



Generation

Nkangala District Municipality
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1050

Attention:

Mr V Mahlangu

AND

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Services
The Chief Director:
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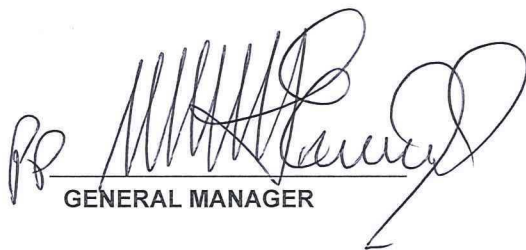
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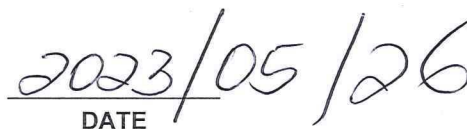
Total number of pages:16

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DUVHA POWER STATION

Atmospheric Emission License 17/4/AEL/MP312/11/07


GENERAL MANAGER


DATE

DUVHA POWER STATION MONTHLY EMISSIONS REPORT
 Atmospheric Emission License 17/4/AEL/MP312/11/07



1 RAW MATERIALS AND PRODUCTS

Raw Materials and Products	Raw Material Type	Units	Maximum Permitted Consumption Rate	Consumption Rate Mar-2023
	Coal	Tons	1 400 000	592 534.65
	Fuel Oil	Tons	5 000	3710.43
Production Rates	Product / By-Product Name	Units	Maximum Production Capacity Permitted	Production Rate Mar-2023
	Energy	GWh	3600	988.62
	Ash	Tons	not specified	159 332.57

2 ENERGY SOURCE CHARACTERISTICS

Coal Characteristic	Units	Stipulated Range	Monthly Average Content
Sulphur Content	%	0.6 TO >1.2	0.85
Ash Content	%	27 TO 30	26.89

3 EMISSION LIMITS (mg/Nm³)

Associated Unit/Stack	PM	SO ₂	NO _x
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-2023	Technology Type	SO ₃ Utilization Mar-2023
Unit 1	FFP	99.9%	n/a	n/a
Unit 2	FFP	99.9%	n/a	n/a
Unit 4	ESP + SO ₃	99.5%	SO ₃	96.5%
Unit 5	ESP + SO ₃	99.6%	SO ₃	98.1%
Unit 6	ESP + SO ₃	99.7%	SO ₃	97.7%

Note: ESP and FFP plants do not have bypass mode operation, hence plants 100% Utilised.

5 MONITOR RELIABILITY (%)

Associated Unit/Stack	PM	SO ₂	NO
Unit 1	97.8	99.1	99.0
Unit 2	99.3	95.3	95.3
Unit 4	99.7	96.1	96.1
Unit 5	98.7	97.2	97.2
Unit 6	99.7	95.6	94.3

Note: NO_x emissions is measured as NO in PPM. Final NO_x value is expressed as total NO₂

6 EMISSION PERFORMANCE

Table 6.1: Monthly tonnages for the month of March 2023

Associated Unit/Stack	PM (tons)	SO ₂ (tons)	NO _x (tons)
Unit 1	30.2	3 706	1 875
Unit 2	23.5	2 811	1 315
Unit 4	90.6	1 675	957
Unit 5	161.5	2 518	956
Unit 6	43.0	1 370	645
SUM	348.80	12 080	5 747

Table 6.2: Operating days in compliance to PM AEL Limit - March 2023

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average PM (mg/Nm ³)
Unit 1	30	0	0	0	0	15.0
Unit 2	25	0	0	0	0	16.3
Unit 4	7	6	0	0	6	156.1
Unit 5	16	15	0	0	15	119.7
Unit 6	11	7	0	0	7	75.9
SUM	89	28	0	0	28	

Table 6.3: Operating days in compliance to SO₂ AEL Limit - March 2023

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SO ₂ (mg/Nm ³)
Unit 1	31	0	0	0	0	1 753.7
Unit 2	27	0	0	0	0	1 886.8
Unit 4	18	0	0	0	0	1 753.0
Unit 5	31	0	0	0	0	1 773.0
Unit 6	21	0	0	0	0	1 638.5
SUM	128	0	0	0	0	

Table 6.4: Operating days in compliance to NO_x AEL Limit - March 2023

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NO _x (mg/Nm ³)
Unit 1	31	0	0	0	0	886.5
Unit 2	27	0	0	0	0	868.8
Unit 4	18	0	0	0	0	979.9
Unit 5	31	0	0	0	0	671.6
Unit 6	21	0	0	0	0	764.5
SUM	128	0	0	0	0	

Note: NO_x emissions is measured as NO in PPM. Final NO_x value is expressed as total NO₂

Table 6.5: Legend Description

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 1: Duvha Unit 1 PM Emissions - March 2023

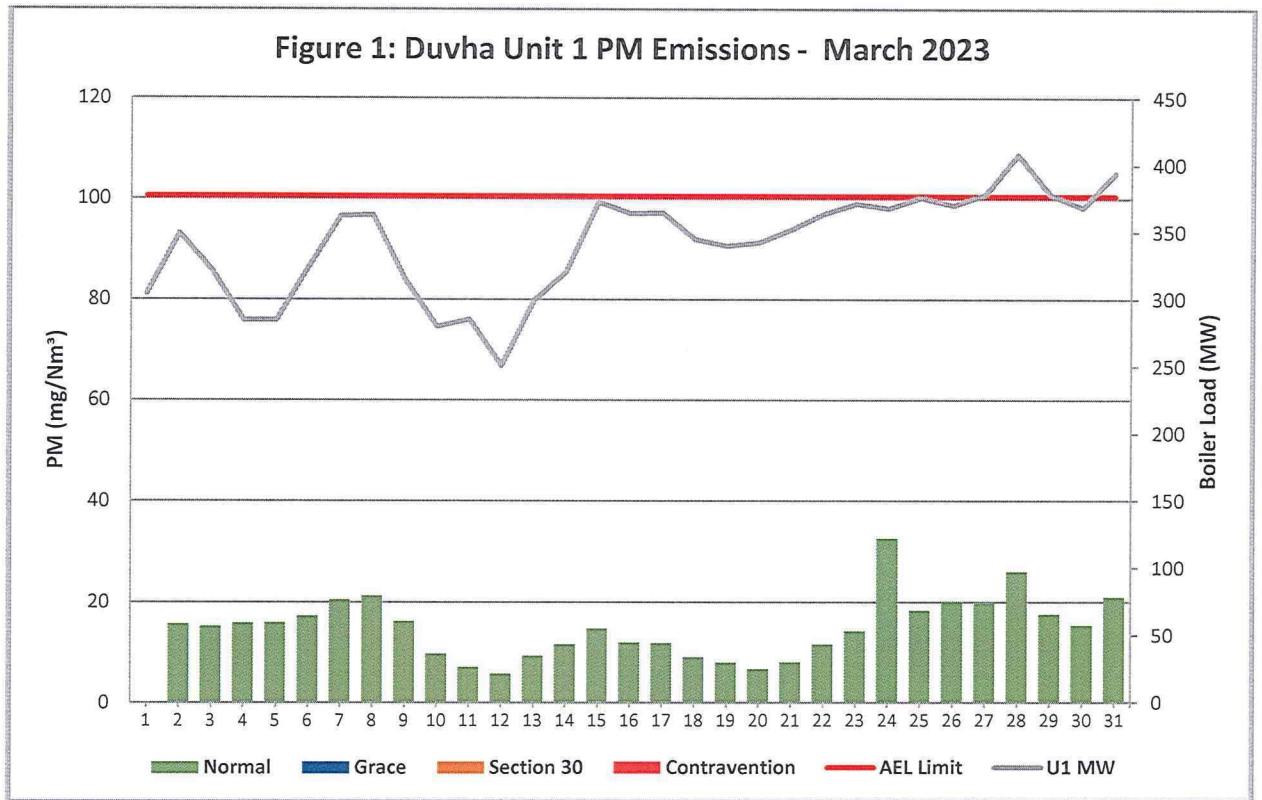


Figure 2: Duvha Unit 2 PM Emissions - March 2023

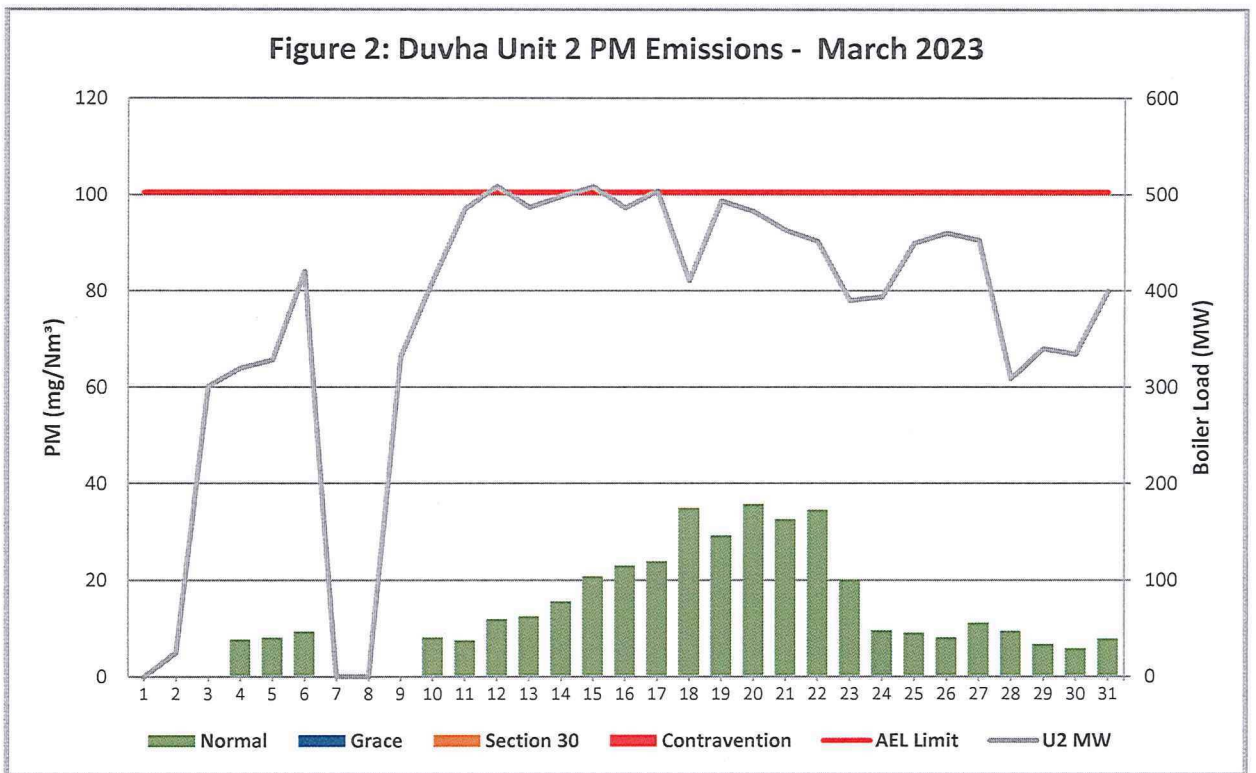


Figure 3: Duvha Unit 4 PM Emissions - March 2023

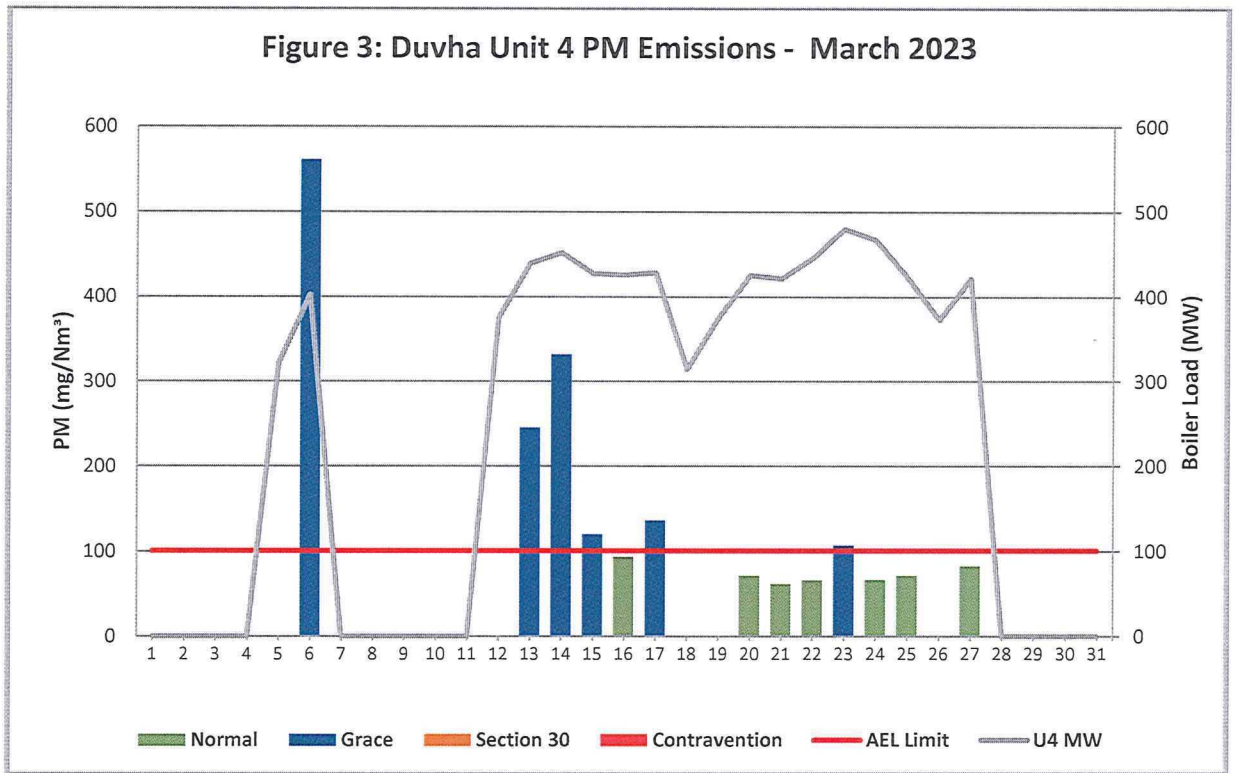


Figure 4: Duvha Unit 5 PM Emissions - March 2023

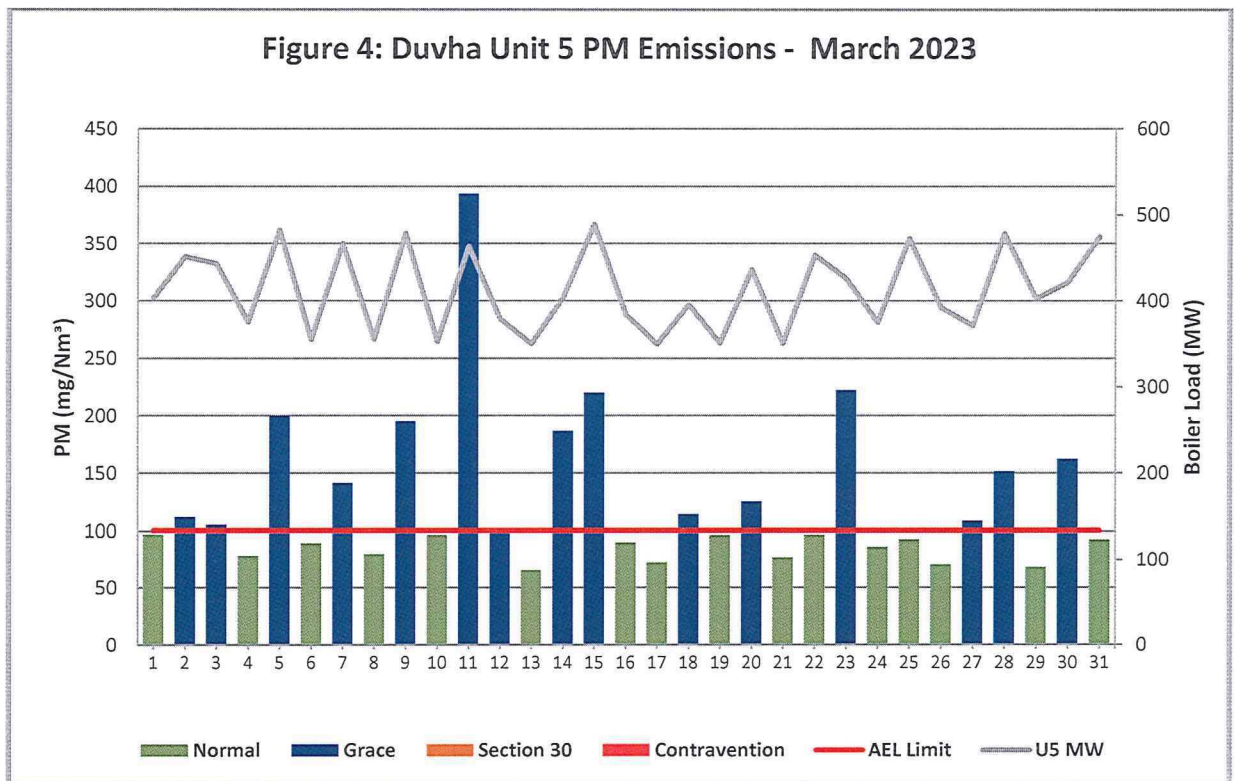


Figure 5: Duvha Unit 6 PM Emissions - March 2023

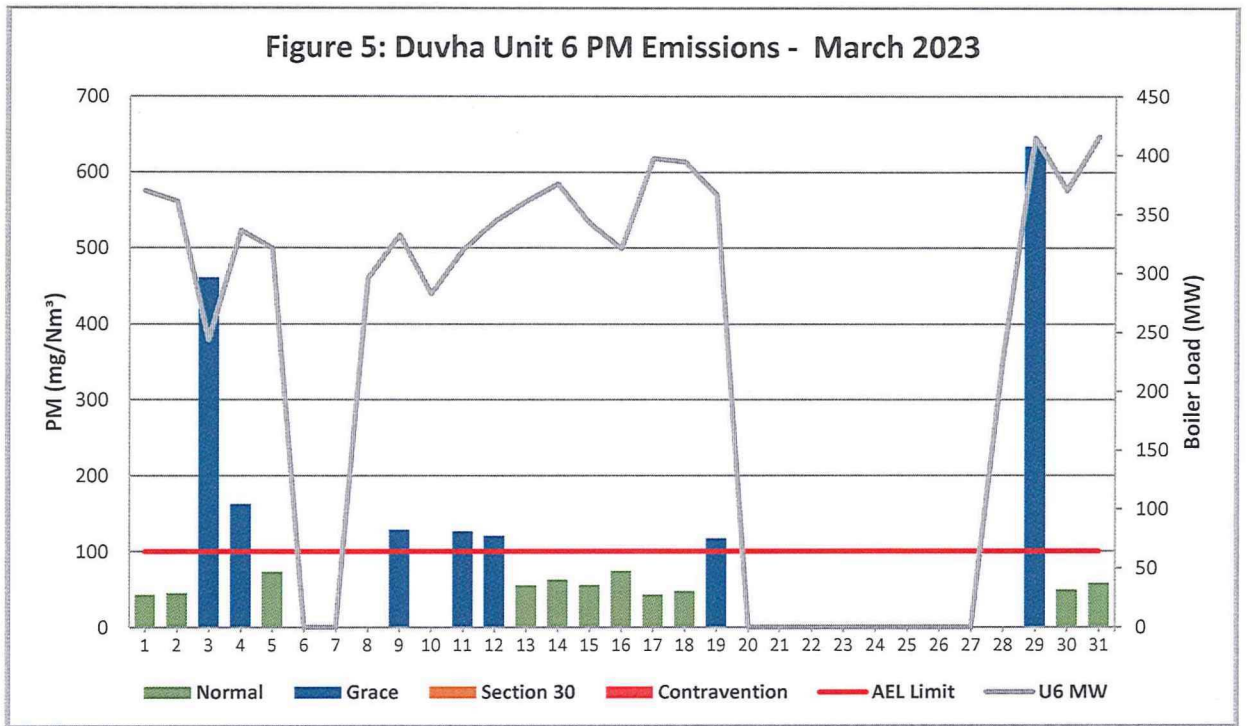


Figure 6: Duvha Unit 1 SO₂ Emissions - March 2023

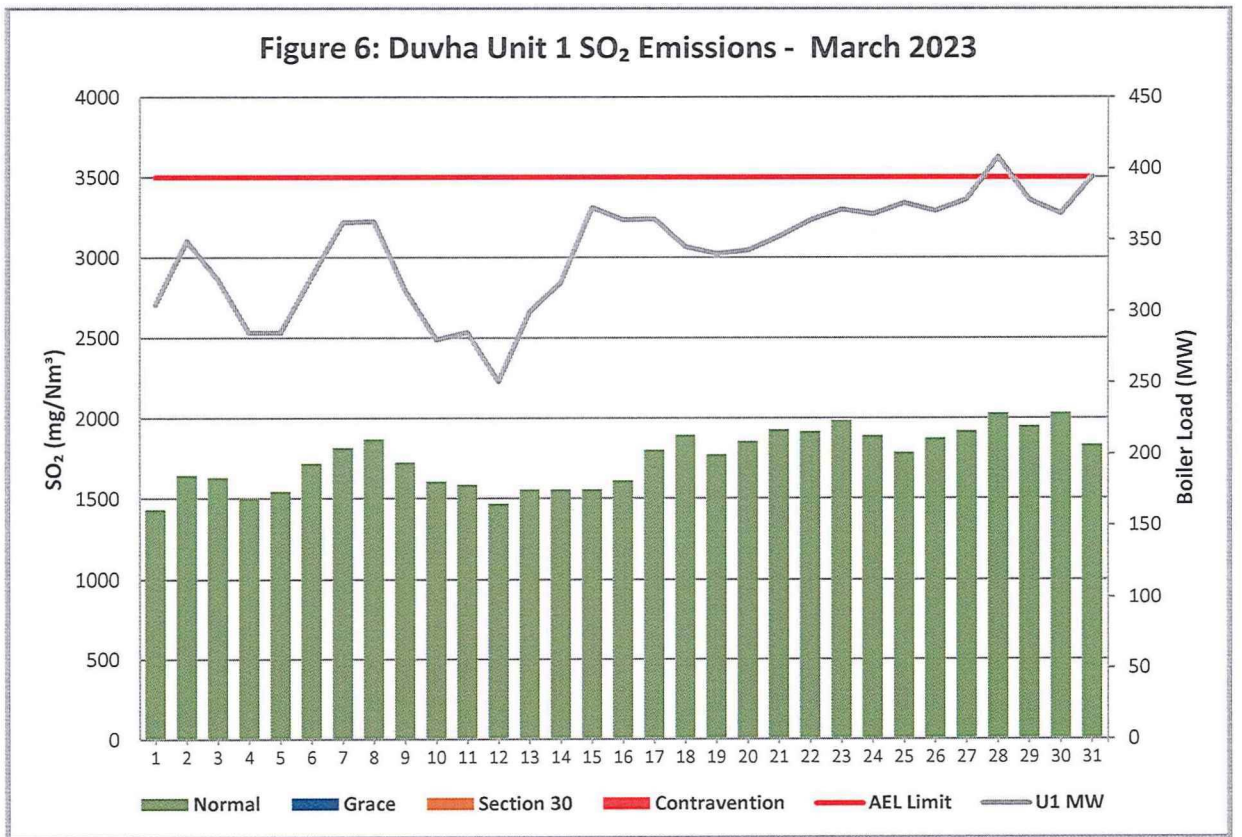


Figure 7: Duvha Unit 2 SO₂ Emissions - March 2023

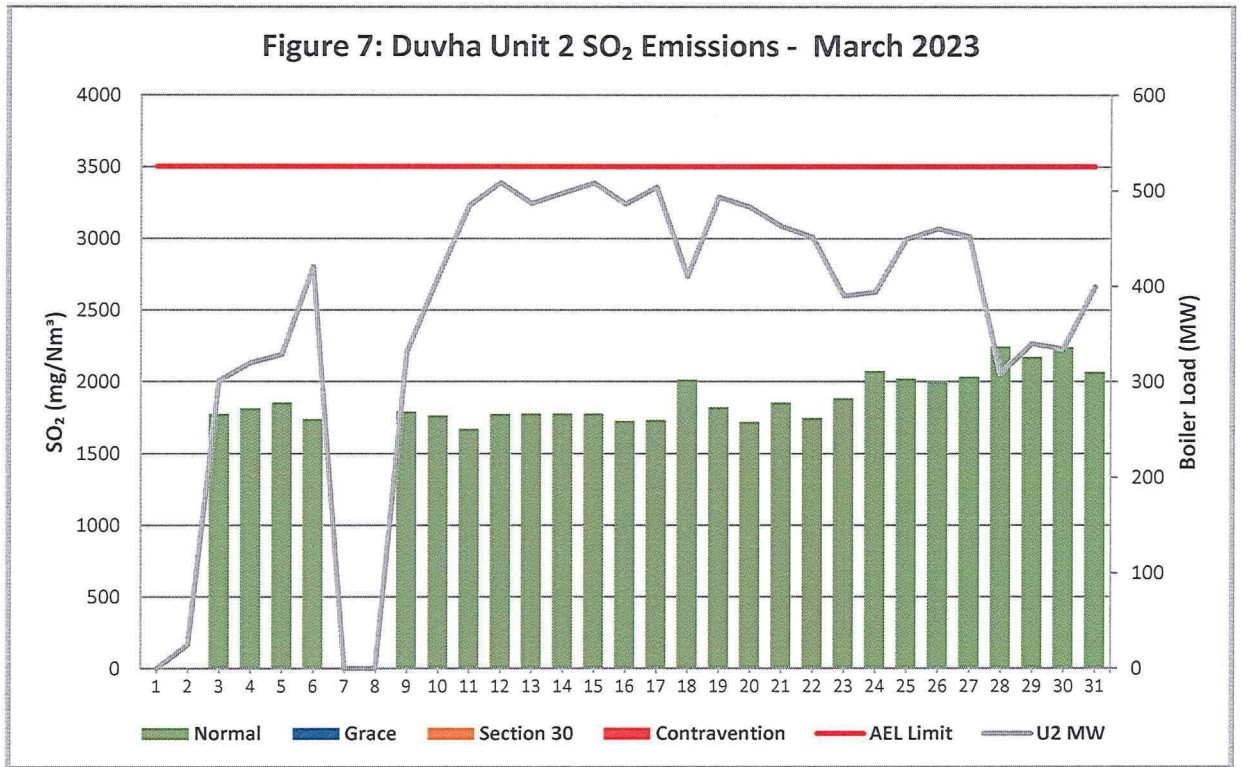


Figure 8: Duvha Unit 4 SO₂ Emissions - March 2023

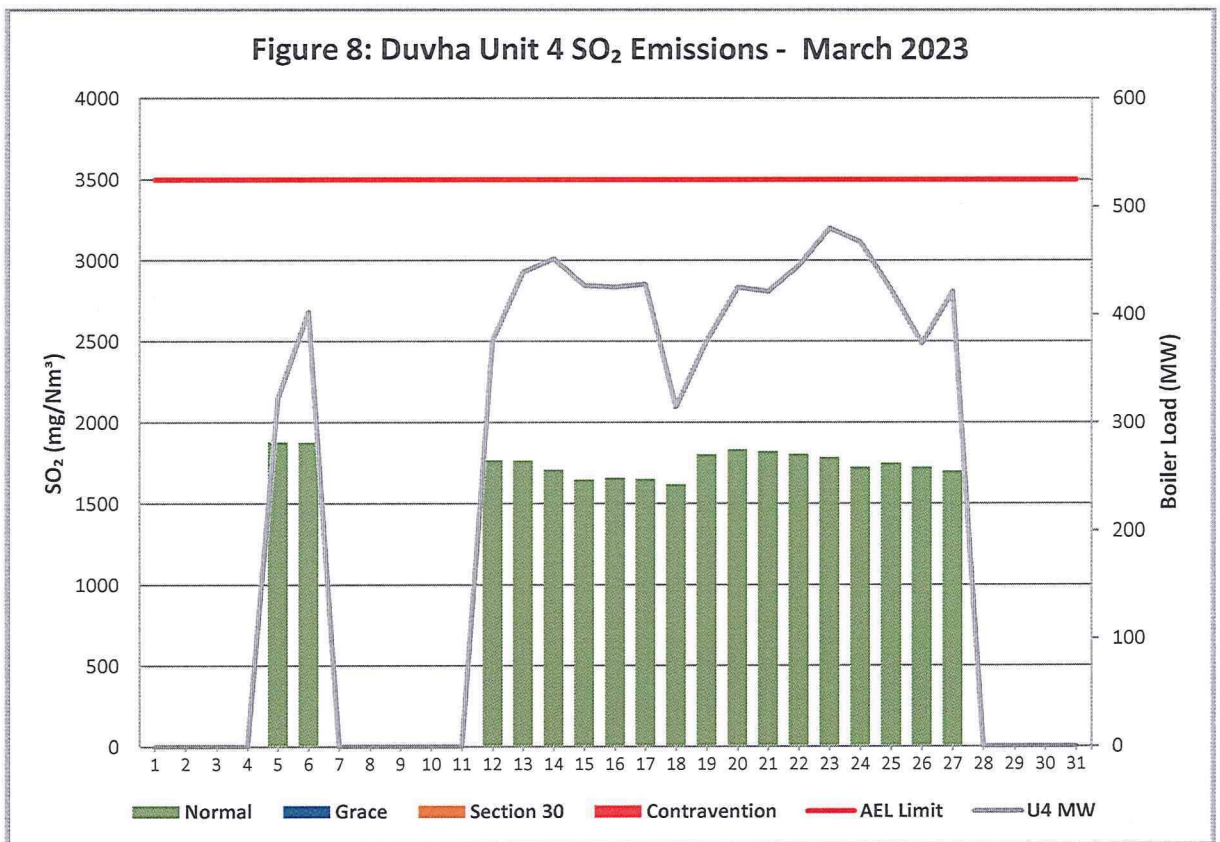


Figure 9: Duvha Unit 5 SO₂ Emissions - March 2023

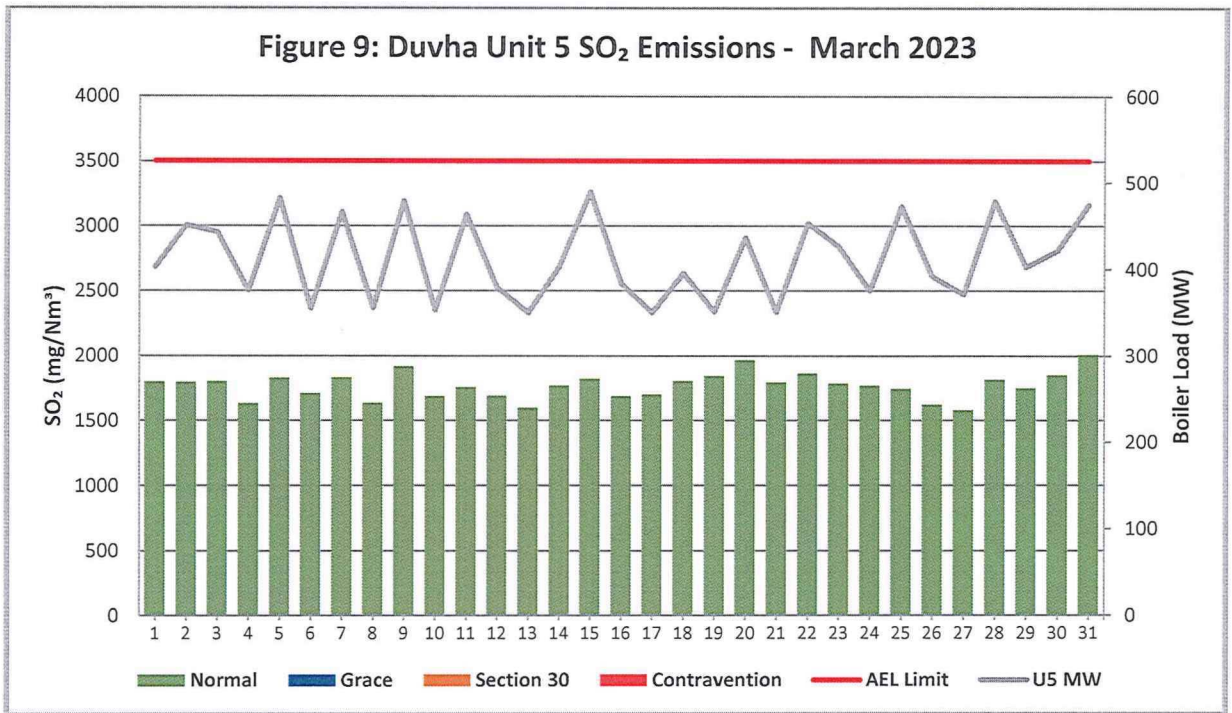


Figure 10: Duvha Unit 6 SO₂ Emissions - March 2023

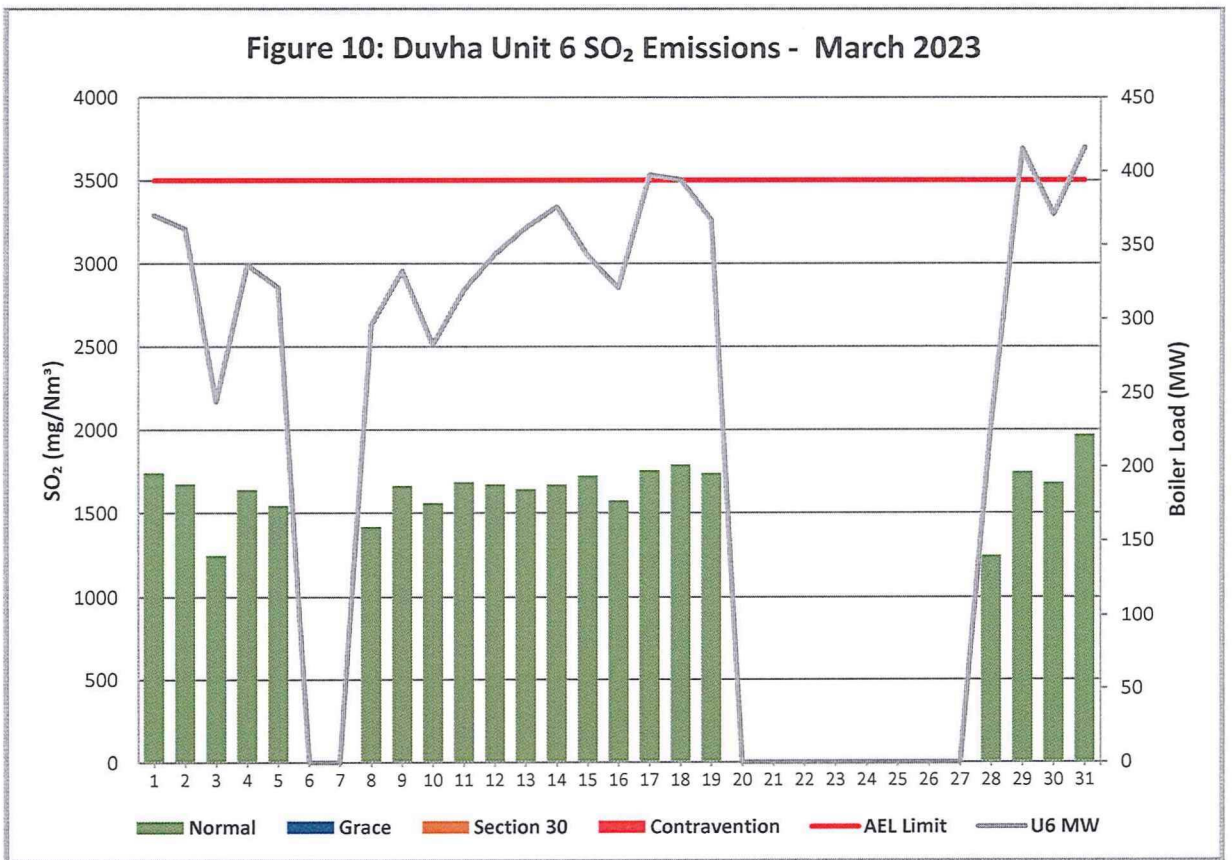


Figure 11: Duvha Unit 1 NOx Emissions - March 2023

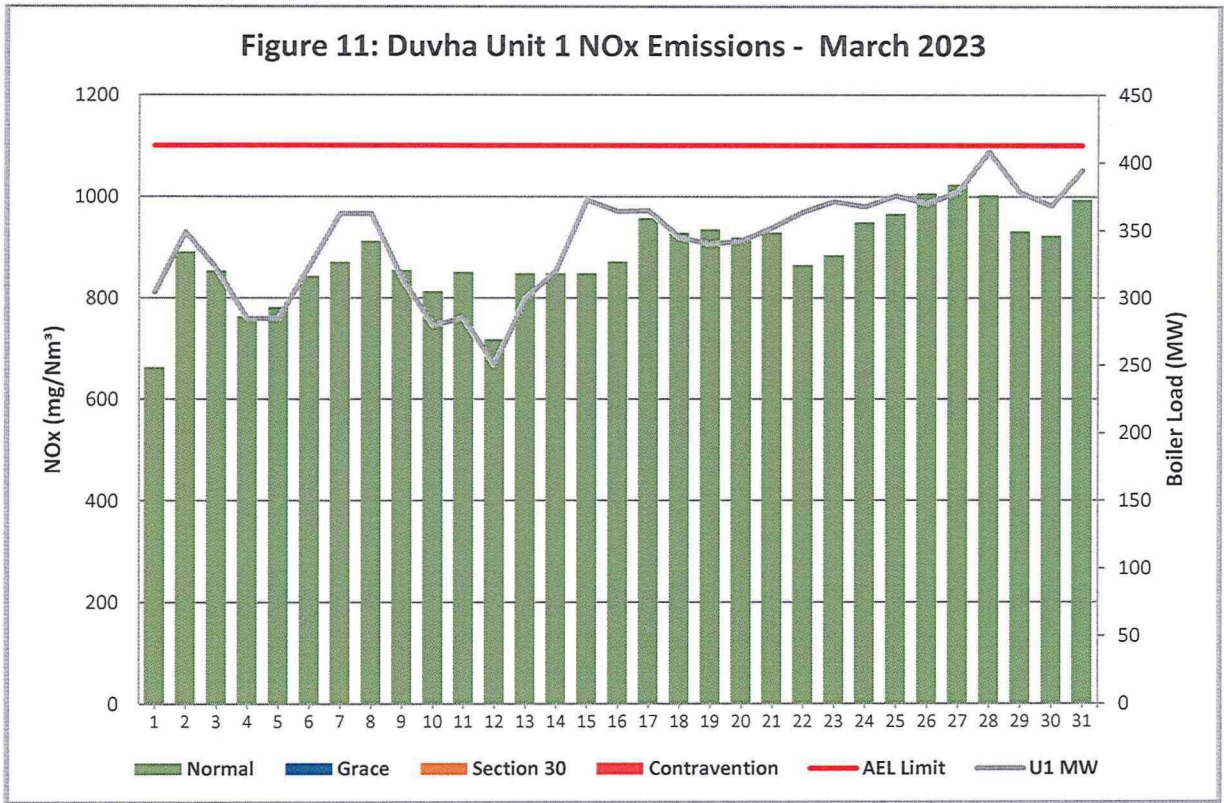


Figure 12: Duvha Unit 2 NOx Emissions - March 2023

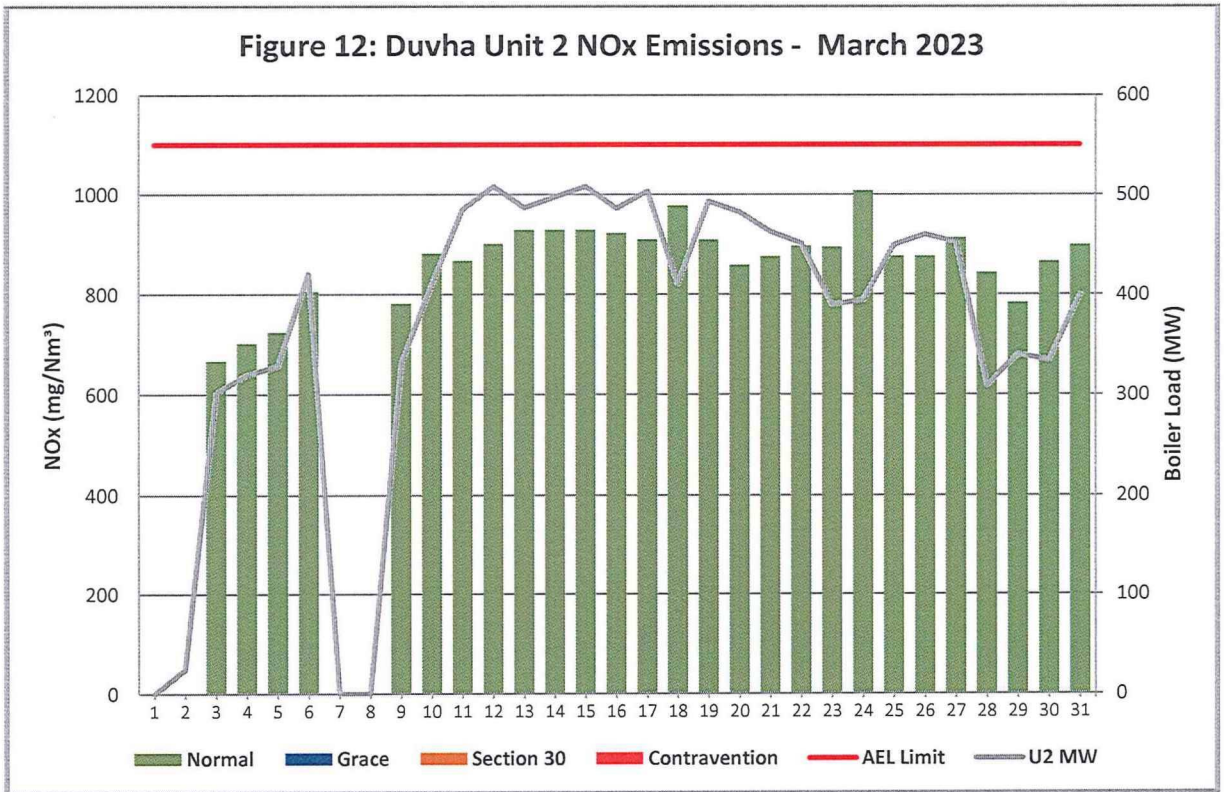


Figure 13: Duvha Unit 4 NOx Emissions - March 2023

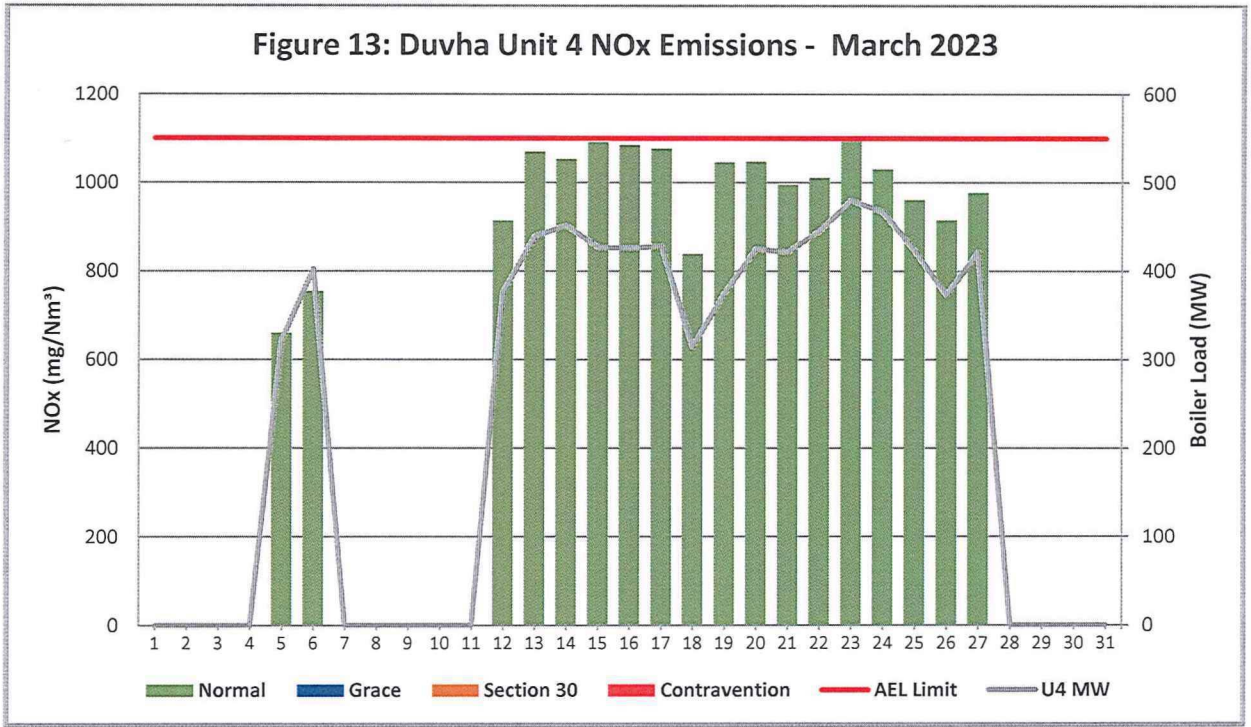
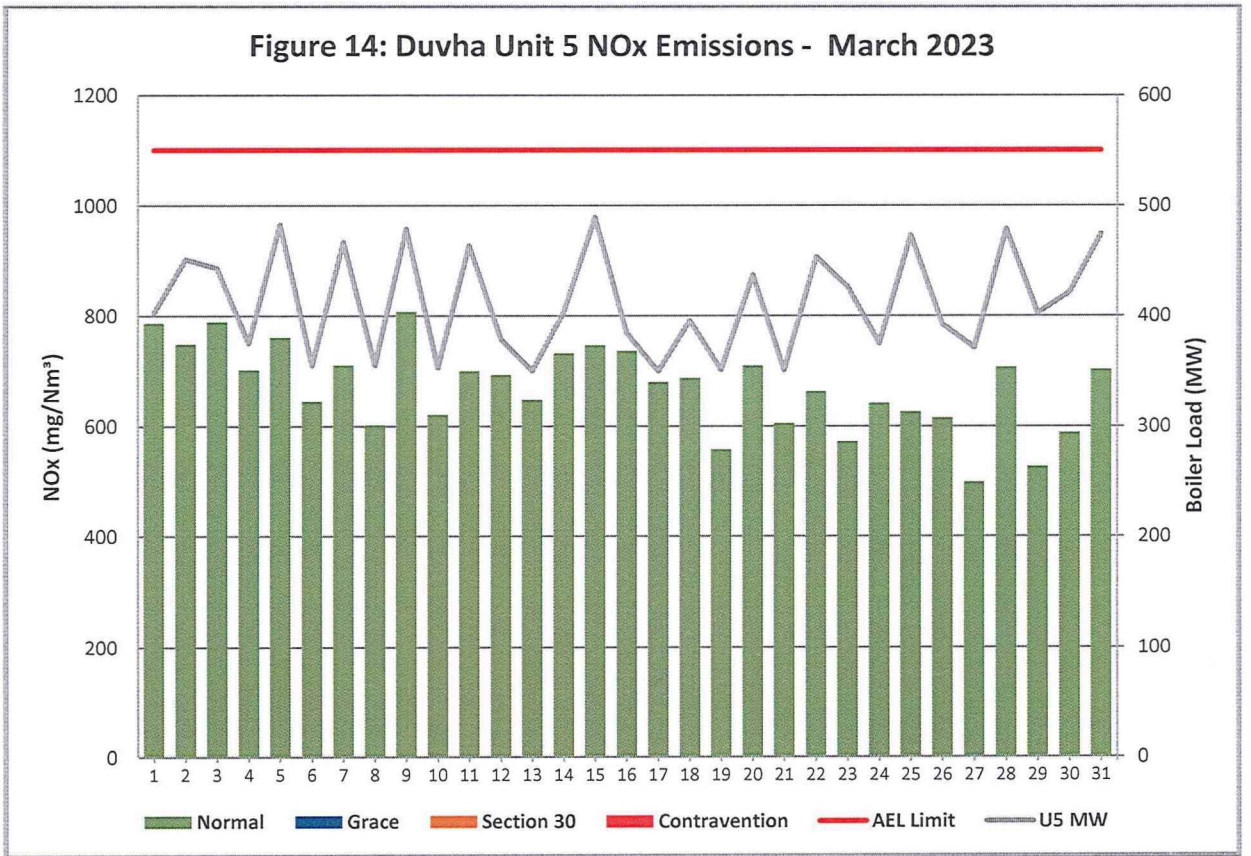
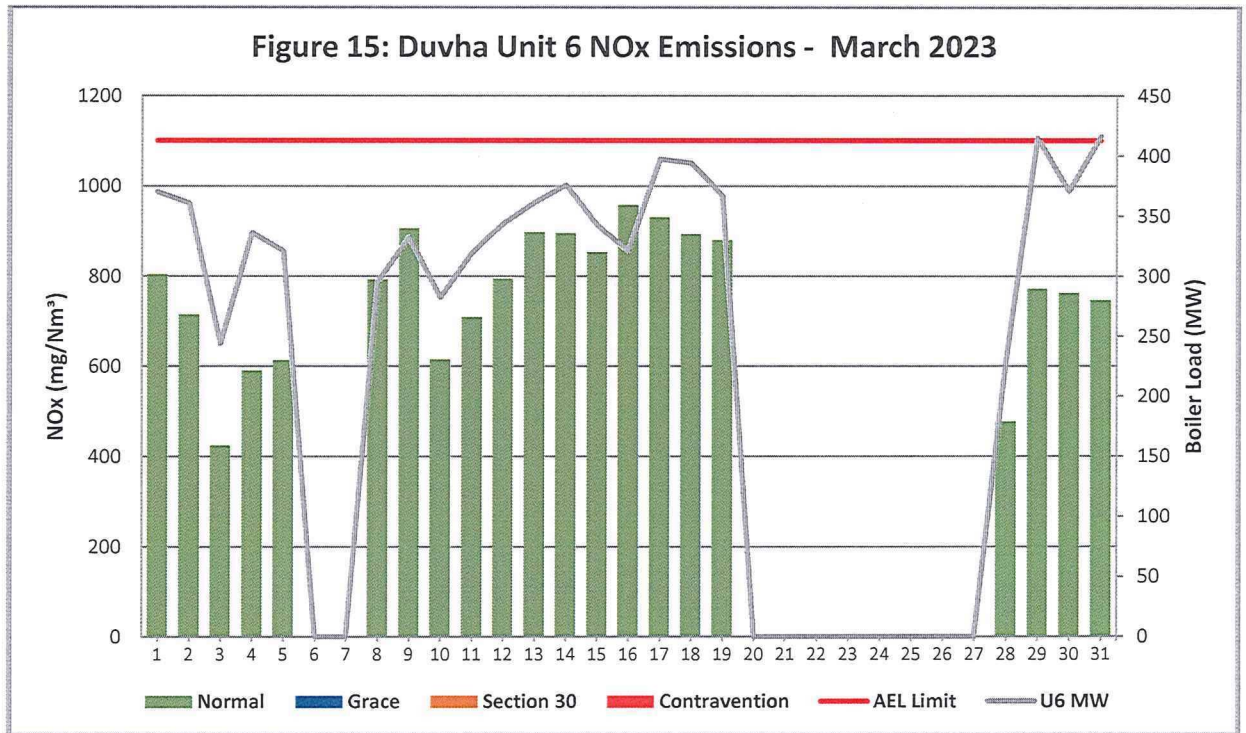


Figure 14: Duvha Unit 5 NOx Emissions - March 2023





7 SHUT DOWN AND LIGHT UP INFORMATION

Tables 7.1: Shut-down and light-up information for the month of March 2023

Unit No.1	Event 1		Event 2	
Breaker Open (BO)	BO previously	BO previously	2:50 am	2023/03/12
Draught Group (DG) Shut Down (SD)	n/a	n/a	DG did not trip or SD	DG did not trip or SD
BO to DG SD (duration)	n/a	DD:HH:MM	n/a	DD:HH:MM
Fires in time	11:10 am	2023/03/01		
Synch. to Grid (or BC)	4:20 pm	2023/03/01		
Fires in to BC (duration)	00:05:10	DD:HH:MM		DD:HH:MM
Emissions below limit from BC (end date)	not > limit	not > limit		
Emissions below limit from BC (duration)	n/a	DD:HH:MM		DD:HH:MM

Unit No.2	Event 1		Event 2		Event 3		Event 4	
Breaker Open (BO)	BO previously	BO previously	5:55 am	2023/03/06	BO previously	BO previously	2:45 am	2023/03/28
Draught Group (DG) Shut Down (SD)	n/a	n/a	1:45 am	2023/03/07	n/a	n/a	8:00 am	2023/03/28
BO to DG SD (duration)	n/a	DD:HH:MM	00:19:50	DD:HH:MM	n/a	DD:HH:MM	00:05:15	DD:HH:MM
Fires in time	4:40 pm	2023/03/02			9:45 am	2023/03/09		
Synch. to Grid (or BC)	2:05 am	2023/03/03			3:25 pm	2023/03/09		
Fires in to BC (duration)	00:09:25	DD:HH:MM		DD:HH:MM	00:05:40	DD:HH:MM		DD:HH:MM
Emissions below limit	not > limit	not > limit			not > limit	not > limit		

from BC (end date)								
Emissions below limit from BC (duration)	<i>n/a</i>	DD:HH:MM		DD:HH:MM	<i>n/a</i>	DD:HH:MM		DD:HH:MM

Unit No.5	<i>Event 1</i>		<i>Event 2</i>	
Breaker Open (BO)	<i>1:15 pm</i>	<i>2023/03/14</i>	<i>8:15 am</i>	<i>2023/03/27</i>
Draught Group (DG) Shut Down (SD)	<i>DG did not trip or SD</i>	<i>DG did not trip or SD</i>	<i>DG did not trip or SD</i>	<i>DG did not trip or SD</i>
BO to DG SD (duration)	<i>n/a</i>	DD:HH:MM	<i>n/a</i>	DD:HH:MM
Fires in time				
Synch. to Grid (or BC)				
Fires in to BC (duration)		DD:HH:MM		DD:HH:MM
Emissions below limit from BC (end date)				
Emissions below limit from BC (duration)		DD:HH:MM		DD:HH:MM

8 GENERAL

Exceedances:

Unit 4:

06/03/2023

- Cold unit light up.

13-14/03/2023

- Cold unit light up.

17/03/2023

- Electrostatic Precipitators fields were switched off to conduct scouring.

23/03/2023

- The SO3 plant was not in service due to the common plant that was on permit to work, to replace Sulphur flow sensor.

Unit 5:

02-03/03/2023

- Electrostatic Precipitator (ESP) fields 2.2 ,2.5 and 4.4 were not performing optimally.
- ESP field 1.2 off due to shortage of spares (Capacitor bank)

05/03/2023

- Underperforming ESPs fields (Field 1.2 off due to shortage of spares (Capacitor bank), 2.5 trips on UV, 3.4 transformer to be replaced, 3.2 not performing/sparking, 3.3 not performing, 3.5 not performing/firing angle limit 4.4 not performing),
- High Back-end temperatures after soot blowing conducted. This is due to low sootblower availability.

07/03/2023

- Underperforming ESPs fields (Field 1.2 off due to shortage of spares (Capacitor bank), 2.5 trips on UV, 3.4 transformer to be replaced, 3.2 not performing/sparking, 3.3 not performing, 3.5 not performing/firing angle limit 4.4 not performing),
- High Back-end temperatures after soot blowing conducted. This is due to low sootblower availability.

09/03/2023

- Underperforming ESPs fields (Field 1.2 off due to shortage of spares (Capacitor bank), 2.5 trips on UV, 3.4 transformer to be replaced, 3.2 not performing/sparking, 3.3 not performing, 3.5 not performing/firing angle limit 4.4 not performing),
- High Back-end temperatures after soot blowing conducted. This is due to low sootblower availability.

12-13/02/2023

- ESPs SCADA screen frozen in the control room,
- Dust Handling plant (DHP) left hand hopper no 7 was blocked,
- SO3 plant was off due to the loss of power supply caused by the Station Board 1 that tripped due to water ingress.

18/03/2023

- Unit cold light up.

20/03/2023

- High dust silo level,
- DHP left hand row no:4 was blocked,

23/03/2023

- The SO3 plant was not in service due to the common plant that was on permit to work, to replace Sulphur flow sensor

27-28/03/2023

- Unit hot light up.

30/03/2023

- High Back-end temperatures after soot blowing conducted. This is due to low sootblower availability.
- ESP field 3.5 failed to start

Unit 6:

09/03/2023

- Cold unit light up.

11-13/03/2023

- Contravention Incident: The 48 Hours allowable for a hot unit light up were exceeded on Duvha's unit 6 on the 13th of March 2023. A detailed investigation report with root cause and preventative actions will be submitted to your office once the investigation is completed.

19/03/2023

- High back-end temperatures after sootblowing was conducted. This is due to low sootblowers availability.

29/03/2023

- Cold unit light up.

The gaseous emissions monitors for units 1 and 2 tripped on the 12th to 16th due to loss of power supply,

The particulate matters monitors for units 1 to 6 were being calibrated on the 09th of March 2023.

The averages Oxygen(O2) and Carbon Dioxide (CO2) data from the QAL 2 tests reports were used for reporting for Units 1, 2, 4, 5, and 6 due to poor performance of the O2 and CO2 gaseous monitors. These poor performances of the gaseous monitors were identified to be caused by the incorrect installation of O2 analyser. An action is being implemented to relocate all the units' O2 monitors to their own measurement port. The monitors have been relocated successfully and are in the process of being verified.

The rest of the information demonstrating compliance with the emission license conditions is supplied in the annual emission report which will be sent to your office

9 Complaints and 10 S30 Incidents Register

Refer to addendum A


Boiler Plant Engineering
Manager

18 May 2023

Date

pp 
Environmental
Manager

11/05/2023

Date


Engineering Manager

2023/05/24

Date

Compiled by: Environmental Officer

For: Nkangala District Municipality Air Quality Officer

Copies: Generation Environmental Management D Herbst
B Mccourt
Generation Compliance Management R Rampiar
Generation Asset Management E Patel
Duvha Power Station: Engineering Manager
Operating Manager
Maintenance Manager
Production Manager
Boiler Engineering Manager
System Engineer
Environmental Manager

9 COMPLAINTS REGISTER

Table 9. Complaints for the month of March 2023

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 measure will be implemented
No complaints were received during the month of March 2023.					

10 S30 INCIDENT OR LEGAL CONTRAVENTION REGISTER

To be completed in the case of a S30 incident or a legal contravention:

Unit no	Incident Start Date	Incident End Date	Incident Cause	Remedial action	S30 initial notification sent	Date S30 investigation report sent	Date DEA Acknowledgment	Date DEA Acceptable	Comments / Reference No.
Unit 6	11/03/2023	13/03/2023	Incident still under investigation	Contravention incident not reported as a Section 30. Final investigation report will be submitted once investigation completed			N/A	N/A	Contravention Incident: The 48 Hours allowable for a hot unit light were exceeded on Duvha's unit 6 on the 13 th of March 2023. A detailed investigation report with root cause and preventative actions will be submitted to your office once the investigation is completed.