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Ref: H16/1/13-AEL/M1M/R1_Bi-Annual 2024/2025

Dear Mr Koenaite

MEDUPI POWER STATION BI-ANNUAL EMISSIONS REPORT

This report serves to fulfil the requirements of Section 7.7.2 of the Medupi Power Station Provisional Atmospheric Emission License (AEL) number H16/1/13-AEL/M1M/R1. This report reflects verified emissions data for the period of October 2024 to March 2025. The daily emissions figures for the reporting period were submitted monthly to the licensing authority.

The content of this report is aligned to the requirements of the Medupi Power Station provisional Atmospheric Emissions License and covers the following aspects:

- Compliance with regards to each AEL condition
- Interpretation of all available data, tests, and monitoring results regarding operation and all impacts on the environment
- Recommendations regarding non-compliance or potential non-compliance
- Target dates for the implementation of recommendations by the License Holder to achieve compliance.
- Impact of implemented corrective action taken for identified non-compliance.

1. Bi-annual Reporting Requirements as per condition 7.7.2 of the AEL

Compliance with regards to each AEL condition, recommendations regarding non-compliance or potential non-compliance and target dates.

Non-compliances to conditions of the license are reported to the licensing authority as soon as they are identified by the Power Station. The Station uses Continuous Emissions Monitoring System (CEMS) for emissions monitoring. Online monitoring is conducted on Unit 1, 2, 3, 5 and 6 for both Particulate Matter (PM) and Gaseous (NOx and SO2) emissions. The accuracy of the monitors is confirmed by the parallel tests and correlation tests conducted annually. Note the AEL requirement is to conduct the tests once every two years. The AEL Compliance status is indicated on table 1 below.

	Condition	Finding /Non-Compliance	Recommendation	Target Date
4.1	The holder of the atmospheric emission License must ensure that all units, processes and apparatus are used for the purpose of undertaking the listed activity in question, and all appliances and mitigation measures for preventing or reducing atmospheric emissions are always properly maintained and operated.	All unit processes and apparatus used to undertake the listed activity, as well as all appliances and mitigation measures for preventing or reducing atmospheric emissions, are consistently maintained and operated in accordance with the relevant procedures and work instructions (WI). However, the analyzer has been faulty and has been giving incorrect pollutant results that are outside of the regulatory limit. In addition, the station has been operating without an emission control technology such as the Flue-gas Desulphurization (FGD) plant for over seven years since the units were commissioned. The project update indicates that the FGD plant is	The station should ensure that the analyzer is repaired and the plant is retrofitted with FGD to comply with legislation and international best practices.	30 September 2029

		scheduled for commissioning in September 2029.		
4.8a.	The License Holder is responsible for quality assurance of methods and performance. Where the License Holder uses external laboratories for sampling or analysis, accredited laboratories shall be used.	The Station does not have proof of notification of the Interested and Affected Parties, to the effect that an AEL has been issued.	Submit a variation of the current License and once the new License is received then a notification will be sent to the I&AP registered during the variation process	31 July 2026
7.15	The License Holder shall, continuously operate, and maintain a flue gas desulphurization (FGD) plant for control of SO_2 on all six units. The Flue Gas Desulphurization plant shall be retrofitted in each unit within six (06) years after the first commissioning of each unit and during the General Overhaul outages	The Flue Gas Desulphurization (FGD) plant is not installed at the station, and it has been more than 06 years since the first unit was commissioned. Notwithstanding, a letter notifying the authorities regarding the change of construction dates, dated 03 September 2018	Drive FGD implementation and ensure the project is executed	30 September 2029
7.3.2	The CEMS shall be operated, calibrated and maintained continuously, dependent on the unit's operation. The License Holder must measure and record valid continuous emission data for the parameters listed in condition 7.3 during all periods of the unit's operation including periods of unit startup, shut down, or emergency conditions, except	The Station conducts monthly CEMS functionality and reliability tests, maintenance, and calibrations and reports malfunctions accordingly. However, the CEMS yield is below the required 90%. At the time of the audit, it was noted that CEMS gas reliability for Units 1 and 3 was low. As a result, the data being reported is	The SANAS audit requirement must be met accordingly. This will enhance the credibility of the data.	31 July 2026

	for periods of CEMS quality assurance/quality control ('QA/QC"), routine maintenance, or uncontrolled malfunction. Nevertheless, the CEMS must be maintained to yield a minimum of 90% valid hourly average values during the reporting period. CEMS must be audited by a SANAS accredited laboratory at least once every two (02) years.	not reliable and accurate. The license condition furthermore requires that the CEMS be audited by a SANAS-accredited laboratory at least once every two years. The Station has appointed Levego Environmental Services to monitor Parallel gaseous emissions and test correlation on the Flue of Unit 6. Each unit has its annual schedule, and the Station conducts these tests annually.		

2. **Interpretation of all available data, test, and monitoring results regarding operation of the plant and all impacts on the environment.**

Emission Exceedances

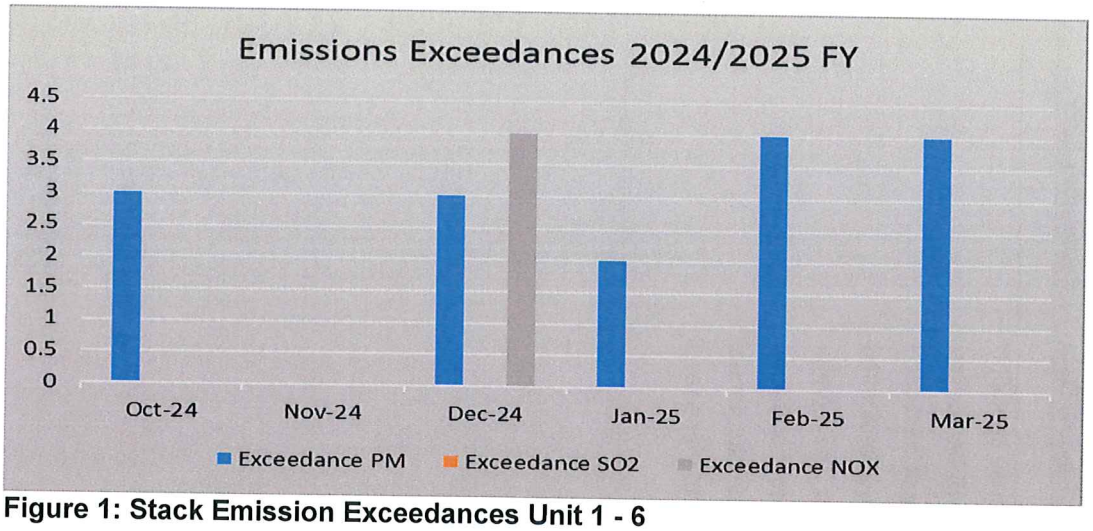


Figure 1: Stack Emission Exceedances Unit 1 - 6

PM Exceedances

Medupi Power Station makes use of the Pulse Jet Fabric Filter Plant (PJFF) to reduce PM from the stacks. A daily average PM limit of 50 mg/Nm3 was granted and is in effect from 01 December 2020 as reflected on the Medupi Power Station AEL. There was a total of sixteen (16) PM exceedances recorded during the reporting period. Nine (9) of the exceedances were within grace (start-up and shutdowns), and four (4) were due to CEMS issues. Three (3) were reported as section 30 incident.

SO_2 and NO_x Exceedances

A monthly average SO_2 limit of 3500 mg/Nm3 was granted effective from 01 December 2020 as reflected on the Medupi Power Station AEL. SO_2 emissions are monitored and managed daily to ensure duty of care. There were no SO_2 exceedances for this reporting period.

The Medupi Power Station firing system is equipped with 30 swirl stage low NO_x burners, arranged in 5 rows of burners, and designed for normal operation with one standby-mill (4- mill operation), i.e., with 24 out of 30 burners. The processes that occur in the pulverized-coal firing system are grinding,

drying, and distributing of the coal. The Low NO_x burners are designed to ensure efficiency and improved performance.

The Low NO_x Burners are required to maintain a minimum control efficiency of 70% with 100 utilizations in terms of condition 7.1 of the Medupi Power Station AEL. The Station's stack emissions for NO_x generally performs below the AEL limit of 750mg/Nm3. The Station recorded a high NO_x above the 750 mg/Nm3 limit on four (4) occasions due to faulty CEMS.

Unit 1-6 Emission Tonnages

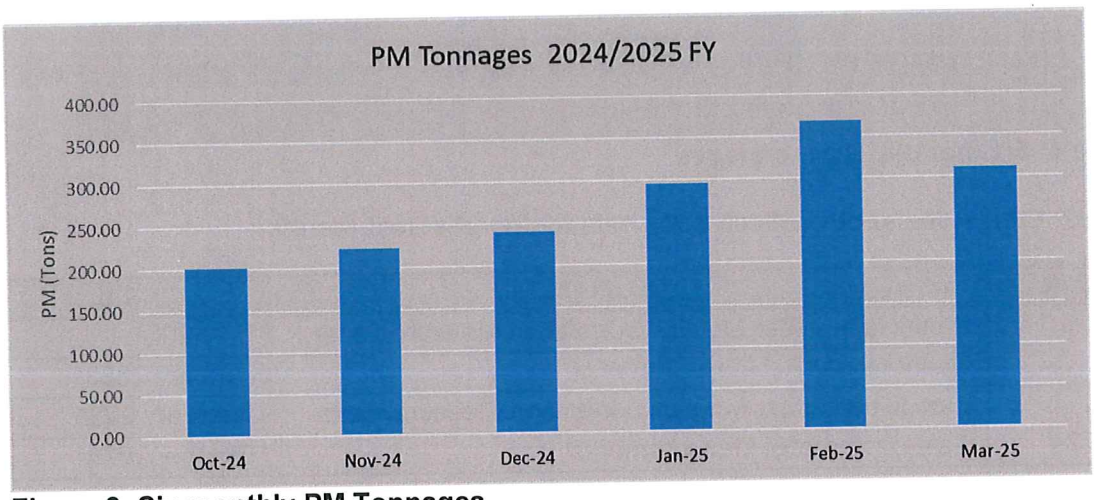


Figure 2: Six monthly PM Tonnages

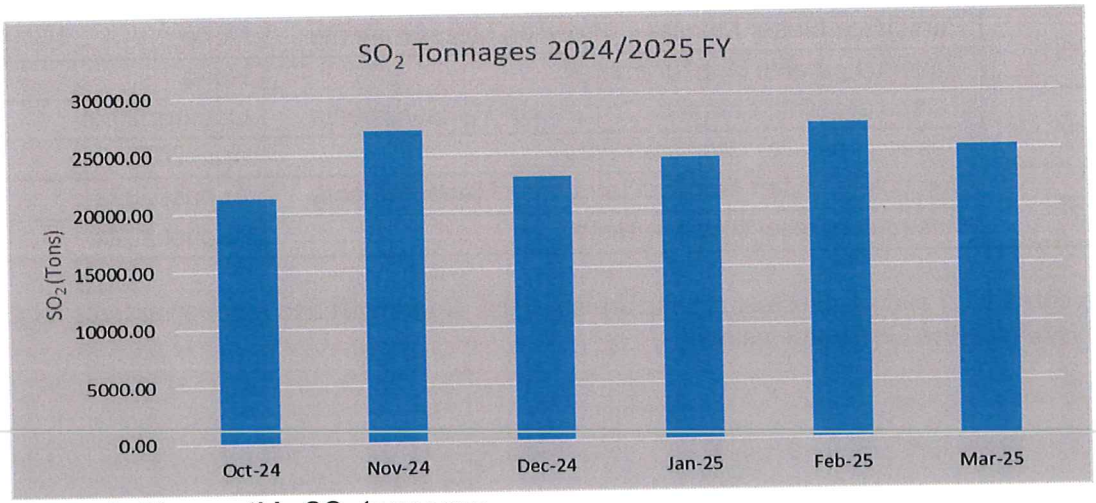


Figure 3: Six monthly SO_2 tonnages

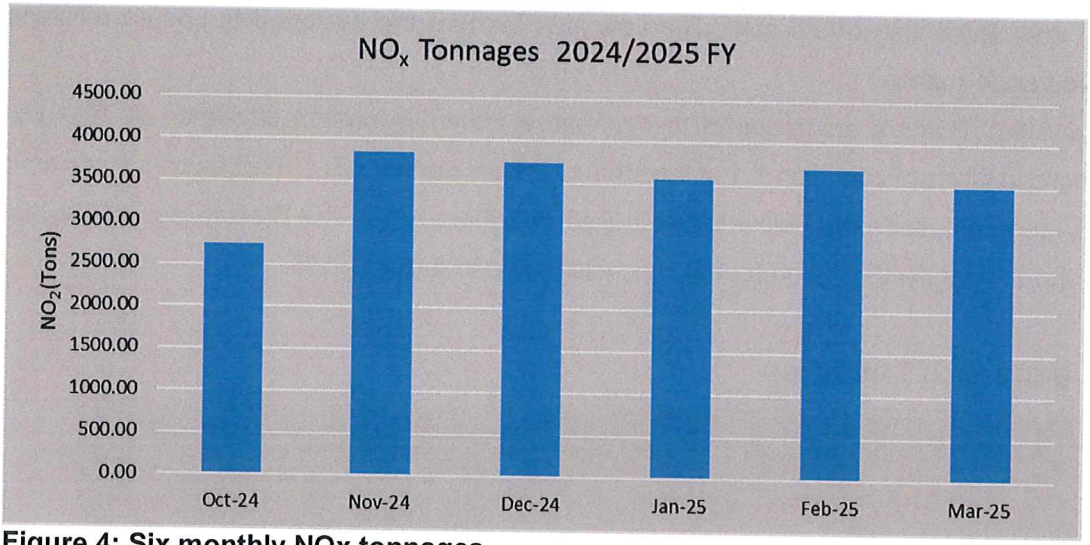


Figure 4: Six monthly NOx tonnages

Table 2: Emissions spot/verification/correlation/parallel test results

Unit	Type of test	Date
1	Particulate Matter Monitor Correlation Measurements	May 2024
	Gaseous parallel Measurements	January 2023
2	Particulate Matter Monitor Correlation Measurements	February 2025
	Gaseous parallel Measurements	October 2023
3	Particulate Matter Monitor Correlation Measurements	January 2023
	Gaseous parallel Measurements	January 2024
4	Particulate Matter Monitor Correlation Measurements	None
	Gaseous parallel Measurements	None
5	Particulate Matter Monitor Correlation Measurements	October 2024
	Gaseous parallel Measurements	April 2023
6	Particulate Matter Monitor Correlation Measurements	August 2023
	Gaseous parallel Measurements	August 2024

All the correlation and parallel test reports are still valid. No parallel and correlation tests for Unit 4 which is off due the Generator incident.

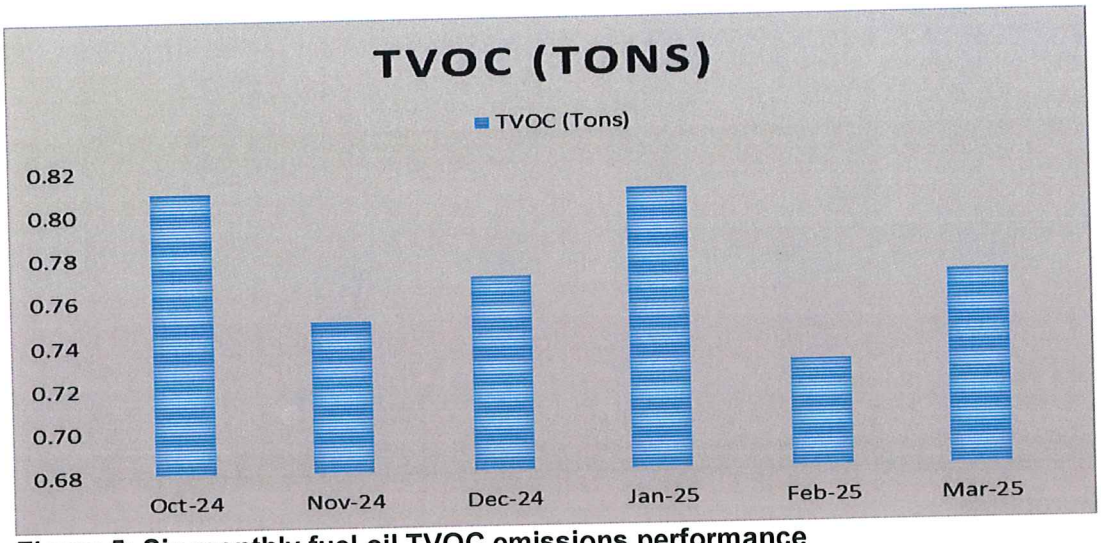


Figure 5: Six monthly fuel oil TVOC emissions performance

Fuel Oil Consumption

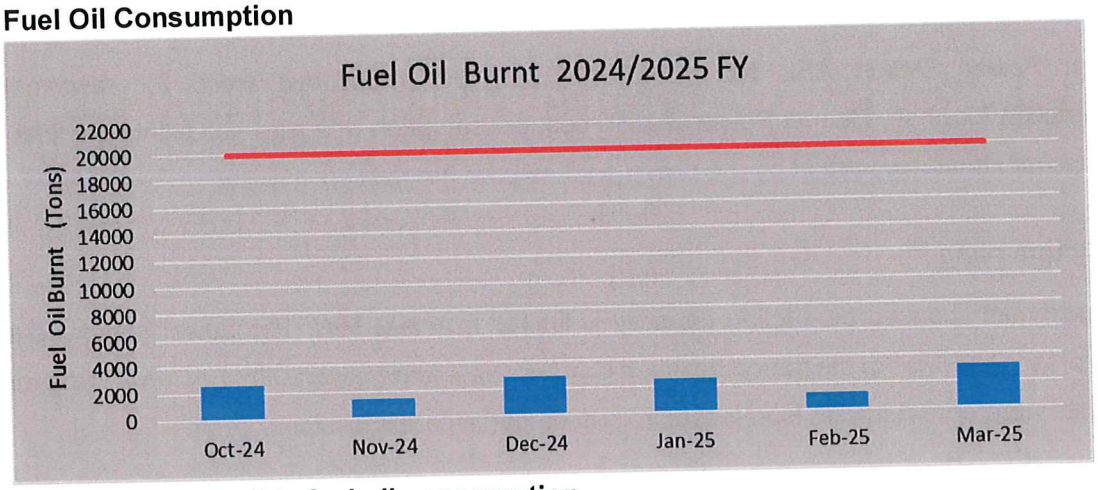
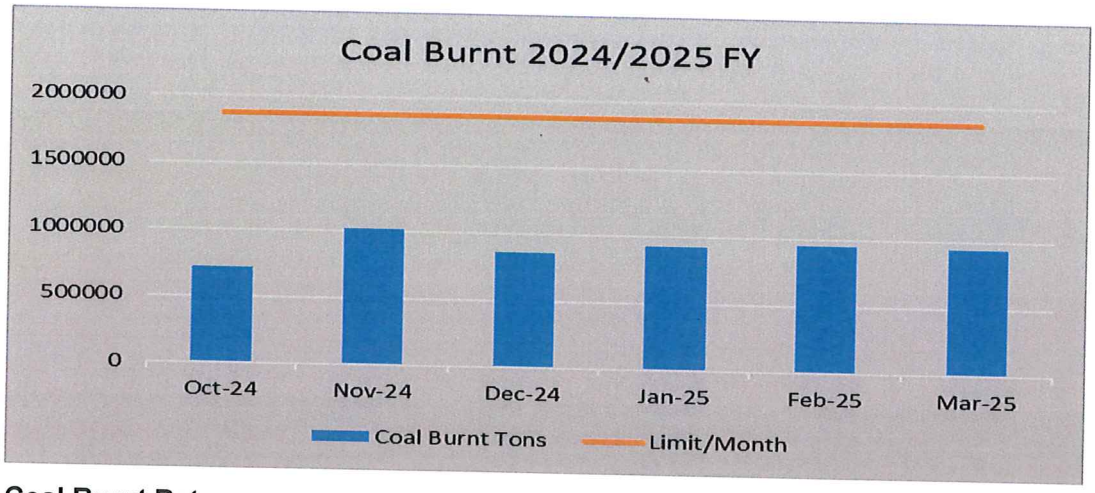


Figure 6: Six monthly fuel oil consumption

Medupi Power Station uses fuel oil during unit light up, the maximum allowable tons of fuel oil to be used by Medupi Power Station is 20 000 tons/month. The Power Station monitors the monthly usage and reports to Waterberg District Municipality (WDM), figure 6 above indicates that the Power Station complies with the requirements of the provisional AEL limit of 20 000 tons per month.



Coal Burnt Rate

Figure 7: Six monthly coal burnt rate.

Medupi Power Station AEL No. H16/1/13-AEL/M1/R1 prescribes limits for raw materials consumption for coal. Medupi Power Station coal consumption rate was well within the limit 1 875 000 tons/month as prescribed by the provisional AEL for the past six months.

Production rates

The maximum licensed production capacity is limited to 4 800 MW. The power station remained within prescribed limit for the period between October 2024 and March 2025. For most of the months, the Units were operated with load losses to reduce particulate emissions.

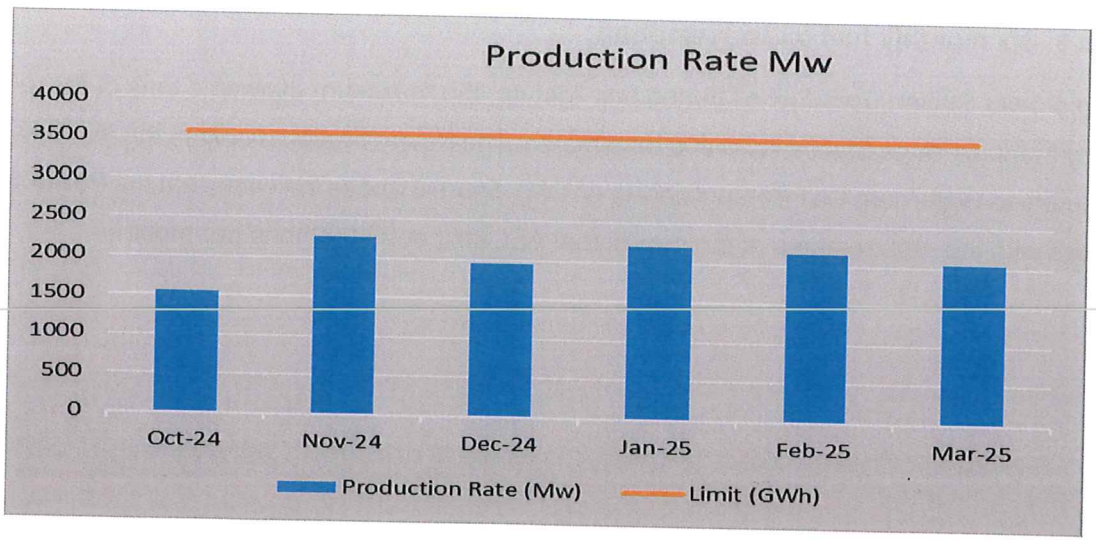


Figure 8: Six monthly production rates

Ambient Air Quality Results for January 2025 – March 2025

Eskom commissioned two (2) ambient air quality monitoring stations at Kroomdraai farm and Marapong to assess background conditions of ambient air quality prior to the commissioning of Medupi Power Station and the impacts on the environment thereof. The Medupi site is equipped for continuous monitoring of ambient concentrations of sulphur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), fine particulate matter of sizes <10µm and <2.5 in diameter (PM_{10} and $PM_{2.5}$). Table 3 below presents ambient air quality monitoring concentrations for the year 2025 monitoring period. The number of exceedances are within the allowable annual limit in all the parameters.

Month	SO_2 hourly	SO_2 daily	SO_2 10-minute	NO_2 hourly	PM_{10} daily	$PM_{2.5}$ daily	O_3 8-hourly
January	0	0	1	0	0	0	0
February	0	0	0	0	0	0	0
March	0	0	0	0	0	ND	2
Total	**0**	**0**	**1**	**0**	**0**	**0**	**2**
Allowed number of exceedances	88	4	526	88	4	4	11

ND = no data recorded

Table 3: Number of exceedances of the National Ambient Air Quality Limits for reporting period.

ND – No Data PM2.5 Daily monitoring equipment was faulty for the month of March 2025.

Fugitive Dust Fall Results

Medupi Power Station dust monitoring network consists of 20 buckets which are collected and analysed within 30 +- 3 days. The results for the reporting period of October 2024 to March 2025 are depicted in figure 9 below. It is evident that the dust management practice within the Power Station is a challenge. D13 exceedances experienced from January 2025 to February 2025 were due to tempering of the dust bucket by (animals) wildlife. The bucket was secured after the incidents to prevent future tempering.

Table 4: Six monthly Fugitive Dust Buckets Exceedances

Monitoring Point	Number of Exceedances	Months and Dust fallout (mg/m^2/days)
D03	2	Nov 2024 = 1919 & Dec 2024 = 1554

D15a	3	Oct 2024 = 1650, Nov 2024 =1988, Jan 2025=1337
D5a	3	Oct 2024= 2473, Nov 2024=1528, Dec 2024 = 1753
D13	2	Jan 2025 = 2676, Feb 2025 = 5043

Note: Medupi Power Station developed a dust management plan, and the measures are being implemented and monitored regularly to determine their effectiveness

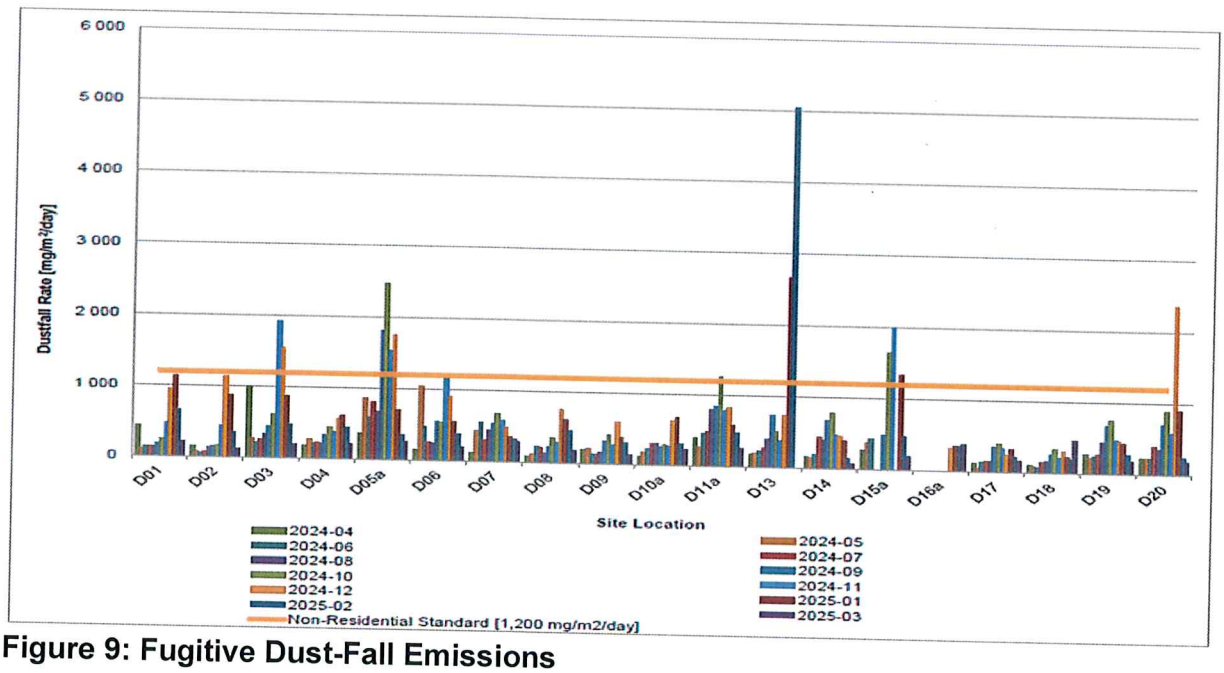


Figure 9: Fugitive Dust-Fall Emissions

Conclusion

Medupi Power Station complies with most of the requirement of the AEL issued in terms of Section 40(1) (a) of the National Environmental Management: Air Quality Act, 2004, listed activity No. 1.1, 2.4 and 5.1.

The stack emissions tonnages increased from January 2025 to March 2025. Most of the exceedances that were recorded were attributed to grace periods and faulty CEMS.

The ambient air monitoring station indicated no exceedances for this year. The ADF and other sources of fugitive dust around Lephalale contributed to the elevated PM concentrations.

Fugitive dust monitoring network recorded multiple exceedances from October 2024 to December 2024. A dust management plan with actions to address the exceedances was developed and submitted to the authorities &Implementation of the actions is in progress.

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