



Generation

Nkangala District Municipality
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AND

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Total number of pages: 14

Total number of annexes: 1

DUVHA POWER STATION

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

GENERAL MANAGER

2024/11/05

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 Sep-2024
	Coal	Tons	1 400 000	491 554.130
	Fuel Oil	Tons	5 000	3479.26
Production Rates	Product / By-Product Name	Units	Maximum Production Capacity Permitted	Indicative Production Rate Sep-2024
	Energy	GWh	2 592.000	973.578
	Ash	Tons	not specified	125 100.5
	RE Ash	kg/MWh	not specified	0.183

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
CV Content	MJ/kg	18-24	21.70
Sulphur Content	%	0.6 TO >1.2	0.66
Ash Content	%	27 TO 30	25.45

3 EMISSION LIMITS (mg/Nm³)

Associated Unit/Stack	PM	SO ₂	NOx
Unit 1	100	3500	1100
Unit 2	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 Sep-2024	Technology Type	SO ₃ Utilization Sep-2024
Unit 1	FFP	99.9%	SO ₃	n/a
Unit 2	FFP	100.0%	SO ₃	n/a
Unit 4	ESP + SO ₃	99.7%	SO ₃	99.6%
Unit 5	ESP + SO ₃	99.8%	SO ₃	100.0%
Unit 6	ESP + SO ₃	99.9%	SO ₃	53.4%

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

5 MONITOR RELIABILITY (%)

Associated Unit/Stack	PM	SO ₂	NO	O ₂
Unit 1	100.0	100.0	100.0	99.8
Unit 2	100.0	97.2	100.0	95.1
Unit 4	100.0	86.4	63.6	89.8
Unit 5	100.0	99.3	25.8	100.0
Unit 6	89.3	0.0	75.3	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 September 2024

Associated Unit/Stack	PM (tons)	SO ₂ (tons)	NO _x (tons)
Unit 1	23.1	2 442	1 185
Unit 2	6.4	1 391	892
Unit 4	67.5	1 698	2 212
Unit 5	51.4	954	4 563
Unit 6	29.8	2 154	481
SUM	178.36	8 639	9 334

Table 6.2: Operating days in compliance to PM AEL Limit - September 2024

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average PM (mg/Nm ³)
Unit 1	25	0	0	0	0	17.3
Unit 2	22	0	0	0	0	5.8
Unit 4	22	1	0	0	0	57.7
Unit 5	15	1	0	0	0	63.5
Unit 6	18	0	0	0	0	38.7
SUM	102	2	0	0	0	

Table 6.3: Operating days in compliance to SO₂ AEL Limit - September 2024

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SO ₂ (mg/Nm ³)
Unit 1	26	0	0	0	0	1 695.3
Unit 2	24	0	0	0	0	1 164.5
Unit 4	25	0	0	0	0	1 367.9
Unit 5	19	0	0	0	0	1 080.4
Unit 6	20	0	0	1	1	2 032.6
SUM	114	0	0	1	1	

Table 6.4: Operating days in compliance to NO_x AEL Limit - September 2024

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NO _x (mg/Nm ³)
Unit 1	23	0	0	3	3	817.6
Unit 2	24	0	0	0	0	737.2
Unit 4	18	0	0	7	7	1 750.8
Unit 5	0	0	0	19	3	5 310.2
Unit 6	18	0	0	3	3	505.8
SUM	83	0	0	32	16	

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 - September 2024

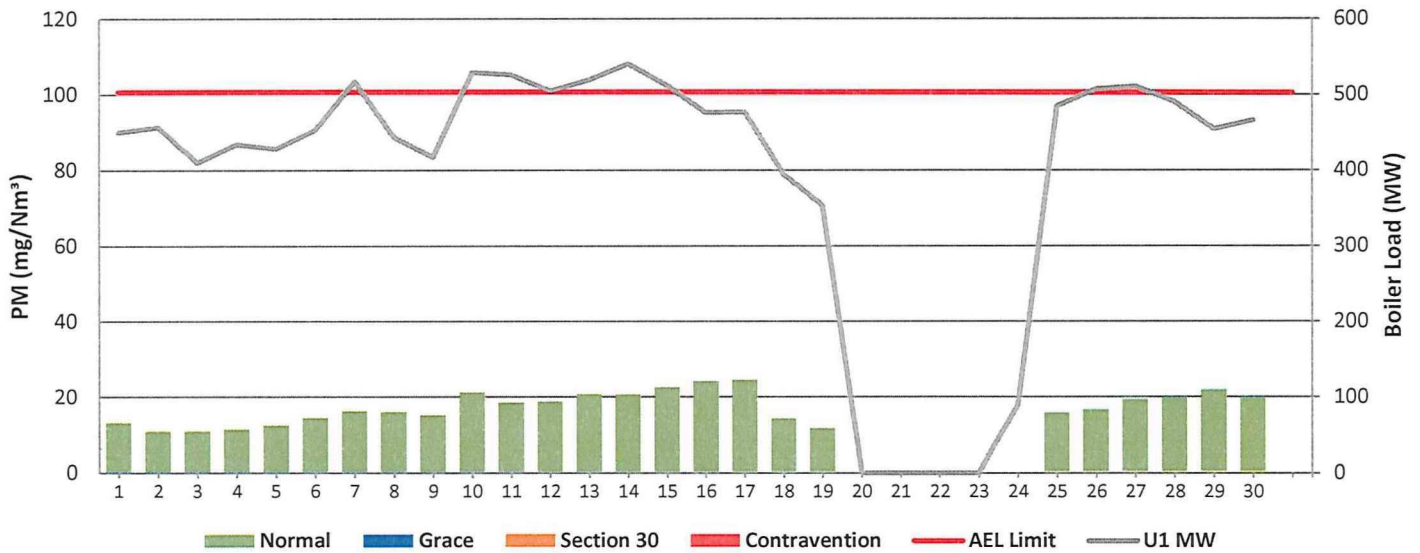


Figure 2: Duvha Unit 2 PM Emissions - September 2024

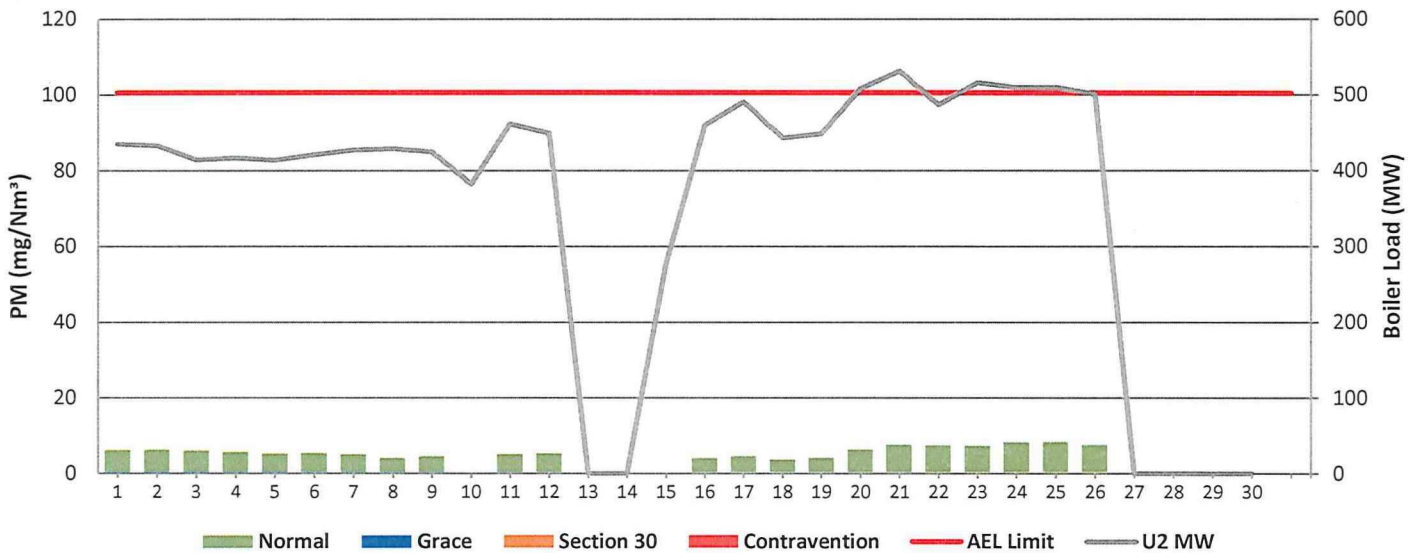


Figure 3: Duvha Unit 4 PM Emissions - September 2024

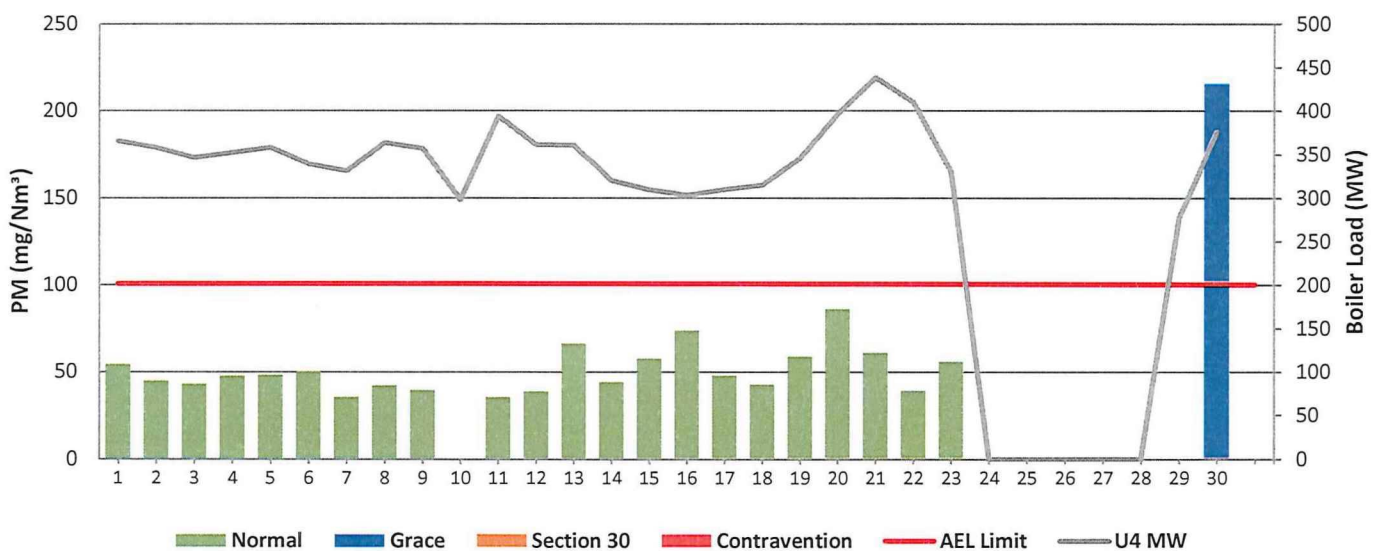


Figure 4: Duvha Unit 5 PM Emissions - September 2024

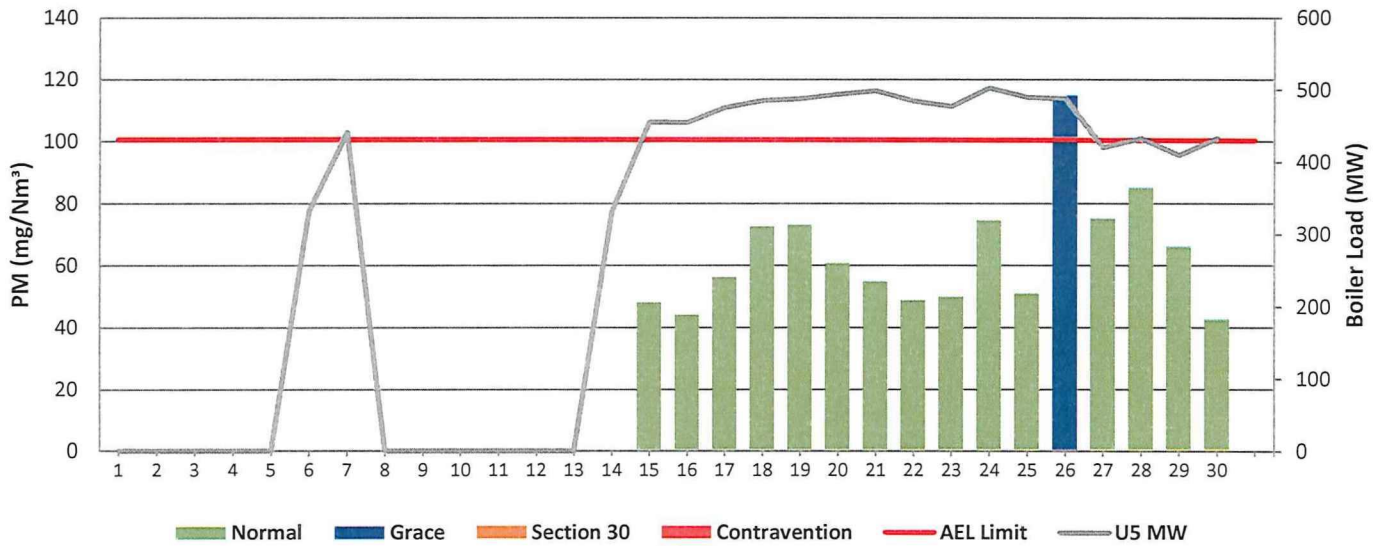


Figure 5: Duvha Unit 6 PM Emissions - September 2024

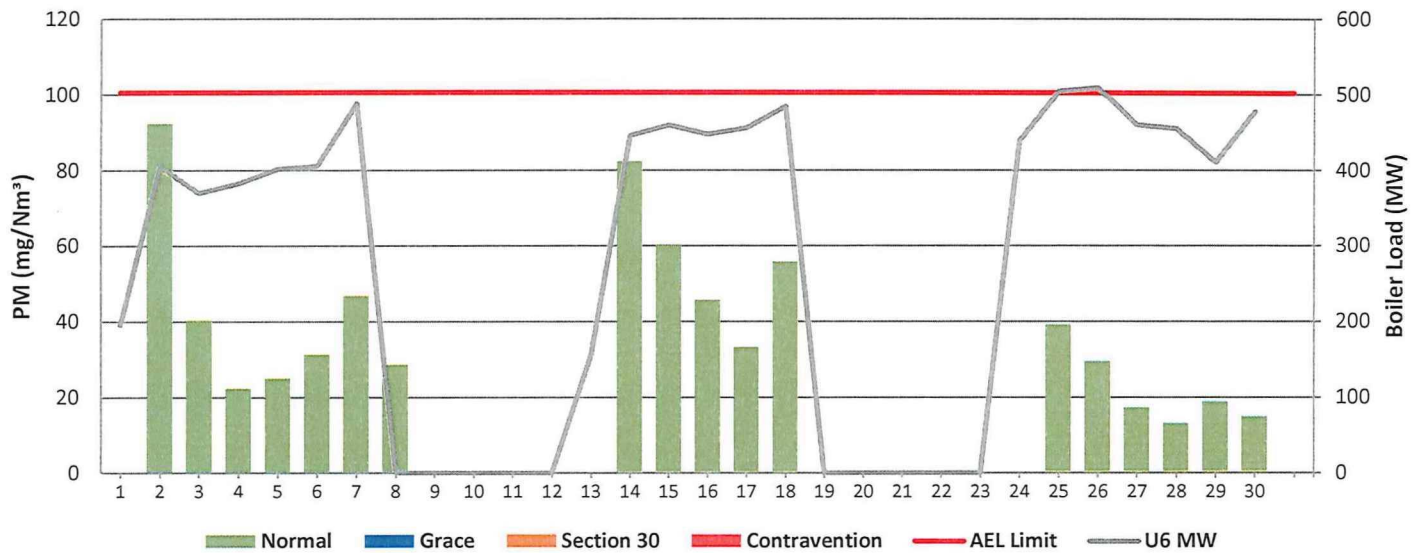


Figure 6: Duvha Unit 1 SO₂ Emissions - September 2024

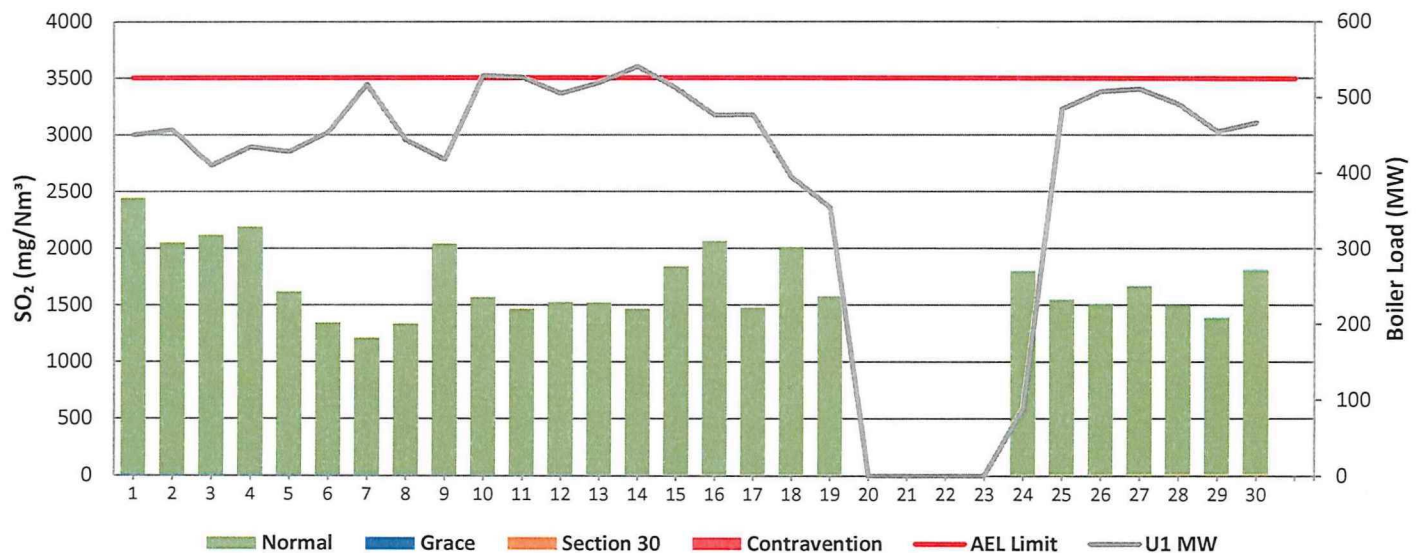


Figure 7: Duvha Unit 2 SO₂ Emissions - September 2024

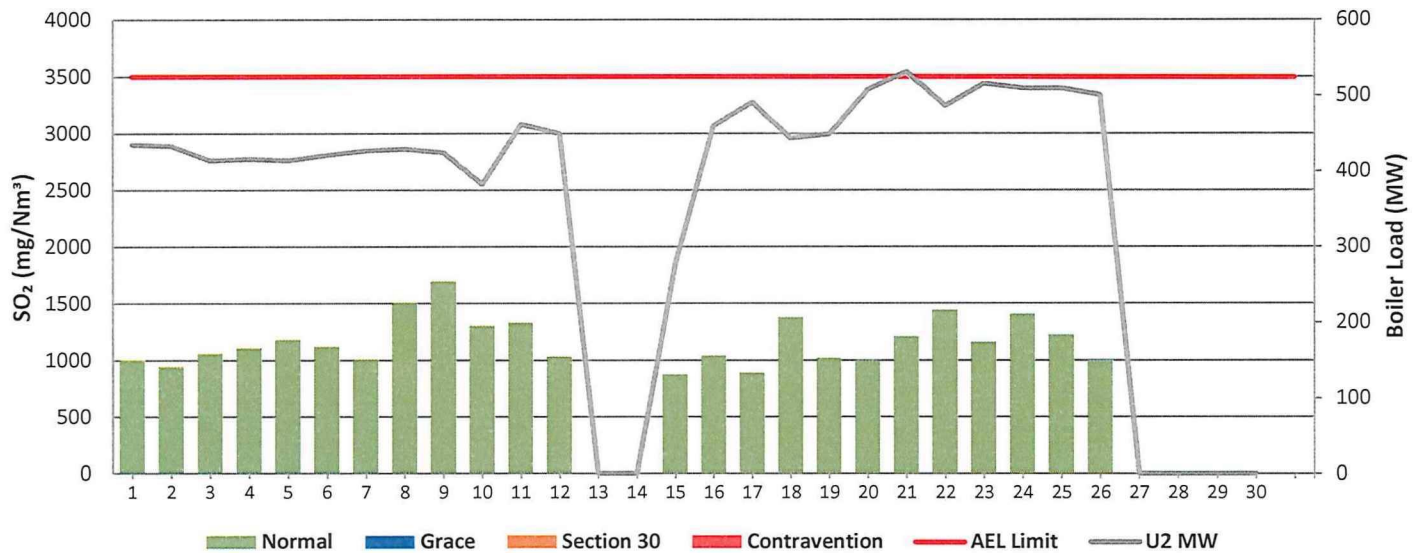


Figure 8: Duvha Unit 4 SO₂ Emissions - September 2024

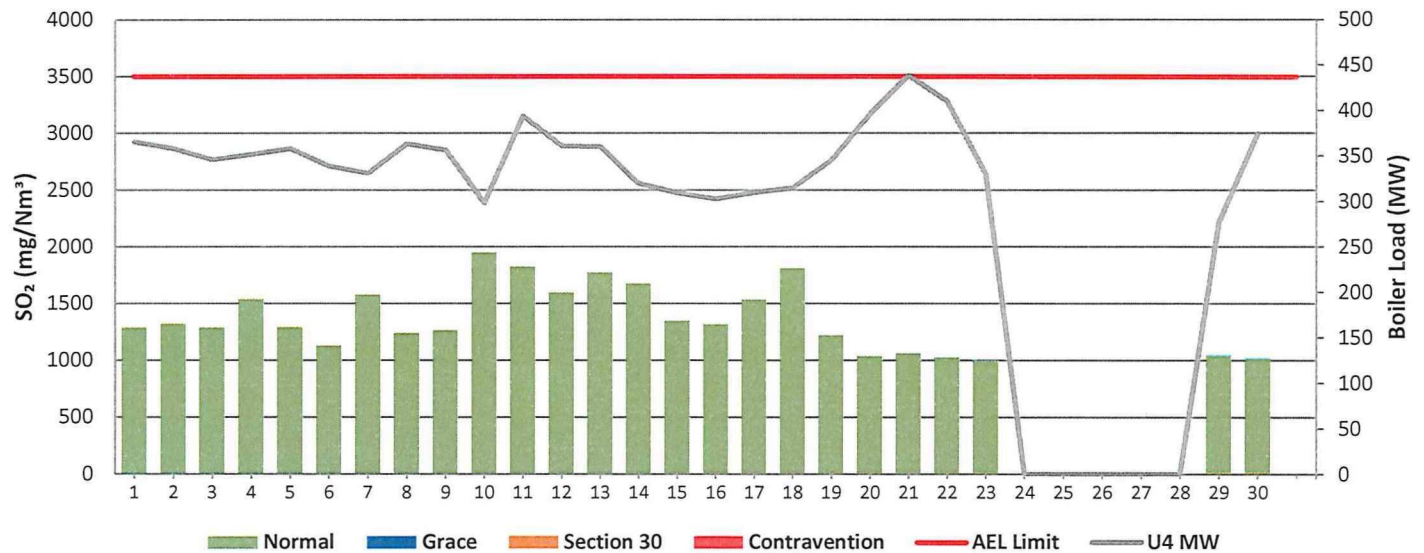


Figure 9: Duvha Unit 5 SO₂ Emissions - September 2024

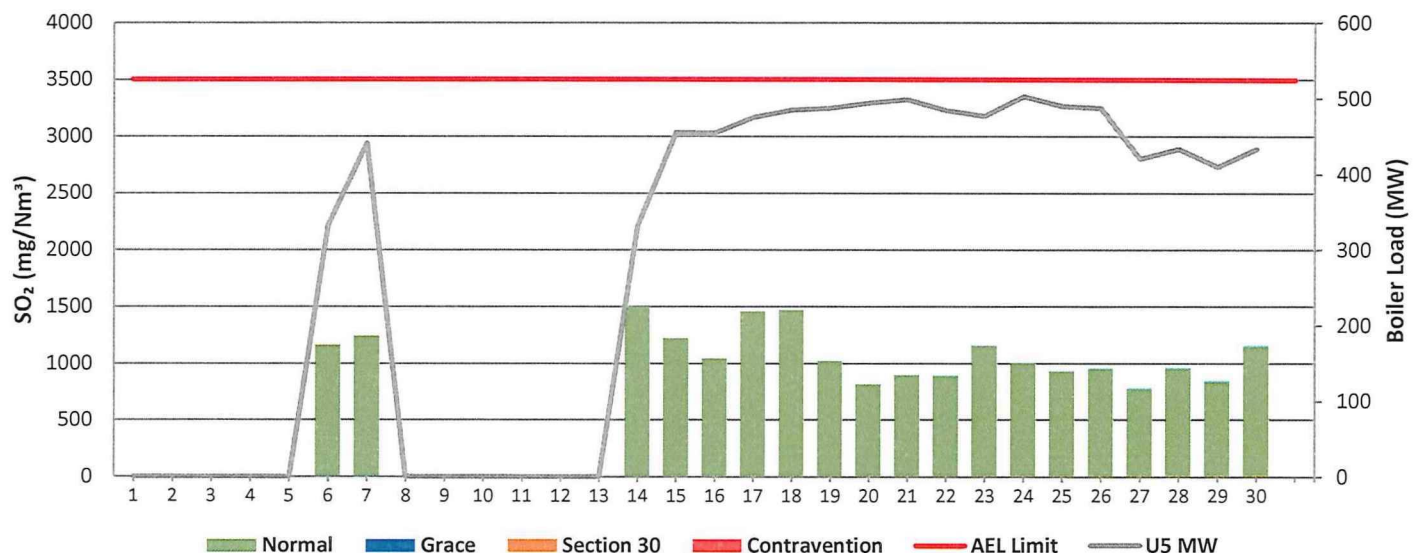


Figure 10: Duvha Unit 6 SO₂ Emissions - September 2024

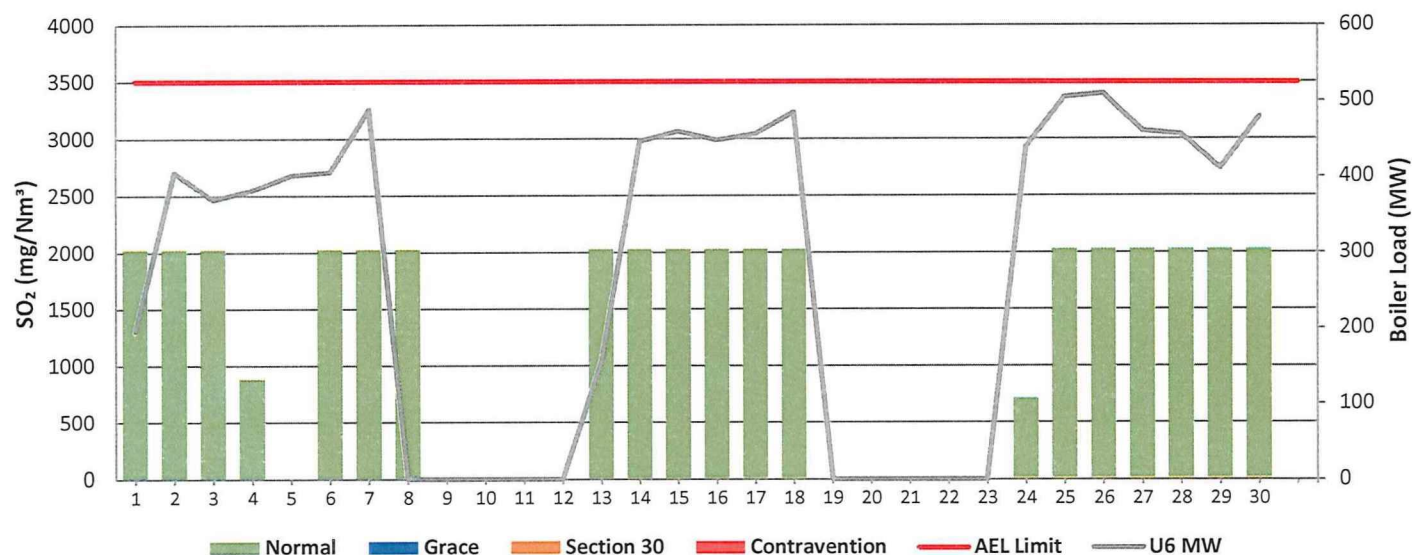


Figure 11: Duvha Unit 1 NO_x Emissions - September 2024

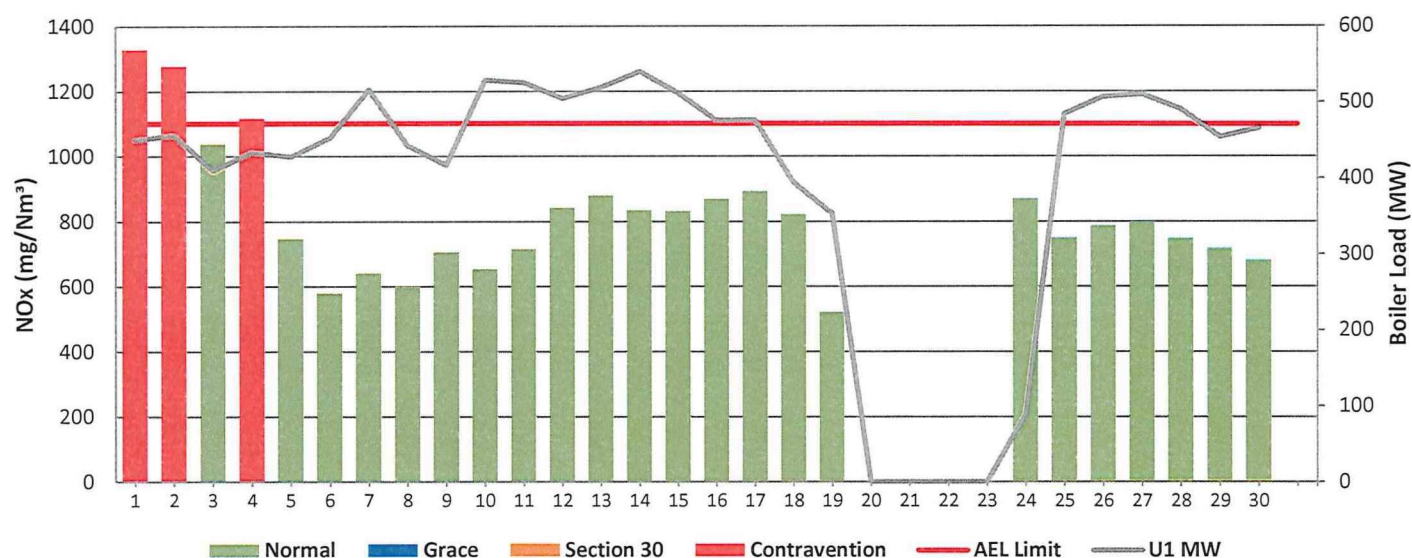


Figure 12: Duvha Unit 2 NO_x Emissions - September 2024



Figure 13: Duvha Unit 4 NOx Emissions - September 2024

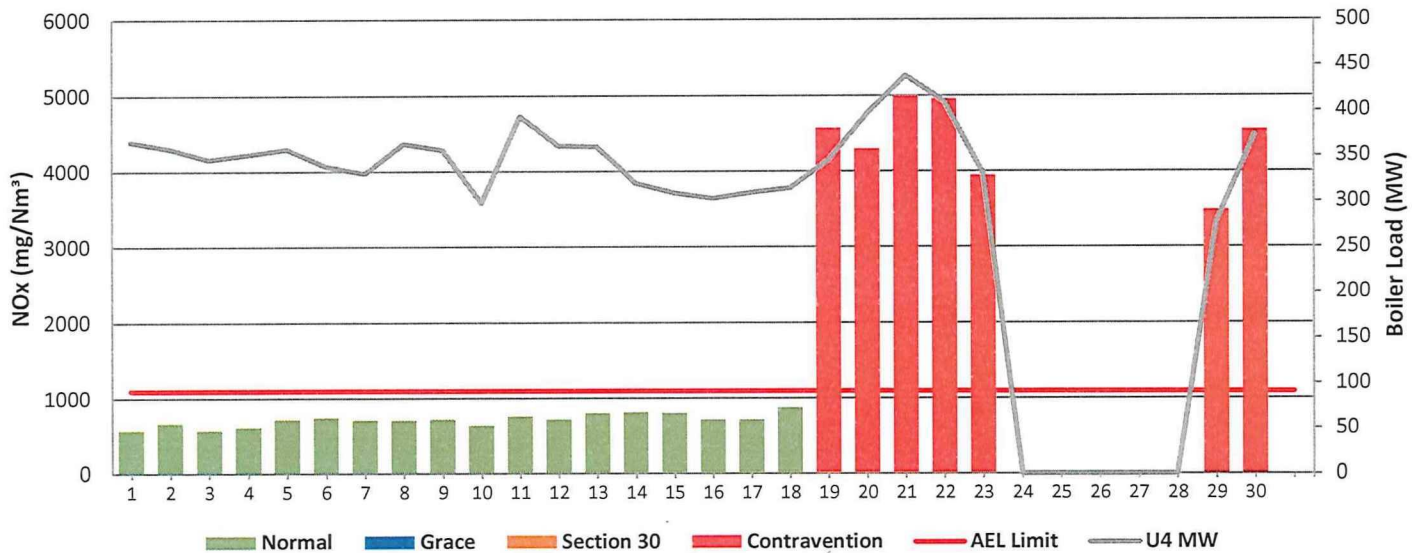


Figure 14: Duvha Unit 5 NOx Emissions - September 2024

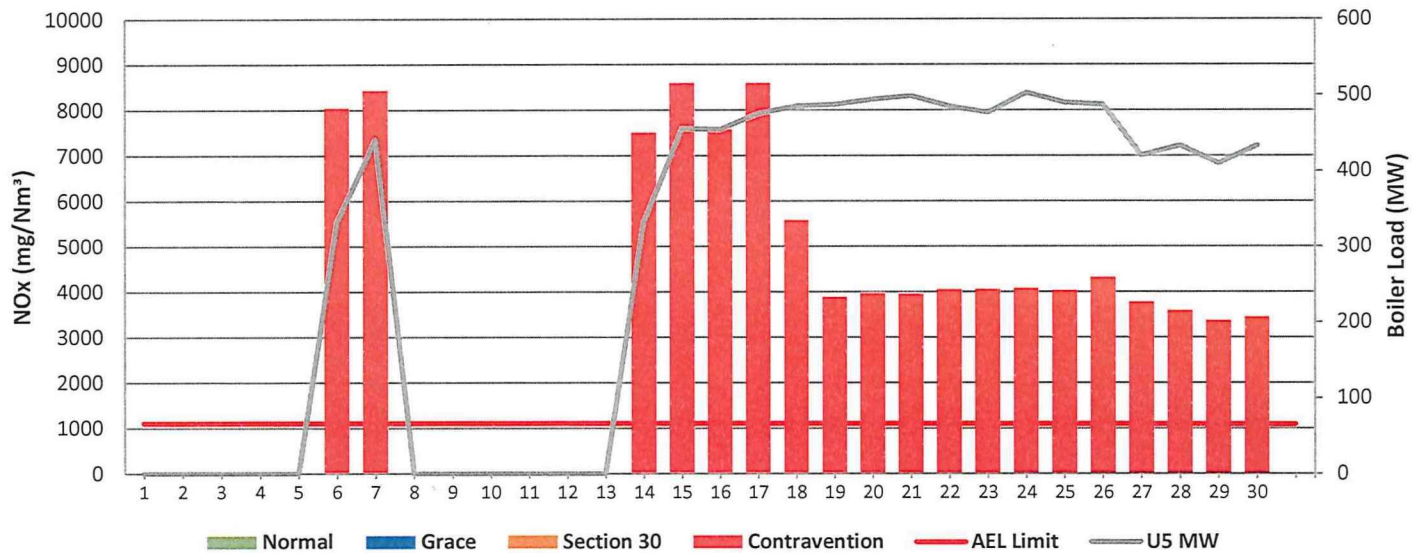
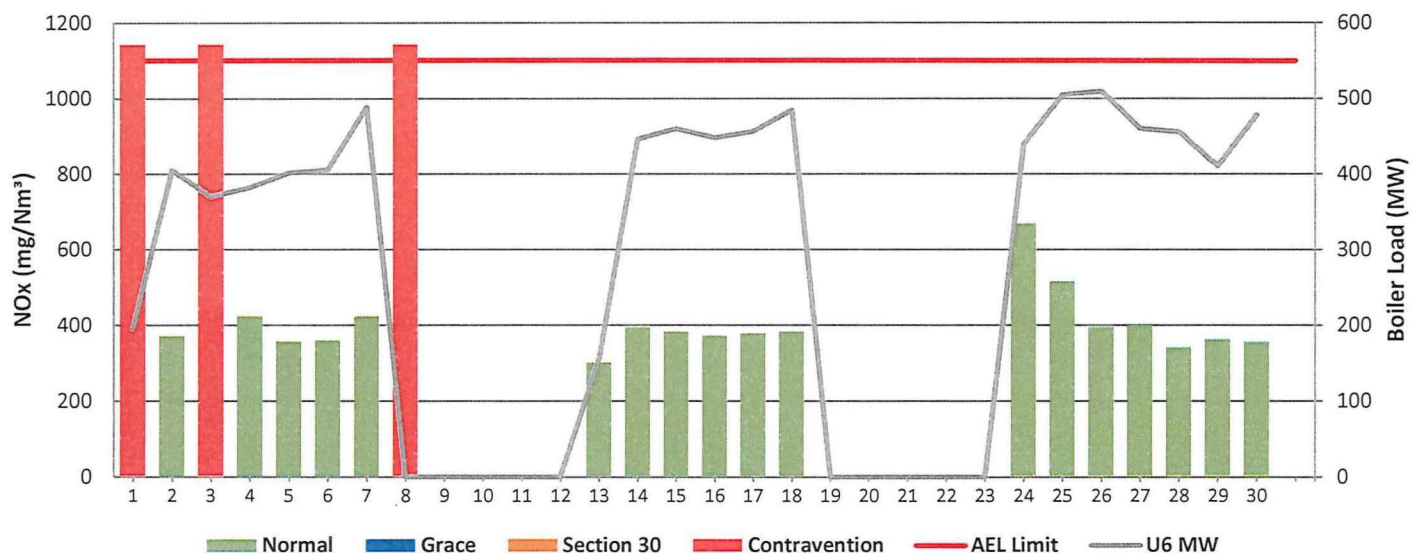


Figure 15: Duvha Unit 6 NOx Emissions - September 2024



Tables 7.1: Shut-down and light-up information for the month of September 2024

Unit No.1	Event 1		Event 2	
Breaker Open (BO)	4:55 pm	2024/09/09	10:15 pm	2024/09/19
Draught Group (DG) Shut Down (SD)	DG did not trip or SD	DG did not trip or SD	4:35 pm	2024/09/20
BO to DG SD (duration)	n/a	DD:HH:MM	00:18:20	DD:HH:MM
Fires in time			5:40 pm	2024/09/24
Synch. to Grid (or BC)	10:30 pm	2024/09/09	10:10 pm	2024/09/24
Fires in to BC (duration)		DD:HH:MM	00:04:30	DD:HH:MM
Emissions below limit from BC (end date)			not > limit	not > limit
Emissions below limit from BC (duration)		DD:HH:MM	n/a	DD:HH:MM

Unit No.2	Event 1		Event 2		Event 3	
Breaker Open (BO)	4:55 pm	2024/09/09	7:45 am	2024/09/12	11:00 pm	2024/09/26
Draught Group (DG) Shut Down (SD)	6:15 pm	2024/09/09	12:55 pm	2024/09/13	8:10 pm	2024/09/27
BO to DG SD (duration)	00:01:20	DD:HH:MM	01:05:10	DD:HH:MM	00:21:10	DD:HH:MM
Fires in time	1:55 am	2024/09/10	1:20 pm	2024/09/15		
Synch. to Grid (or BC)	9:45 am	2024/09/10	7:30 pm	2024/09/15		
Fires in to BC (duration)	00:07:50	DD:HH:MM	00:06:10	DD:HH:MM		DD:HH:MM
Emissions below limit from BC (end date)	not > limit	not > limit	not > limit	not > limit		
Emissions below limit from BC (duration)	n/a	DD:HH:MM	n/a	DD:HH:MM		DD:HH:MM

Unit No.4	Event 1		Event 2	
Breaker Open (BO)	4:55 pm	2024/09/09	1:25 am	2024/09/23
Draught Group (DG) Shut Down (SD)	6:35 pm	2024/09/09	10:20 am	2024/09/23
BO to DG SD (duration)	00:01:40	DD:HH:MM	00:08:55	DD:HH:MM
Fires in time	9:50 am	2024/09/10	5:30 pm	2024/09/28
Synch. to Grid (or BC)				
Fires in to BC (duration)	00:06:00	DD:HH:MM	00:07:40	DD:HH:MM
Emissions below limit from BC (end date)	not > limit	not > limit	not > limit	not > limit
Emissions below limit from BC (duration)		DD:HH:MM		DD:HH:MM

Unit No.5	Event 1	
Breaker Open (BO)	BO previously	BO previously
Draught Group (DG) Shut Down (SD)	n/a	n/a
BO to DG SD (duration)	n/a	DD:HH:MM
Fires in time	10:00 am	2024/09/14
Synch. to Grid (or BC)	2:55 pm	2024/09/14
Fires in to BC (duration)	00:04:55	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.6	Event 1		Event 2		Event 3	
Breaker Open (BO)	12:05 am	2024/09/08	12:20 pm	2024/09/18	2:40 pm	2024/09/27
Draught Group (DG) Shut Down (SD)	1:00 pm	2024/09/08	2:20 pm	2024/09/18	DG did not trip or SD	DG did not trip or SD
BO to DG SD (duration)	00:12:55	DD:HH:MM	00:02:00	DD:HH:MM	n/a	DD:HH:MM
Fires in time	2:20 pm	2024/09/13	10:20 pm	2024/09/23		
Synch. to Grid (or BC)	6:45 pm	2024/09/13	3:30 am	2024/09/24		
Fires in to BC (duration)		DD:HH:MM	00:05:10	DD:HH:MM		DD:HH:MM
Emissions below limit from BC (end date)	not > limit	not > limit	not > limit	not > limit		
Emissions below limit from BC (duration)	n/a	DD:HH:MM	n/a	DD:HH:MM		DD:HH:MM

8 COMPLAINTS

There were no complaints for this month

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

9 GENERAL

Exceedance:

Unit 5

26/092024

The particulate matter exceeded on this day due to planned sootblower maintenance During this period Sootblowing was done 3 times which increased emissions

Unit 4

30/09/2024

The unit was synchronised on the 29th at 01 08 The particulate matter exceeded on this day due to the SO3 plant that delayed injecting due to the sulphur temperature that was reading 27°C vs the normal 126°C Some precip fields had persistent power failures and some precip fields had a communication failure between the plant and human machinery interface

Additionally, the reasons for the NOx gas exceedances for the month of September are attached in an investigation report as appendix A Also covered in appendix A are the reasons why the NOx Monitor reliability was below 80% for unit 4 and 5 and SOx monitor reliability at 0% for unit 6

The SO3 utilisation was 53 4% for the month of September The SO3 utilization calculation is being investigated as the value calculated on the spreadsheet does not align what is seen on the plant historian

Lastly the averages for Oxygen (O2) and Carbon Dioxide (CO2) data from the QAL2 tests reports were used for reporting gaseous emissions for units 2, 4, 5 and 6 due to poor performance of the O2 and CO2 gaseous monitors These poor performances of the monitors are due to the inability to conduct bi-weekly calibrations of the O2 analysers due to the unavailability of a maintenance contract with a service provider The maintenance contract was eventually placed on the 1st of October 2024

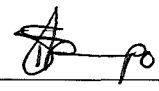
The rest of the information demonstrating compliance with the emission license conditions is supplied in the annual emission report which will be sent to your office

10 S30 Incidents Register

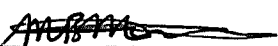
There were no section 30 incident for this month


Boiler Plant Engineering Manager

05/11/2024
Date


Environmental Manager

2024/11/05
Date


Engineering Manager

2024-11-05
Date

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