

## Generation

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1050

**Attention:**

Mr V Mahlangu

AND

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## DUVHA POWER STATION

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



GENERAL MANAGER

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2024/05/22

DATE



**FEBRUARY  
2024**

**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 Feb-2024
	Coal	Tons	1 400 000	519 078.00
	Fuel Oil	Tons	5 000	5 679.73
Production Rates	Product / By-Product Name	Units	Maximum Production Capacity Permitted	Indicative Production Rate Feb-2024
	Energy	GWh	2 505.600	912.44
	Ash	Tons	not specified	133195.41

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	%	0.6 TO >1.2	0.71
Ash Content	%	27 TO 30	25.66

### 3 EMISSION LIMITS (mg/Nm<sup>3</sup>)

Associated Unit/Stack	PM	SO <sub>2</sub>	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 Feb-2024	Technology Type	SO <sub>3</sub> Utilization Feb-2024
Unit 1	FFP	100.0%	SO <sub>3</sub>	n/a
Unit 2	FFP	100.0%	SO <sub>3</sub>	n/a
Unit 4	ESP + SO <sub>3</sub>	99.4%	SO <sub>3</sub>	99.8%
Unit 5	ESP + SO <sub>3</sub>	99.6%	SO <sub>3</sub>	100.0%
Unit 6	ESP + SO <sub>3</sub>	99.8%	SO <sub>3</sub>	100.0%

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

## 5 MONITOR RELIABILITY (%)

Associated Unit/Stack	PM	SO <sub>2</sub>	NO	O <sub>2</sub>
Unit 1	100.0	14.3	14.3	92.9
Unit 2	100.0	35.8	36.1	100.0
Unit 4	99.7	99.7	99.7	99.8
Unit 5	100.0	98.6	98.6	100.0
Unit 6	95.1	98.3	98.7	100.0

Note: NO<sub>x</sub> emissions is measured as NO in PPM. Final NO<sub>x</sub> value is expressed as total NO<sub>2</sub>

## 6 EMISSION PERFORMANCE

Table 6.1: Monthly tonnages for the month of February 2024

6	PM (tons)	SO <sub>2</sub> (tons)	NO <sub>x</sub> (tons)
Unit 1	10.7	660	201
Unit 2	8.6	2 224	1 201
Unit 4	136.1	1 921	862
Unit 5	140.5	2 199	994
Unit 6	58.4	3 118	1 158
SUM	354.36	10 121	4 416

Table 6 2 Operating days in compliance to PM AEL Limit - February 2024

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average PM (mg/Nm³)
Unit 1	8	0	0	0	0	32.6
Unit 2	23	0	0	0	0	7.2
Unit 4	16	8	0	0	8	117.2
Unit 5	21	8	0	0	3	99.0
Unit 6	19	3	0	0	3	52.4
<b>SUM</b>	<b>87</b>	<b>19</b>	<b>0</b>	<b>0</b>	<b>14</b>	

Table 6 3 Operating days in compliance to SO<sub>2</sub> AEL Limit - February 2024

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SO <sub>2</sub> (mg/Nm³)
Unit 1	14	0	0	0	0	1 137.7
Unit 2	25	0	0	0	0	1 724.5
Unit 4	25	0	0	0	0	1 636.7
Unit 5	29	0	0	0	0	1 544.4
Unit 6	24	0	0	0	0	2 273.9
<b>SUM</b>	<b>117</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	



Table 6.4: Operating days in compliance to NO<sub>x</sub> AEL Limit - February 2024

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NO <sub>x</sub> (mg/Nm <sup>3</sup> )
Unit 1	14	0	0	0	0	346.8
Unit 2	25	0	0	0	0	931.6
Unit 4	25	0	0	0	0	723.7
Unit 5	28	0	0	1	0	695.0
Unit 6	24	0	0	0	0	834.8
<b>SUM</b>	<b>116</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>0</b>	

Note: NO<sub>x</sub> emissions is measured as NO in PPM. Final NO<sub>x</sub> value is expressed as total NO<sub>2</sub>

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 - February 2024

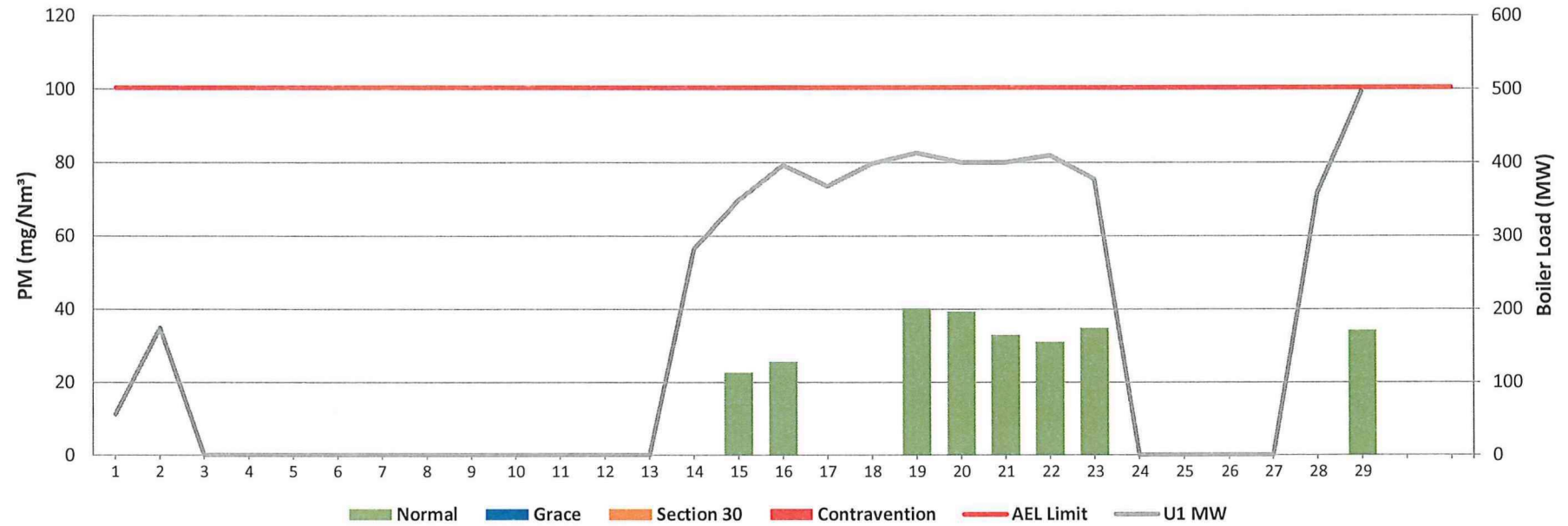


Figure 2: Duvha Unit 2 PM Emissions - February 2024

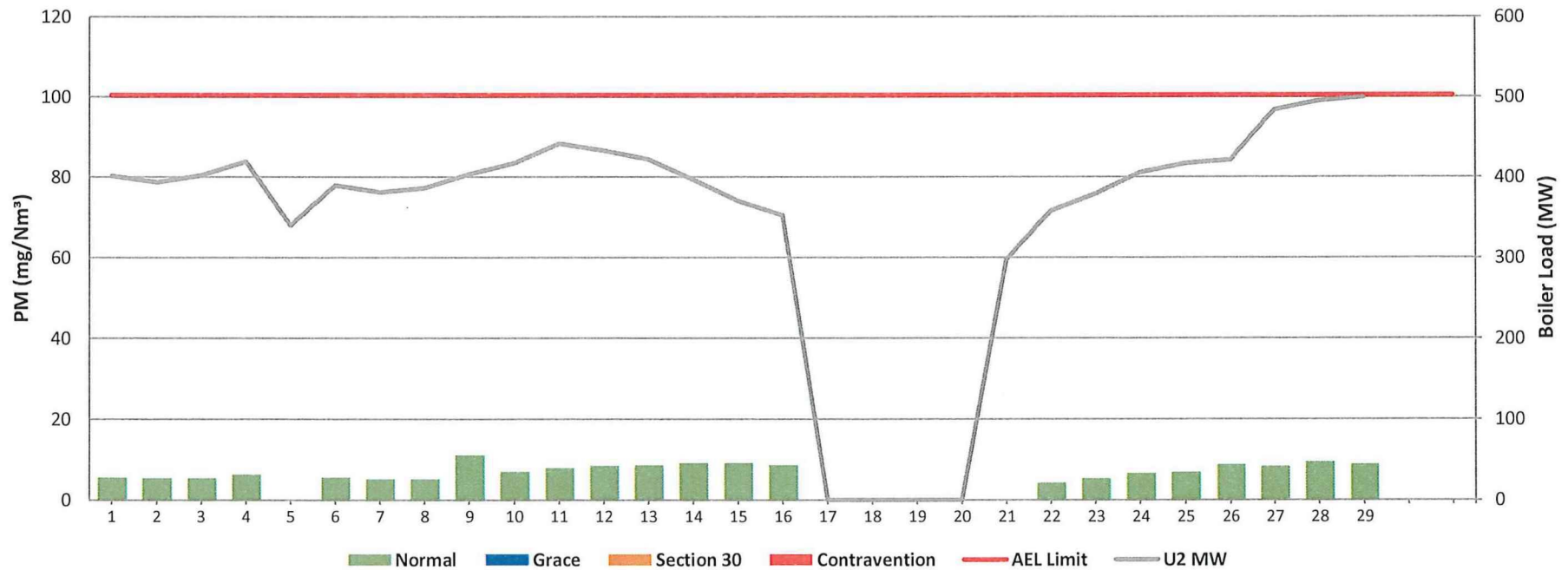




Figure 3: Duvha Unit 4 PM Emissions - February 2024

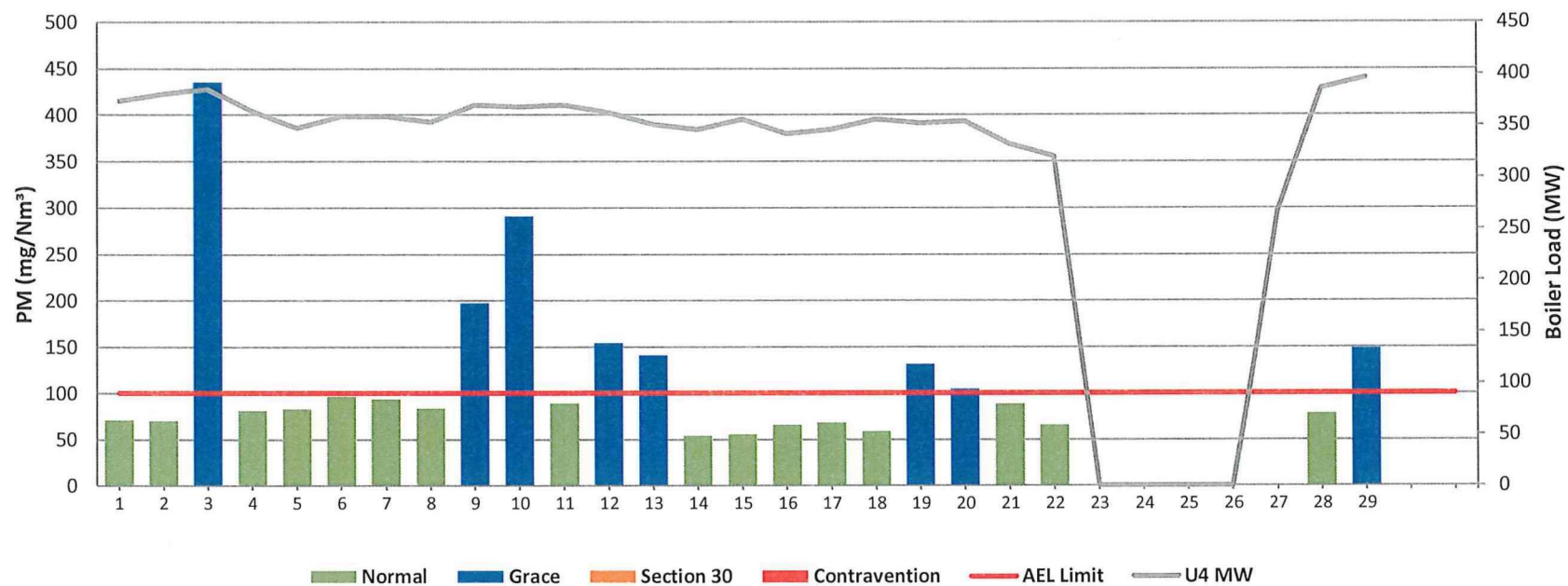


Figure 4: Duvha Unit 5 PM Emissions - February 2024

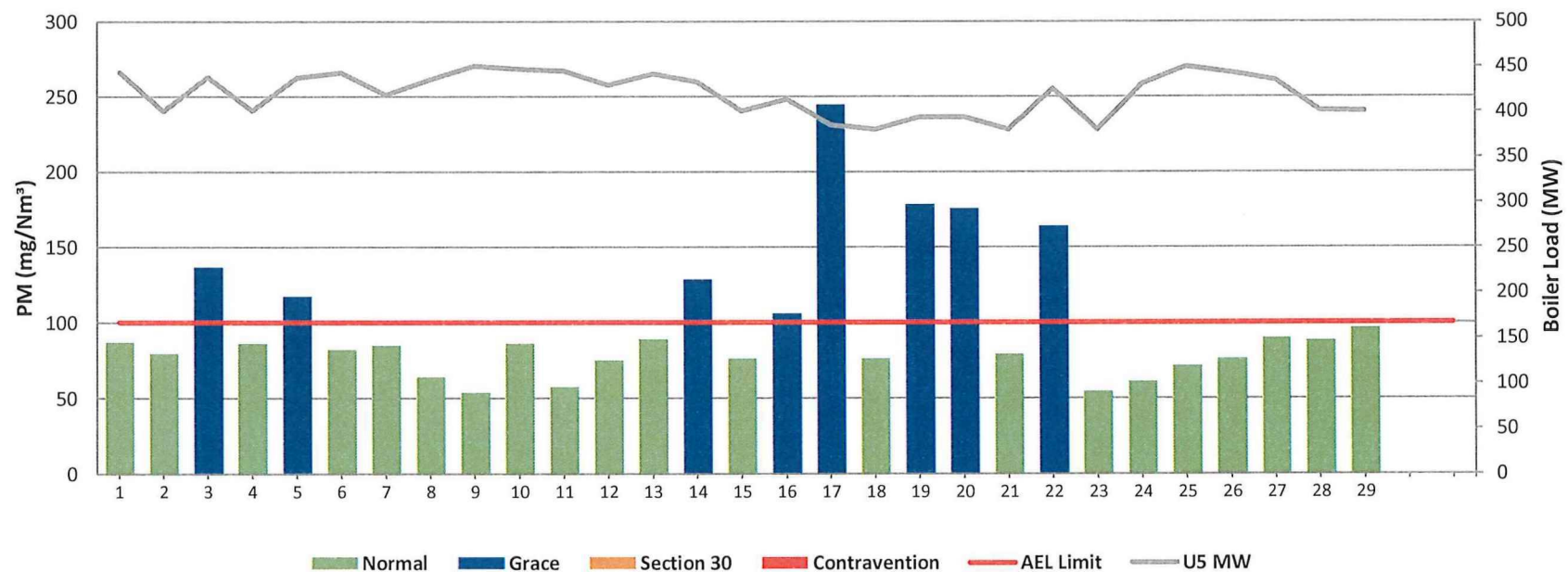


Figure 5: Duvha Unit 6 PM Emissions - February 2024

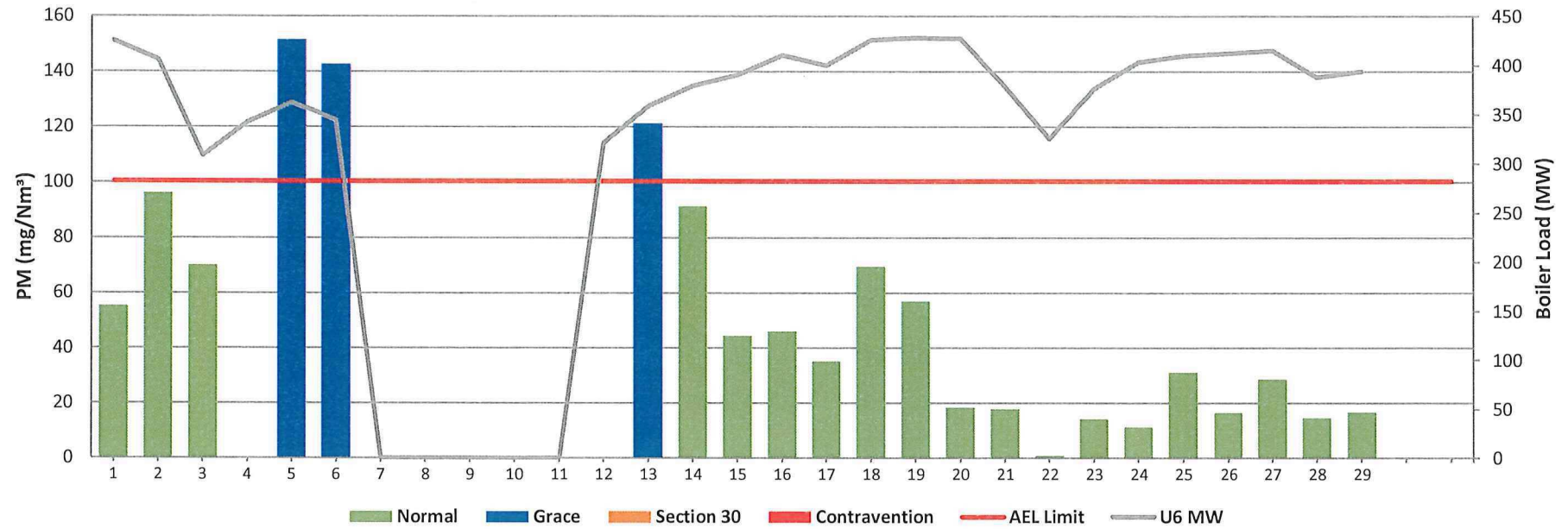


Figure 6: Duvha Unit 1 SO<sub>2</sub> Emissions - February 2024

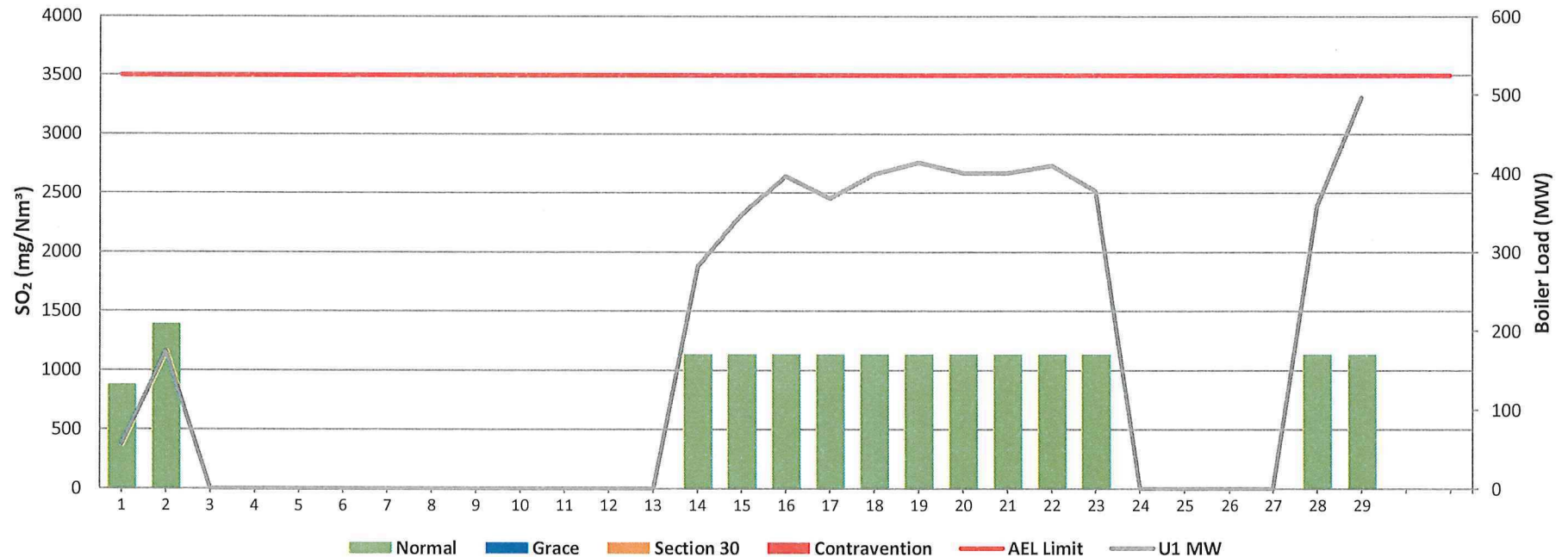


Figure 7: Duvha Unit 2 SO<sub>2</sub> Emissions - February 2024

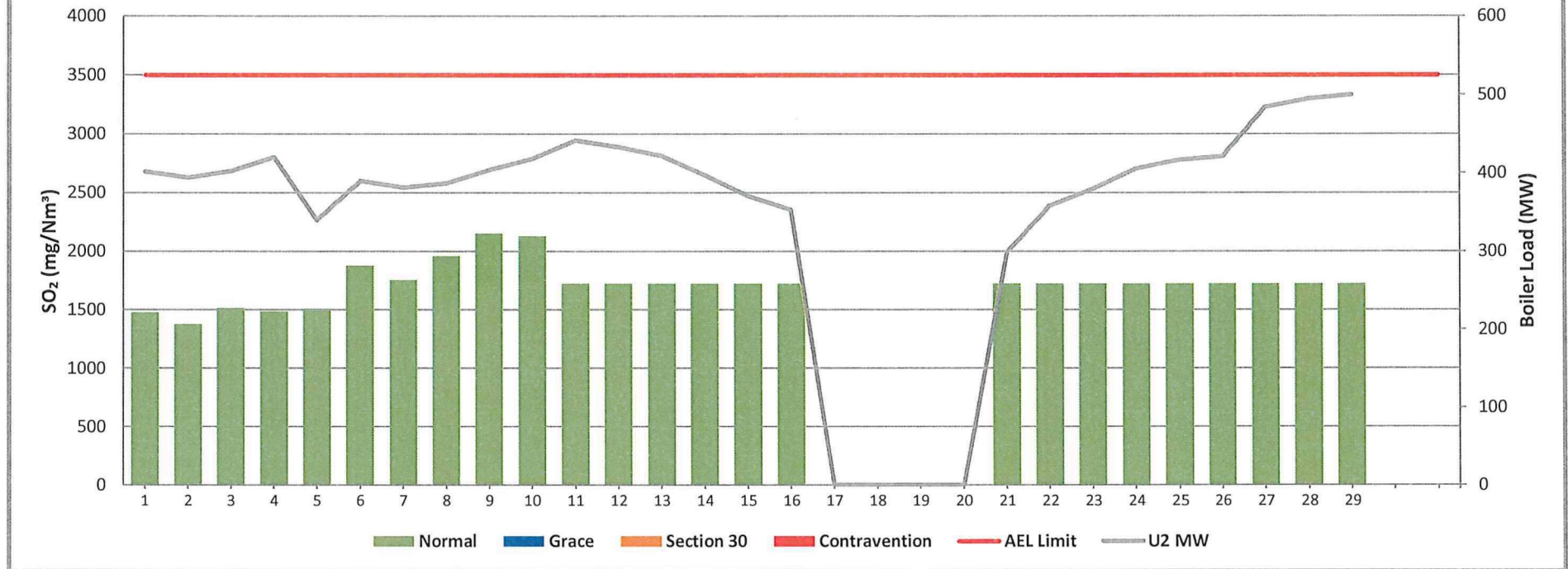


Figure 8: Duvha Unit 4 SO<sub>2</sub> Emissions - February 2024

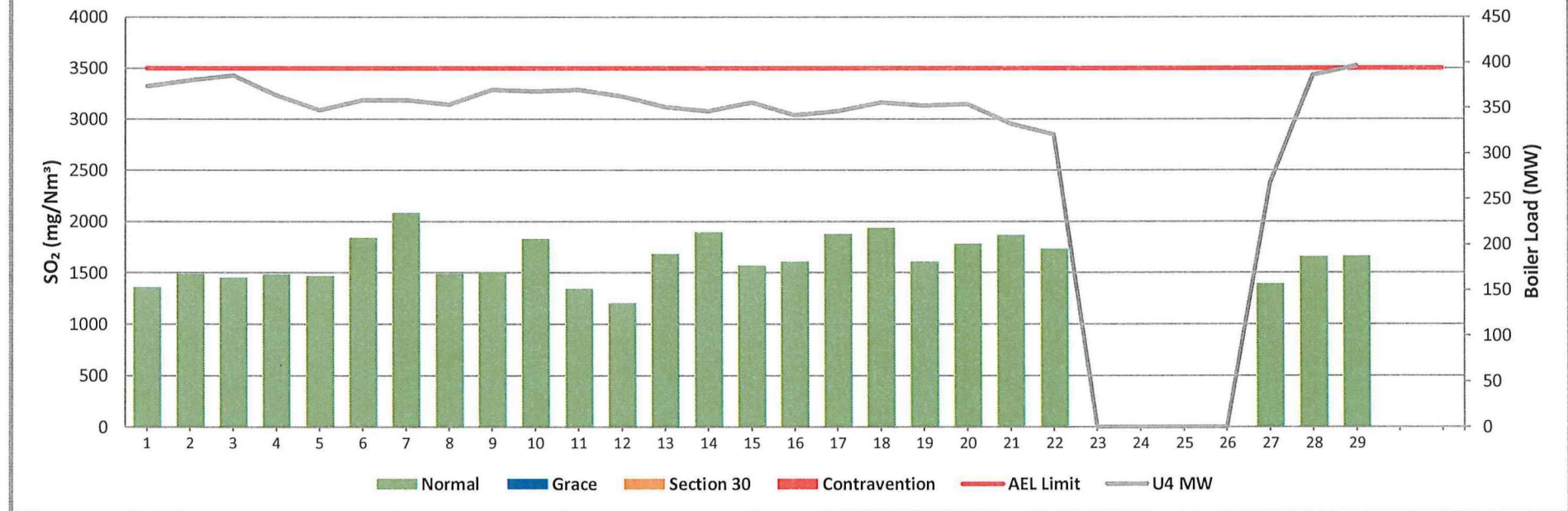




Figure 9: Duvha Unit 5 SO<sub>2</sub> Emissions - February 2024

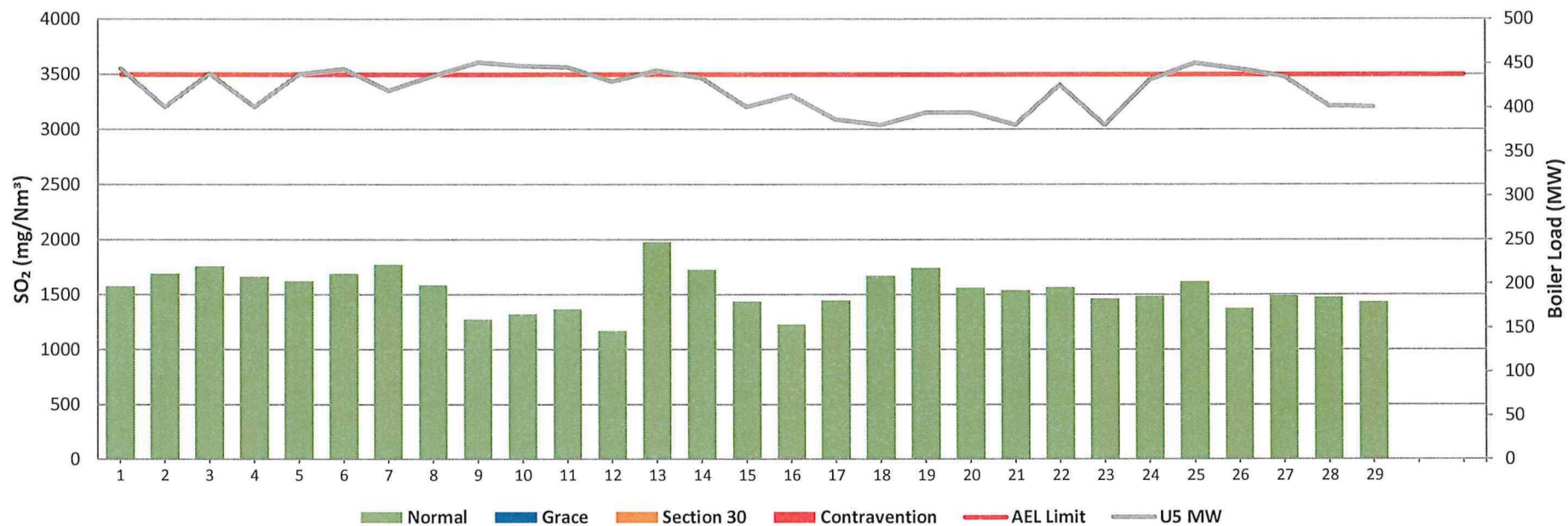


Figure 10: Duvha Unit 6 SO<sub>2</sub> Emissions - February 2024

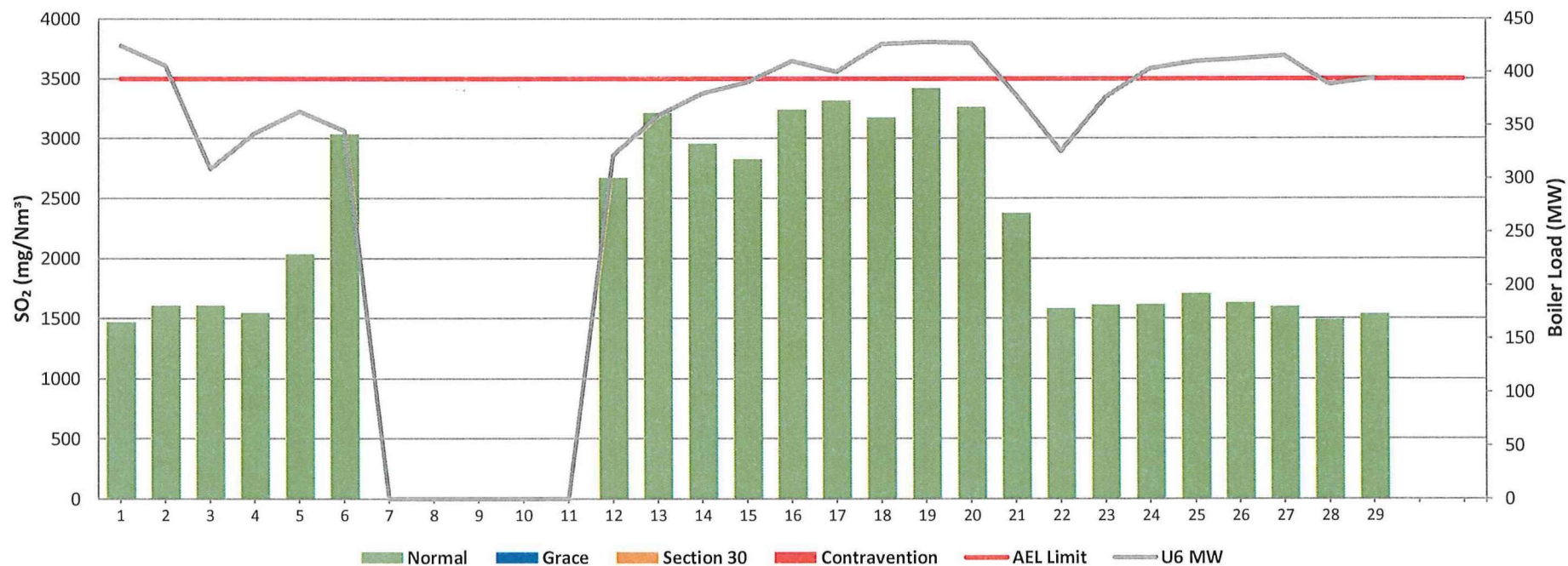


Figure 11: Duvha Unit 1 NOx Emissions - February 2024

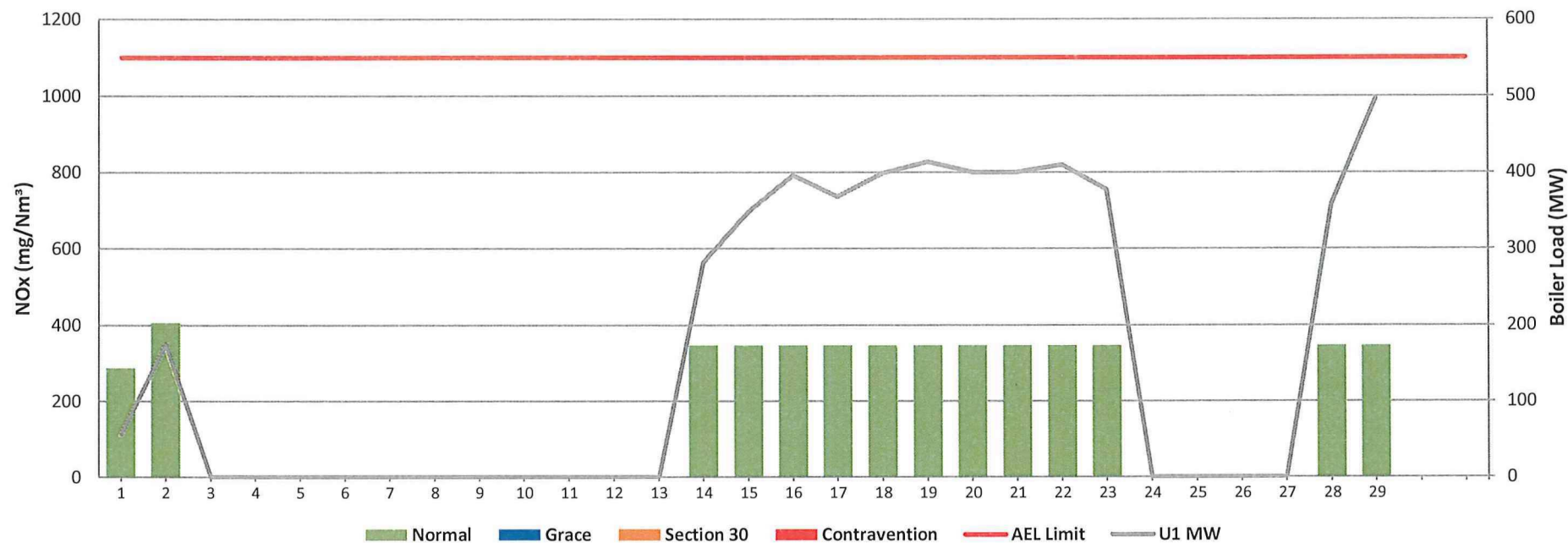


Figure 12: Duvha Unit 2 NOx Emissions - February 2024

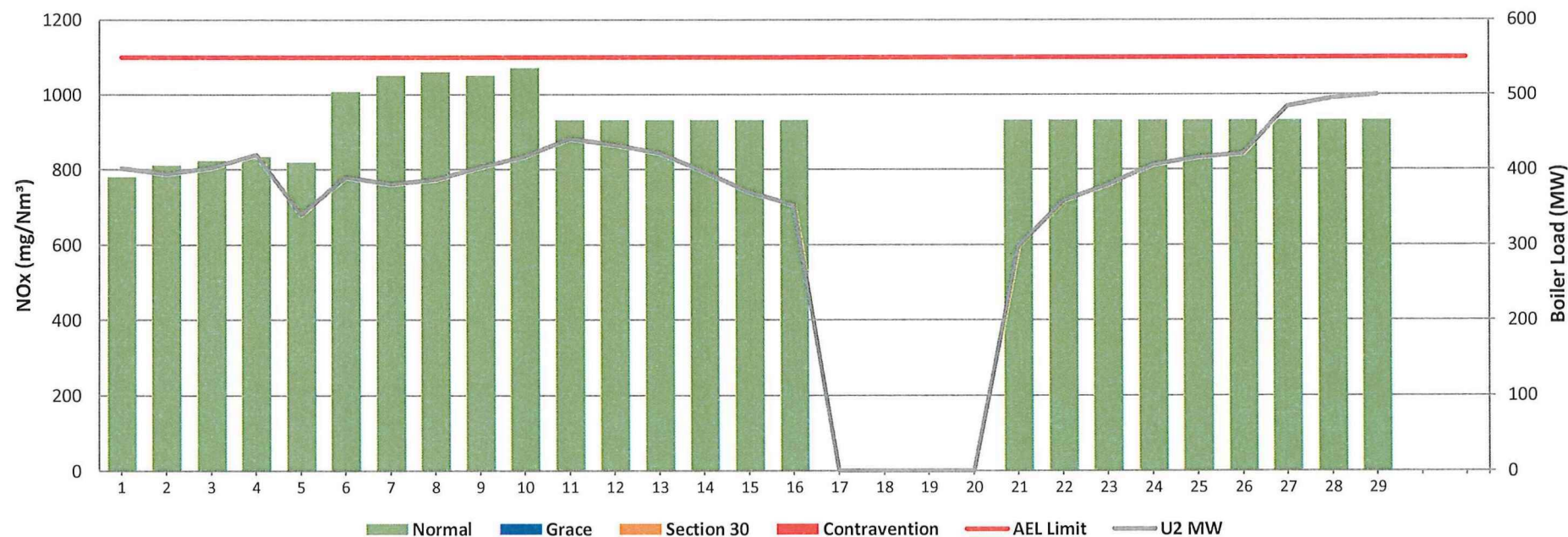




Figure 13: Duvha Unit 4 NOx Emissions - February 2024



Figure 14: Duvha Unit 5 NOx Emissions - February 2024

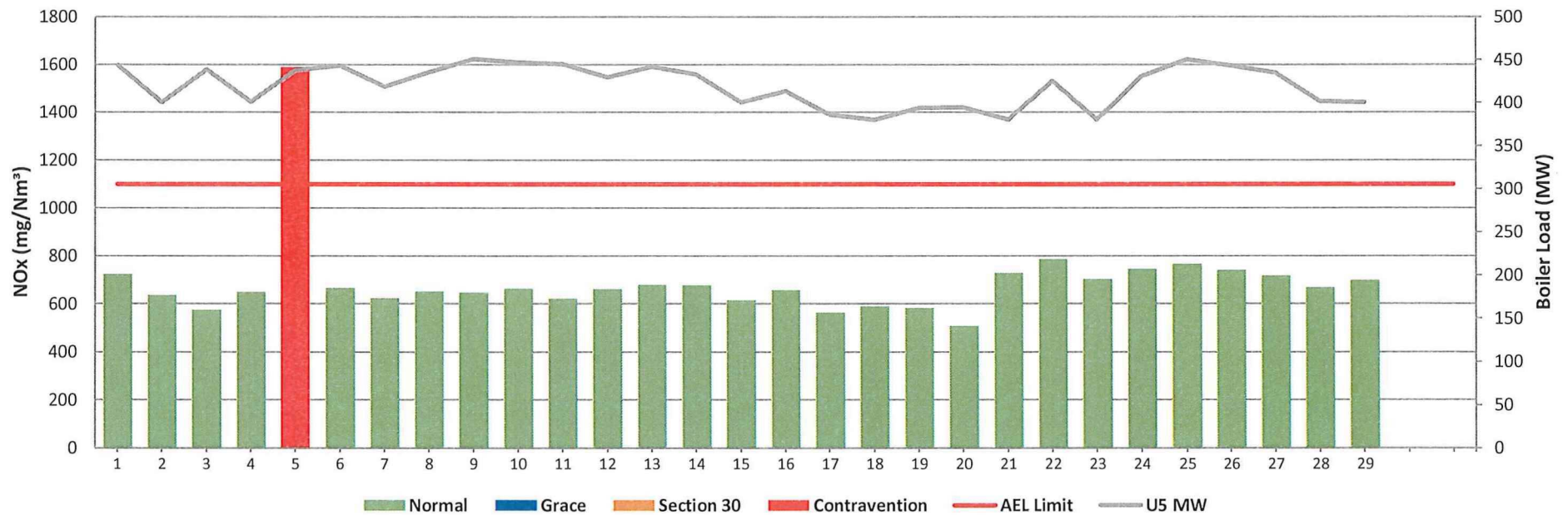
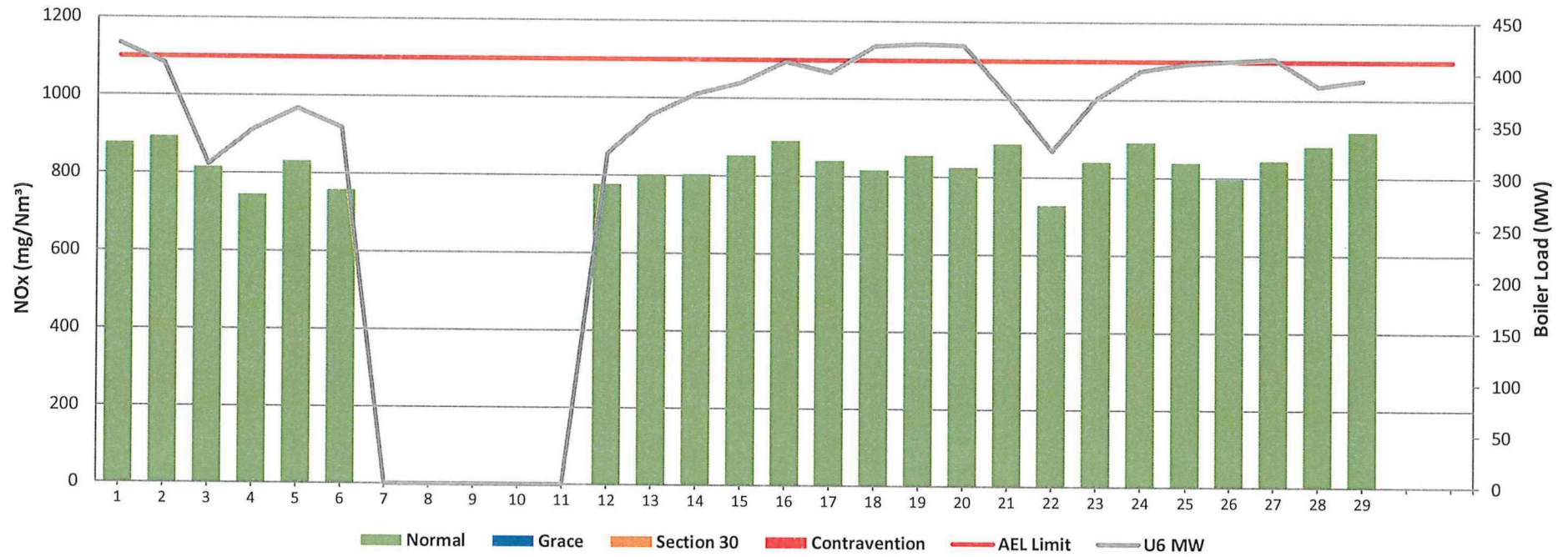




Figure 15: Duvha Unit 6 NOx Emissions - February 2024



## 7 SHUT DOWN AND LIGHT UP INFORMATION

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

Unit No.1	Event 1	Event 2			Event 3	
Breaker Open (BO)	BO previously	BO previously	9:15 am	2024/02/16	8:25 am	2024/02/23
Draught Group (DG) Shut Down (SD)	n/a	n/a	12:15 pm	2024/02/16	10:00 pm	2024/02/23
BO to DG SD (duration)	n/a	DD:HH:MM	00:03:00	DD:HH:MM	00:13:35	DD:HH:MM
Fires in time	3:35 am	2024/02/14	12:45 pm	2024/02/17	12:00 pm	2024/02/28
Synch. to Grid (or BC)	1:30 pm	2024/02/14	2:40 pm	2024/02/18	5:35 pm	2024/02/28
Fires in to BC (duration)	00:09:55	DD:HH:MM	01:01:55	DD:HH:MM	00:05:35	DD:HH:MM
Emissions below limit from BC (end date)	not > limit	not > limit	not > limit	not > limit	not > limit	not > limit
Emissions below limit from BC (duration)	n/a	DD:HH:MM	n/a	DD:HH:MM	n/a	DD:HH:MM

Unit No.2	Event 1	Event 2		
Breaker Open (BO)	11:55 pm	2024/02/04	9:45 am	2024/02/16
Draught Group (DG) Shut Down (SD)	DG did not trip or SD	DG did not trip or SD	6:10 am	2024/02/17
BO to DG SD (duration)	n/a	DD:HH:MM	00:20:25	DD:HH:MM
Fires in time			4:15 am	2024/02/21
Synch. to Grid (or BC)			2:20 pm	2024/02/21
Fires in to BC (duration)		DD:HH:MM	00:10:05	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.4	<i>Event 1</i>	
Breaker Open (BO)	<i>2:25 am</i>	<i>2024/02/22</i>
Draught Group (DG) Shut Down (SD)	<i>7:40 am</i>	<i>2024/02/22</i>
BO to DG SD (duration)	<i>00:05:15</i>	DD:HH:MM
Fires in time	<i>3:15 pm</i>	<i>2024/02/27</i>
Synch. to Grid (or BC)		
Fires in to BC (duration)	<i>00:03:25</i>	DD:HH:MM
Emissions below limit from BC (end date)	<i>10:00 am</i>	<i>2024/03/01</i>
Emissions below limit from BC (duration)		DD:HH:MM

Unit No.6	<i>Event 1</i>	<i>Event 2</i>			<i>Event 3</i>	
Breaker Open (BO)	<i>3:30 pm</i>	<i>2024/02/03</i>	<i>7:55 am</i>	<i>2024/02/06</i>	<i>6:40 pm</i>	<i>2024/02/21</i>
Draught Group (DG) Shut Down (SD)	<i>4:15 pm</i>	<i>2024/02/03</i>	<i>10:30 am</i>	<i>2024/02/06</i>	<i>DG did not trip or SD</i>	<i>DG did not trip or SD</i>
BO to DG SD (duration)	<i>00:00:45</i>	DD:HH:MM	<i>00:02:35</i>	DD:HH:MM	<i>n/a</i>	DD:HH:MM
Fires in time	<i>11:25 pm</i>	<i>2024/02/03</i>	<i>1:50 am</i>	<i>2024/02/12</i>		
Synch. to Grid (or BC)	<i>6:45 am</i>	<i>2024/02/04</i>	<i>10:05 am</i>	<i>2024/02/12</i>		
Fires in to BC (duration)		DD:HH:MM	<i>00:08:15</i>	DD:HH:MM		DD:HH:MM
Emissions below limit from BC (end date)	<i>1:00 pm</i>	<i>2024/02/07</i>	<i>9:00 pm</i>	<i>2024/02/14</i>		
Emissions below limit from BC (duration)	<i>03:06:15</i>	DD:HH:MM	<i>02:10:55</i>	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

### Exceedances:

Unit 4

03/02/2024

The dust handling plant shutdown due to dust handling plant filter fan V Belts damaged.

09/02/2024 and 10/02/2024

- Dust handling plant airlift vessel blocked.
- Dust handling plant tripped on silo.

12/02/2024 and 13/02/2024

SO3 plant that fails to inject, the dust handling plant room aircon not working (ash plant) dust handling plant fails to start, start furnace sootblowing.

19/02/2024 and 20/02/2024

- Blocked duct hoppers
- Dust handling plant silo hydrovac that are blocked
- Precip fields 4.4, 2.5 and 1.2 defective

29/02/2024

The Dust Handling Plant was not in service due to maintenance that was in progress, and this resulted in high hoppers. Work on the Dust handling plant was completed, and dusting commenced

## Unit 5

03/02/2024

The dust handling plant was off due to RH airlift vessel blower fails to start.

05/02/2024

The precept fields 1.2 ,1.5 ,2 5 ,3.1 & 3 5 were off due to comms fault

14/02/2024

Dust handling plant tripped on silo.

16/02/2024

High backend temperatures, Precip field 3 4 tripped on UV protection, field 2.5 was off

19/02/2024

High backend temperatures left hand dust hoppers full, Precip field 3.4 tripped on UV protection, field 2 5 was off.

22/02/2024

High backend temperatures, no sootblowing due to low demin levels. Fields 3 4 and 1.2 tripping on UV protection and 2.5 off. SO3 plant switched off for C&I to attend to the injection rate.

## Unit 6

05/02/2024 and 06/02/2024

- Dust handling plant tripped, dust handling plant vent fan that fails to reset.
- Dust handling plant fails to start.
- Dust handling plant filter fan that keeps tripping on silo vacuum



- Dust handling plant lh row 1 blocked
- Dust handling plant LH row 4 blocked.dust hoppers 16,17 and 18 full
- All precipitators switched off.

13/02/2024

Cold unit light up.

On 05/02/2024 unit 5 NOx value was reading at 1588 Precept fields 1 2 ,1.5 ,2.5 ,3 1 & 3 5 were off due to comms fault.

The Fuel oil usage for the month of February 2024 exceeded the permitted consumption rate due to the following reasons

Unit 1

- There was an Attempted return to service from outage The unit was on 3 mills from the cold return to service B and F on Permit to work and a mill raw coal chute blocked
- Hot Return to Service on the 17th of February 2024

Unit 2

- There was an Oil burner testing and oil burner support during soot blowing
- Milling plant challenges
- Cold return to service E from boiler tube leaks repairs
- Hot return to service unit on condenser vacuum while attempting unit half load to repair
- Condenser tube leaks
- Soot blowing boiler manually (soot blowing testing)
- Continuously on oil burner support due to unstable bottom pyros (B4)

Unit 4

- Continuously supporting combustion due to unstable bottom pyros
- B3 and B4 continuously on oil burner support
- Cold return to service from Boiler tube leaks repairs
- Supporting combustion while soot blowing the boiler and testing of soot blowing lances
- Milling plant challenges from the 10th of February to 14th February

- 

#### Unit 5


- Support unstable combustion due to milling plant challenges (mills rejecting excessively)
- A mill tripped due to lube oil, unit on 3 mills loading (D, A and B mill O/C) on the 20th of February
- Supporting combustion while soot blowing the boiler and testing of soot blowing lances
- Unit 6
  
- Support Unstable combustion due to milling plant challenges
- Continuous combustion - support due to unstable bottom pyros and unavailable mills
- Unit running with defective mills  
Oil burner testing and oil burner support during soot blowing
- Cold return to service
- Hot return to service

Lastly the averages Oxygen (O<sub>2</sub>) and Carbon Dioxide (CO<sub>2</sub>) 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 O<sub>2</sub> and CO<sub>2</sub> gaseous monitors. These poor performances of the monitors are due to faulty O<sub>2</sub> analysers. The station is in the process to replace all the faulty analysers by 31 March 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 incidents for the month of February.

  
Boiler Plant Engineering Manager

22/05/2024  
Date

  
Environmental Manager

2024/05/22  
Date

  
Engineering Manager

2024-05-22  
Date

Compiled by

Environmental Officer

For

Nkangala District Municipality

Air Quality Officer

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Engineering Manager

Operating Manager

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Production Manager

Boiler Engineering Manager

System Engineer

Environmental Manager