



Generation

Nkangala District Municipality
P O Box 437
Middleburg

1050

Attention:

Mr V Mahlangu

AND

Directorate: Air Quality Management
Services
The Chief Director:
Mr S S Maluleka
Department of Environmental Services
Private Bag X447
PRETORIA
0001
Tel: (012) 310 3263
Fax: (012) 320 0488

Date: 2024/01/15

Enquiries: Duvha Environmental
Management
☎ +27 13 690 0445
☎ +27 66 212 2105

Enquiries: Ms Simthandile Nhlapo
☎ +27 13 690 0445
☎ +27 66 212 2105

Total number of pages:18

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DUVHA POWER STATION

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


Type text here

GENERAL MANAGER

2024/01/30

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 Aug-2023
	Coal	Tons	1 400 000.00	744 574.44
Fuel Oil	Tons	5 000.00	6870.81	
Production Rates	Product / By-Product Name	Units	Maximum Production Capacity Permitted	Production Rate Aug-2023
	Energy	GWh	2678.40	1 295.13
	Ash	Tons	not specified	200 513.90

Note: Maximum energy rate is as per the maximum capacity stated in the AEL: [3 600 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
Sulphur Content	%	0.60 TO >1.20	0.74
Ash Content	%	27.00 TO 30.00	26.93

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 Aug-2023	Technology Type	SO ₃ Utilization Aug-2023
Unit 1	FFP	99.8%		
Unit 2	FFP	99.9%		
Unit 4	ESP + SO ₃	99.6%	SO ₃	99.8%
Unit 5	ESP + SO ₃	99.6%	SO ₃	98.5%
Unit 6	ESP + SO ₃	99.4%	SO ₃	98.8%

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

5 MONITOR RELIABILITY (%)

Associated Unit/Stack	PM	SO ₂	NO
Unit 1	100.00	100.00	100.00
Unit 2	100.00	100.00	100.00
Unit 4	100.00	100.00	100.00
Unit 5	100.00	99.90	99.60
Unit 6	100.00	99.70	99.70

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 August 2023

Associated Unit/Stack	PM (tons)	SO ₂ (tons)	NO _x (tons)
Unit 1	66.70	4 532	2 099
Unit 2	38.70	3 540	1 805
Unit 4	92.10	2 084	855
Unit 5	140.40	2 150	904
Unit 6	188.00	2 092	1 057
SUM	525.77	14 398	6 720

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

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average PM (mg/Nm ³)
Unit 1	31	0	0	0	0	28.40
Unit 2	31	0	0	0	0	19.40
Unit 4	16	5	3	0	8	93.70
Unit 5	21	3	1	0	4	118.20
Unit 6	17	9	2	0	11	158.40
SUM	116	17	6	0	23	

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

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SO ₂ (mg/Nm ³)
Unit 1	31	0	0	0	0	1 886.80
Unit 2	31	0	0	0	0	1 735.20
Unit 4	26	0	0	0	0	1 605.60
Unit 5	29	0	0	0	0	1 564.30
Unit 6	29	0	0	0	0	1 530.00
SUM	146	0	0	0	0	

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

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NO _x (mg/Nm ³)
Unit 1	31	0	0	0	0	874.20
Unit 2	31	0	0	0	0	883.40
Unit 4	26	0	0	0	0	653.90
Unit 5	29	0	0	0	0	653.70
Unit 6	29	0	0	0	0	775.10
SUM	146	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 - August 2023

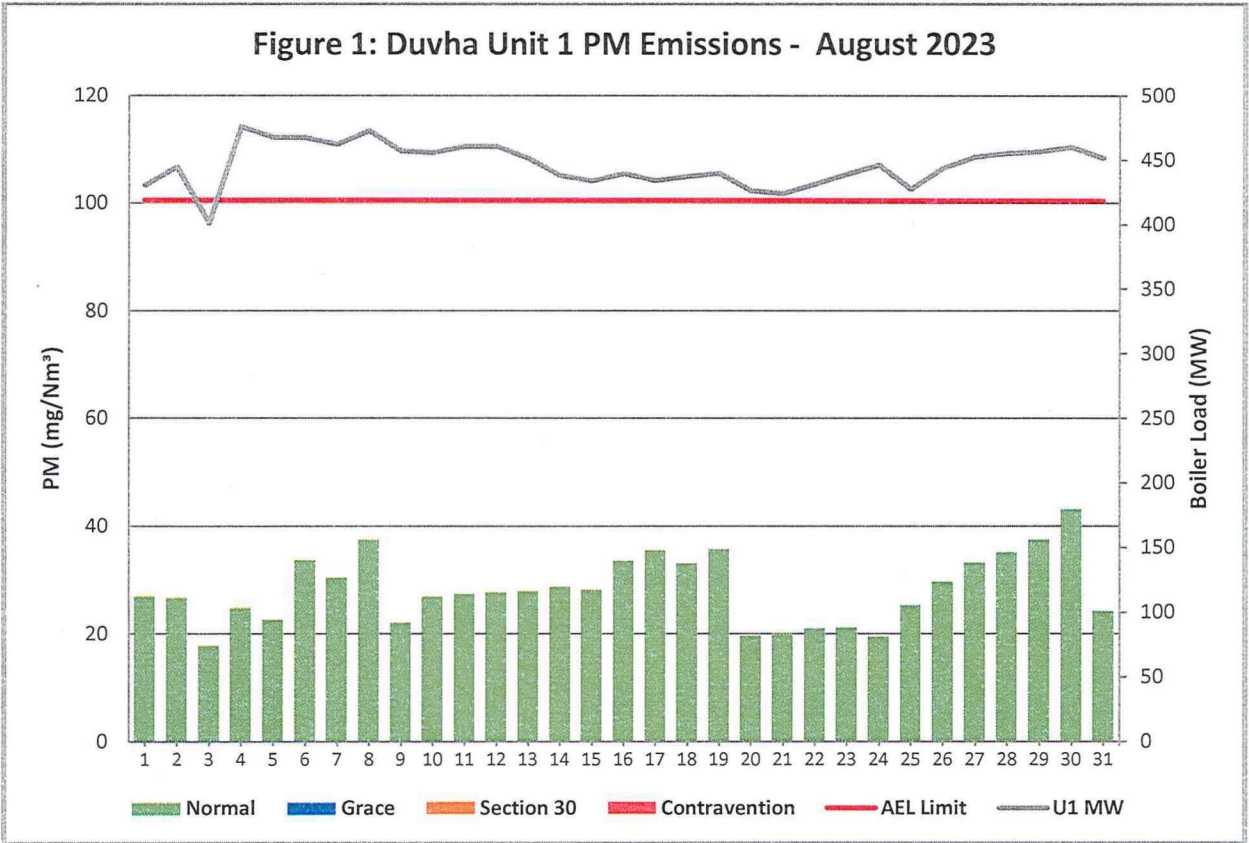


Figure 2: Duvha Unit 2 PM Emissions - August 2023

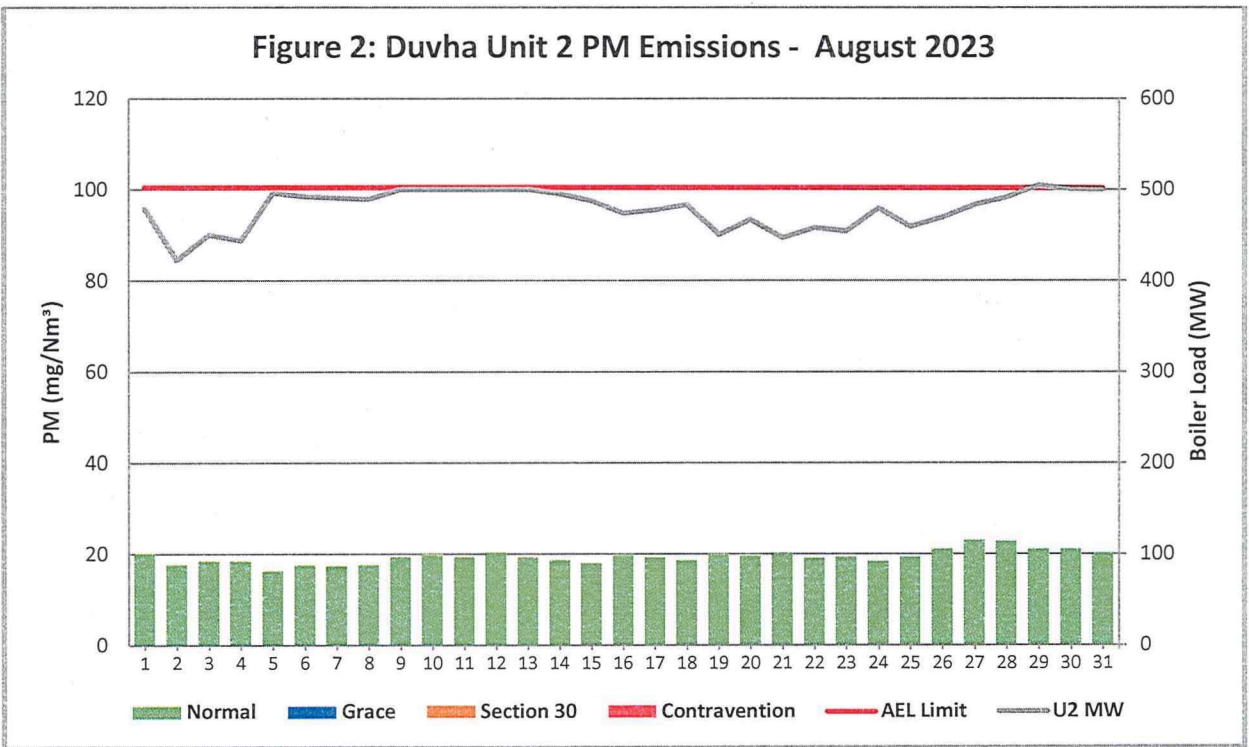


Figure 3: Duvha Unit 4 PM Emissions - August 2023

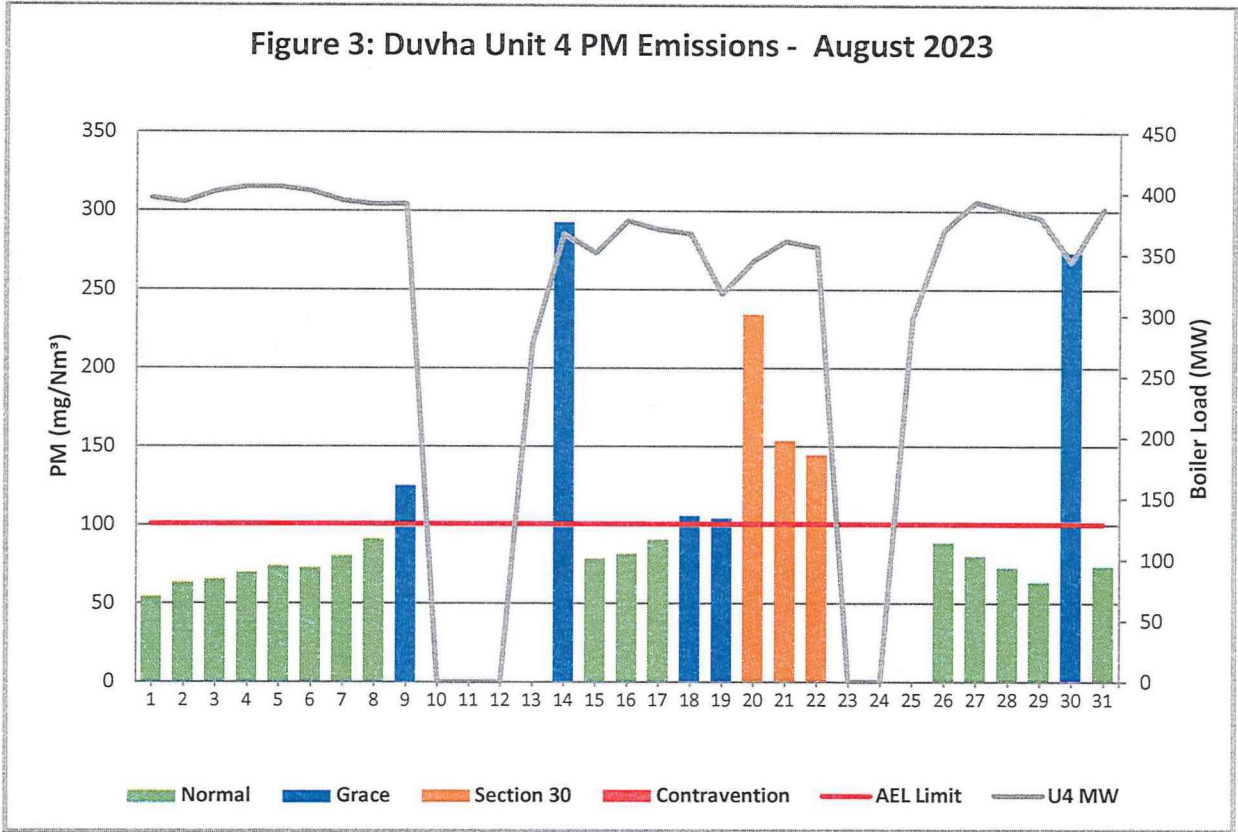


Figure 4: Duvha Unit 5 PM Emissions - August 2023

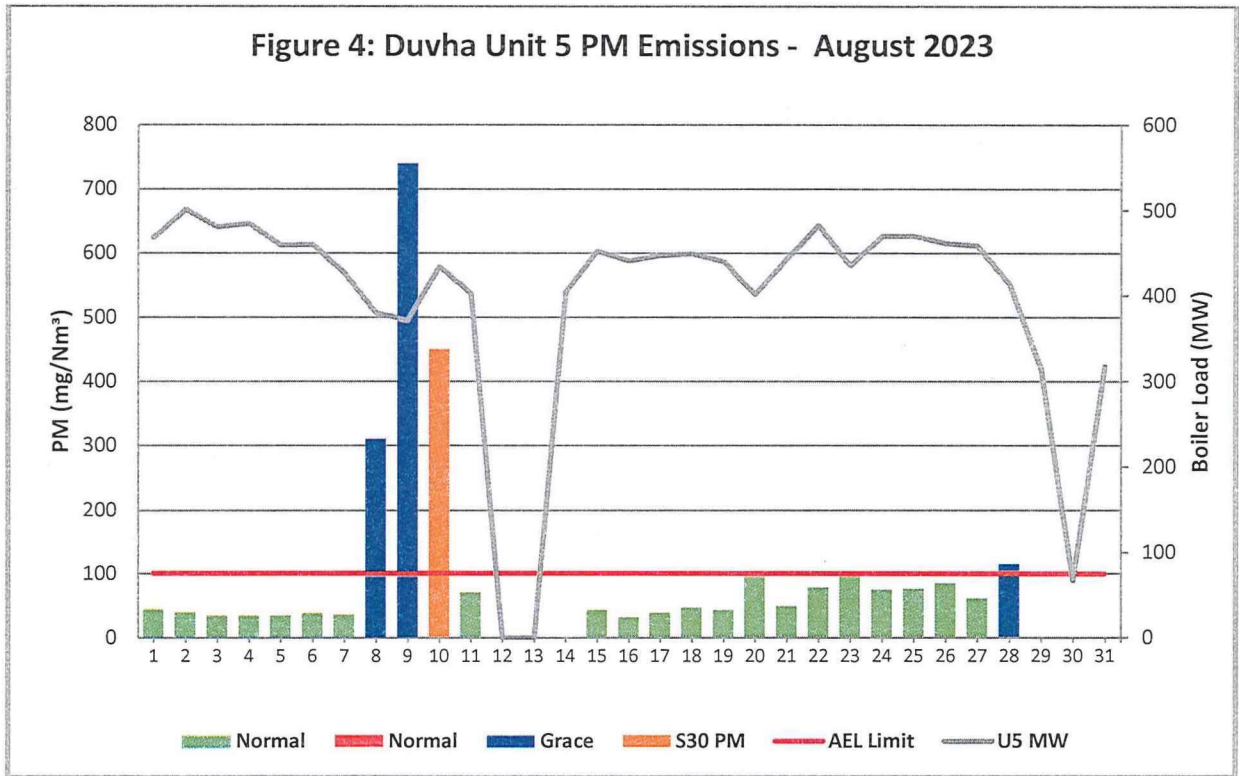


Figure 5: Duvha Unit 6 PM Emissions - August 2023

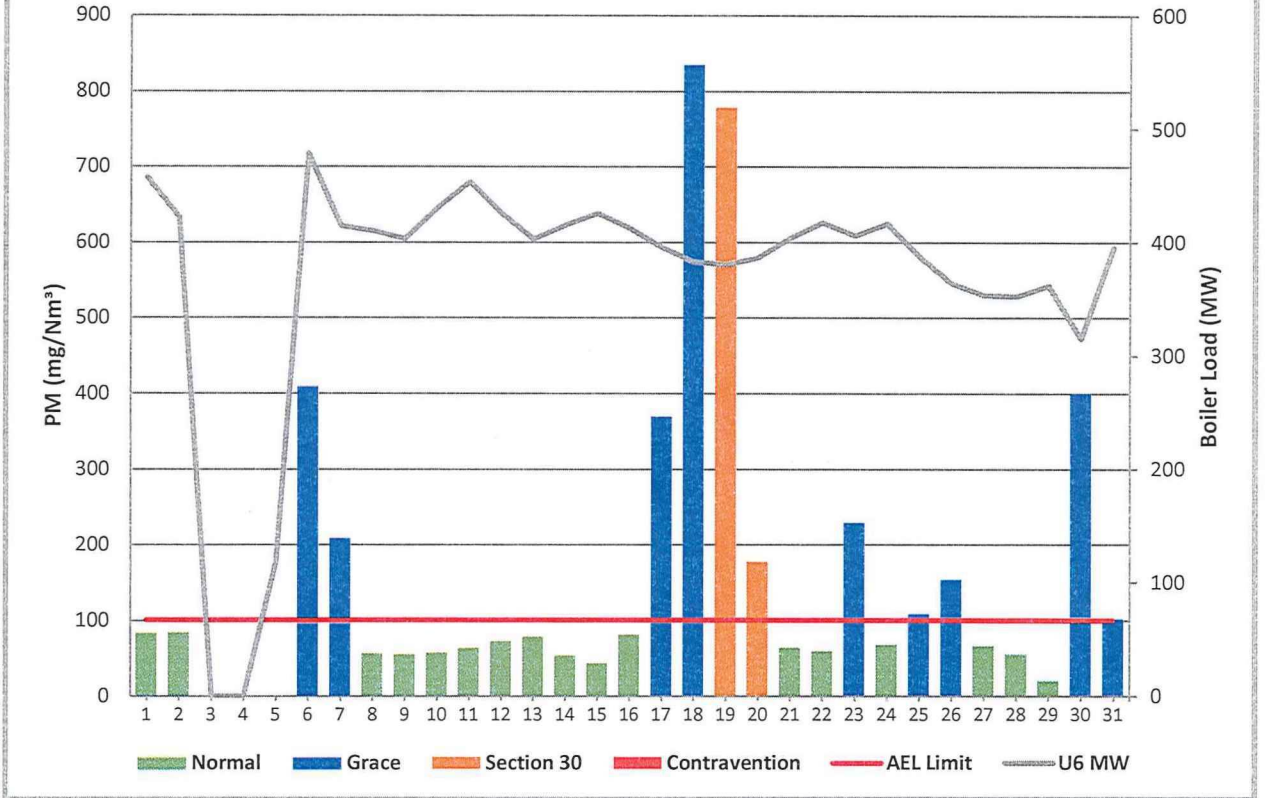


Figure 6: Duvha Unit 1 SO₂ Emissions - August 2023

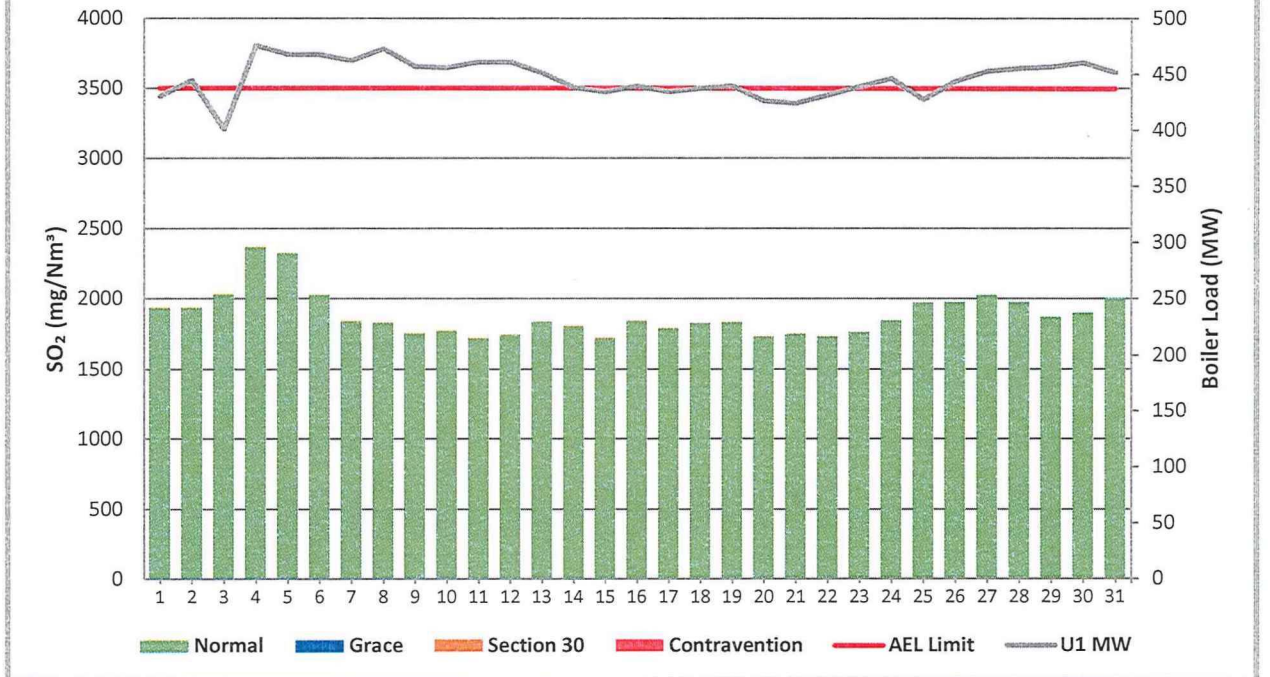


Figure 7: Duvha Unit 2 SO₂ Emissions - August 2023

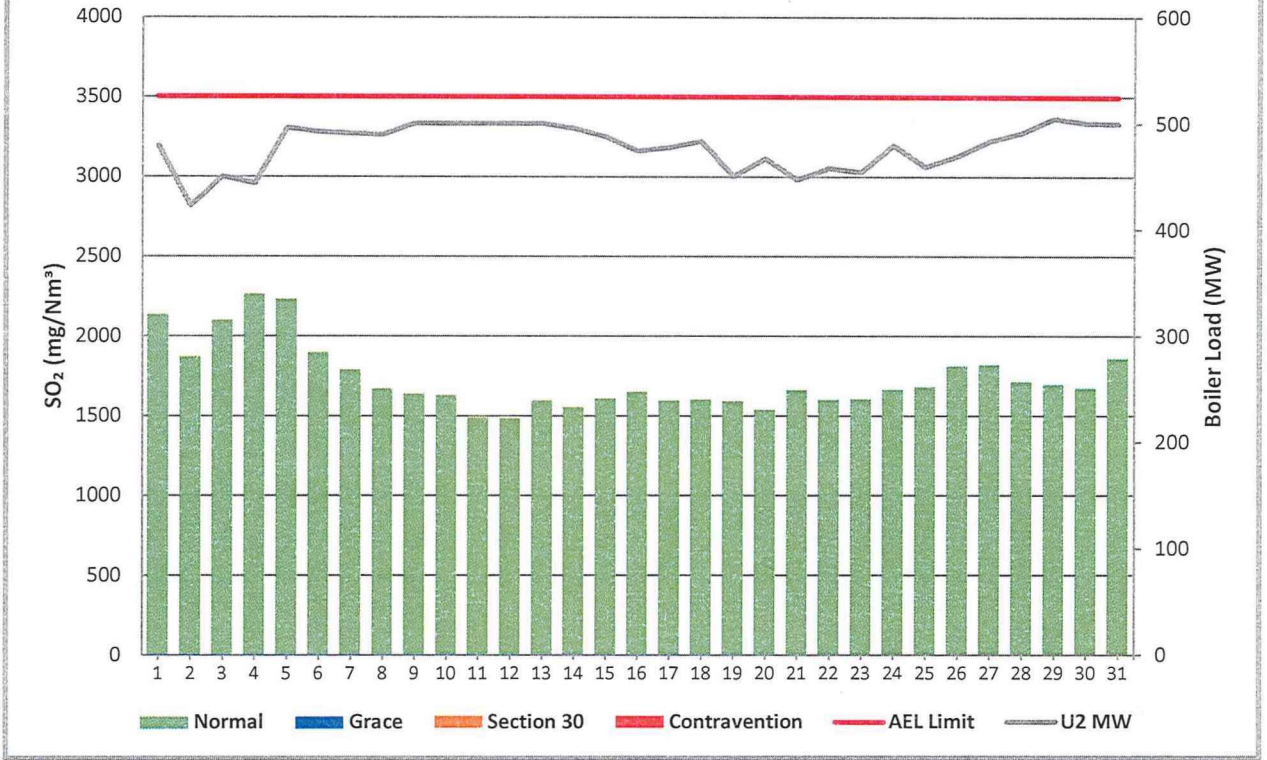


Figure 8: Duvha Unit 4 SO₂ Emissions - August 2023

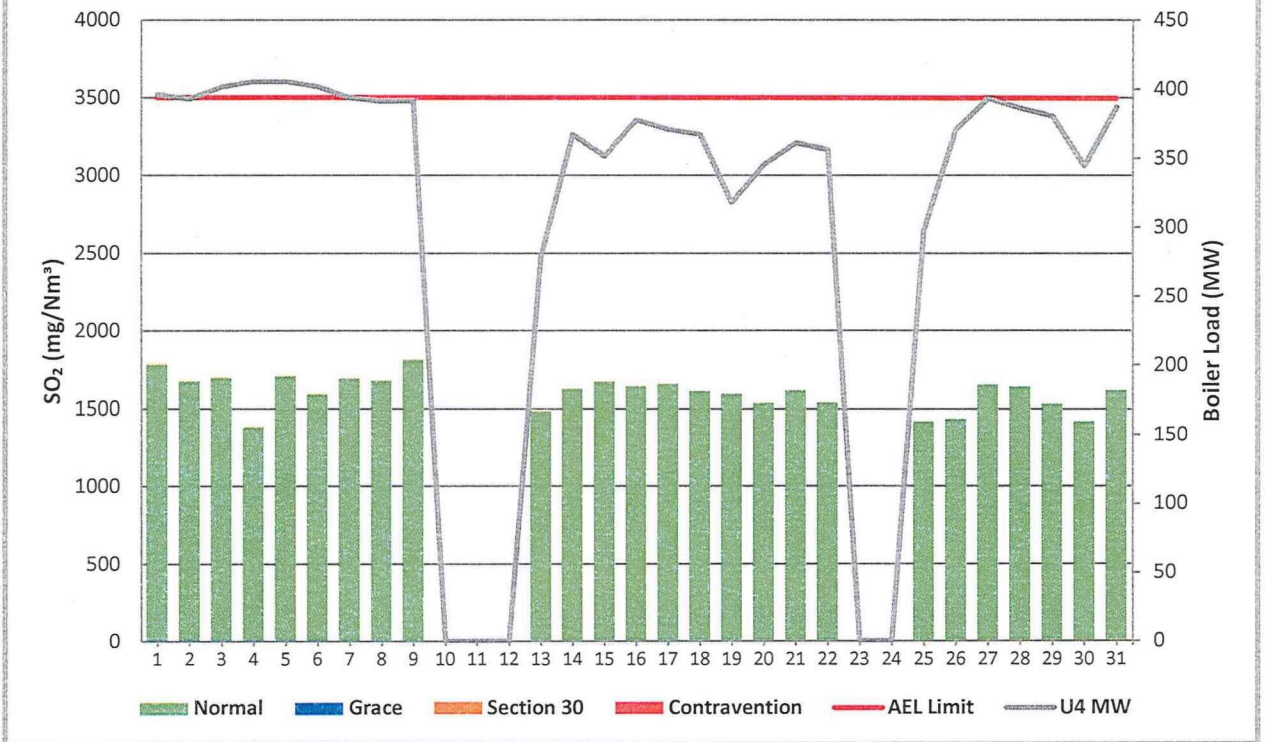


Figure 9: Duvha Unit 5 SO₂ Emissions - August 2023

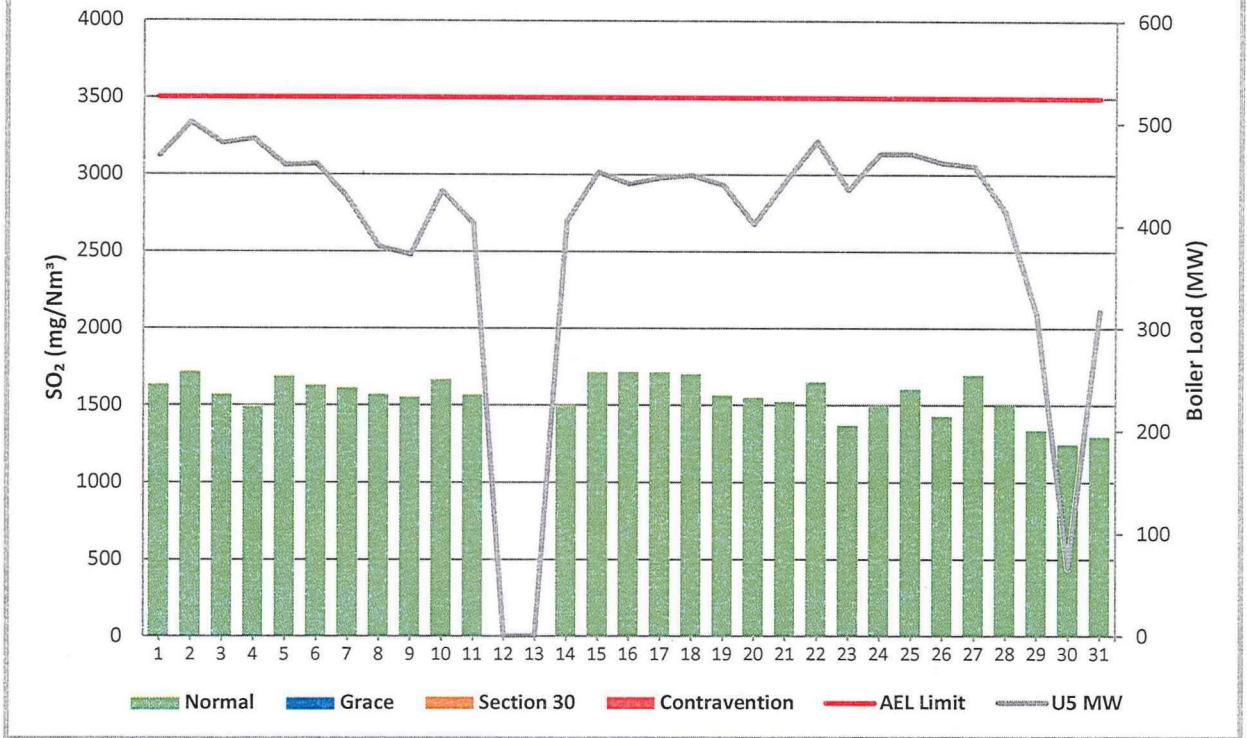


Figure 10: Duvha Unit 6 SO₂ Emissions - August 2023

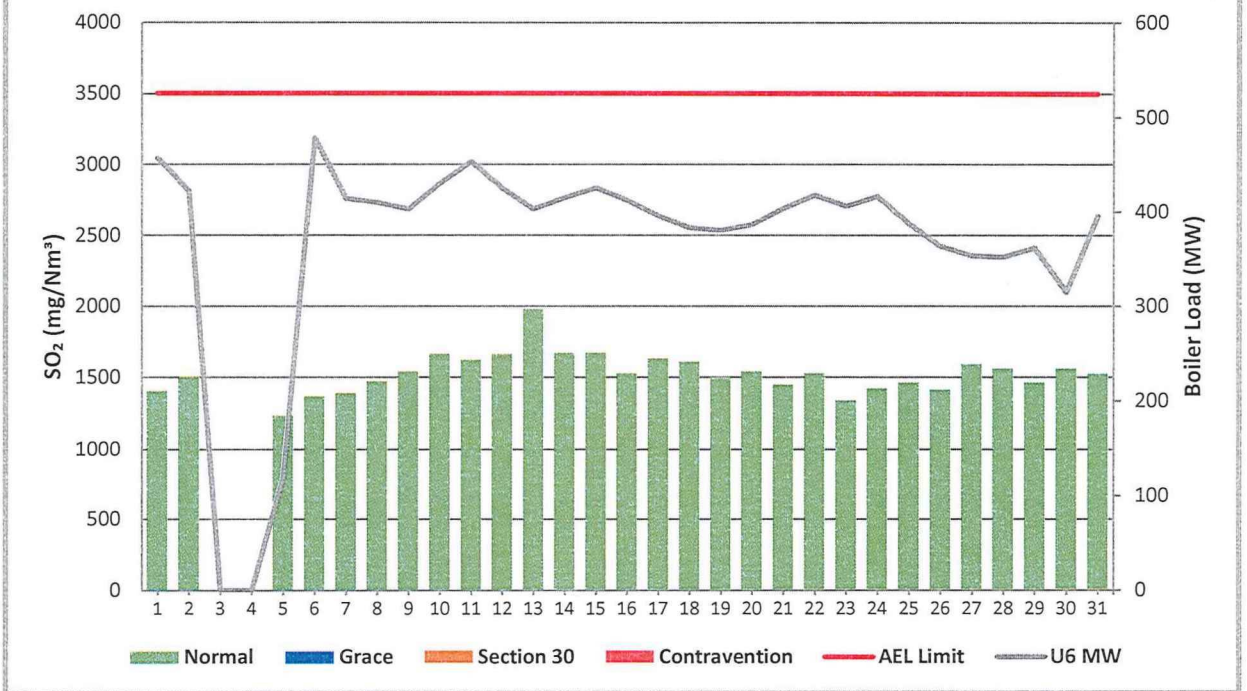


Figure 11: Duvha Unit 1 NOx Emissions - August 2023

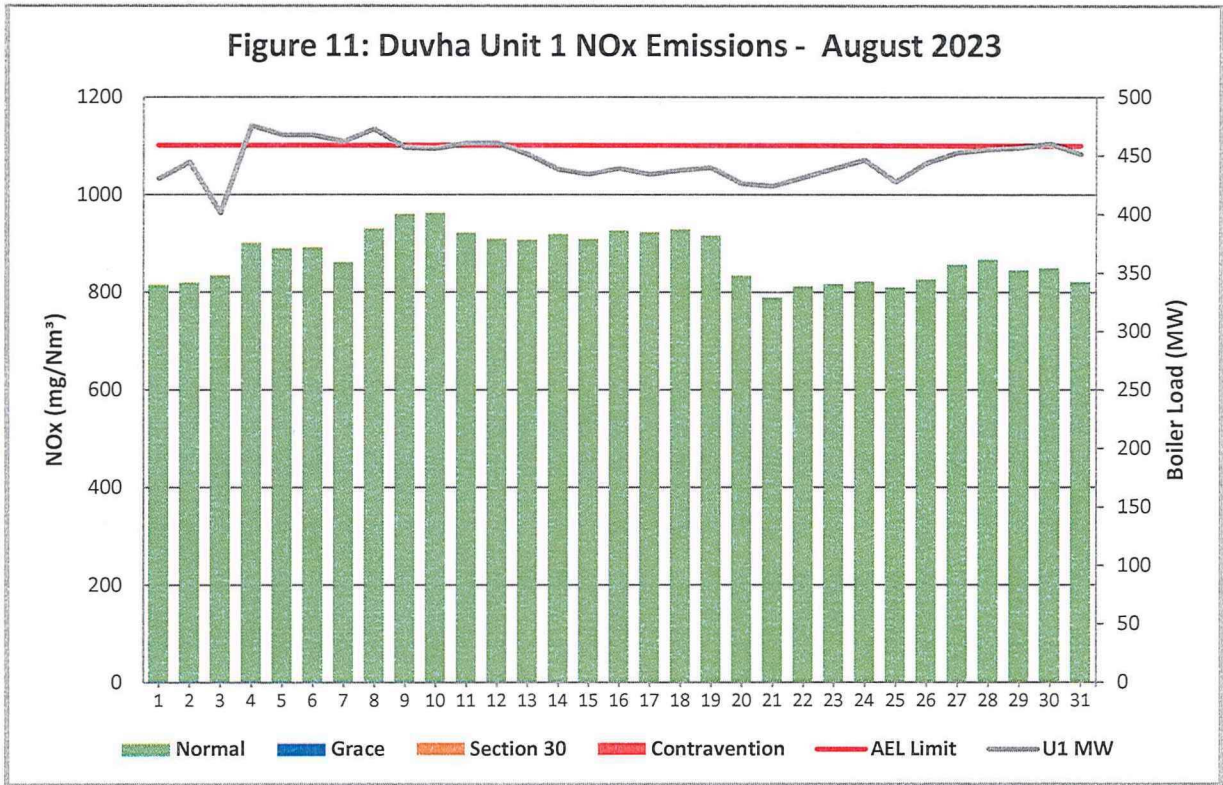


Figure 12: Duvha Unit 2 NOx Emissions - August 2023

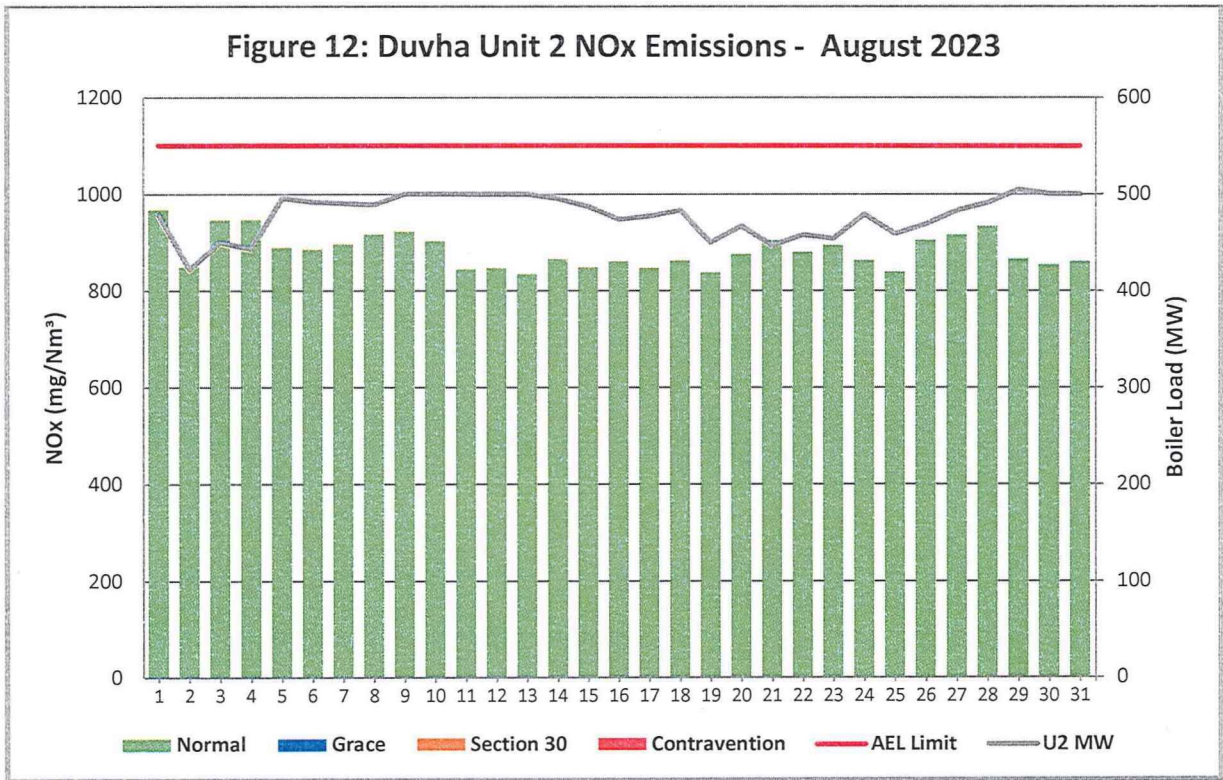


Figure 13: Duvha Unit 4 NOx Emissions - August 2023

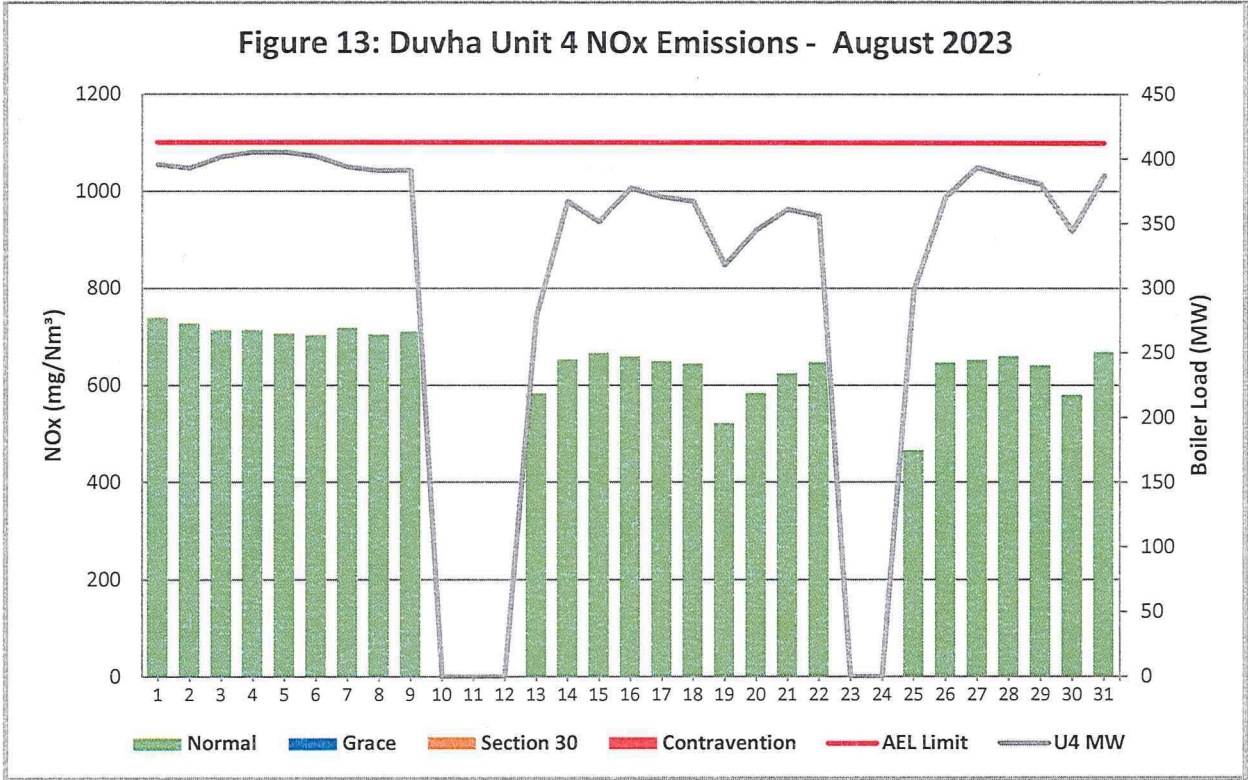
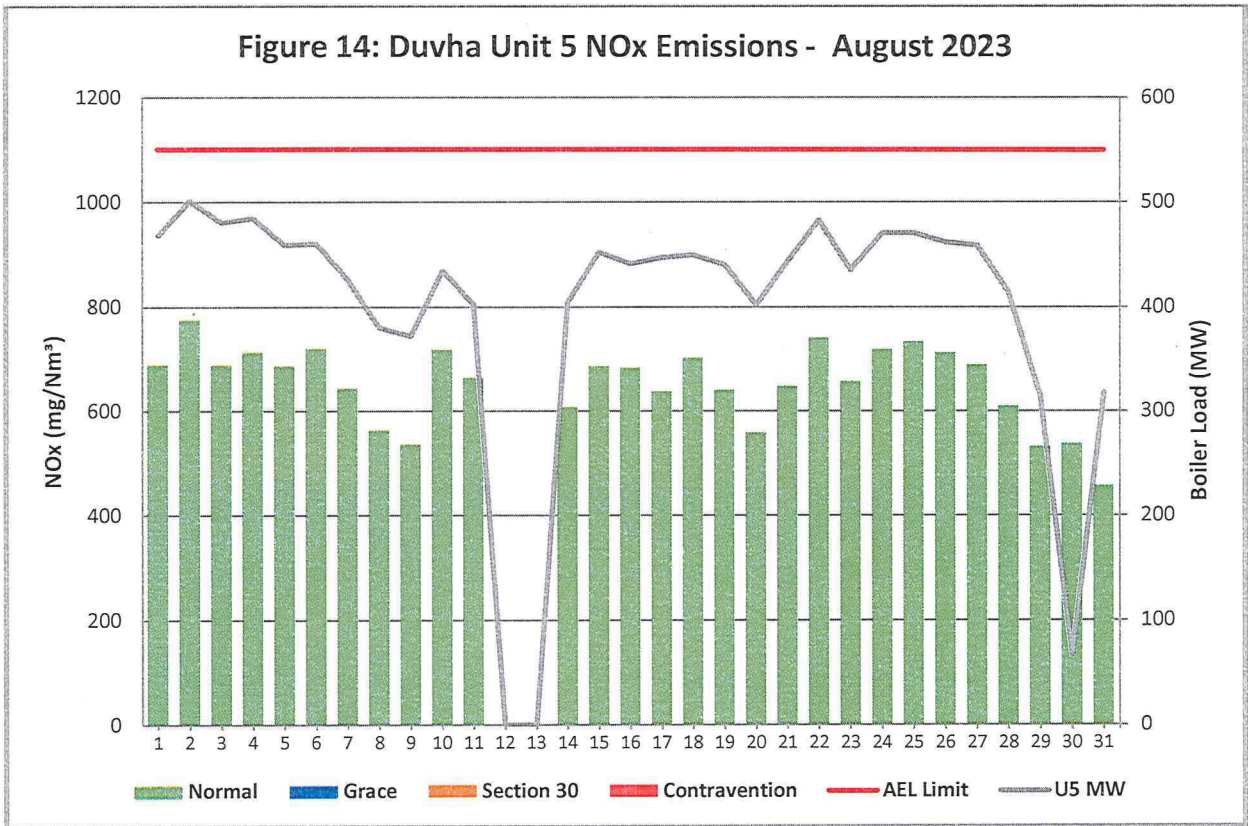
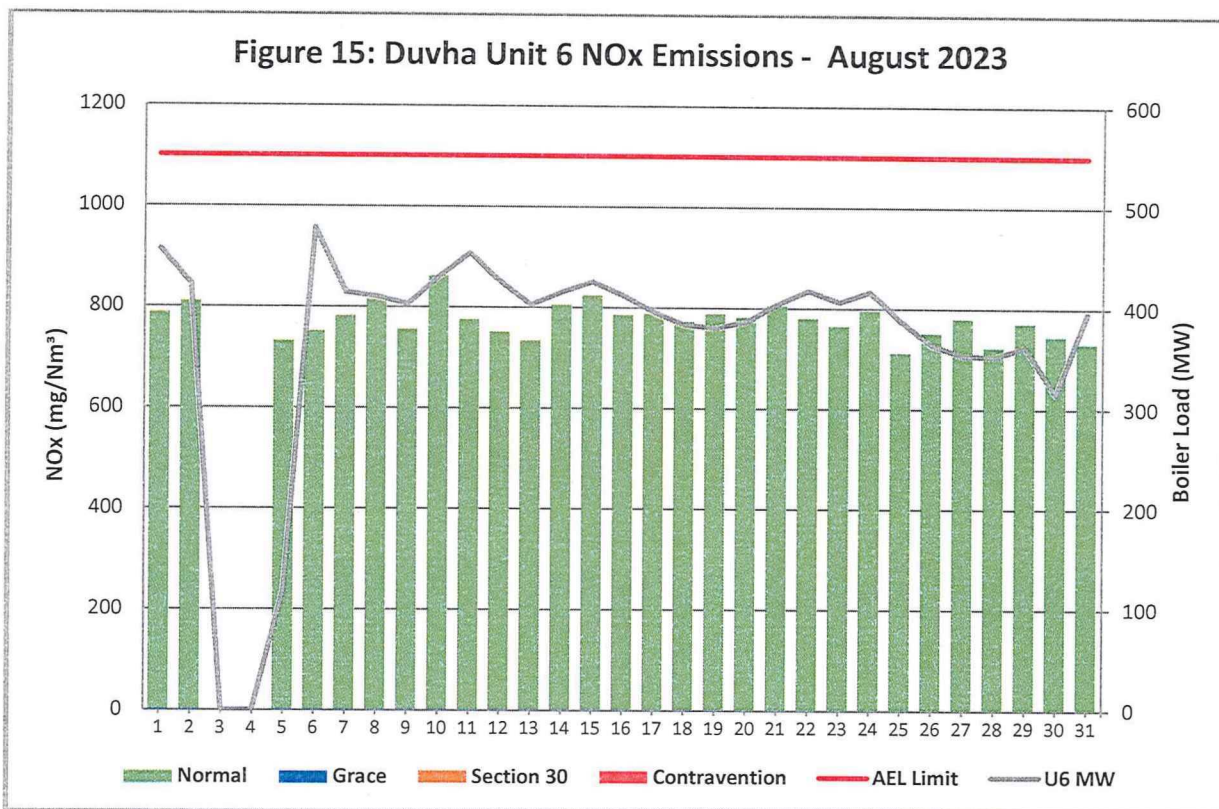


Figure 14: Duvha Unit 5 NOx Emissions - August 2023





7 SHUT DOWN AND LIGHT UP INFORMATION

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

Unit No.1	<i>Event 1</i>	
Breaker Open (BO)	<i>BO previously</i>	<i>BO previously</i>
Draught Group (DG) Shut Down (SD)	<i>n/a</i>	<i>n/a</i>
BO to DG SD (duration)	<i>n/a</i>	DD:HH:MM
Fires in time	<i>11:05 am</i>	<i>2023/07/31</i>
Synch. to Grid (or BC)	<i>5:05 pm</i>	<i>2023/07/31</i>
Fires in to BC (duration)	<i>00:04:00</i>	DD:HH:MM
Emissions below limit from BC (end date)	<i>not > limit</i>	<i>not > limit</i>
Emissions below limit from BC (duration)	<i>n/a</i>	DD:HH:MM

Unit No.2	<i>Event 1</i>	
Breaker Open (BO)	<i>12:10 am</i>	<i>2023/08/02</i>
Draught Group (DG) Shut Down (SD)	<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
Fires in time		
Synch. to Grid (or BC)		

Fires in to BC (duration)		DD:HH:MM
Emissions below limit from BC (end date)		
Emissions below limit from BC (duration)		DD:HH:MM

Unit No.4	Event 1		Event 2		Event 3		Event 4	
Breaker Open (BO)	11:20 pm	2023/08/09	1:15 pm	2023/08/20	10:10 pm	2023/08/22	12:55 am	2023/08/30
Draught Group (DG) Shut Down (SD)	1:40 pm	2023/08/10	2:35 pm	2023/08/20	6:25 pm	2023/08/23	1:15 am	2023/08/30
BO to DG SD (duration)	00:14:20	DD:HH:MM	00:01:20	DD:HH:MM	00:20:15	DD:HH:MM	00:00:20	DD:HH:MM
Fires in time	12:10 pm	2023/08/13	5:15 pm	2023/08/20	8:45 am	2023/08/25	6:40 am	2023/08/30
Synch. to Grid (or BC)	4:00 pm	2023/08/13	8:10 pm	2023/08/20	5:05 pm	2023/08/25	11:50 am	2023/08/30
Fires in to BC (duration)	00:03:50	DD:HH:MM	00:02:55	DD:HH:MM	00:08:20	DD:HH:MM	00:05:10	DD:HH:MM
Emissions below limit from BC (end date)	1:00 am	2023/08/16	12:00 am	2023/08/24	12:00 am	2023/08/26	12:00 am	2023/09/02
Emissions below limit from BC (duration)	02:09:00	DD:HH:MM	03:03:50	DD:HH:MM	00:06:55	DD:HH:MM	02:12:10	DD:HH:MM

Unit No.5	Event 1		Event 2	
Breaker Open (BO)	11:05 pm	2023/08/11	6:40 pm	2023/08/28
Draught Group (DG) Shut Down (SD)	3:10 am	2023/08/12	12:25 am	2023/08/30
BO to DG SD (duration)	00:04:05	DD:HH:MM	01:05:45	DD:HH:MM
Fires in time	2:25 am	2023/08/14		
Synch. to Grid (or BC)	7:00 am	2023/08/14		
Fires in to BC (duration)	00:04:35	DD:HH:MM		DD:HH:MM
Emissions below limit from BC (end date)	12:00 am	2023/08/15		
Emissions below limit from BC (duration)	00:17:00	DD:HH:MM		DD:HH:MM

Unit No.6	Event 1		Event 2		Event 3	
Breaker Open (BO)	11:05 pm	2023/08/02	6:55 am	2023/08/07	12:55 am	2023/08/30
Draught Group (DG) Shut Down (SD)	2:00 pm	2023/08/03	7:40 am	2023/08/07	1:05 am	2023/08/30

BO to DG SD (duration)	00:14:55	DD:HH:MM	00:00:45	DD:HH:MM	00:00:10	DD:HH:MM
Fires in time	3:55 pm	2023/08/05	7:50 am	2023/08/07	7:25 am	2023/08/30
Synch. to Grid (or BC)	9:30 pm	2023/08/05	11:45 am	2023/08/07	3:20 pm	2023/08/30
Fires in to BC (duration)	00:05:35	DD:HH:MM	00:03:55	DD:HH:MM	00:07:55	DD:HH:MM
Emissions below limit from BC (end date)	6:55 am	2023/08/07	8:00 am	2023/08/11	12:00 am	2023/09/01
Emissions below limit from BC (duration)	01:09:25	DD:HH:MM	03:20:15	DD:HH:MM	01:08:40	DD:HH:MM

8 GENERAL

Exceedances:

Unit 4:

09/08/2023

- Due to sootblowing an abnormally dirty boiler which resulted in the exceedance.

14/08/2023

- Cold unit light up.

18 - 20/08/2023

NEMA Section 30 Incident: The 48 hours allowable for Upset Conditions were exceeded on Duvha Unit 4 on the 20th of August 2023. A detailed investigation report with root cause and preventative actions will be submitted to your office once the investigation is completed.

21-22/08/2023

- Hot unit light up.

26/08/2023

- Cold unit light up.

30/08/2023

- Cold unit light up.

Unit 5:

08-10/08/2023

NEMA Section 30 Incident: The 48 hours allowable for Upset Conditions were exceeded on Duvha Unit 5 on the 10th of August 2023. A detailed investigation report with root cause and preventative actions will be submitted to your office once the investigation is completed.

28/08/2023

- Due to sootblowing an abnormally dirty boiler which resulted in the exceedance.

Unit 6:

06-07/08/2023

- Cold unit light up.

17-20/08/2023

Contravention Incident: NEMA Section 30 Incident: The 48 hours allowable for Upset Conditions were exceeded on Duvha Unit 6 on the 19th and 20th of August 2023. A detailed investigation report with root cause and preventative actions will be submitted to your office once the investigation is completed.

23/08/2023

- Electrostatic Precipitator (ESP) fields 1.2 and 3.2 were underperforming.
- The SO₃ plant tripped.

25 – 26/08/2023

- Dust Handling plant (DHP) right hand hopper number 2 was blocked.
- Electrostatic Precipitator (ESP) fields 1.2, 3.2 and 4.4 kept tripping on undervoltage and failing to start.
- ESP field 2.3 had a communication fault.
- ESP fields 4.2 and 4.5 tripped and were failing to start.

30 31/08/2023 - 01/07/2023

- Hot unit light up.

Lastly the averages Oxygen (O₂) and Carbon Dioxide (CO₂) data from the QAL 2 tests reports were used for reporting for gaseous emissions 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 are due to faulty O₂ analysers. The Station is in the process to replace all the faulty analysers by 31 March 2024.

The fuel oil usage for the month of August 2023 exceeded the permitted consumption rate. The investigation for the high fuel oil usage is completed and attached as an annexure to this report.

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.

10 Complaints and S30 Incidents Register

Refer to addendum A


Boiler Plant Engineering
Manager

25/01/2024
Date


Environmental
Manager

2024/01/29
Date


Engineering Manager

2024-01-25
Date

Compiled by:	Environmental Officer	
For:	Nkangala District Municipality	Air Quality Officer
Copies:	Generation Environmental Management	D Herbst B Mccourt
	Generation Compliance Management Generation Asset Management	R Rampiar 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 August 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 August 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 4	20/08/2023	20/08/2023	Incident still under investigation		23/08/2023	Incident still under investigation	Not yet received	N/A	Reference number not yet received.
Unit 5	10/08/2023	10/08/2023	Incident still under investigation		11/08/2023	Incident still under investigation	Not yet received	N/A	Reference number not yet received.
Unit 6	19/08/2023	20/08/2023	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: Contravention Incident: NEMA Section 30 Incident: The 48 hours allowable for Upset Conditions were exceeded on Duvha Unit 6 on the 19 th and 20 th of August 2023. A detailed investigation report with

								root cause and preventative actions will be submitted to your office by 31 March 2024.
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