Appendix F.3

NOISE DESKTOP ASSESSMENT

DESKTOP NOISE IMPACT ASSESSMENT FOR THE ESKOM KOMATI SOLAR PHOTOVOLTAICS PROJECT

INTRODUCTION

Eskom Holdings SOC (Ltd) (Eskom) is a South African utility that generates, transmits and distributes electricity. Eskom supplies about 95% of the country's electricity. Eskom's 2035 strategy encompasses the journey that Eskom intends to take in response to the changing energy environment and the impact this has towards a sustainable power utility. This strategy is necessitated by the challenges that Eskom faces as a business as well as the global and local shifts occurring in the energy sector particularly with respect to environmental and climate change challenges, difficulties in accessing financing and changes to the macro industry environment significantly altering the energy supply industry (ESI). The road to 2035 includes the shutting down of several coal-fired power stations, repurposing and repowering, delivering new clean generation projects, expanding the transmission grid, and rolling out micro grid solutions. Several power stations are reaching the end of life. These stations will go into extended cold reserve and are most likely to be fully decommissioned in the future. Eskom is considering a shutdown, dismantling and repurposing of some of its fleet as it reaches its end of life. Komati Power Station, situated in Mpumalanga, will reach its end of life expectancy in September 2022. As such, Eskom is proposing the establishment of a solar electricity generating facility and associated infrastructure as part of its repurposing programme for Komati Power Station. The plan is to install 100 MW of Solar Photovoltaics (PV) and 150 MW of Battery Energy Storage System (BESS).

The first phase of the Komati Power Station repurposing programme, i.e. the installation of the Solar PV and BESS necessitates an Environmental and Social Impact Assessment (ESIA). As part of the ESIA a desktop Noise Impact Assessment is required.

Importantly this ESIA is also being run concurrently with the scope of work for the shutdown and dismantling of the power station and is therefore treated as a separate assessment process to the shutdown and dismantling of the power station.

DESKTOP REVIEW

LOCATION OF SITE AND IDENTIFICATION OF SENSITIVE RECEPTORS

The Komati Power Station is situated about 37 km from Middelburg, 43 km from Bethal and 40 km from Witbank, via Vandyksdrift on the Highveld in the Mpumalanga Province of South Africa. Komati is surrounded by farmlands mostly practicing agriculture (maize and livestock). It is near Komati Village which includes the business areas (shopping centre) and industrial areas (mines).

Table 1 presents the sensitive receptors within the surrounding environment. Sensitive receptors are identified as areas that may be impacted negatively due to noise associated with the proposed project. Examples of receptors include, but are not limited to, schools, shopping centres, hospitals, office blocks and residential areas. The site layout and receptors are presented in **Figure 1**.

Table 1: Sensitive receptors within a 5 km radius of the proposed project

ID.	Sensitive Receptor Name	Latitude (S)	Longitude (E)	Distance from Site Boundary (km)	Direction from Site
SR1	Komati Village	26° 5'46.52"	29°27'37.62"	Within the boundary	
SR2	Residential Area 1	26° 4'9.85"	29°25'16.62"	3.7	Northwest
SR3	Residential Area 2	26° 5'14.28"	29°26'18.46"	1.2	Northwest
SR4	Residential Area 3	26° 5'24.70"	29°26'47.50"	0.4	Northwest

Figure 1: Site layout and sensitive receptors for the proposed project

NOISE IMPACTS

EXISTING SOURCES OF NOISE WITHIN THE PROJECT AREA

Existing noise sources in the vicinity of the proposed project include:

- Agricultural activities mostly from maize and livestock.
- Vehicles along the R35, R542, nearby Goedehoop Colliery and internal Komati power station roads.
- Mining activities from the nearby Goedehoop Colliery.
- Industrial activities from the Komati Power Station.

PROPOSED SOURCES OF NOISE FROM THE CONSTRUCTION AND OPERATIONAL PHASE OF THE SOLAR PV PROJECT

CONSTRUCTION PHASE

It is estimated that approximately 200-300 construction workers will be required on the site for this phase. During the construction phase of the proposed project the following activities are anticipated:

- **Site Preparation:** Vegetation and topsoil will be cleared for the footprint of the infrastructure as well as for the access roads to the Solar PV site, internal roads and the laydown yard, etc. The topsoil removed will need to be stored for rehabilitation purposes of the site.

- **Transportation of Equipment:** All equipment will be transported to site by means of national, provincial and district roads. This includes but is not limited to, transformers, Solar PV modules, inverters, excavators, graders, trucks, compacting equipment, construction material, etc.
- **Site Establishment Works:** The site will have temporary laydown areas and offices for the construction contractors. This will include the contractor's chosen electricity supply infrastructure e.g. use of generators and fuel storage that will be required to conform to acceptable measures to ensure no harm to the environment. The laydown area will also be used for assembling of Solar PV modules and structures. A concrete batching plant may also be required as part of the site establishment works.
- **Construction of the Solar PV Facility:** Trenches would need to be excavated for underground cabling to connect Solar PV arrays, inverter stations, and combiner substations. Foundations for the Solar PV array mounting structures and inverter stations may need to be excavated, with the final extent depending on the geotechnical studies that will be conducted. The geotechnical studies will determine the type of foundations that can be utilised at the PV site. Construction of access, perimeter, and internal gravel roads may require material to be imported from outside the site, from a permitted quarry.
- **Construction of Electrical Interconnection Line:** Construction and installation of overhead electrical interconnection lines, connecting the Solar PV facilities to the grid PoC.
- **Storage:** Storage of diesel and oil for construction activities.

Given the type of noisy activities detailed above (i.e as a result of the concrete batching plant, equipment (such as excavators, graders, bulldozers, compactors, water bowsers, front end loaders, etc) and vehicles used during the construction activities of the proposed project), increased noise levels are likely to be anticipated at nearby receptors within a ~ 2.5 km radius (i.e at SR1, SR3 and SR4) of the proposed site during the construction phase, based on experience of similar construction studies. Importantly, for every doubling of distance, the sound level reduces by 6 dB. Noise levels are thus expected to be of most significance at SR1 (Komati Village) which is within the proposed project site boundary. As such, the necessary mitigation measures must be implemented during the construction phase to reduce impacts at all nearby receptors, with particular reference to the SR1, SR3 and SR4. However, it must be noted that noise levels from construction activities are highly uncertain due to the site specific and erratic nature of construction activities, with no set locations for equipment at a given time. Further, the construction phase is expected to occur during daytime hours only and is therefore limited and short-lived to the local project site area.

OPERATIONAL PHASE

The Solar PV plant is expected to have a minimum design life of 25 years. During the life of the Solar PV facility, there will be normal maintenance of all electrical and mechanical components of the plant. Thus, limiting the number of vehicle movements and electrical and mechanical equipment noise in and around the site. In addition, there will be periodic cleaning and washing of the Solar PV modules. This PV module cleaning will be performed when required, and it is estimated to occur two to four times a year, again limiting the noise levels to a minimum.

As such, minimal noise impacts are anticipated during the operational phase of the proposed project, with changes in noise unlikely to occur at the nearest sensitive receptors.

CUMULATIVE IMPACTS AS A RESULT OF THE PROPOSED SOLAR PV PROJECT

Cumulative impacts as a result of the construction phase are anticipated to be short-lived. As such, this will result in a restoration of current background conditions once the construction phase is completed.

MITIGATION MEASURES

CONSTRUCTION PHASE

Notwithstanding that impacts to noise associated with the construction phase of the project are considered to be of transient nature, the following mitigation measures would serve to further reduce such impacts to the receiving environment and sensitive receptors:

- Planning construction activities in consultation with local communities (such as the Komati Village) so that activities with the greatest potential to generate noise are planned during periods of the day that will result in least disturbance. Information regarding construction activities should be provided to all local communities. Such information includes:
    - Proposed working times.
    - Anticipated duration of activities.

    - Explanations on activities to take place and reasons for activities.
    - Contact details of a responsible person on site should complaints arise.
- When working near a potential sensitive receptor (within 100 m), limit the number of simultaneous activities to a minimum as far as possible.
- Using noise control devices, such as temporary noise barriers and deflectors for high impact activities, and exhaust muffling devices for combustion engines.
- Selecting equipment with the lowest possible sound power levels.
- Ensuring equipment is well-maintained to avoid additional noise generation.
- A drop height policy should be implemented onsite to reduce the level of noise generation when handling materials. All equipment operators should be trained in the policy such that drop height reduction is implemented onsite.
- It is recommended that a maximum speed of 20-40 km/h should be set on all unpaved roads.
- Ensure a reduction in unnecessary traffic volumes by developing plans to optimise vehicle usage and movement.
- Encouraging the receipt of materials during non-peak traffic hours to avoid traffic build-up and associated noise.
- Vehicles should not be allowed to idle for more than five minutes when not in use.

OPERATIONAL PHASE

Minimal noise impacts are anticipated during the operational phase of the proposed project and as such, no mitigation measures are deemed necessary during the operational phase of the proposed project.

IMPACT ASSESSMENT RATING

All impacts of the proposed project operations were evaluated using a semi-quantitative risk assessment methodology. This system derives an environmental impact significance level on the basis of the magnitude, reversibility, extent, duration and probability of potentially significant impacts. The overall risk level is determined using professional judgement based on a clear understanding of the nature of the impact, potential mitigatory measures that can be implemented and changes in risk profile as a result of implementation of these mitigatory measures. Key localised noise impacts associated with the proposed project operations include:

- Construction phase impacts of noise on sensitive receptors.

Outcomes of the noise impact assessment are contained within **Table 2** outlining the impact of each parameter and the resulting risk level. *Important to note that impacts predicted here are from the proposed project operations only and not a result of cumulative impacts.*

The resultant environmental noise risks for sensitive receptors were ranked “low” during the construction phase of the proposed project with mitigation in place.

Table 2: Impact assessment of risks associated with the proposed project

	Without Mitigation							With Mitigation						
Description	Probability	Duration	Extent	Magnitude	Reversibility	Significance	**Risk Level**	Probability	Duration	Extent	Magnitude	Reversibility	Significance	**Risk Level**
Construction phase impacts of noise on sensitive receptors	3	2	2	3	3	30	**Low**	2	2	1	2	3	16	**Low**

CONCLUSION

Given the nature of the proposed project, with noise during the construction phase expected to be short-lived and minimal noise anticipated during the operational phase, it is in our opinion that the proposed project can be authorised with the recommended mitigation measures implemented during the construction phase of the proposed project. Furthermore, no additional noise studies are required for the proposed project.