Eskom

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Date:
12 May 2025

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Dear Ms. Nompumelelo Simelane

Ref: Kendal Power Station AEL (17/4/AEL/MP312/11/15)

SUBMISSION OF KENDAL POWER STATION'S EMISSIONS REPORT FOR THE MONTH OF MARCH 2025.

This is a monthly report required in terms of Section 7.4 in the Kendal Power Station's Atmospheric Emission License. The emissions are for Eskom Kendal Power Station.

Compiled by:

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ENVIRONMENTAL SENIOR ADVISOR- KENDAL POWER STATION
Date: 12/05/2025

Supported by:

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Date: 12/05/2025

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KENDAL POWER STATION'S EMISSIONS REPORT FOR THE MONTH OF MARCH 2025

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Tshepiso Temo
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Date: 04/06/2025

MARCH 2025

KENDAL POWER STATION MONTHLY EMISSIONS REPORT

Atmospheric Emission License 17/4/AEL/MP312/11/15

1 RAW MATERIALS AND PRODUCTS

Raw Materials and Products	Raw Material Type	Units	Maximum Permitted Consumption Rate	Consumption Rate Mar-2025
	Coal	Tons	2 260 000	765 255
	Fuel Oil	Tons	5 000	9236.300
Production Rates	**Product / By-Product Name**	**Units**	**Maximum Production Capacity Permitted**	**Indicative Production Rate Mar-2025**
	Energy	GWh	3 062.304	1 302.474
	Ash	Tons	770 000	241 055.325
	RE Ash	kg/MWh	not specified	1.336

Note: Maximum energy rate is as per the maximum capacity stated in the AEL: [4 116 MW] x 24 hrs x days in Month/1000 to convert to GWh

2 ENERGY SOURCE CHARACTERISTICS

Coal Characteristic	Units	Stipulated Range	Monthly Average Content
CV Content	MJ/kg	16-24 (MJ/kg)	18.800
Sulphur Content	%	<1 (%)	0.860
Ash Content	%	40 (%)	31.500

3 EMISSION LIMITS (mg/Nm^3)

Associated Unit/Stack	PM	SO_2	NOx
Unit 1	100	3500	1100
Unit 2	100	3500	1100
Unit 3	100	3500	1100
Unit 4	100	3500	1100
Unit 5	100	3500	1100
Unit 6	100	3500	1100

4 ABATEMENT TECHNOLOGY (%)

Associated Unit/Stack	Technology Type	Efficiency Mar-2025	Technology Type	SO_3 Utlization Mar-2025
Unit 1	ESP + SO_3	99.464%	SO_3	77.4%
Unit 2	ESP + SO_3	97.328%	SO_3	35.5%
Unit 3	ESP + SO_3	99.467%	SO_3	61.3%
Unit 4	ESP + SO_3	99.425%	SO_3	32.3%
Unit 5	ESP + SO_3	98.588%	SO_3	58.1%
Unit 6	ESP + SO_3	99.589%	SO_3	93.5%

***Note**: ESP plant does not have bypass mode operation, hence plant 100% Utilised.*

There is no Sulphur value for SO3 utilization due to switch failure on the server, however DCS signals used for its tripping alarms were used to get its utilization values. Sulphur flow will be available once we have commissioned the new PI system.

5 MONITOR RELIABILITY (%)

Associated Unit/Stack	PM	SO_2	NO	O_2
Unit 1	90.2	99.8	99.8	96.2
Unit 2	22.6	100.0	100.0	0.0
Unit 3	93.6	100.0	99.6	100.0
Unit 4	89.2	100.0	97.1	0.0
Unit 5	97.7	100.0	96.5	0.0
Unit 6	92.2	100.0	100.0	100.0

Note: NOx emissions is measured as NO in PPM. Final NOx value is expressed as total NO_2

6 EMISSION PERFORMANCE

Table 6.1: Monthly tonnages for the month of March 2025

Associated Unit/Stack	PM (tons)	SO_2 (tons)	NO_x (tons)
Unit 1	227.0	2 746	1 072
Unit 2	613.6	1 287	560
Unit 3	154.6	1 448	557
Unit 4	122.2	1 763	660
Unit 5	431.4	2 690	747
Unit 6	191.7	3 694	1 448
SUM	1 740.59	13 628	5 044

Table 6.2: Operating days in compliance to PM AEL Limit - March 2025

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average PM (mg/Nm³)
Unit 1	4	6	0	15	21	191.2
Unit 2	0	1	0	12	13	729.3
Unit 3	6	5	0	8	13	169.4
Unit 4	6	3	0	7	10	187.3
Unit 5	0	2	0	18	20	441.7
Unit 6	16	7	0	5	12	108.8
SUM	32	24	0	65	89	

Table 6.3: Operating days in compliance to SO_2 AEL Limit - March 2025

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SO_2 (mg/Nm³)
Unit 1	26	0	0	0	0	2 035.0
Unit 2	15	0	0	0	0	1 428.8
Unit 3	21	0	0	0	0	1 250.4
Unit 4	19	0	0	0	0	2 075.2
Unit 5	24	0	0	0	0	2 183.7
Unit 6	30	0	0	0	0	1 897.0
SUM	135	0	0	0	0	

Table 6.4: Operating days in compliance to NOx AEL Limit - March 2025

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NOx (mg/Nm³)
Unit 1	26	0	0	0	0	776.1
Unit 2	15	0	0	0	0	597.2
Unit 3	21	0	0	0	0	472.1
Unit 4	19	0	0	0	0	764.3
Unit 5	24	0	0	0	0	575.0
Unit 6	30	0	0	0	0	738.2
SUM	135	0	0	0	0	

Note: NOx emissions is measured as NO in PPM. Final NOx value is expressed as total NO_2

Table 6.5: Legend Description

Condition	Colour	Description
Normal	GREEN	Emissions below Emission Limit Value (ELV)
Grace	BLUE	Emissions above the ELV during grace period
Section 30	ORANGE	Emissions above ELV during a NEMA S30 incident
Contravention	RED	Emissions above ELV but outside grace or S30 incident conditions

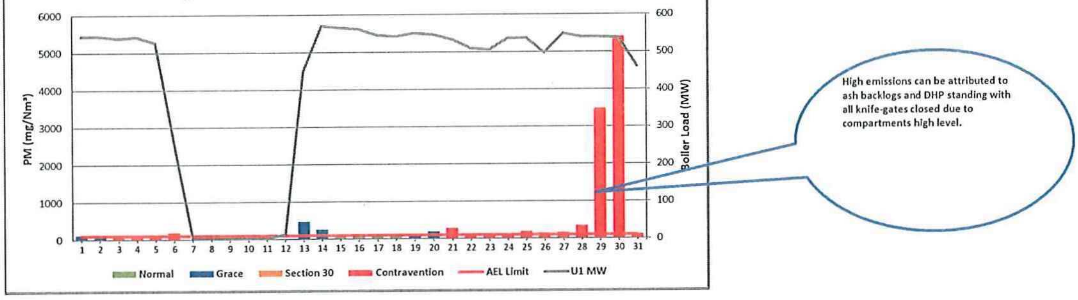


Figure 1: Kendal Unit 1 PM Emissions - March 2025

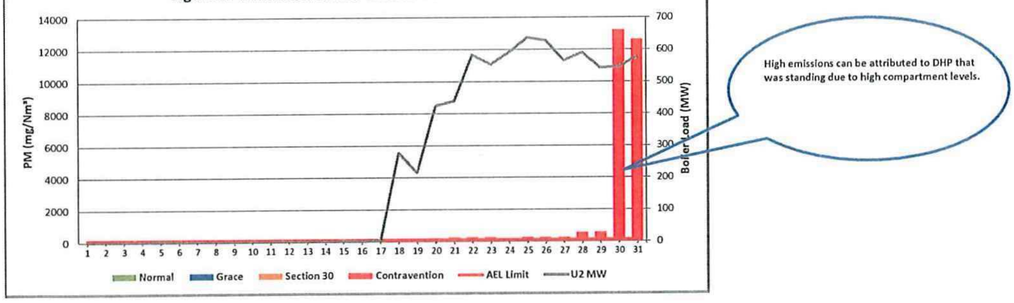


Figure 2: Kendal Unit 2 PM Emissions - March 2025

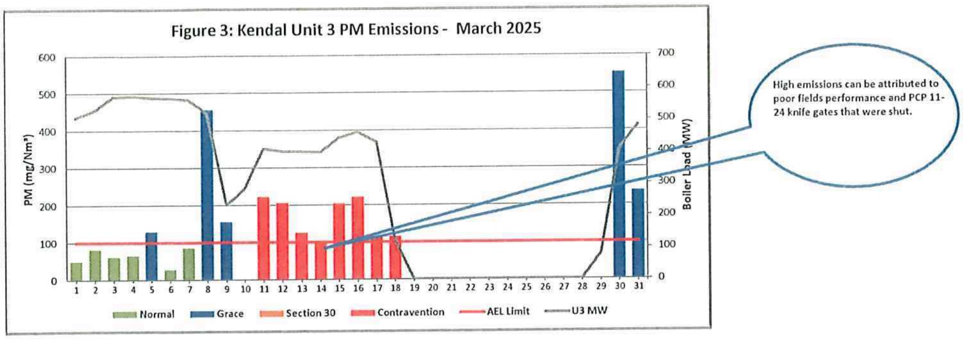


Figure 3: Kendal Unit 3 PM Emissions - March 2025

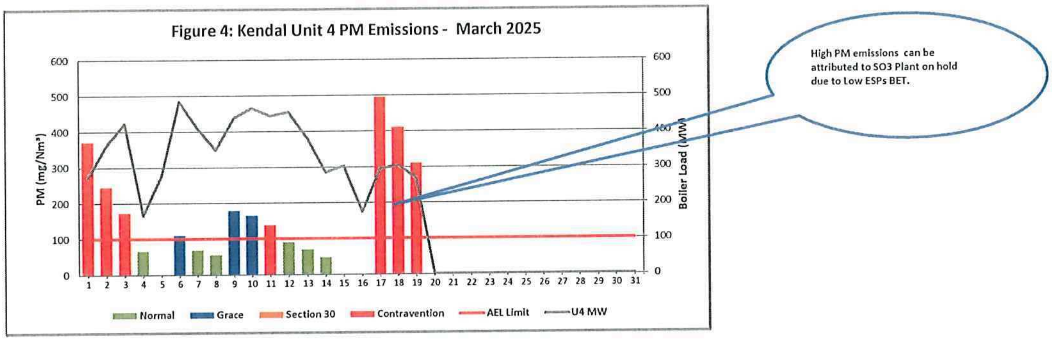


Figure 4: Kendal Unit 4 PM Emissions - March 2025

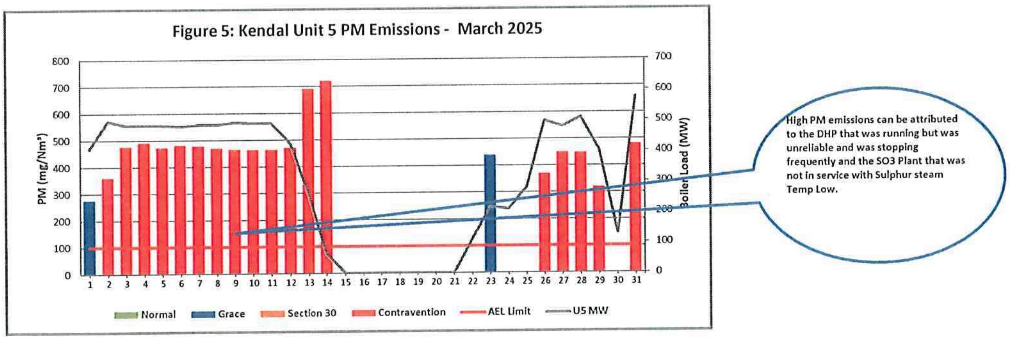


Figure 5: Kendal Unit 5 PM Emissions - March 2025

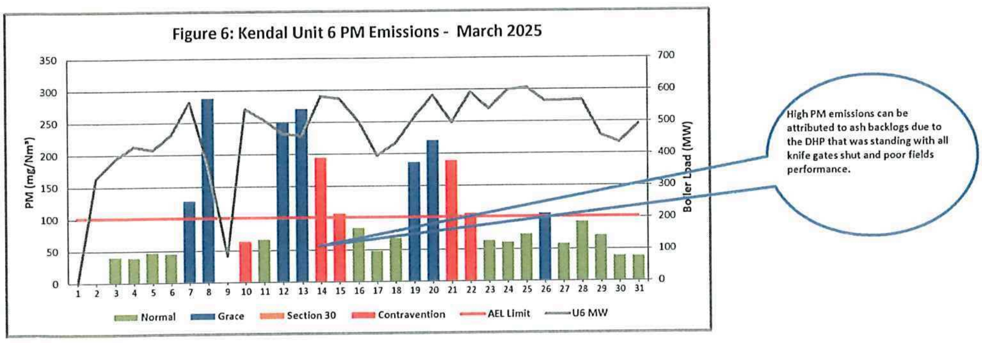


Figure 6: Kendal Unit 6 PM Emissions - March 2025

Figure 7: Kendal Unit 1 SO_2 Emissions - March 2025

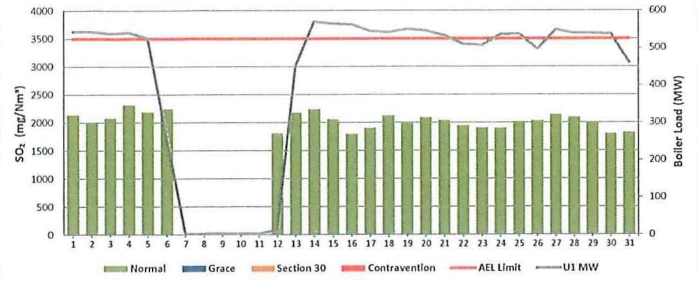


Figure 8: Kendal Unit 2 SO_2 Emissions - March 2025

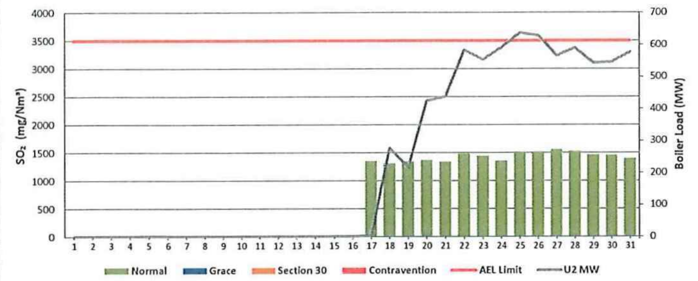


Figure 9: Kendal Unit 3 SO_2 Emissions - March 2025

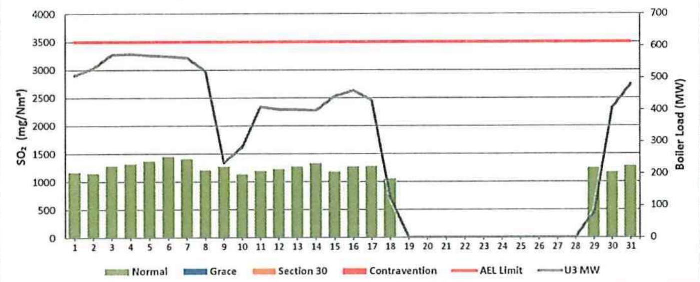


Figure 10: Kendal Unit 4 SO_2 Emissions - March 2025

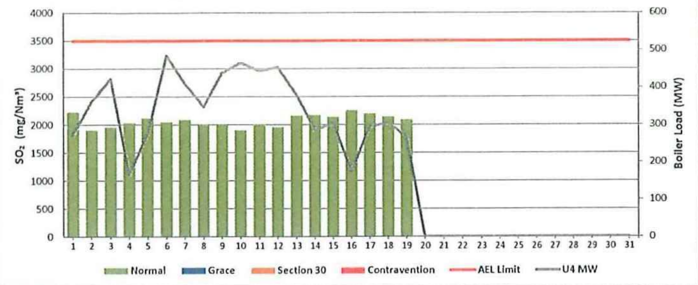


Figure 11: Kendal Unit 5 SO_2 Emissions - March 2025

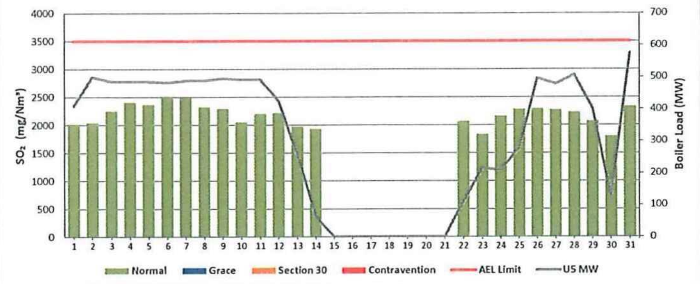


Figure 12: Kendal Unit 6 SO_2 Emissions - March 2025

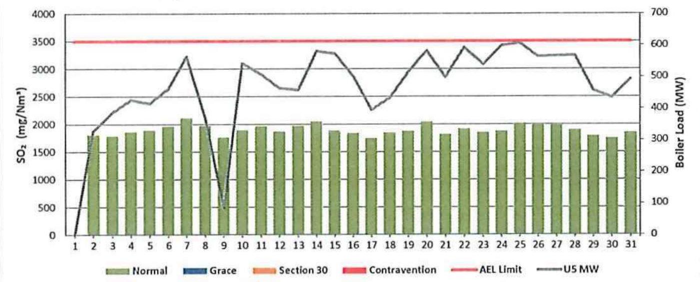


Figure 13: Kendal Unit 1 NOx Emissions - March 2025

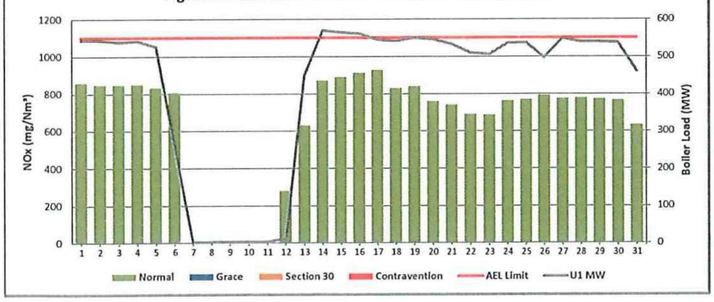


Figure 14: Kendal Unit 2 NOx Emissions - March 2025

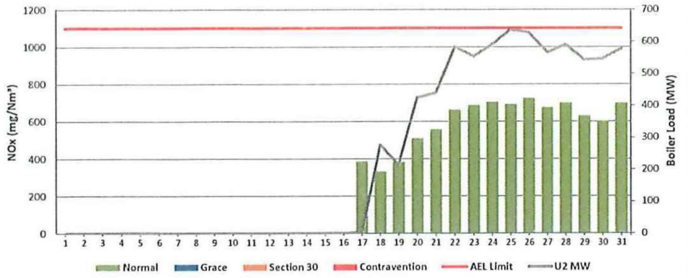


Figure 15: Kendal Unit 3 NOx Emissions - March 2025

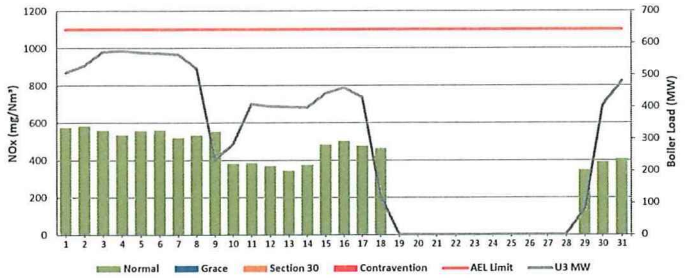


Figure 16: Kendal Unit 4 NOx Emissions - March 2025

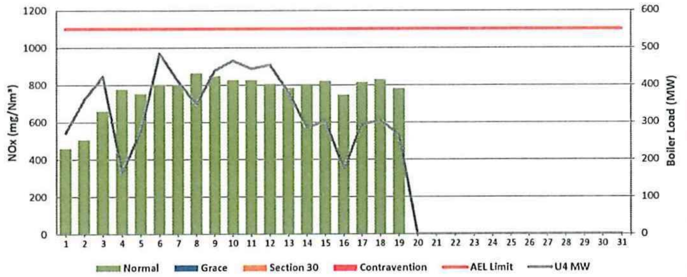


Figure 17: Kendal Unit 5 NOx Emissions - March 2025

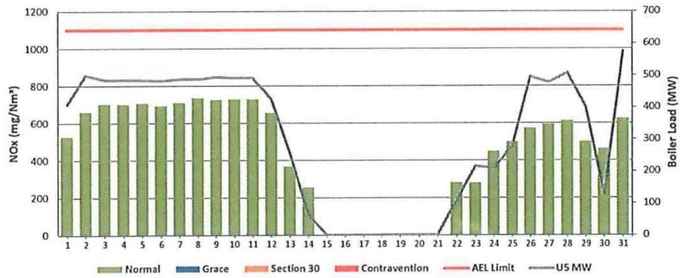
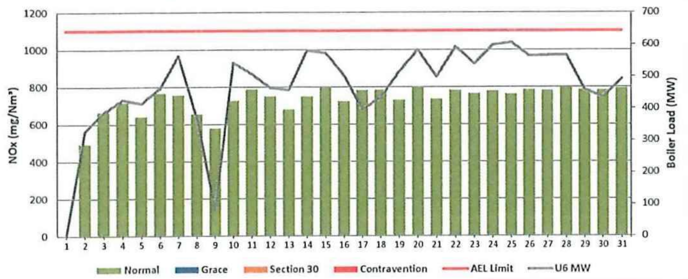


Figure 18: Kendal Unit 6 NOx Emissions - March 2025



7 COMPLAINTS

There were no complaints for this months

Source Code / Name	Root Cause Analysis	Calculation of Impacts / emissions associated	Dispersion modeling of pollutants where applicable	Measures implemented to prevent reoccurrence

Abatement Technology-Table 4

In order to achieve the required operational dust removal efficiency based on measured values, several assumptions such as
- Coal ash content (%) and burnt rate mass
- Fly : Coarse ash ratio of 80:20 - 80% of fly-ash mass obtained from burnt coal goes to ESP
- Measurement of dust emission by Dust Monitor over a period of time (monthly)

Operational Dust Removal Efficiency

$\eta = (1 - (Output/Input)) \times 100$

$$\eta = 1 - \frac{(DustEmissionFromAQR\ ReportDustMonitor(tons))}{(CoalBurnt(tons) * \%AshContent * 80\%)} \times 100$$

Monitor Reliability-Table 5

In terms of the minimum emissions standard, the requirement is that a monitor should be 80% reliable on a monthly average.
The **monitor reliability** refers to **data reliability** because the assumed value of 99.325% reliability is compared to the dust concentration signal. If the dust concentration signal is above 99.325% opacity,the data information is no longer reliable because the monitor reading is out of its maximum reading range. The data reliability looks at how many times did the dust concentration signal go above 98% over a period of time e.g 24hours
The formula is as follows:
= (1 – (count hours above 99.325%/24hours))x 100

Emissions Performance:

- Average velocity values from the latest correlation report were used on the gaseous emissions on Units due to defective CEMS monitors and velocity correction factors were set M=1 and C=0
- Unit 1,2,3,4 and 6 maxed out, meaning the emissions were higher than what the monitor was correlated for, in which case we use surrogate values. This is attributed to abnormal plant conditions.
- Please note that the reported figures in tonnage calculation are the figures after the station usd the maxing out quantification exercise which is the use of "surrogate values" on days when the monitor maxed out.
- Flow was not working for the whole month because of sensors that are faulty and the sensors have to be replaced on all the units. The process for procuring new sensors is in progress.
- Correlation curves for units 1,4 and 5 were changed to suite changes of the data signals from *AAA* to *HME* data values because of the damaged cables for *AAA* signal giving vaues that were not reliable.
- Surrogation values were recalculated after updating raw data based on curves update.
- The QAL 2 average values for gaseous were used as raw data in cases where the monitor had an error, were used as surogation values.
- Dust monitor for unit 2 in some of the days was not reliable due to the monitor being defective.
- Average emissions for unit 2,4 and 5 were used from the available data as the monitor was defective.

- Unit 1
- Findings: High emissions can be attributed to ash backlogs and DHP that was standing with all knife-gates closed due to compartments high level.
- Resolution: Plant repaired.

- Unit 2
- Findings: High emissions can be attributed to DHP that was standing due to high compartment levels.
- Resolution: Plant repaired.

- Unit 3
- Findings: High emissions can be attributed to poor fields performance and PCP 11-24 knife gates that wwere shut.
- Resolution: Plant repaired.

- Unit 4

Findings: High PM emissions can be attributed to SO3 Plant on hold due to Low ESPs BET
- Resolution: Plant repaired.

Unit 5
Findings: High PM emissions can be attributed to the DHP that was running but was unreliable and was stopping frequently and the SO3 Plant that was not in service with Sulphur steam Temp Low.
Resolution: Plant repaired.

- Unit 6
- Findings: High PM emissions can be attributed to ash backlogs due to the DHP that was standing with all knife gates shut and poor fields performance. .
- Resolution: Plant repaired.