Eskom

Mr. Dan Hlanyane
Air Quality Officer
Gert Sibande District Municipality
c/o Joubert & Oosthuise Street
ERMELO
2350

E-mail: Dan.Hlanyane@gsibande.gov.za
E-mail: records@sibande.gov.za

Date:
27 May 2021

Enquiries: Monica Mokgawa
(017) 749 9399

Dear Mr. Hlanyane

TUTUKA POWER STATION SUBMISSION MONTHLY EMISSIONS PERFORMANCE MONITORING REPORT AS STIPULATED ON CONDITION 7.5 OF TUTUKA POWER STATION ATMOSPHERIC EMISSION LICENCE NO: Lekwa/Eskom H SOC Ltd TPS/0013/2019/F03 Dated 25 APRIL 2019

In terms of Tutuka PS AEL, the station is required to submit the monthly emissions monitoring report on/before the 12th every month. The report shall indicate the emission performance for the previous month. This report contains the emission performance for the month of April 2021.

1. RAW MATERIALS AND PRODUCTS

Raw Materials and Products	**Raw Material Type**	**Units**	**Max. Permitted**	**Actual Consumption April-2021**
	Coal	Tons	*1 200 000*	686 587
	Fuel Oil	Tons	*10 000*	*9 398*
Production Rates	**Product / By-Product Name**	**Units (per Month)**	**Max. Production Capacity Permitted**	**Production Rate April-2021**
	Energy	GWh	*2611.44*	1 021.166
	Ash	Tons	*Not specified*	*187 712.80*
	RE Ash	kg/MWh	*Not specified*	*1.94*

Table 1: Quantity of raw materials and products used/produces for the month of April 2021

2. ENERGY SOURCE CHARACTERISTICS

Coal Characteristics	Units	Stipulated Range	Monthly Average Content
CV Content	MJ/kg	*Not specified*	20.08
Sulphur Content	%	*0.6 - 2.6*	0.59
Ash Content	%	*21 - 33*	27.34

Table 2: Energy sources material characteristics for the month of April 2021

3. ABATEMET TECHNOLOGY (%)

Associated Unit/Stack	Technology Type	Minimum Control Efficiency (%)	Calculated Efficiency (%)
Unit 1	*Electro Static Precipitators (ESP)*	*95.00*	*99.7%*
Unit 2	*Electro Static Precipitators (ESP)*	*95.00*	*99.2%*
Unit 3	*Electro Static Precipitators (ESP)*	*98.00*	*99.5%*
Unit 4	*Electro Static Precipitators (ESP)*	*95.00*	*98.5%*
Unit 5	*Electro Static Precipitators (ESP)*	*95.00*	*99.3%*
Unit 6	*Electro Static Precipitators (ESP)*	*95.00*	*99.2%*

Table 3.1: Abatement Equipment Control Technology for month of April 2021.

Note: The ESP does not have a bypass mode operation, hence the plant is 100% utilised.

3.2. MONITOR DATA RELIABILITY (%)

Associated Unit/Stack	PM	SOx	NOx
Unit 1	*100.0*	*100.0*	*100.0*
Unit 2	*100.0*	*100.0*	*100.0*
Unit 3	*100.0*	*100.0*	*100.0*
Unit 4	*100.0*	*100.0*	*100.0*
Unit 5	*100.0*	*100.0*	*100.0*
Unit 6	*99.7*	*99.7*	*99.7*

Table 3.2: Monitor reliability for month of April 2021

4. EMISSION PERFORMANCE

Associated Unit/Stack	PM (tons)	SO_2 (tons)	NO_x (tons)
Unit 1	122.0	1 068	347
Unit 2	335.1	2 230	639
Unit 3	231.0	2 545	885
Unit 4	812.6	4 110	1 458
Unit 5	278.2	2 216	917
Unit 6	350.7	2 702	715
SUM	2 129.6	14 872	4 960

Table 4.1: Monthly tonnages for the month of April 2021

Table 4.2: Legend Description for figure 1-18(below)

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

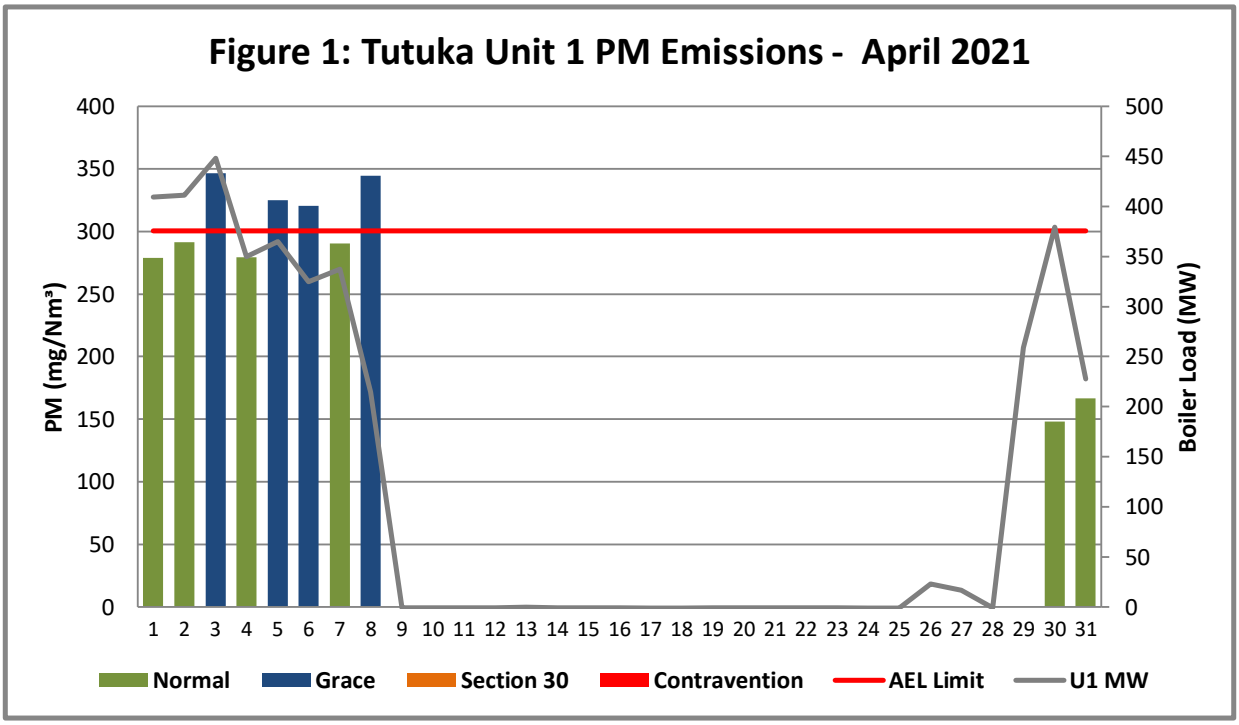

Figure 4: Unit 4 Daily Average PM emissions for the month of April 2021(against the emission limits and load Generated)

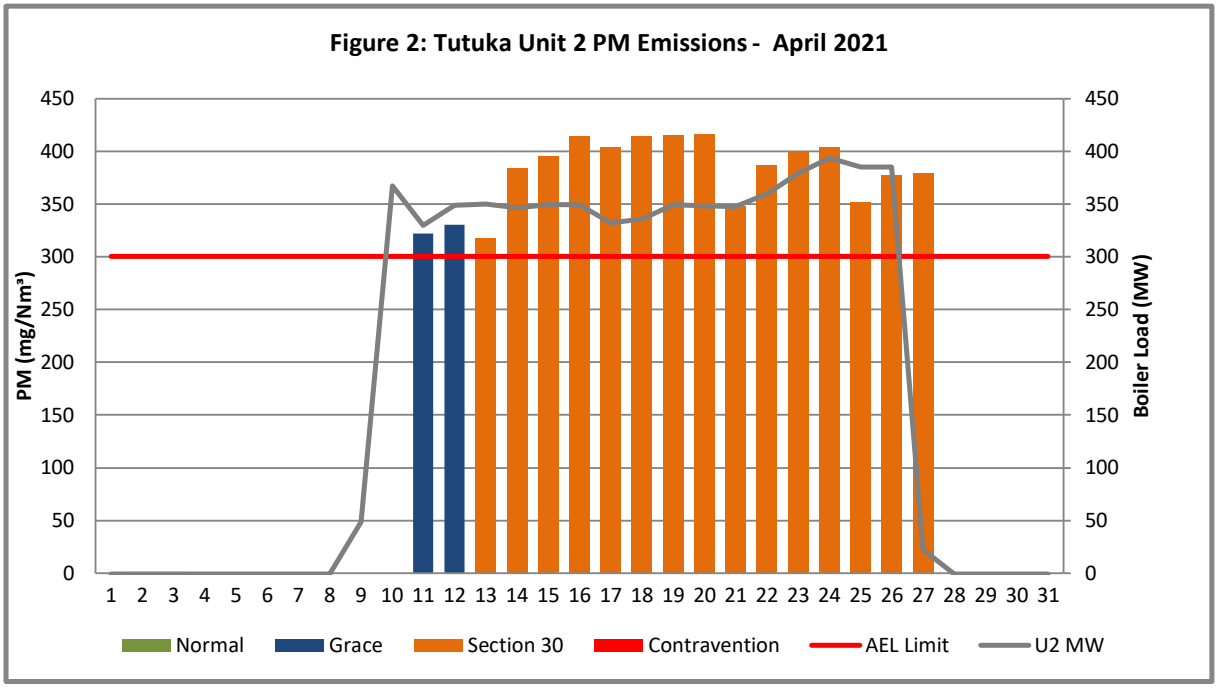

Figure 2: Unit 2 Daily Average PM emissions for the month of April 2021(against the emission limits and load Generated)

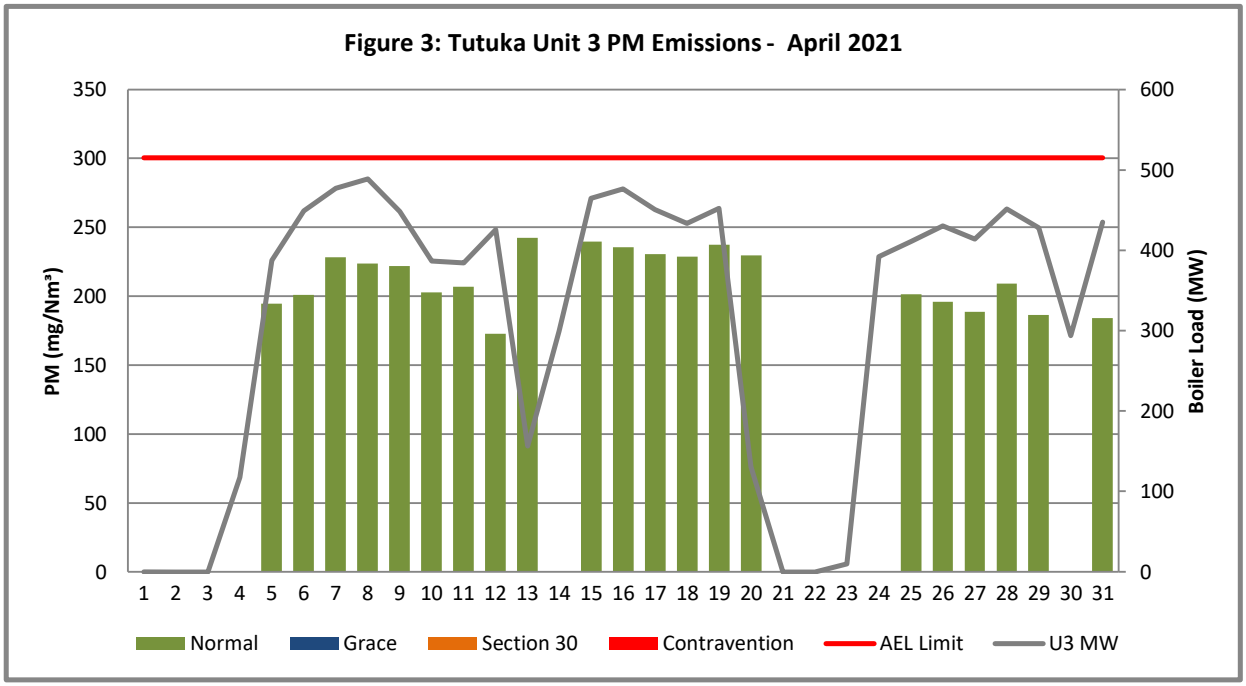

Figure 3: Unit 3 Daily Average PM emissions for the month of April 2021(against the emission limits and load Generated)

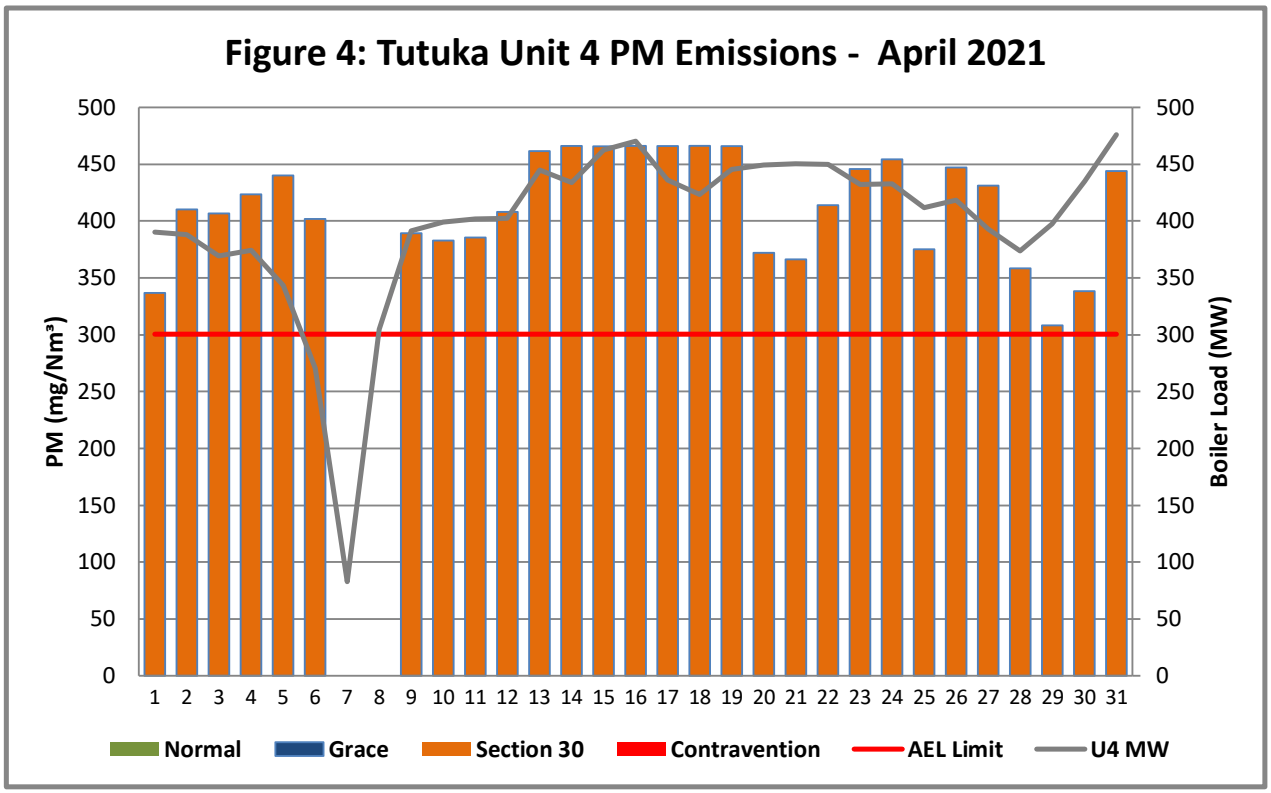

Figure 4: Unit 4 Daily Average PM emissions for the month of April 2021(against the emission limits and load Generated)

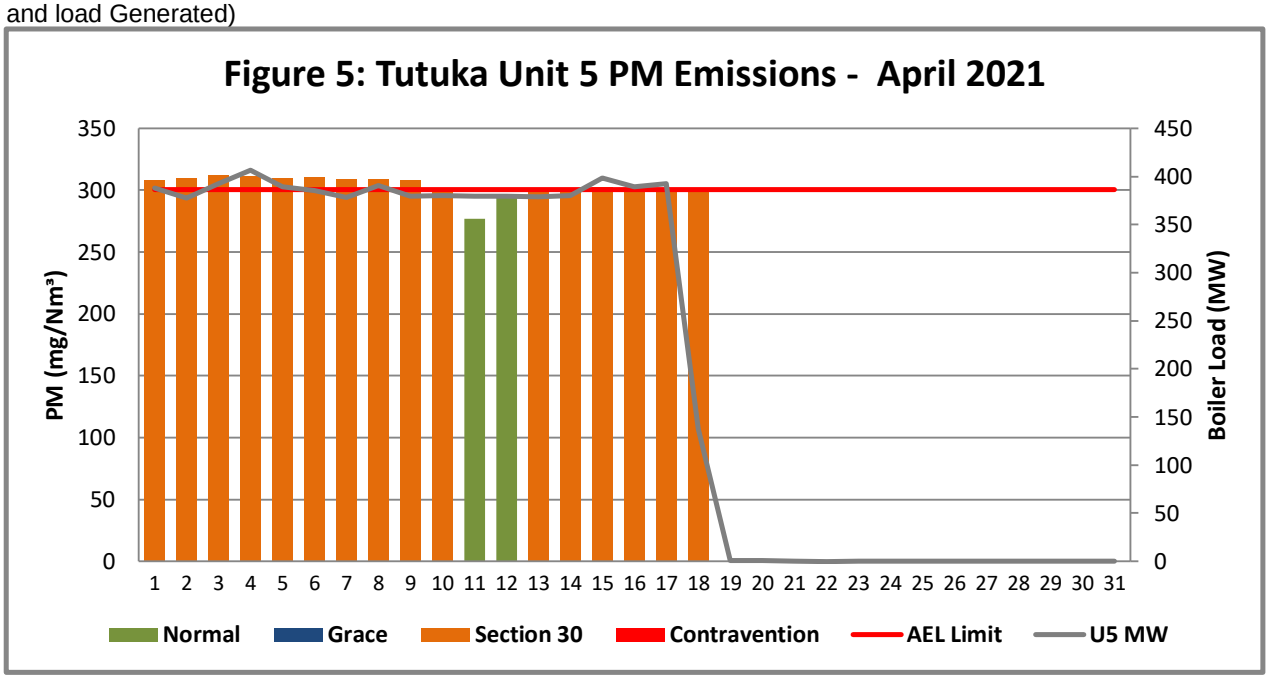

Figure 5: Unit 5 Daily Average PM emissions for the month of April 2021(against the emission limits and load Generated)

Note: Unit 5 started exceeding the emissions limits on the 30 March 2021 and incurred a section 30 on the 1st April 2021.

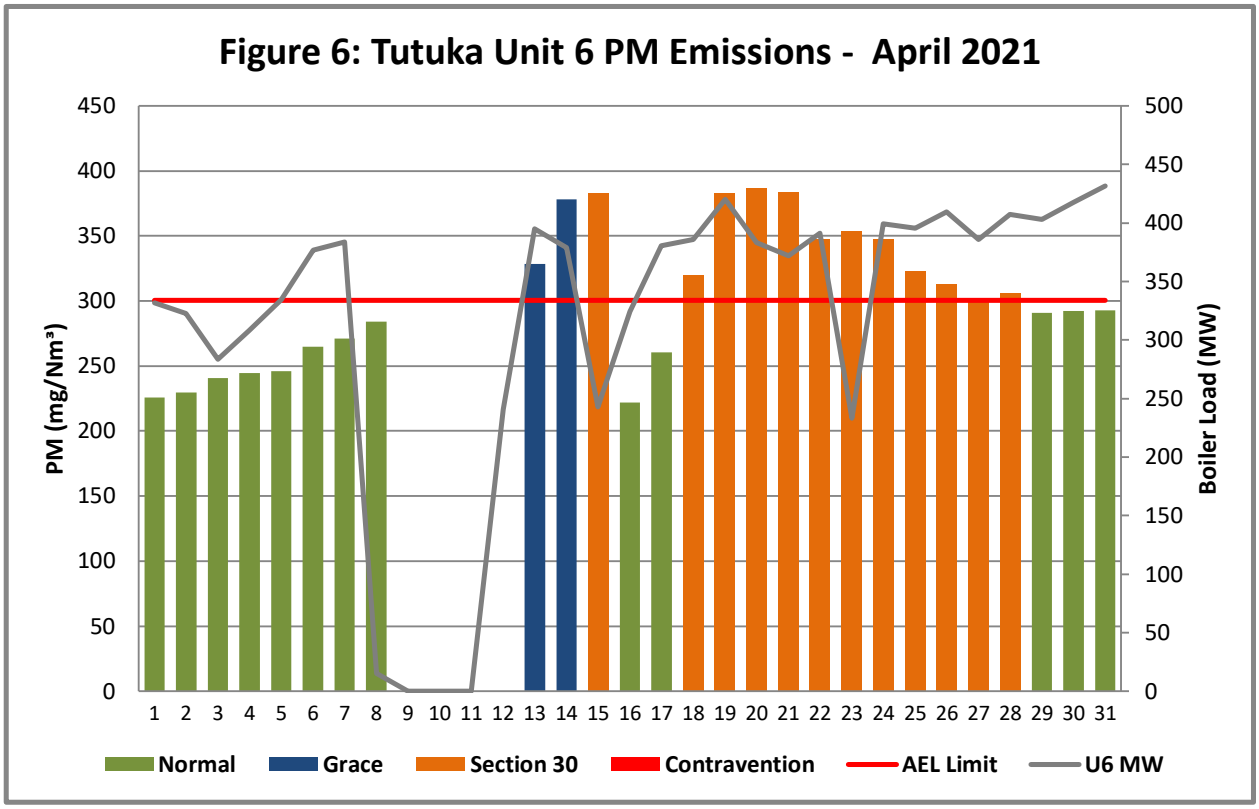

Figure 6: Unit 6 Daily Average PM emissions for the month of April 2021(against the emission limits and load Generated)

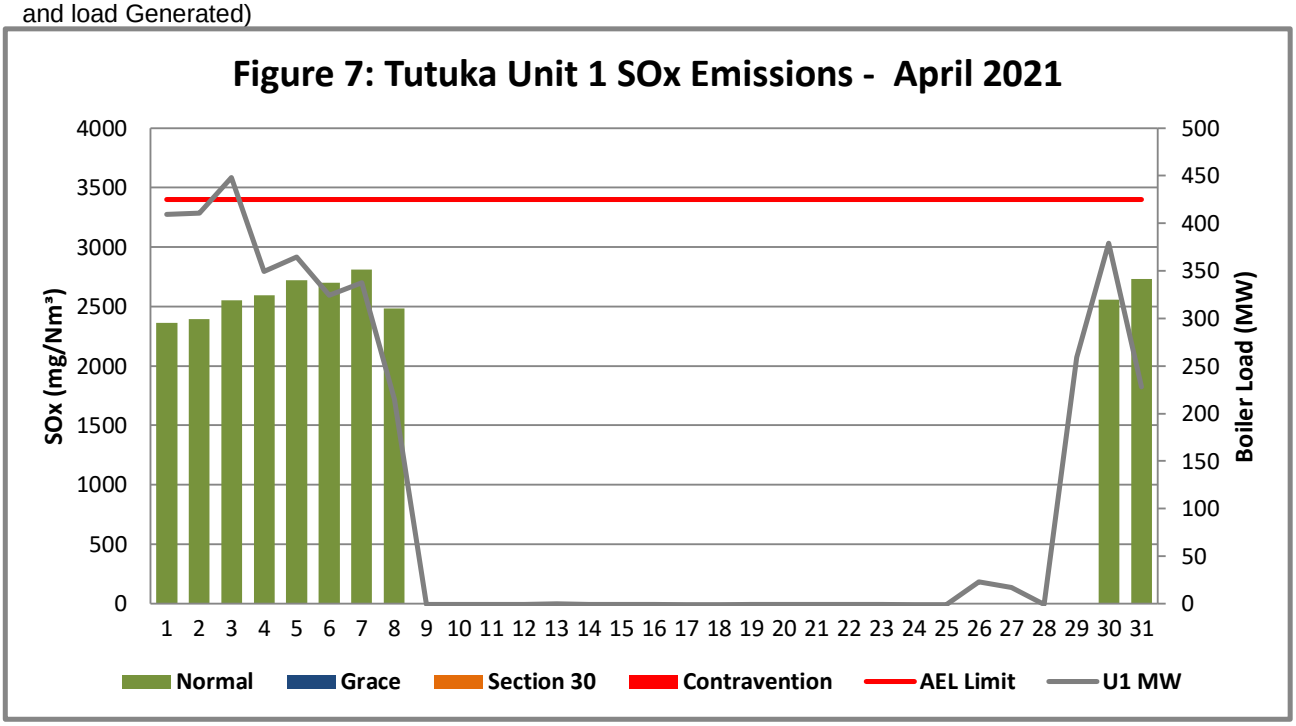

Figure 7: Unit 1 Daily Average SOx emissions for the month of April 2021(against the emission limits and load Generated)

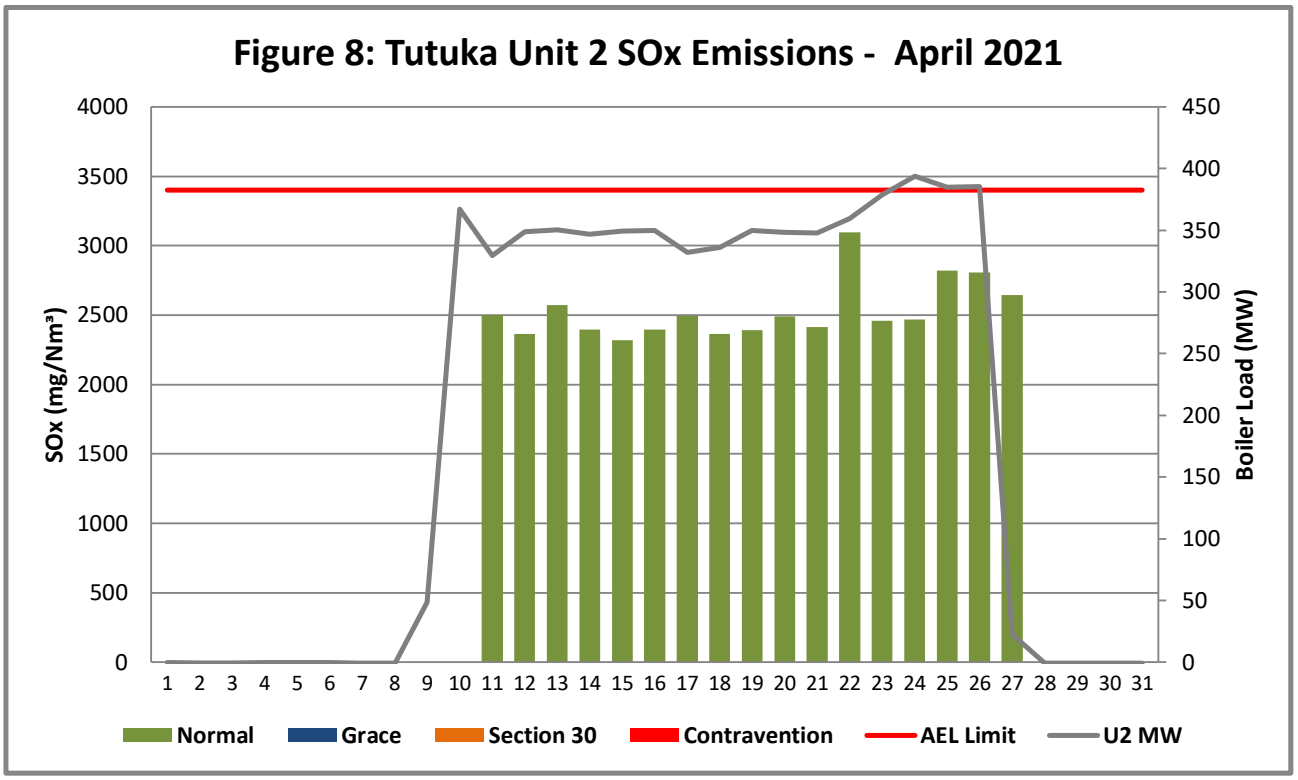

Figure 8: Unit 2 Daily Average SOx emissions for the month of April 2021(against the emission limits and load Generated)

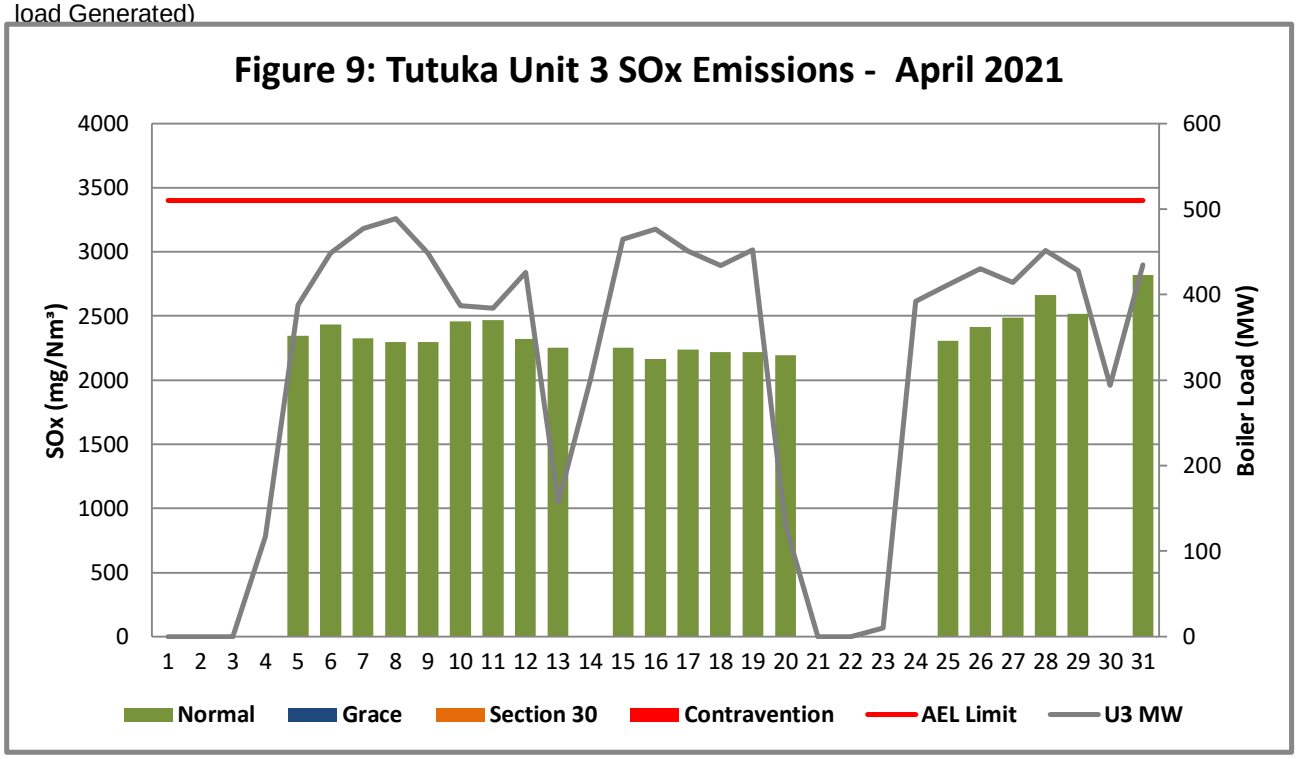

Figure 9: Unit 3 Daily Average SOx emissions for the month of April 2021(against the emission limits and load Generated)

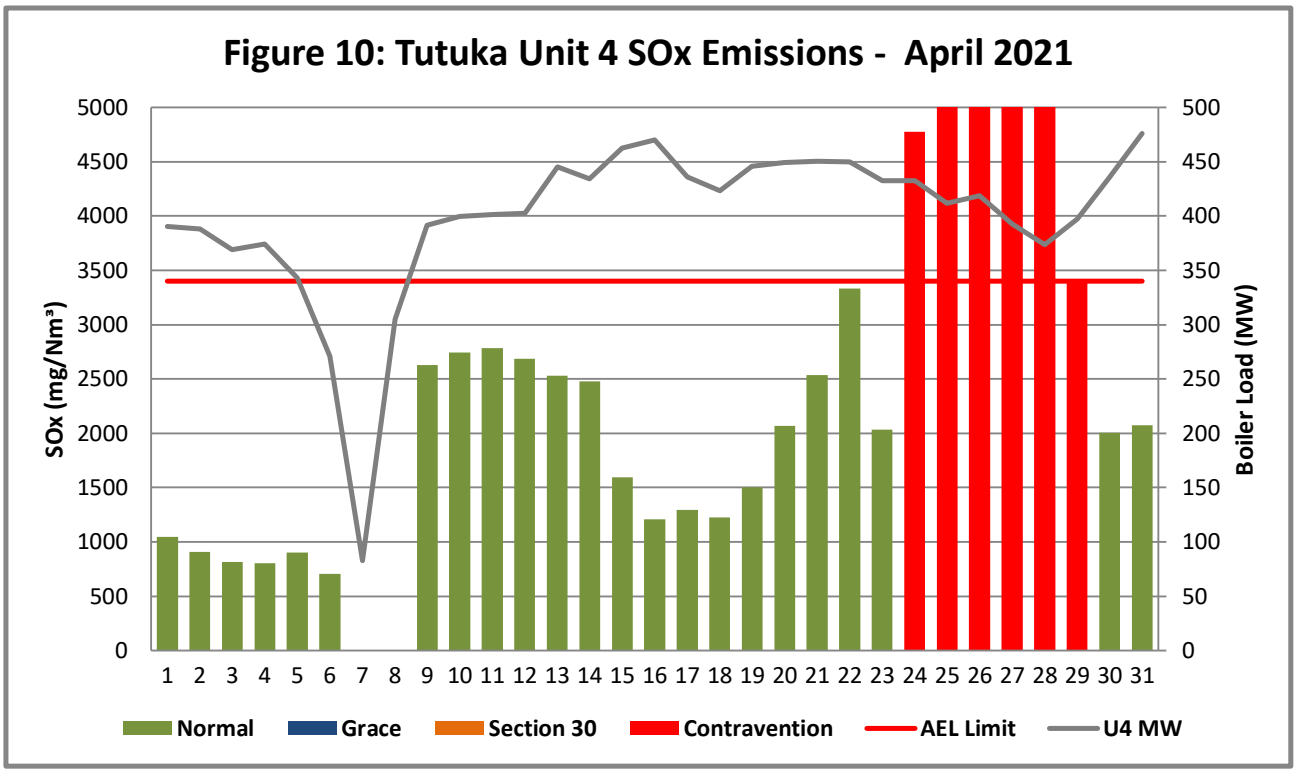

Figure 10: Unit 4 Daily Average SOx emissions for the month of April 2021(against the emission limits and load Generated)

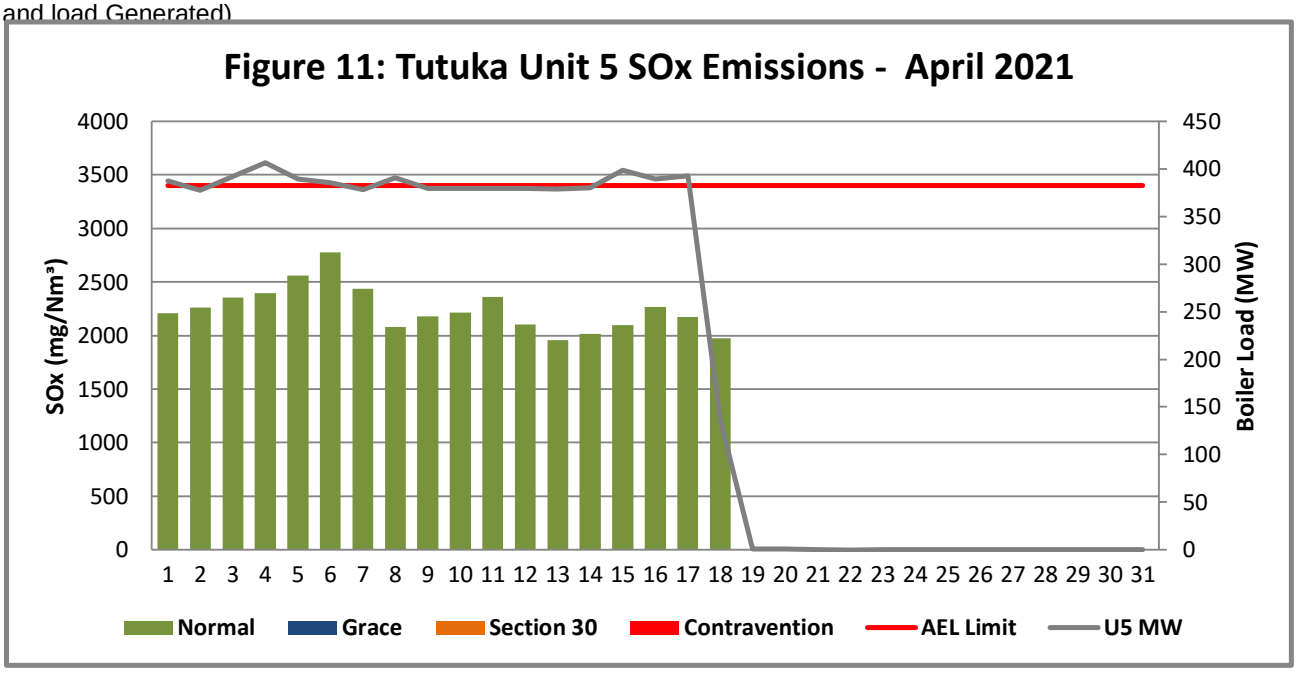

Figure 11: Unit 5 Daily Average SOx emissions for the month of April 2021(against the emission limits and load Generated)

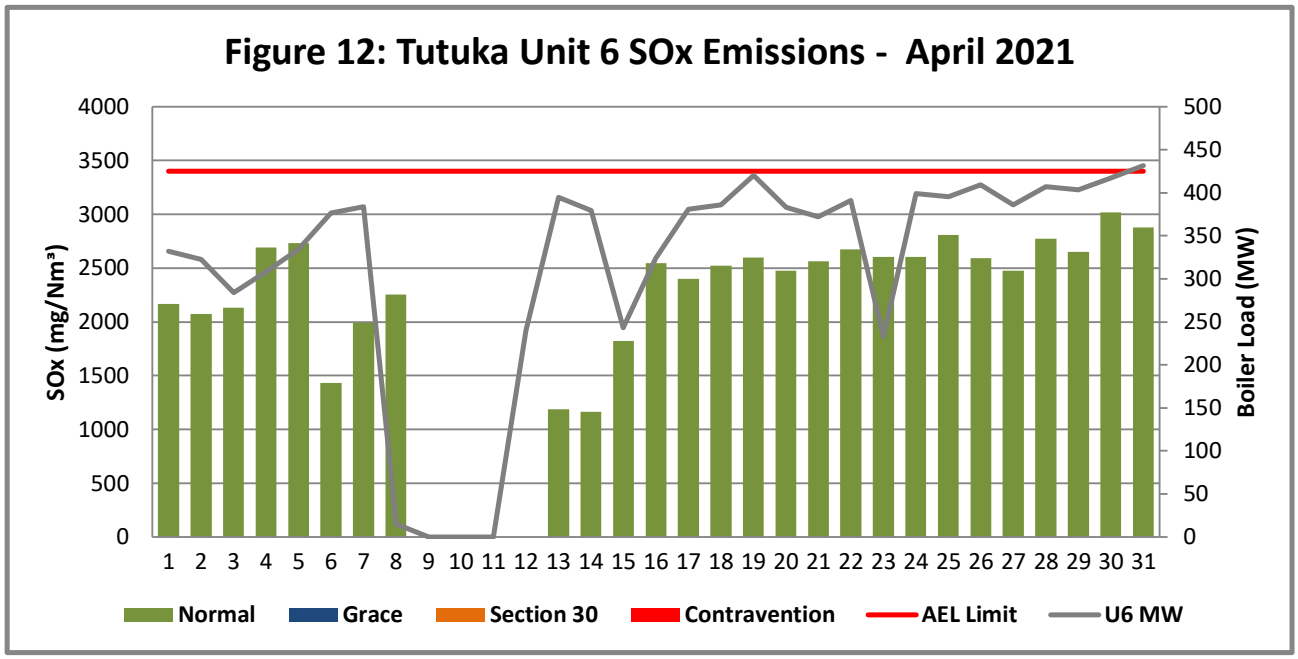

Figure 12: Unit 6 Daily Average SOx emissions for the month of April 2021(against the emission limits and load Generated)

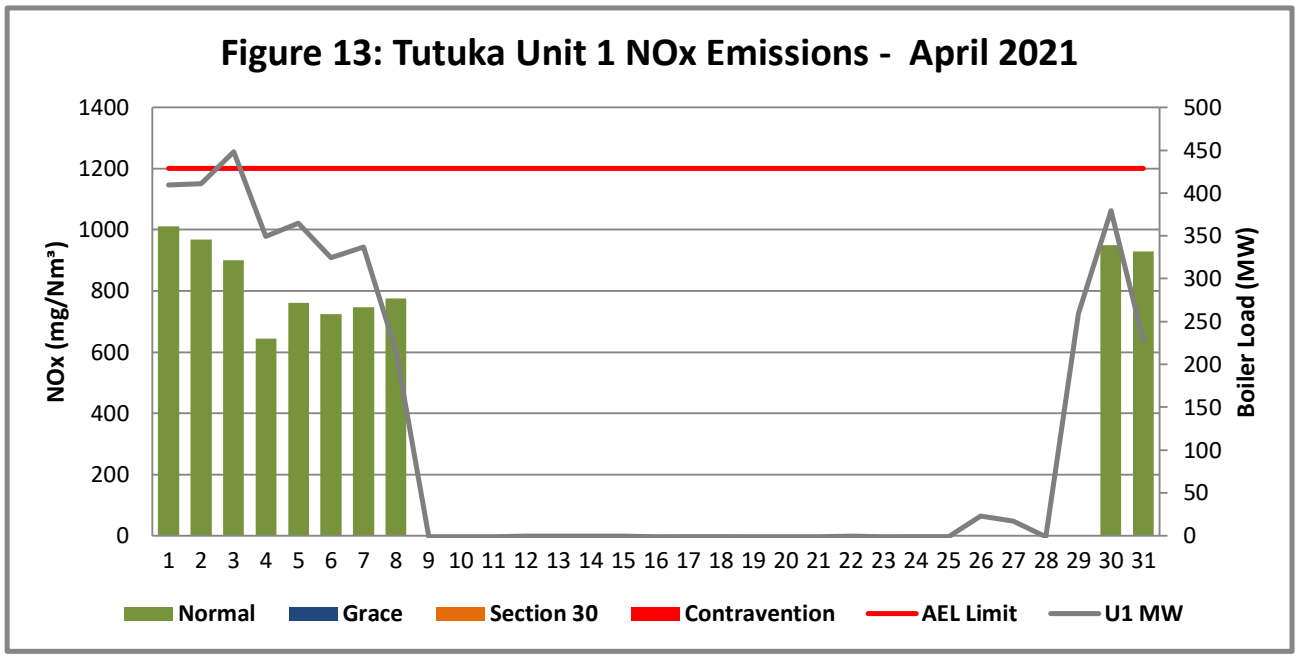

Figure 13: Unit 1 Daily Average NOx emissions for the month of April 2021(against the emission limits and load Generated)

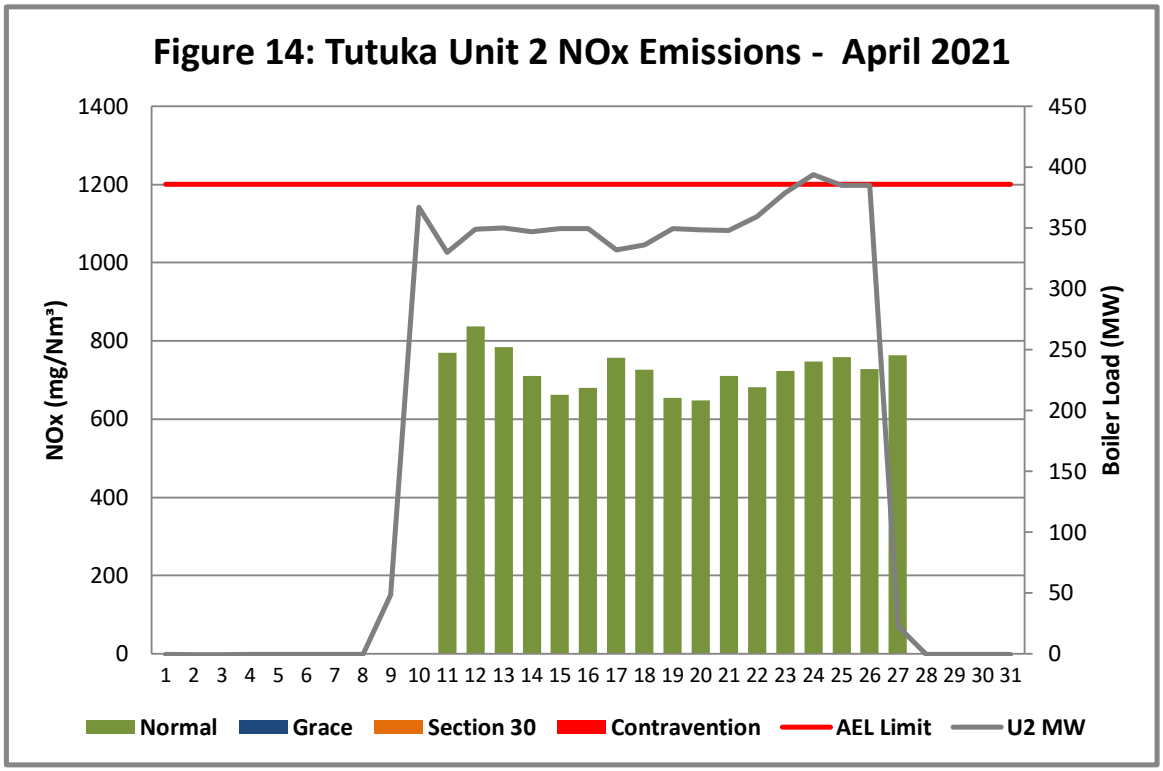

Figure 14: Unit 2 Daily Average NOx emissions for the month of April 2021(against the emission limits and load Generated)

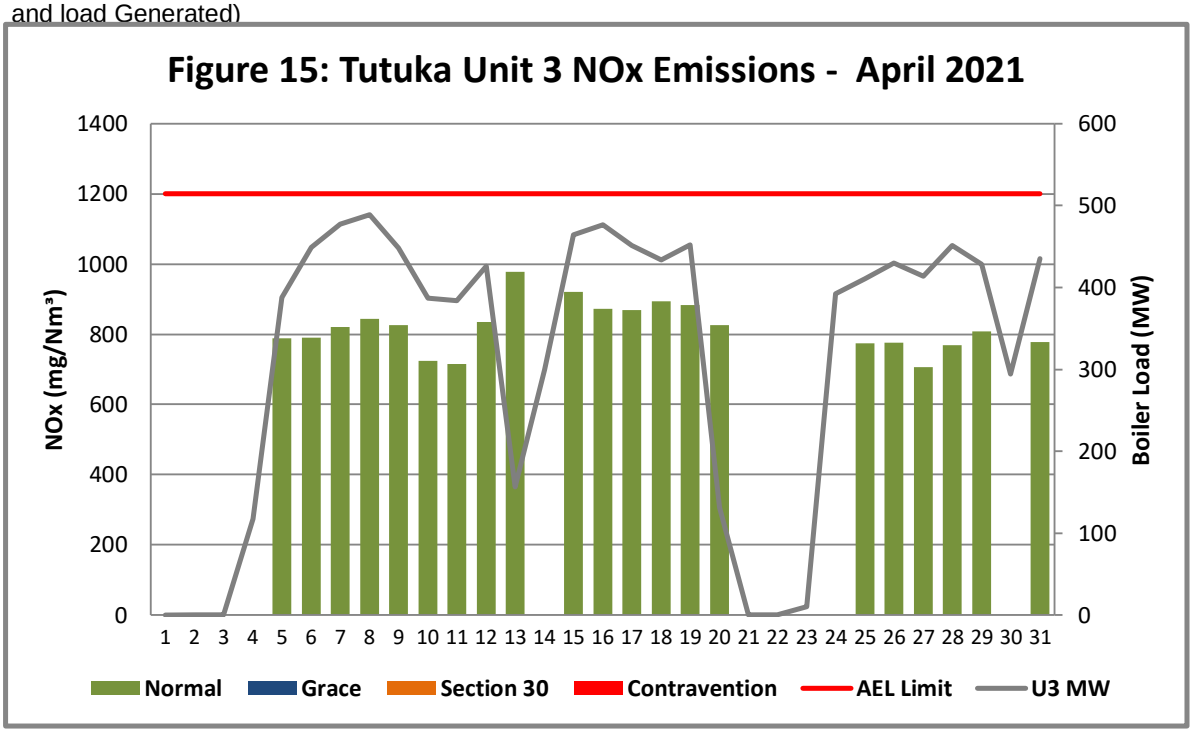

Figure 15: Unit 3 Daily Average NOx emissions for the month of April 2021(against the emission limits and load Generated)

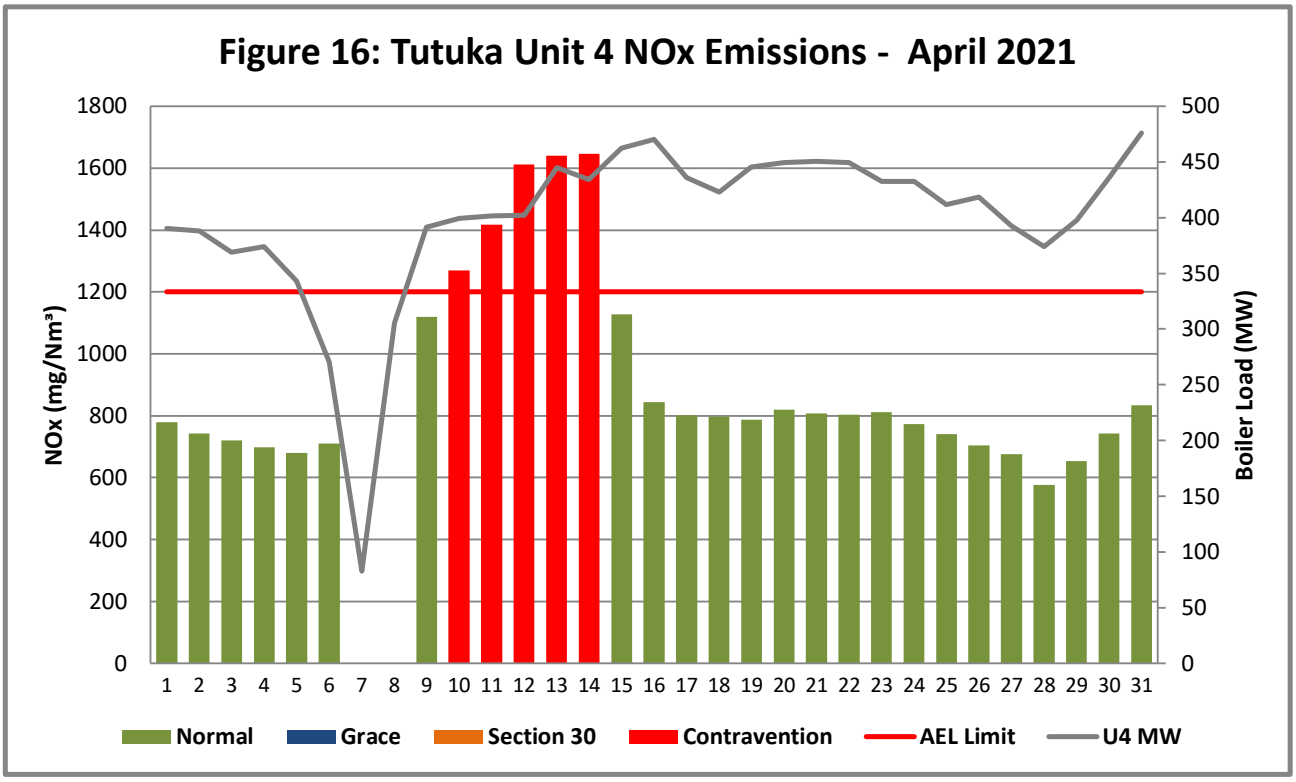

Figure 16: Unit 4 Daily Average NOx emissions for the month of April 2021(against the emission limits and load Generated)

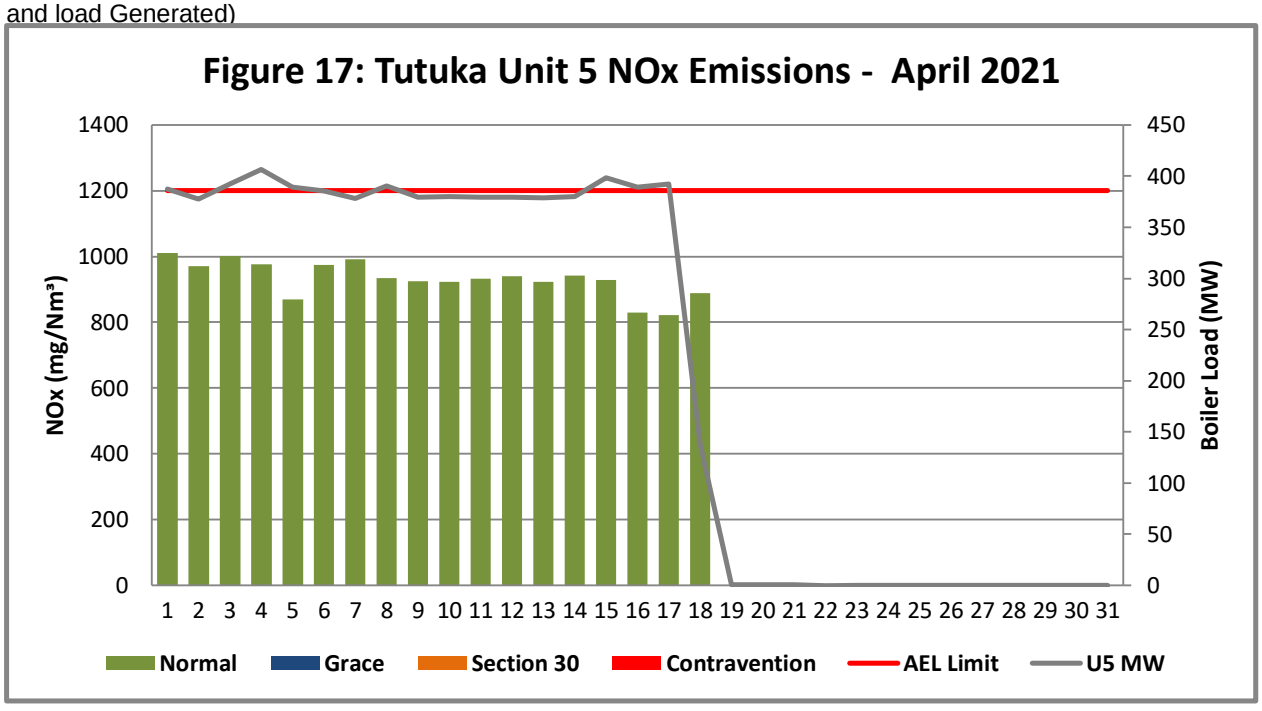

Figure 17: Unit 5 Daily Average NOx emissions for the month of April 2021(against the emission limits and load Generated)

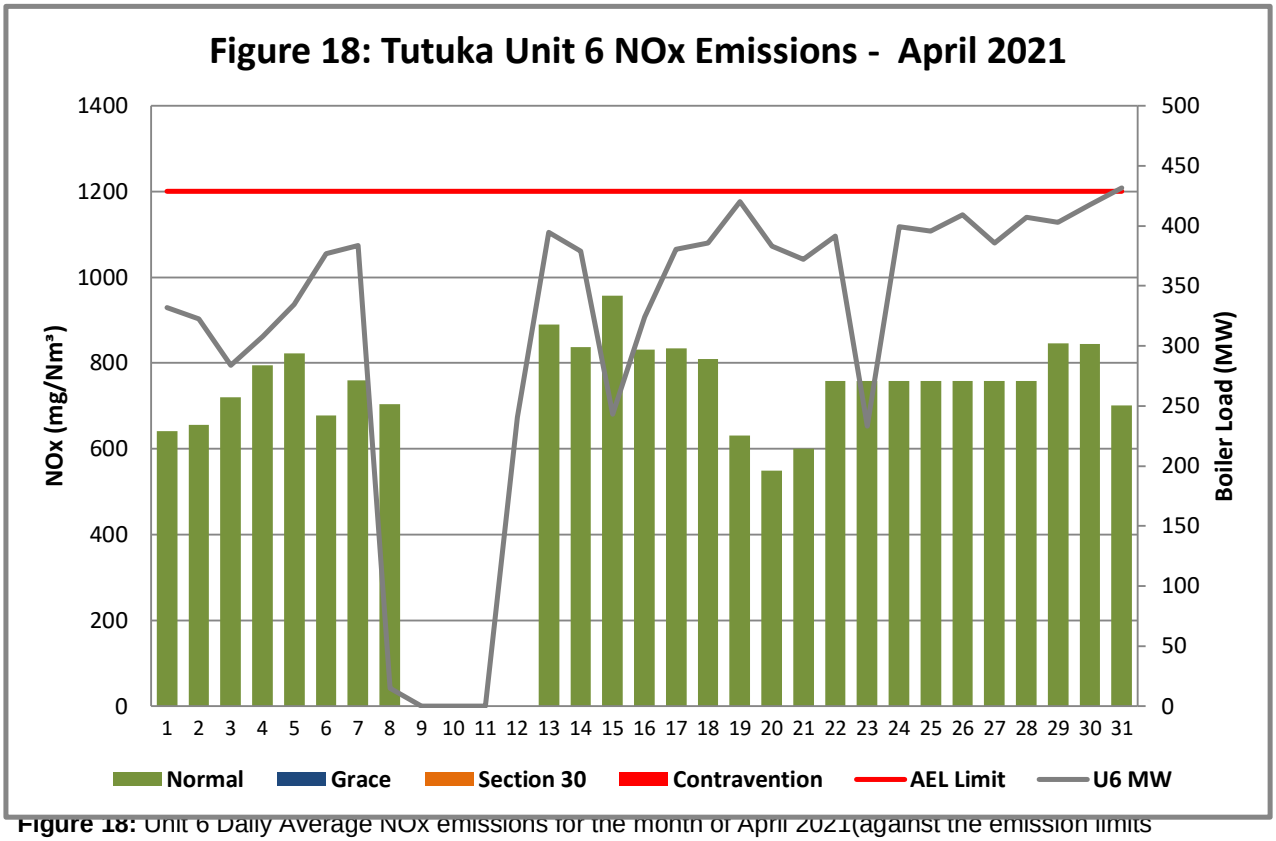

Figure 18: Unit 6 Daily Average NOx emissions for the month of April 2021(against the emission limits and load Generated)

5. Number and Types of unit's start-ups

Number & Type of Starts	U1	U2	U3	U4	U5	U6
Number Of Hot Starts (Off-Load < 30 Hrs)	0	1	4	2	0	0
Number Of Cold Starts (Off-Load > 30 hrs)	2	1	2	0	0	1

Table 5: Number and type of Unit start-ups for each unit respectively for the month of April 2021

6. Complaints

No public complaints received for the month of April 2021

Source Code/ Name	Root Cause Analysis	Calculation of Impacts/ emissions associated with the incident	Dispersion modeling of pollutants where applicable	Measures implemented to prevent reoccurrence	Date by which measure will be implemented
None		N/A	N/A	N/A	N/A

Table 6: Complaints for the month of April 2021

7. General

Section 30 incidents were incurred on unit 2, 4, 5 &6 in the month of April 2021(See table 7.4 below).

Unit 2: Incurred a section 30 on the 13 April 2021 due to the unavailability of the ash conditioners and downstream conveyors. The absence of air conditioners and conveyors resulted in 37 full hoppers. The initial notification was sent to the authorities on the 20th April 2021.

Unit 4: incurred a section 30 on the 12 April 2021.This was after the unit returned to service. .The unit had challenges with HFPS defects, Dust handling plant (DHP) defects as well as internal faults on the precips. The initial notification was sent to the authorities on the 20 April 2021.

Unit 5: Incurred section 30 on the .The incident was due to mechanical failure on ash condition 5 and 6, fields out of service and repairs of bucket elevator C. Ash Bunker 3A was full resulting in the full hoppers levels.

Unit 6: incurred a section 30 incident on the 20 April 2021.The initial notification was sent to the authorities on the 20 April 2021.The incident was due to failure of conveyors (overland and ash transverse convers) and the unavailability of ash conditioners.

There were 5 NOx exceedances were incurred in the month of April 2021(See tables 7.1 - 7.3 below) and 6 SOx exceedances were recorded.

Table 7.1: Operating days in compliance to PM AEL Limit – April 2021

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average PM (mg/Nm³)
Unit 1	6	4	0	0	4	291.7
Unit 2	0	2	15	0	17	380.2
Unit 3	21	0	0	0	0	213.9
Unit 4	0		29	0	29	508.7
Unit 5	18	0	0	0	0	283.1
Unit 6	13	2	12	0	14	304.9
SUM	**58**	**8**	**56**	**0**	**64**	

Table 7.2: Operating days in compliance to SOx AEL Limit -April 2021

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SOx (mg/Nm³)
Unit 1	10	0	0	0	0	2 575.3
Unit 2	17	0	0	0	0	2 529.1
Unit 3	21	0	0	0	0	2 343.1
Unit 4	23	0	0	6	6	2 565.3
Unit 5	18	0	0	0	0	2 245.1
Unit 6	27	0	0	0	0	1 217.5
SUM	**116**	**0**	**0**	**6**	**6**	

Table 7.3: Operating days in compliance to NOx AEL Limit - April 2021

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NOx (mg/Nm³)
Unit 1	10	0	0	0	0	832.5
Unit 2	17	0	0	0	0	725.9
Unit 3	21	0	0	0	0	820.8
Unit 4	24	0	0	5	5	738.0
Unit 5	18	0	0	0	0	768.4
Unit 6	27	0	0	0	0	361.4
SUM	**117**	**0**	**0**	**5**	**5**	

Table 7.4: Section 30 & PM exceedances for the month of April 2021

Unit	No.Not days in Exceedance	Date of Submission of Initial Notification	Intervention to reduce high emissions
Unit 2	17	20 April 2021	-Repair the downstream conveyors -Replace the aeration air blowers and stacker slew system -Long term: Replace north transverse conveyor belt and replace stacker cable reels guides
Unit 4	28	20 April 2021	Book 17 days outage to inspect and repair the precip internals and rectify defects on the isolator.
Unit 5	16	20 April 2021	Ash conditioners and Route C bucket elevator were back to normal operation -Long term action: Replace the motor for B-route transfer conveyor and repair the south overland conveyor
Unit 6	14	22 April 2021	Unit was de-loaded and load loss was booked to reduce emissions Replace the south overland oil coolers. Long Term: Replace the north transverse conveyor belt

8. Conclusion

Eskom Centre of Excellence (CoE): Air Quality submitted an application on behalf of Tutuka PS for the postponement for the implementation of the Minimum Emissions Standard (MES) limits to the Department of Environment Fisheries and Forestry (DEFF) and Gert Sibande District Municipality on the 09th of November 2018. In the application, a postponement of 300 mg/Nm³ was requested (24 hour moving average).Tutuka PS's new PM emissions limit of 100 mg/Nm³ (previously- 350 mg/Nm³), came into effect on the 1st January 2020.The Station is unable to meet the limits with the current abatement technology.

All documentation in respect of the stations MES postponement application was submitted and DEFF has confirmed that while the application is being assessed the previous emission limits apply i.e. 300 mg/Nm³ for PM. In addition to that, the station has also submitted an AEL variation request.

For more information or enquiries contact the Tutuka environmental team.

Yours Sincerely

Compiled by: Monica Mokgawa **ENVIRONMENTAL MANAGER: TUTUKA POWER STATION** **Signature:……..**	**Verified By: Mike Molepo** **SENIOR CHEMIST CHEMISTRY: TUTUKA POWER STATION** **Signature:……**
Supported By: Thokozani Maseko **RISK AND ASSURANCE MANAGER (ACTING)** **Signature:……**	**Approved by: Sello Mametja** **GENERAL MANAGER: TUTUKA POWER STATION** **Signature:……** **Date :……**