the absence of the sound under investigation (e.g. sound from a particular noise source or sound generated for test purposes). Ambient sound level as per Noise Control Regulations.
Best Practices	A best practice is a method or technique that has consistently shown results superior to those achieved with other means, and that is used as a benchmark. In addition, a "best" practice can evolve to become better as improvements are discovered.
Broadband Noise	Spectrum consisting of a large number of frequency components, none of which is individually dominant.
C-Weighting	This is an international standard filter, which can be applied to a pressure signal or to a *SPL* or *PWL* spectrum, and which is essentially a pass-band filter in the frequency range of approximately 63 to 4000 Hz. This filter provides a more constant, flatter, frequency response, providing significantly less adjustment than the A-scale filter for frequencies less than 1000 Hz.
dB(A)	Sound Pressure Level in decibel that has been A-weighted, or filtered, to match the response of the human ear.

Decibel (db)	A logarithmic scale for sound corresponding to a multiple of 10 of the threshold of hearing. Decibels for sound levels in air are referenced to an atmospheric pressure of 20 μ Pa.
Diffraction	The process whereby an acoustic wave is disturbed and its energy redistributed in space as a result of an obstacle in its path, Reflection and refraction are special cases of diffraction.
Direction of Propagation	The direction of flow of energy associated with a wave.
Disturbing noise	Means a noise level that exceeds the zone sound level or, if no zone sound level has been designated, a noise level that exceeds the ambient sound level at the same measuring point by 7 dBA or more.
Echolocation	Echo locating animals emit calls out to the environment and listen to the echoes of those calls that return from various objects near them. They use these echoes to locate and identify the objects. Echolocation is used for navigation and for foraging (or hunting) in various environments.
Environment	The external circumstances, conditions and objects that affect the existence and development of an individual, organism or group; these circumstances include biophysical, social, economic, historical, cultural and political aspects.
Environmental Control Officer	Independent Officer employed by the applicant to ensure the implementation of the Environmental Management Plan (EMP) and manages any further environmental issues that may arise.
Environmental impact	A change resulting from the effect of an activity on the environment, whether desirable or undesirable. Impacts may be the direct consequence of an organisation's activities or may be indirectly caused by them.
Environmental Impact Assessment	An Environmental Impact Assessment (EIA) refers to the process of identifying, predicting and assessing the potential positive and negative social, economic and biophysical impacts of any proposed project, plan, programme or policy that requires authorisation of permission by law and that may significantly affect the environment. The EIA includes an evaluation of alternatives, as well as recommendations for appropriate mitigation measures for minimising or avoiding negative impacts, measures for enhancing the positive aspects of the proposal, and environmental management and monitoring measures.
Environmental issue	A concern felt by one or more parties about some existing, potential or perceived environmental impact.
Equivalent continuous A-weighted sound exposure level ($L_{Aeq,T}$)	The value of the average A-weighted sound pressure level measured continuously within a reference time interval *T*, which have the same mean-square sound pressure as a sound under consideration for which the level varies with time.
Equivalent continuous A-weighted rating level ($L_{Req,T}$)	The Equivalent continuous A-weighted sound exposure level *($L_{Aeq,T}$)* to which various adjustments has been added. More commonly used as ($L_{Req,d}$) over a time interval 06:00 – 22:00 (T=16 hours) and ($L_{Req,n}$) over a time interval of 22:00 – 06:00 (T=8 hours). It is a calculated value.
F (fast) time weighting	(1) Averaging detection time used in sound level metre. (2) Fast setting has a time constant of 125 milliseconds and provides a fast reacting display response allowing the user to follow and measure not too rapidly fluctuating sound.
Footprint area	Area to be used for the construction of the proposed development, which does not include the total study area.
Free Field Condition	An environment where there is no reflective surfaces.
Frequency	The rate of oscillation of a sound, measured in units of Hertz (Hz) or kiloHertz (kHz). One hundred Hz is a rate of one hundred times per second. The frequency of a sound is the property perceived as pitch: a low-frequency sound (such as a bass note) oscillates at a relatively slow rate, and a high-frequency sound (such as a treble note) oscillates at a relatively high rate.
Green field	A parcel of land not previously developed beyond that of agriculture or forestry use; virgin land. The opposite of Greenfield is Brownfield, which is a site previously developed and used by an enterprise, especially for a manufacturing

	or processing operation. The term Brownfield suggests that an investigation should be made to determine if environmental damage exists.
G-Weighting	An International Standard filter used to represent the infrasonic components of a sound spectrum.
Harmonics	Any of a series of musical tones for which the frequencies are integral multiples of the frequency of a fundamental tone.
I (impulse) time weighting	(1) Averaging detection time used in sound level metre as per South African standards and Regulations. (2) Impulse setting has a time constant of 35 milliseconds when the signal is increasing (sound pressure level rising) and a time constant of 1,500 milliseconds while the signal is decreasing.
Impulsive sound	A sound characterized by brief excursions of sound pressure (transient signal) that significantly exceed the ambient sound level.
Infrasound	Sound with a frequency content below the threshold of hearing, generally held to be about 20 Hz. Infrasonic sound with sufficiently large amplitude can be perceived, and is both heard and felt as vibration. Natural sources of infrasound are waves, thunder and wind.
Integrated Development Plan	A participatory planning process aimed at developing a strategic development plan to guide and inform all planning, budgeting, management and decision-making in a Local Authority, in terms of the requirements of Chapter 5 of the Municipal Systems Act, 2000 (Act 32 of 2000).
Integrated Environmental Management	IEM provides an integrated approach for environmental assessment, management, and decision-making and to promote sustainable development and the equitable use of resources. Principles underlying IEM provide for a democratic, participatory, holistic, sustainable, equitable and accountable approach.
Interested and affected parties	Individuals or groups concerned with or affected by an activity and its consequences. These include the authorities, local communities, investors, work force, consumers, environmental interest groups and the general public.
Key issue	An issue raised during the Scoping process that has not received an adequate response and that requires further investigation before it can be resolved.
Listed activities	Development actions that is likely to result in significant environmental impacts as identified by the delegated authority (formerly the Minister of Environmental Affairs and Tourism) in terms of Section 21 of the Environment Conservation Act.
L_{AMin} *and* L_{AMax}	Is the RMS (root mean squared) minimum or maximum level of a noise source.
Loudness	The attribute of an auditory sensation that describes the listener's ranking of sound in terms of its audibility.
Magnitude of impact	Magnitude of impact means the combination of the intensity, duration and extent of an impact occurring.
Masking	The raising of a listener's threshold of hearing for a given sound due to the presence of another sound.
Mitigation	To cause to become less harsh or hostile.
Natural Sounds	Are sounds produced by natural sources in their normal baseline.
Negative impact	A change that reduces the quality of the environment (for example, by reducing species diversity and the reproductive capacity of the ecosystem, by damaging health, or by causing nuisance).
Noise	a. Sound that a listener does not wish to hear (unwanted sounds). b. Sound from sources other than the one emitting the sound it is desired to receive, measure or record. c. A class of sound of an erratic, intermittent or statistically random nature.
Noise Level	The term used in lieu of sound level when the sound concerned is being measured or ranked for its undesirability in the contextual circumstances.
Noise-sensitive development	developments that could be influenced by noise such as: a) districts (see table 2 of SANS 10103:2008) 1. rural districts, 2. suburban districts with little road traffic, 3. urban districts,

	4. urban districts with some workshops, with business premises, and with main roads, 5. central business districts, and 6. industrial districts; b) educational, residential, office and health care buildings and their surroundings; c) churches and their surroundings; d) auditoriums and concert halls and their surroundings; e) recreational areas; and f) nature reserves. In this report Noise-sensitive developments is also referred to as a Potential Sensitive Receptor
Octave Band	A filter with a bandwidth of one octave, or twelve semi-tones on the musical scale representing a doubling of frequency.
Positive impact	A change that improves the quality of life of affected people or the quality of the environment.
Property	Any piece of land indicated on a diagram or general plan approved by the Surveyor-General intended for registration as a separate unit in terms of the Deeds Registries Act and includes an erf, a site and a farm portion as well as the buildings erected thereon
Public Participation Process	A process of involving the public in order to identify needs, address concerns, choose options, plan and monitor in terms of a proposed project, programme or development
Reflection	Redirection of sound waves.
Refraction	Change in direction of sound waves caused by changes in the sound wave velocity, typically when sound wave propagates in a medium of different density.
Reverberant Sound	The sound in an enclosure which results from repeated reflections from the boundaries.
Reverberation	The persistence, after emission of a sound has stopped, of a sound field within an enclosure.
Significant Impact	An impact can be deemed significant if consultation with the relevant authorities and other interested and affected parties, on the context and intensity of its effects, provides reasonable grounds for mitigating measures to be included in the environmental management report. The onus will be on the applicant to include the relevant authorities and other interested and affected parties in the consultation process. Present and potential future, cumulative and synergistic effects should all be taken into account.
S (slow) time weighting	(1) Averaging times used in sound level metre. (2) Time constant of one [1] second that gives a slower response which helps average out the display fluctuations.
Sound Level	The level of the frequency and time weighted sound pressure as determined by a sound level meter, i.e. A-weighted sound level.
Sound Power	Of a source, the total sound energy radiated per unit time.
Sound Pressure Level (SPL)	Of a sound, 20 times the logarithm to the base 10 of the ratio of the RMS sound pressure level to the reference sound pressure level. International values for the reference sound pressure level are 20 micropascals in air and 100 millipascals in water. SPL is reported as L_p in dB (not weighted) or in various other weightings.
Study area	Refers to the entire study area encompassing all the alternative routes as indicated on the study area map.
Sustainable Development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: the concept of "needs", in particular the essential needs of the world's poor, to which overriding priority should be given; and the idea of limitations imposed by the state of technology and social organization on the environment's ability to meet present and the future needs (Brundtland Commission, 1987).
Tone	Noise can be described as tonal if it contains a noticeable or discrete, continuous note. This includes noises such as hums, hisses, screeches, drones, etc. and any

	such subjective description is open to discussion and contradiction when reported.
Zone of Potential Influence	The area defined as the radius about an object, or objects beyond which the noise impact will be insignificant.
Zone Sound Level	Means a derived dBA value determined indirectly by means of a series of measurements, calculations or table readings and designated by a local authority for an area. This is similar to the Rating Level as defined in SANS 10103:2008.

APPENDIX B

Preliminary Site Sensitivity Verification

SITE SENSITIVITY VERIFICATION (IN TERMS OF PART A OF THE ASSESSMENT PROTOCOLS PUBLISHED IN GN 320 ON 20 MARCH 2020

Part A of the Assessment Protocols published in GN 320 on 20 March 2020 (i.e. Site sensitivity verification is required where a specialist assessment is required but no specific assessment protocol has been prescribed) is applicable where the Department of Environment, Forestry and Fisheries Screening Tool has the relevant themes to verify.

A site sensitivity verification was undertaken in accordance with Part A of GNR 320 of 20 March 2020 prior to commencing with the Noise Specialist Assessment. The site sensitivity verification is completed as per Appendix 6 of the 2014 NEMA EIA Regulations (as amended), that defines site sensitivity verification requirements where a Specialist Assessment is required. This is completed to confirm the current land use and environmental sensitivity of the proposed project area as identified by the National Web-Based Environmental Screening Tool (Screening Tool).

The details of the specialists that completed the site sensitivity verification are noted below:

Date of Site Visit	24 – 27 November 2020
Specialist Name	Morné de Jager / Francois de Vries
Professional Registration Number (if applicable)	Not applicable, there is no registration body in South Africa that could allow professional registration for acoustic consultants.
Specialist Affiliation / Company	Enviro-Acoustic Research CC

Output from National Environmental Screening Tool

The site was initially assessed using the National Environmental Screening tool, available at, https://screening.environment.gov.za. The output from the National Online Screening tool indicates a number of areas within, and up to 2,000 m from the project boundary is considered to be of a "very high" sensitivity to noise. These potentially "very high" sensitive areas (in terms of noise) are indicated on **Figure B.1** together with the potential noise-sensitive receptors as identified using available aerial images and confirmed during the site visit.

Description on how the site sensitivity verification was undertaken

The site sensitivity was confirmed using:

a) *available aerial images (Google Earth®) (See **Figure B.1** for preliminary identified potential noise-sensitive receptors);*
b) *information gained during the site visit in November 2020.*

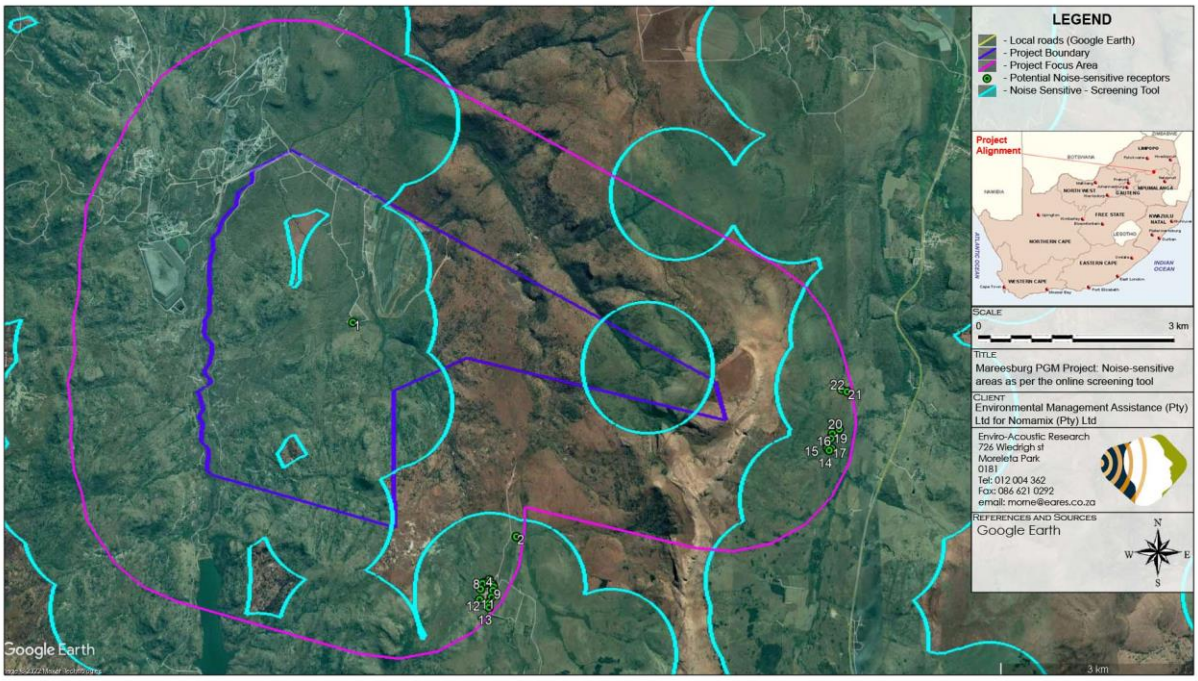


Figure B.1: Areas defined to be of "Very High" sensitivity in terms of noise by the online screening tool

<u>Outcome of the Site Sensitivity Verification</u>

1. *The online screening tool identified a number of areas that may have a "very high" sensitivity to noise; and*
2. *The desktop assessment and site visit identified a number of potentially noise-sensitive receptors within the areas identified to have a "very high" sensitivity to noise by the online screening tool.*

Due to the number of potential noise-sensitive locations in the area, it is recommended that the potential significance of the noise impact be assessed in a noise specialist study should the Mareesburg PGM project require invasive prospecting (drilling), or if the applicant progress to the mining of the PGM resource.

Signature
Morné de Jager
2022 – 08 – 23