



Generation

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DUVHA POWER STATION

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

GENERAL MANAGER

2023/07/31

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 Jun-2023
	Coal	Tons	1 400 000	647 289.17
	Fuel Oil	Tons	5 000	7 415.63
Production Rates	Product / By-Product Name	Units	Maximum Production Capacity Permitted	Production Rate Jun-2023
	Energy	GWh	3600	1 133.64
	Ash	Tons	not specified	176 580.49

2 ENERGY SOURCE CHARACTERISTICS

Coal Characteristic	Units	Stipulated Range	Monthly Average Content
Sulphur Content	%	0.6 TO >1.2	0.77
Ash Content	%	27 TO 30	27.28

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 Jun-2023	Technology Type	SO ₃ Utilization Jun-2023
Unit 1	FFP	99.8%	n/a	n/a
Unit 2	FFP	99.9%	n/a	n/a
Unit 4	ESP + SO ₃	99.2%	SO ₃	94.7%
Unit 5	ESP + SO ₃	99.6%	SO ₃	97.8%
Unit 6	ESP + SO ₃	99.7%	SO ₃	99.8%

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

5 MONITOR RELIABILITY (%)

Associated Unit/Stack	PM	SO ₂	NO
Unit 1	99.4	100.0	100.0
Unit 2	93.8	100.0	100.0
Unit 4	99.5	100.0	100.0
Unit 5	100.0	100.0	100.0
Unit 6	100.0	100.0	100.0

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 June 2023

Associated Unit/Stack	PM (tons)	SO ₂ (tons)	NO _x (tons)
Unit 1	53.7	3 272	1 674
Unit 2	23.0	3 111	1 619
Unit 4	231.8	2 417	1 248
Unit 5	136.3	2 196	772
Unit 6	43.5	1 049	360
SUM	488.29	12 045	5 674

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

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average PM (mg/Nm ³)
Unit 1	30	0	0	0	0	23.6
Unit 2	30	0	0	0	0	12.8
Unit 4	13	8	0	5	13	156.3
Unit 5	24	5	0	0	5	100.7
Unit 6	13	4	0	0	4	61.4
SUM	110	17	0	5	22	

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

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SO ₂ (mg/Nm ³)
Unit 1	30	0	0	0	0	1 444.3
Unit 2	30	0	0	0	0	1 725.3
Unit 4	27	0	0	0	0	1 535.4
Unit 5	30	0	0	0	0	1 540.1
Unit 6	19	0	0	0	0	1 296.9
SUM	136	0	0	0	0	

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

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NO _x (mg/Nm ³)
Unit 1	30	0	0	0	0	737.9
Unit 2	30	0	0	0	0	887.4
Unit 4	27	0	0	0	0	792.6
Unit 5	30	0	0	0	0	540.7
Unit 6	19	0	0	0	0	441.5
SUM	136	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 - June 2023

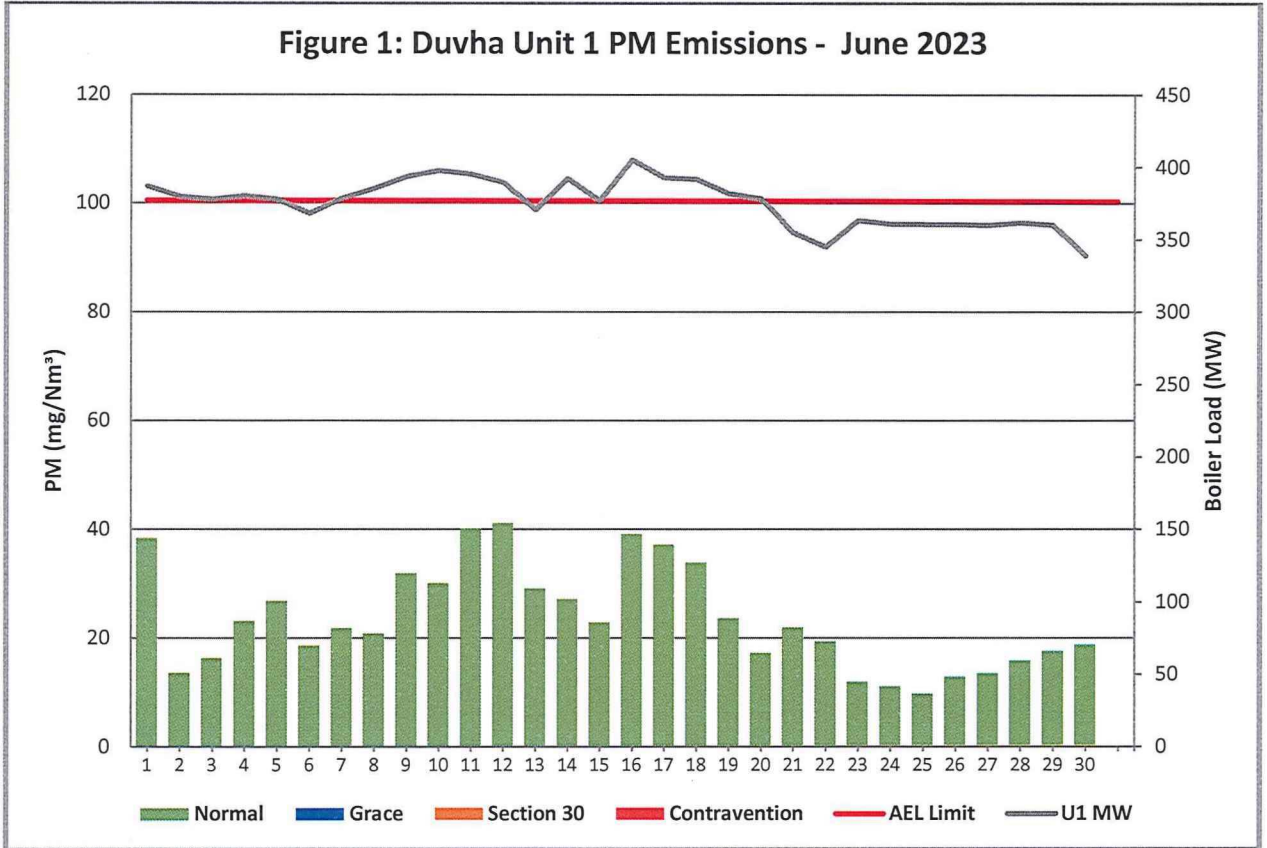


Figure 2: Duvha Unit 2 PM Emissions - June 2023

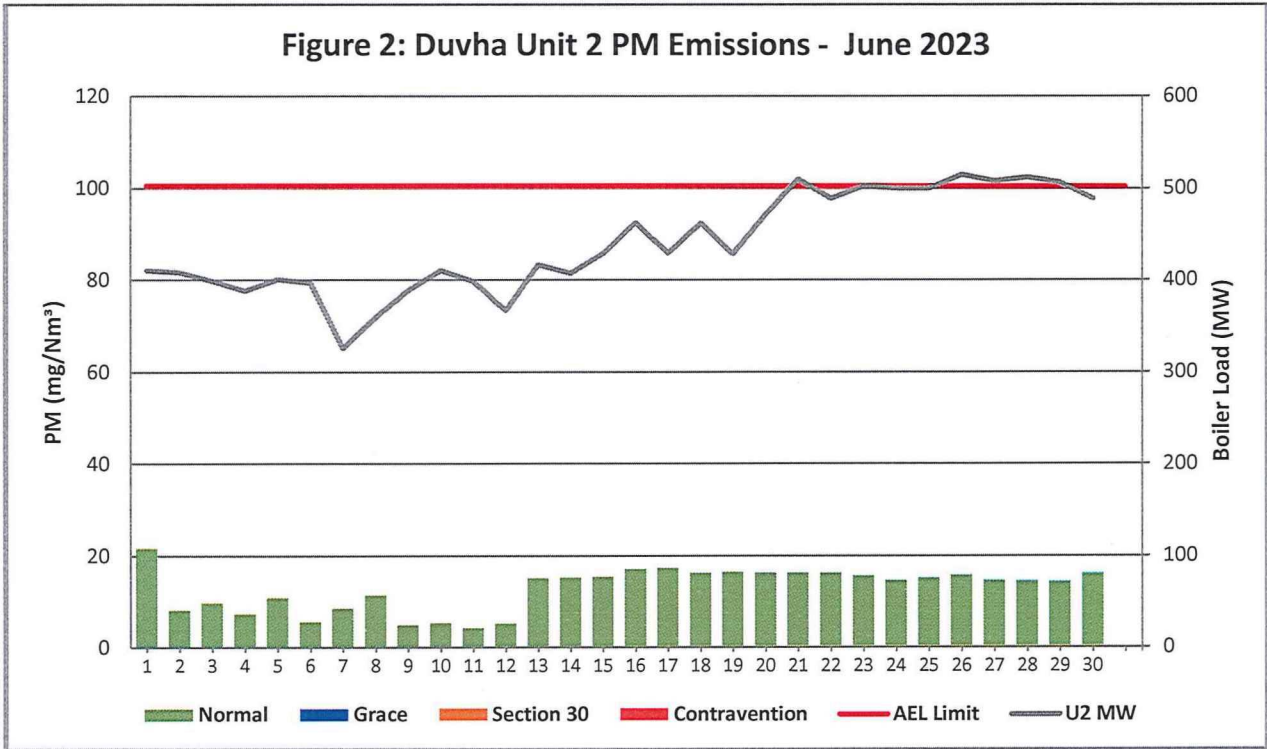


Figure 3: Duvha Unit 4 PM Emissions - June 2023

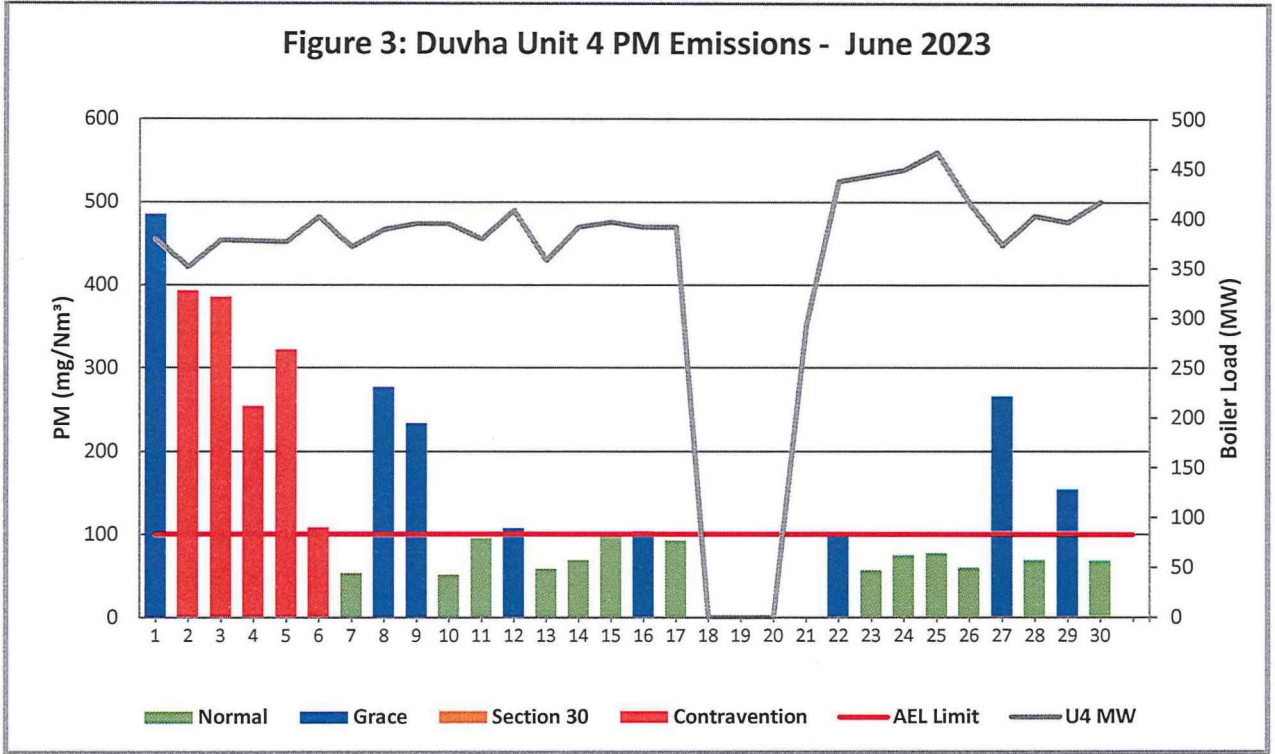


Figure 4: Duvha Unit 5 PM Emissions - June 2023

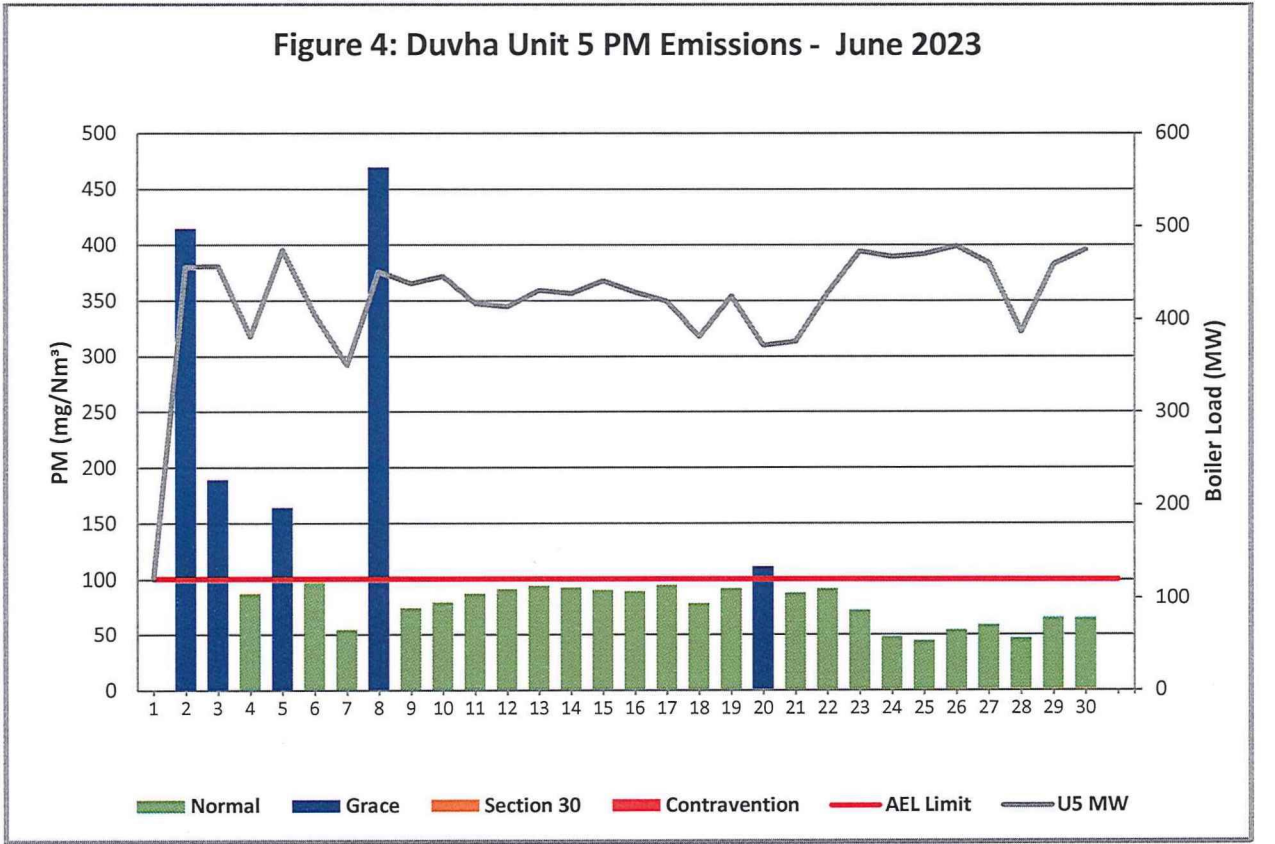


Figure 5: Duvha Unit 6 PM Emissions - June 2023

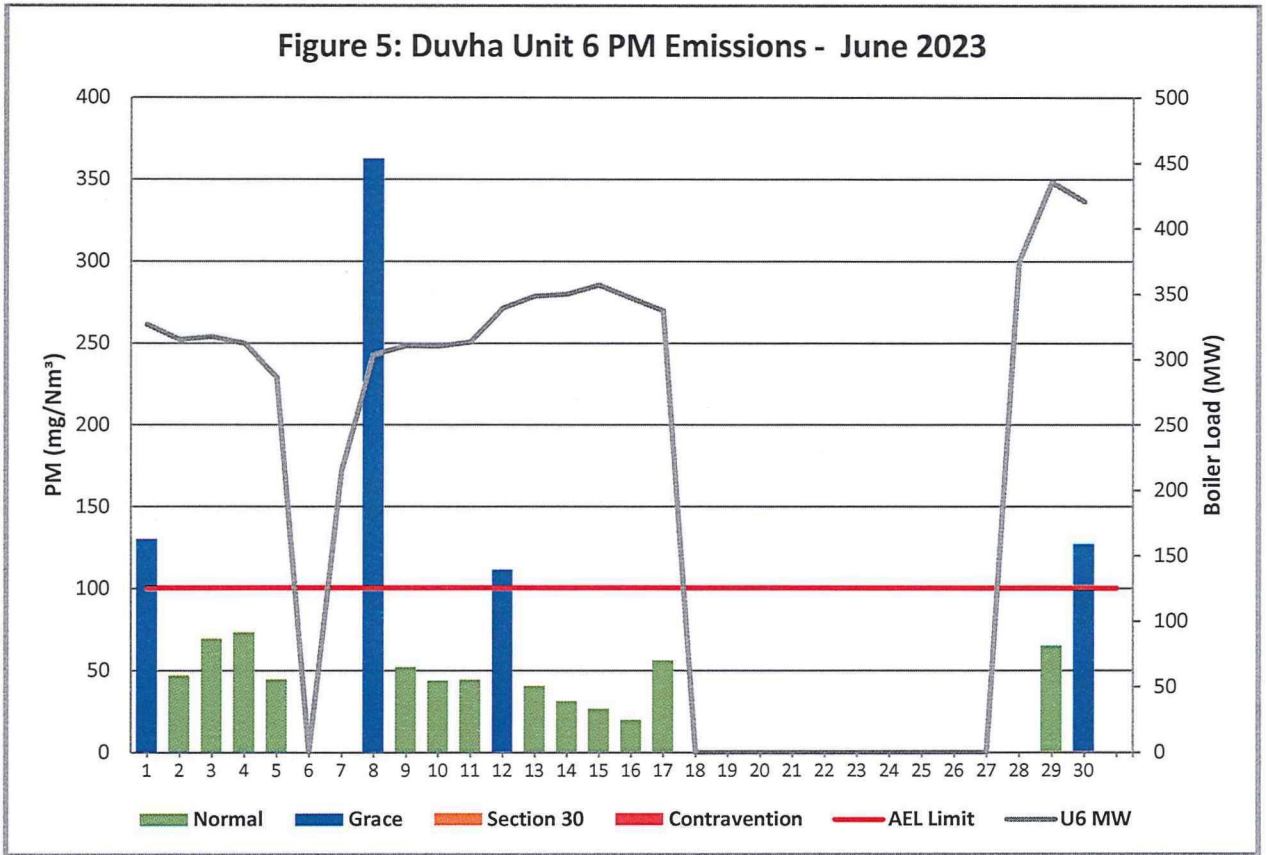


Figure 6: Duvha Unit 1 SO₂ Emissions - June 2023

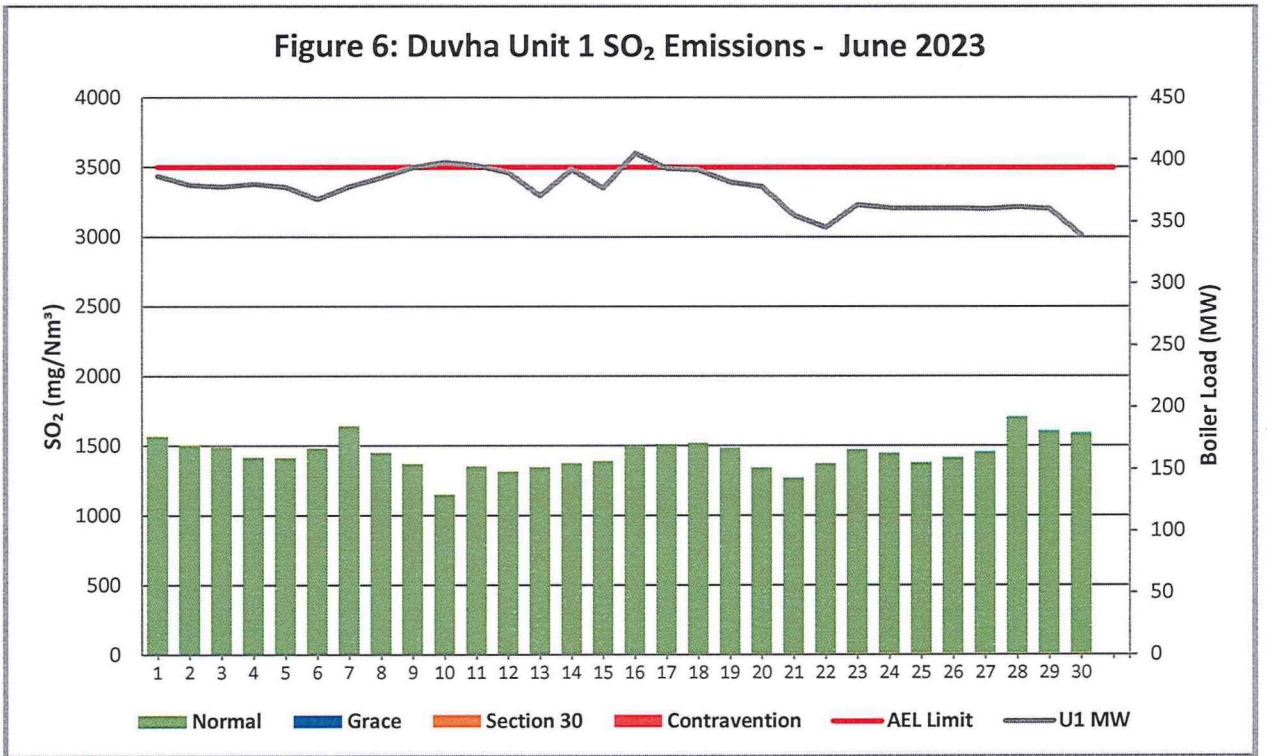


Figure 7: Duvha Unit 2 SO₂ Emissions - June 2023

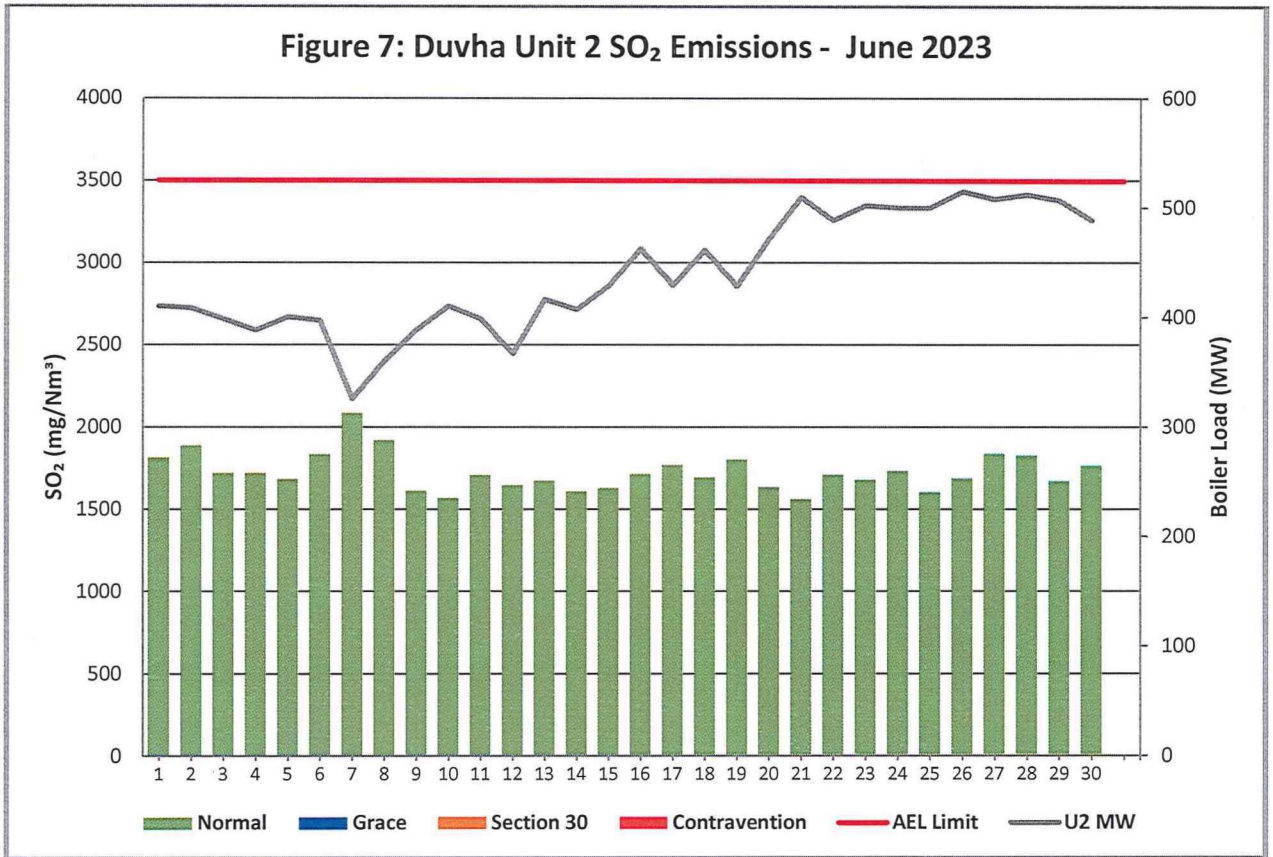


Figure 8: Duvha Unit 4 SO₂ Emissions - June 2023

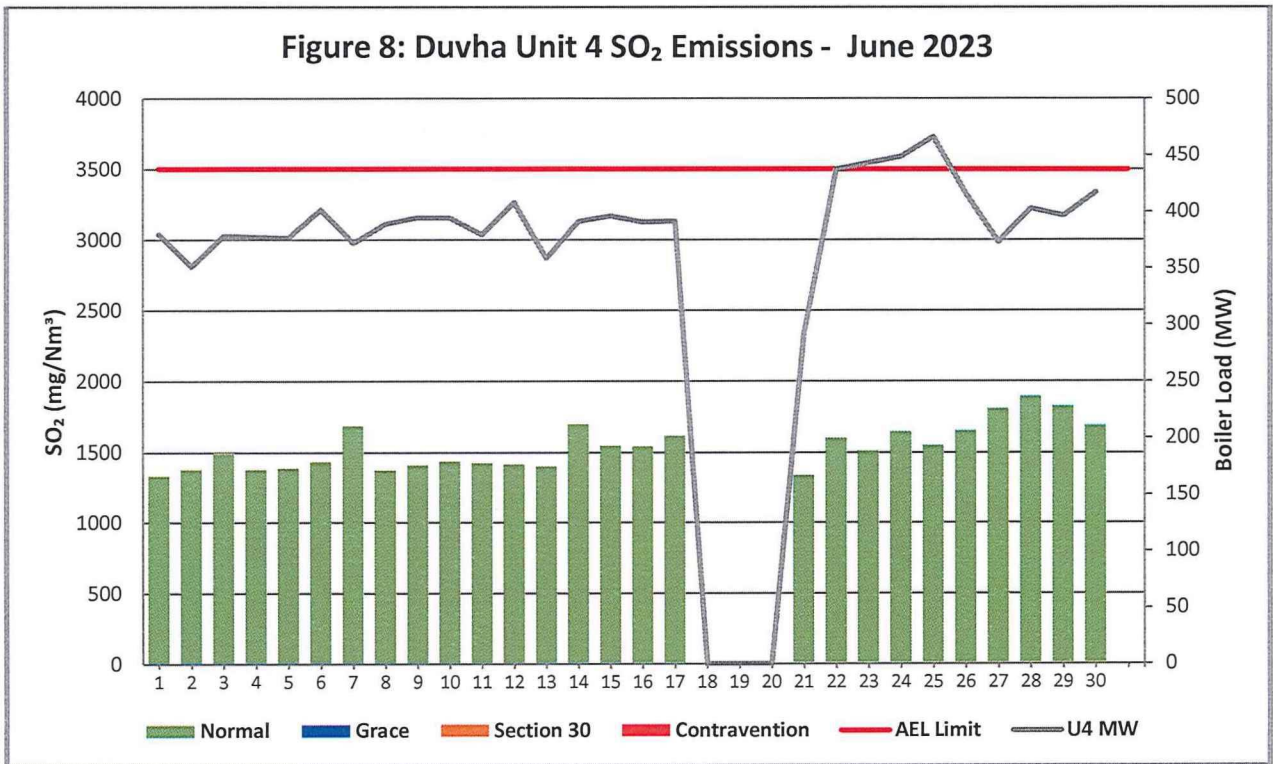


Figure 9: Duvha Unit 5 SO₂ Emissions - June 2023

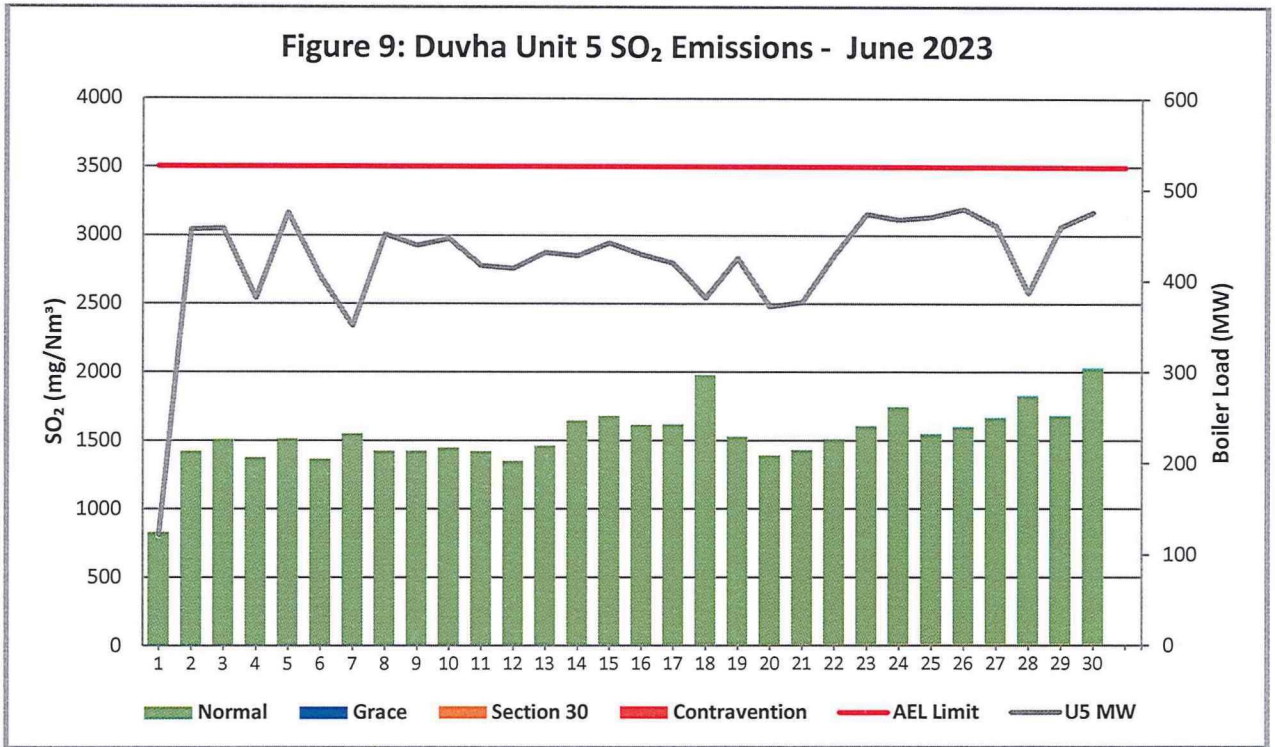


Figure 10: Duvha Unit 6 SO₂ Emissions - June 2023

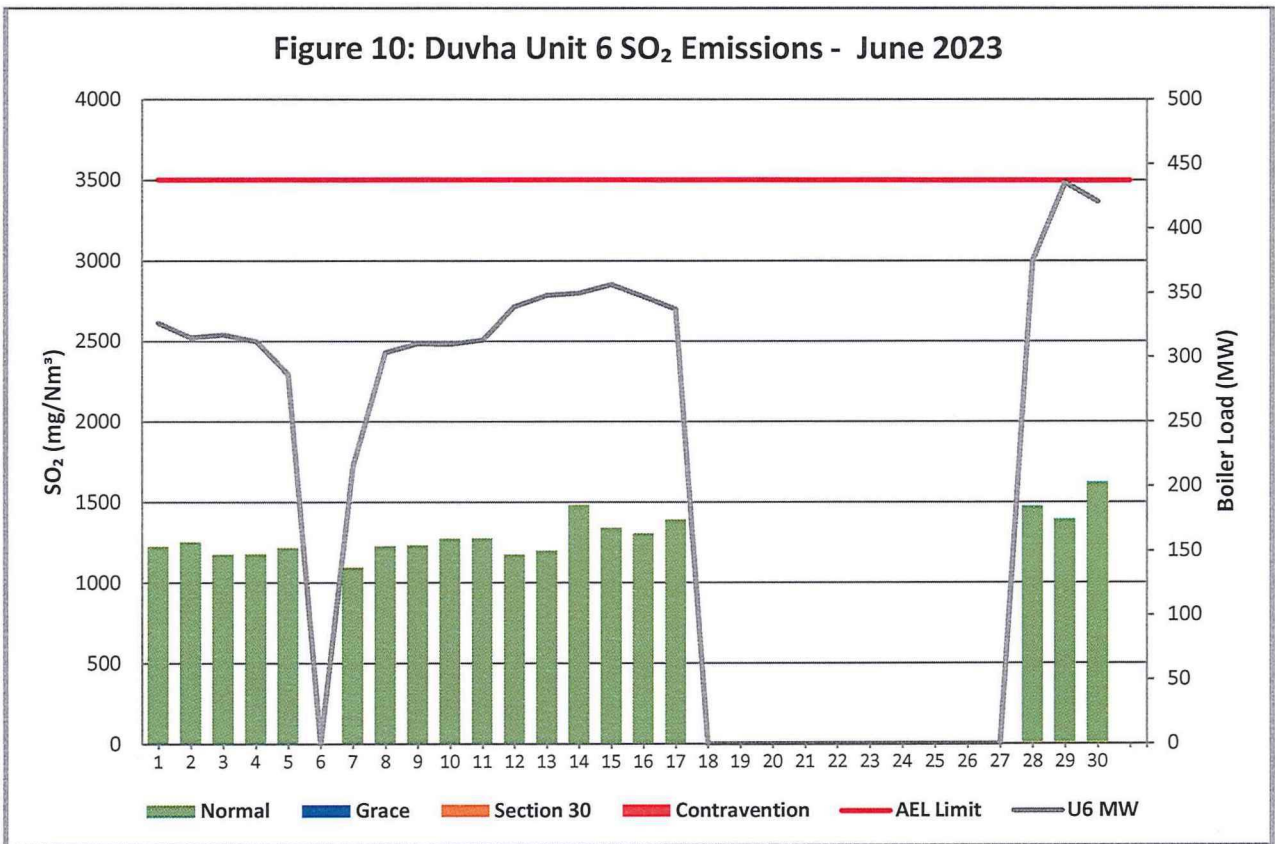


Figure 11: Duvha Unit 1 NOx Emissions - June 2023

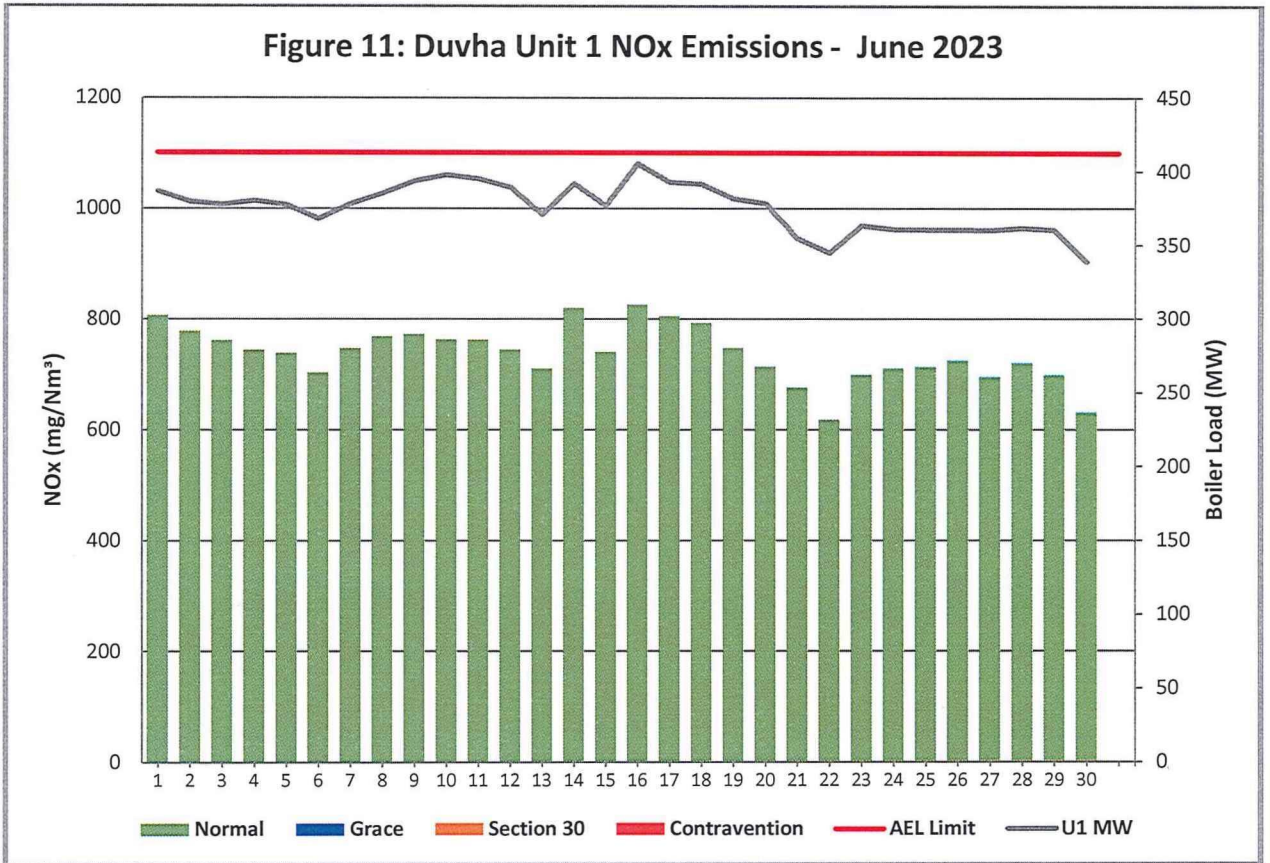


Figure 12: Duvha Unit 2 NOx Emissions - June 2023

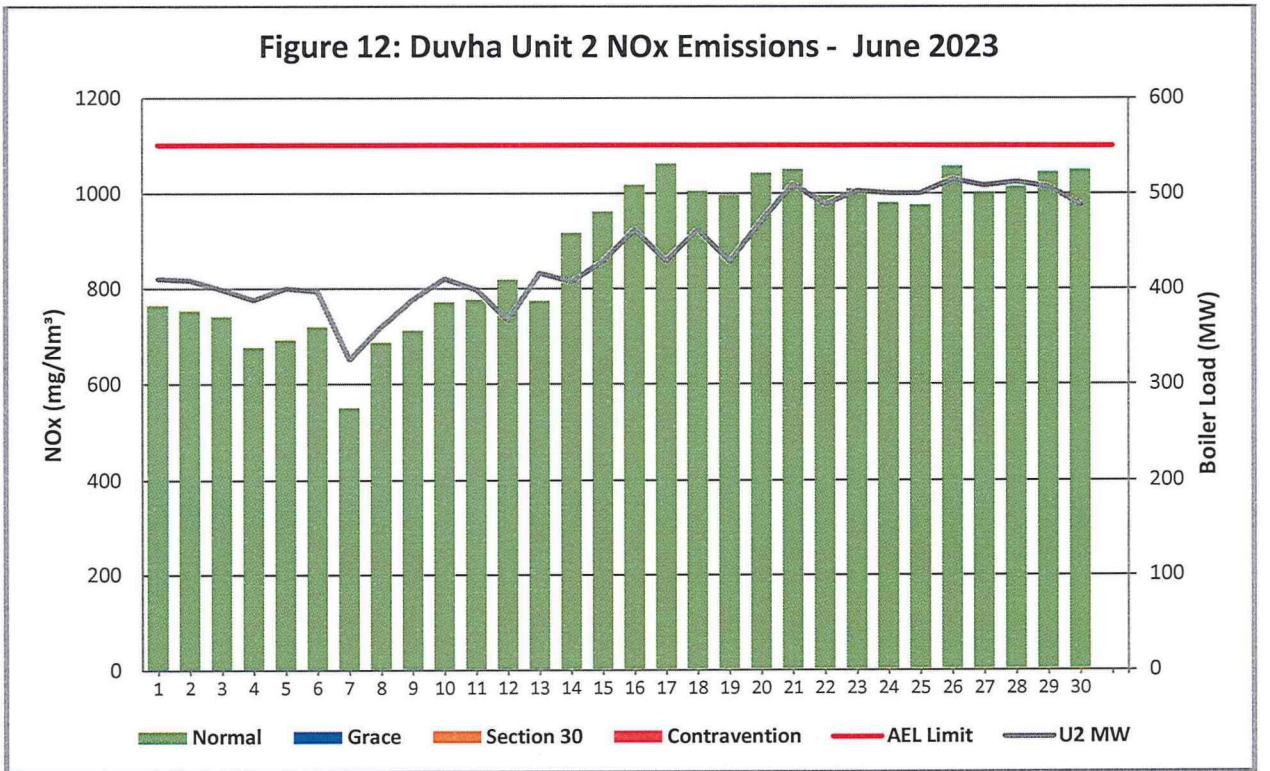


Figure 13: Duvha Unit 4 NOx Emissions - June 2023

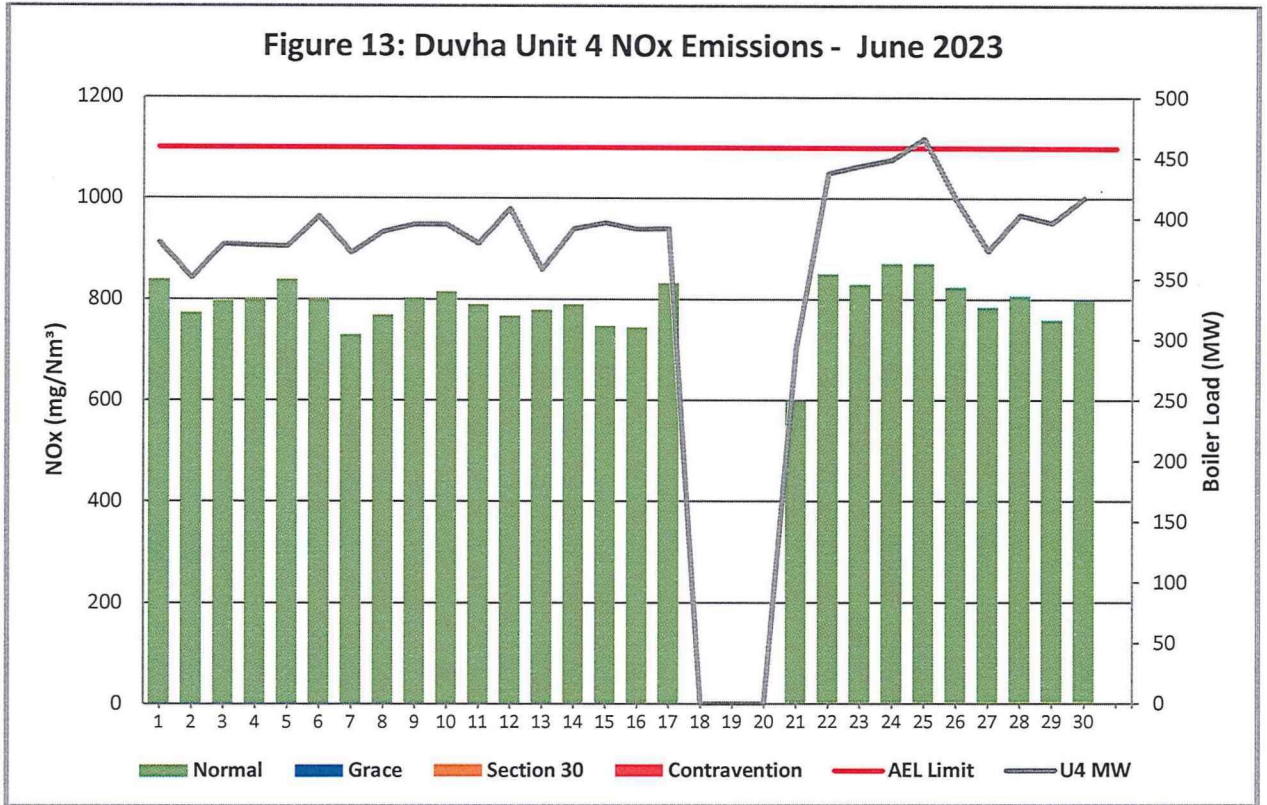
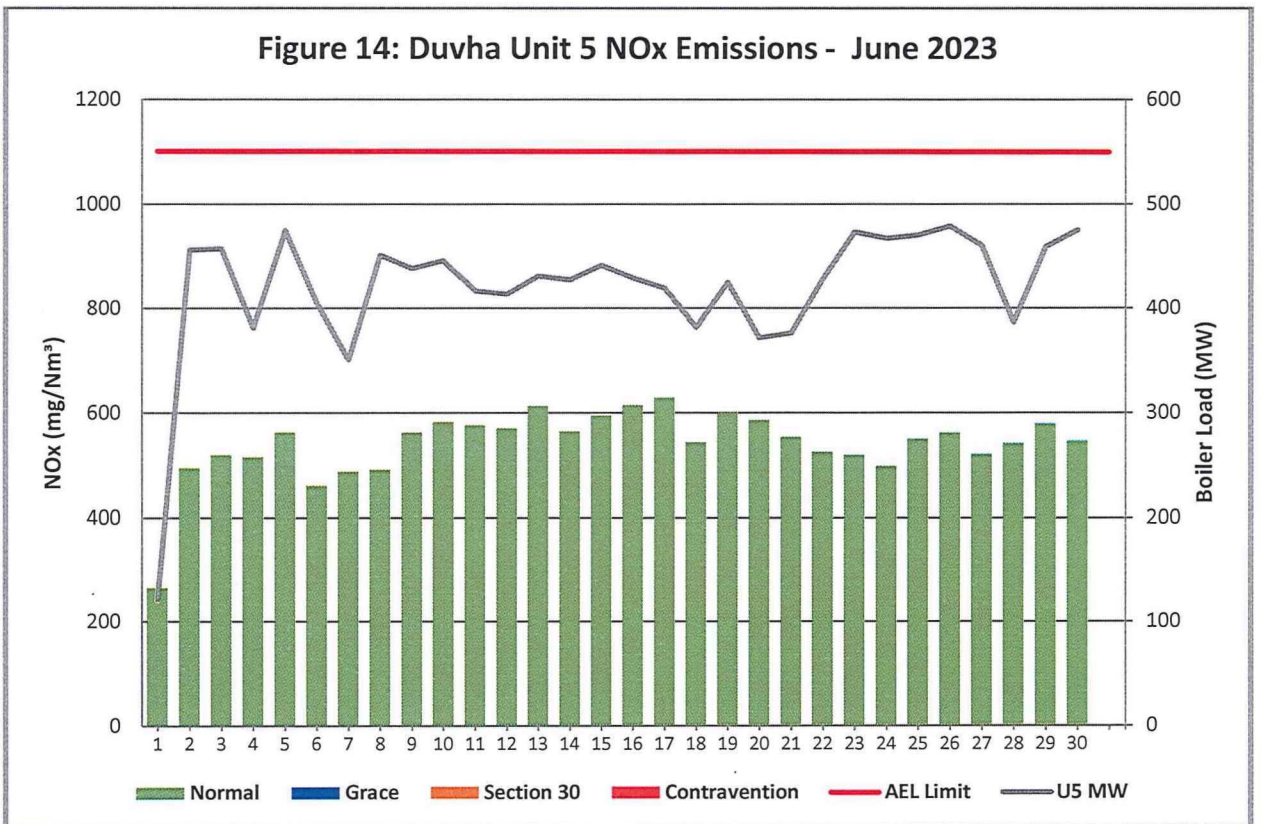
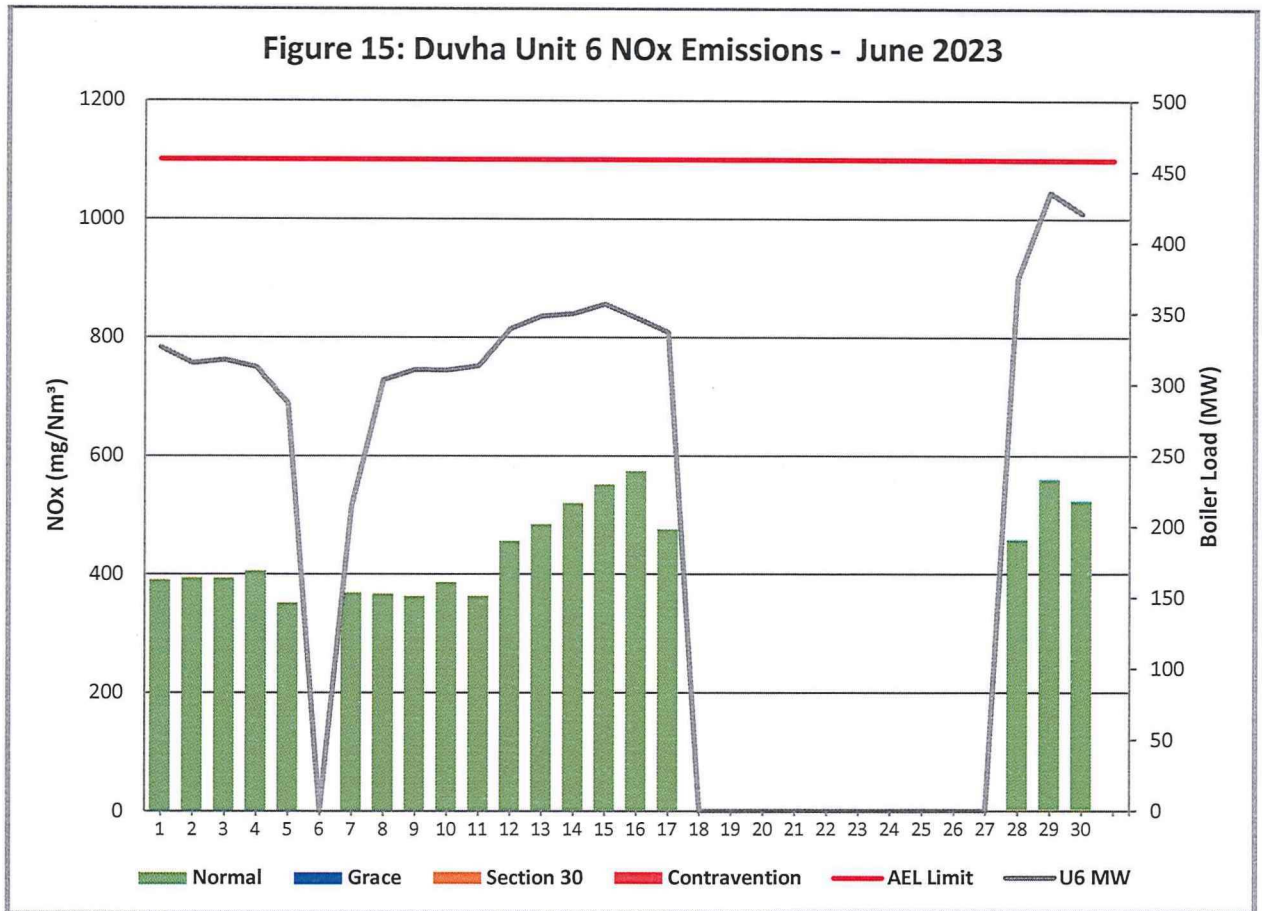


Figure 14: Duvha Unit 5 NOx Emissions - June 2023





7 SHUT DOWN AND LIGHT UP INFORMATION

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

Unit No.2	Event 1	
Breaker Open (BO)	6:50 am	2023/06/12
Draught Group (DG) Shut Down (SD)	9:30 am	2023/06/12
BO to DG SD (duration)	00:02:40	DD:HH:MM
Fires in time	11:00 am	2023/06/12
Synch. to Grid (or BC)	2:40 pm	2023/06/12
Fires in to BC (duration)	00:03:40	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

Unit No.4	Event 1	
Breaker Open (BO)	5:50 pm	2023/06/17
Draught Group (DG) Shut Down (SD)	11:20 am	2023/06/18
BO to DG SD (duration)	00:17:30	DD:HH:MM

Fires in time	1:55 am	2023/06/21
Synch. to Grid (or BC)	3:30 pm	2023/06/21
Fires in to BC (duration)	00:13:35	DD:HH:MM
Emissions below limit from BC (end date)	12:00 am	2023/06/23
Emissions below limit from BC (duration)	02:00:00	DD:HH:MM

Unit No.5	<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	5:05 pm	2023/06/01
Synch. to Grid (or BC)	11:10 pm	2023/06/01
Fires in to BC (duration)	00:06:05	DD:HH:MM
Emissions below limit from BC (end date)	1:00 pm	2023/06/04
Emissions below limit from BC (duration)	02:13:50	DD:HH:MM

Unit No.6	<i>Event 1</i>		<i>Event 2</i>	
Breaker Open (BO)	5:10 pm	2023/06/05	9:15 pm	2023/06/17
Draught Group (DG) Shut Down (SD)	5:30 pm	2023/06/05	4:20 pm	2023/06/19
BO to DG SD (duration)	00:00:20	DD:HH:MM	01:19:05	DD:HH:MM
Fires in time	11:50 am	2023/06/07	1:40 am	2023/06/28
Synch. to Grid (or BC)	7:00 pm	2023/06/07	8:45 am	2023/06/28
Fires in to BC (duration)	00:07:05	DD:HH:MM	00:07:05	DD:HH:MM
Emissions below limit from BC (end date)	12:00 am	2023/06/09	<i>not > limit</i>	<i>not > limit</i>
Emissions below limit from BC (duration)	01:05:00	DD:HH:MM	<i>n/a</i>	DD:HH:MM

8 GENERAL

Exceedances:

Unit 4:

01 -06/06/2023

- Contravention Incident: The 48 Hours allowable for upset conditions were exceeded on Duvha's unit 4 from the 02nd to 06th of June 2023. A detailed investigation report with root

cause and preventative actions will be submitted to your office once the investigation is completed.

08-09/06/2023

- The SO₃ common plant was switched off for replacing the Sulphur Hand Block Valve on the 8th of June 2023.
- There was a sulphur sensor failure.
- There were low process temperatures causing insufficient sulphur flow.

12/06/2023

- Backlog of dust on the Dust Handling plant (DHP) due to the plant failures (ash pumps flooding and right hand Airlift Blower pulling high temperatures) experienced.

16/06/2023

- High back-end temperatures due to a dirty boiler that was not soot blown the previous day.
- Electrostatic Precipitators (ESP) fields were underperforming

27/06/2023

- Due to the DHP that was off. The Electrostatic Precipitators (ESP) fields rows 1 – 3 and rappers were switched off to protect them.

29/06/2023

- SO₃ plant injection kept on going low.
- The oxygen was skewed (high on the right hand side) on the air damper affecting the performance of the ESPs.
- Back-end temperatures were high which resulted in high back-end temperatures.

Unit 5:

02-03/06/2023

- Cold unit light up.

05/06/2023

- Due to SO₃ plant issues. The Sulphur flow meter was suspected to not be reading. it was zeroed and the Sulphur flow increased

08/06/2023

- The SO₃ common plant was switched off for the replacement of common plant Sulphur supply pump.

20/06/2023

- The 1st and 2nd row of Electrostatic Precipitators (ESP) fields were switched off due to the Dust Handling plant (DHP) backlog.

Unit 6:

01/06/2023

- Cold unit light up.

12/06/2023

- High back-end temperatures after sootblowing conducted. Due low availability of sootblowers.

30/06/2023

- Cold unit light up.

Lastly 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. The monitors have been relocated successfully and verified. The Station is now conducting new Parallel tests required after relocation of the monitors.

Unit 2 Particulate Matter Emissions monitor:

31/05/2023 -05/06/2023

- Monitor reliability below 80% due to the virtual machine (duvsrv22) was in a transitioning/rebooting state and thus was down. This VM is responsible for the OPC link to the DCS and VA. The VM was restarted and the OPC link was restored.

The fuel oil usage for the month of June 2023 exceeded the permitted consumption rate. A detailed investigation report with root cause and preventative actions will be submitted to your office once the investigation is completed.

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

28/07/2023.
Date


Environmental
Manager

2023/07/27
Date


Engineering Manager
Ollhoff Nel

2023-07-28
Date

Compiled by: Environmental Officer

For: Nkangala District Municipality Air Quality Officer

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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 June 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 June 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	02/06/2023	06/06/2023	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 upset conditions were exceeded on Duvha's unit 4 from the 02 nd to 06 th of June 2023. A detailed investigation report with root cause and preventative actions will be submitted to your office no later than 20 September 2023.