



Department of Agriculture, Rural Development, Land and Environmental Affairs  
 The Director: Pollution and Waste Management  
 Private Bag X11219  
 Nelspruit 1200

Date:  
 15<sup>th</sup> February 2019  
 Enquiries:

Attention:  
 Mr. M Mahlalela

**Nkangala District Municipality**  
 PO Box 437  
 Middelburg 1050

Attention:  
 Mr. V Mahlangu

## MATLA POWER STATION AIR QUALITY REPORT FOR JANUARY 2019

The figures reported in this report are preliminary, and are to be considered for information purposes only. Final annual figures are those reported within 60 days of the independent audit conducted at the end of the financial year (March).

### 1. PARTICULATE EMISSIONS: MONTHLY TONNAGES.

	BLR	FEB 2018	MAR 2018	APR 2018	MAY 2018	JUN 2018	JUL 2018	AUG 2018	SEP 2018	OCT 2018	NOV 2018	DEC 2018	JAN 2019
Monthly Tonnage	1	Off	Off	Off	Off	Off	Off	95.56	41.79	83.20	106.92	132.26	259.04
	2	57.98	60.80	28.57	44.25	74.24	74.20	69.81	61.67	77.79	103.67	212.36	300.99
	3	55.05	62.50	29.56	35.97	86.14	79.36	173.07	71.28	60.47	Off	111.82	237.23
	4	166.34	132.22	87.07	123.63	67.06	56.07	45.66	106.44	131.91	176.72	570.32	364.75
	5	68.06	97.63	61.14	83.25	90.26	45.00	73.61	43.41	63.55	102.66	95.04	78.64
	6	62.15	50.91	52.66	44.17	47.93	46.24	74.64	15.76	96.96	117.45	197.95	175.38
	Station	409.57	404.02	258.99	331.28	365.62	300.89	532.34	340.36	513.89	607.42	1319.8	1416.0
GWhSO		1562.9	1733.7	1594.2	1627.7	1491.5	1398.1	1368.0	1550.7	1890.6	1807.9	1733.2	1790.6

Generation Division (Operating Unit Coal 2)  
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## 2. COAL AND LOAD FACTOR:

STATION		FEB 2018	MAR 2018	APR 2018	MAY 2018	JUN 2018	JUL 2018	AUG 2018	SEP 2018	OCT 2018	NOV 2018	DEC 2018	JAN 2019
Load Factor		88.34	86.45	78.39	89.58	76.24	72.31	71.04	78.96	82.42	88.58	78.26	79.76
Ash Content	%	23.3	26.41	25.3	27.70	27.92	27.6	30.93	31.33	25.43	24.35	31.6	27.36
Sulphur Content	%	0.95	0.90	0.99	1.2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Total Moisture	%	9.60	9.57	9.21	9.7	9.47	9.43	7.91	8.03	6.69	7.81	9.00	7.66

## 3. GASEOUS EMISSIONS:

**CO<sub>2</sub> emissions: kilotons emitted per month, calculated from coal analysis and emission factors.**

	FEB 2018	MAR 2018	APR 2018	MAY 2018	JUN 2018	JUL 2018	AUG 2018	SEP 2018	OCT 2018	NOV 2018	DEC 2018	JAN 2019
Units 1-3												
Unit 4												
Unit 5												
Unit 6												
All Units												

**SO<sub>2</sub> emissions: kilotons emitted per month, calculated from coal analysis and emission factors.**

	FEB 2018	MAR 2018	APR 2018	MAY 2018	JUN 2018	JUL 2018	AUG 2018	SEP 2018	OCT 2018	NOV 2018	DEC 2018	JAN 2019
Units 1-3	6.95	7.84	6.62	7.68	6.18	6.34	6.02	8.74	9.30	6.75	6.65	8.78
Unit 4	2.85	3.16	3.29	3.94	3.18	3.22	2.07	2.81	2.95	3.19	2.87	2.91
Unit 5	3.02	3.51	3.07	3.95	2.77	1.67	2.77	2.82	3.33	3.27	3.48	2.65
Unit 6	2.46	3.13	3.15	3.93	2.99	2.89	2.75	1.03	3.74	3.50	3.48	3.44
All Units	15.28	17.64	16.12	19.50	15.12	14.13	13.61	15.40	19.32	16.71	16.48	17.79

**NO<sub>x</sub> emissions: kilotons emitted per month, calculated from coal analysis and emission factors.**

	FEB 2018	MAR 2018	APR 2018	MAY 2018	JUN 2018	JUL 2018	AUG 2018	SEP 2018	OCT 2018	NOV 2018	DEC 2018	JAN 2019
Units 1-3	2.18	2.46	2.07	2.01	1.94	1.99	1.88	2.74	2.91	2.11	2.08	2.75
Unit 4	0.89	0.99	1.03	1.03	1.00	1.01	0.65	0.88	0.92	1.00	0.90	0.91
Unit 5	0.95	1.10	0.96	1.03	0.87	0.52	0.87	0.88	1.04	1.02	1.09	0.83
Unit 6	0.77	0.98	0.99	10.3	0.94	0.91	0.86	0.32	1.17	1.10	1.09	1.08
All Units	4.79	5.53	5.05	5.09	4.74	4.43	4.26	4.82	6.05	5.24	5.16	5.58

**CO<sub>2</sub> emissions: kilotons emitted per month, measured with the continuous emission monitoring system. NOTE: These are unverified values for information purposes only.**

	FEB 2018	MAR 2018	APR 2018	MAY 2018	JUN 2018	JUL 2018	AUG 2018	SEP 2018	OCT 2018	NOV 2018	DEC 2018	JAN 2019
Units 1-3												
Unit 4												
Unit 5												
Unit 6												
All Units												

**SO<sub>2</sub> emissions: kilotons emitted per month, measured with the continuous emission monitoring system. NOTE: These are unverified values for information purposes only.**

	FEB 2018	MAR 2018	APR 2018	MAY 2018	JUN 2018	JUL 2018	AUG 2018	SEP 2018	OCT 2018	NOV 2018	DEC 2018	JAN 2019
Units 1-3	5.55	8.31	6.73	6.64	6.72	6.43	6.26	8.84	9.70	6.54	5.80	6.88
Unit 4	1.81	2.28	2.18	1.96	1.86	1.84	1.15	1.83	2.13	2.94	2.55	1.95
Unit 5	2.57	2.74	2.61	2.58	2.12	1.13	2.26	2.58	2.77	3.31	3.01	1.95
Unit 6	1.03	1.22	2.73	2.65	2.40	2.38	2.18	0.80	2.81	3.32	3.01	3.21
All Units	10.96	14.55	14.26	13.83	13.10	11.79	11.85	14.06	17.41	16.11	14.37	13.98

**NO<sub>x</sub> emissions: kilotons emitted per month, measured with the continuous emission monitoring system. NOTE: These are unverified values for information purposes only.**

	FEB 2018	MAR 2018	APR 2018	MAY 2018	JUN 2018	JUL 2018	AUG 2018	SEP 2018	OCT 2018	NOV 2018	DEC 2018	JAN 2019
Units 1-3	2.98	3.78	2.82	2.47	2.61	2.48	2.27	3.48	4.40	3.12	2.58	3.03
Unit 4	1.30	1.26	1.01	0.84	0.87	0.81	0.53	0.79	1.00	1.53	1.36	0.82
Unit 5	1.32	1.28	1.06	1.02	0.90	0.37	0.70	0.91	0.95	1.19	1.13	0.77
Unit 6	0.55	0.63	1.25	1.10	1.19	1.11	0.89	0.33	1.27	1.45	1.29	1.62
All Units	6.15	6.95	6.15	5.43	5.57	4.77	4.40	5.52	7.62	7.28	6.36	6.23

**CO<sub>2</sub> emissions (mg/Nm<sup>3</sup>): Average concentration per month (at 273 K, 101.3 kPa and 10% O<sub>2</sub>), measured with the continuous emission monitoring system. NOTE: These are unverified values for information purposes only**

	FEB 2018	MAR 2018	APR 2018	MAY 2018	JUN 2018	JUL 2018	AUG 2018	SEP 2018	OCT 2018	NOV 2018	DEC 2018	JAN 2019
Units 1-3												
Unit 4												
Unit 5												
Unit 6												

**SO<sub>2</sub> emissions (mg/Nm<sup>3</sup>): Average concentration per month (at 273 K, 101.3 kPa and 10% O<sub>2</sub>), measured with the continuous emission monitoring system. NOTE: These are unverified values for information purposes only**

Limit	FEB 2018	MAR 2018	APR 2018	MAY 2018	JUN 2018	JUL 2018	AUG 2018	SEP 2018	OCT 2018	NOV 2018	DEC 2018	JAN 2019
4000												
Units 1-3	1587	2246	2036	2153	2203	2116	2129	2096	2232	1919	1922	1668
Unit 4	1350	1626	1628	1685	1590	1761	1614	1791	1697	1658	1625	1765
Unit 5	1827	1856	1850	1797	1656	1533	1658	2033	1995	2148	1930	1785
Unit 6	1406	1425	1540	1620	1529	1554	1572	1361	1552	1597	1544	1676

**SO<sub>2</sub> daily average emissions: AEL limit exceedances**

Limit	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN
3500	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2019
Units 1-3	0	0	0	0	0	0	0	0	0	0	0	0
Unit 4	0	0	0	0	0	0	0	0	0	0	0	0
Unit 5	0	0	0	0	0	0	0	0	0	0	0	0
Unit 6	0	0	0	0	0	0	0	0	0	0	0	0

**NO<sub>x</sub> emissions (mg/Nm<sup>3</sup>): Average concentration per month (at 273 K, 101.3 kPa and 10% O<sub>2</sub>), measured with the continuous emission monitoring system. NOTE: These are unverified values for information purposes only**

Limit	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN
1700	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2019
Units 1-3	851	1017	852	797	853	806	770	823	1028	913	855	734
Unit 4	970	872	752	713	735	773	745	772	799	859	868	736
Unit 5	936	859	753	708	703	493	519	719	675	769	720	705
Unit 6	751	740	711	674	757	717	646	564	702	698	660	846

**NO<sub>x</sub> daily average emissions: AEL limit exceedances**

Limit	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN
1200	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2018	2019
Units 1-3	0	0	0	0	0	0	0	0	0	0	0	0
Unit 4	0	0	0	0	0	0	0	0	0	0	0	0
Unit 5	0	0	0	0	0	0	0	0	0	0	0	0
Unit 6	0	0	0	0	0	0	0	0	0	0	0	0

**4. PARTICULATE EMISSION PERFORMANCE**

	MONTH AVERAGE EMISSIONS	AEL LIMIT(DAILY AVERAGE)	HIGHEST DAILY AVERAGE
UNIT	mg/Nm <sup>3</sup>	mg/Nm <sup>3</sup>	mg/Nm <sup>3</sup>
1, 2 & 3	176.86	200	291.94
4	308.95	200	567.05
5	70.84	100	180.42
6	89.53	100	241.71
Station	161.54		
YTD	77.22		

**ABATEMENT APPARATUS AVAILABILITY**

Unit		1	2	3	4	5	6	Station
Precipitator efficiency	%	99.34	99.29	99.49	98.90	99.75	99.58	99.39
Precipitator availability	%	98.58	96.42	97.32	93.97	94.45	94.64	96.15
SO <sub>3</sub> plant utilisation	%	95.49	94.29	92.77	98.52	94.97	95.86	94.31

## ATMOSPHERIC EMISSION LICENSE LIMIT EXCEEDED

	AEL LIMIT EXCEEDED (TOTAL)	AEL LIMIT EXCEEDED (LIGHT-UP/SHUT DOWN)	AEL LIMIT EXCEEDED (UPSET CONDITIONS)	AEL LIMIT EXCEEDED (MAINTENANCE)	AEL LIMIT EXCEEDED (SECTION 30 / CONTRAVENTION)
UNIT	Days	Days	Days	Days	Days
1, 2 & 3	8	1	3	0	4
4	22	2	0	0	20
5	4	1	2	0	1
6	7	0	4	0	3
Station	41	4	9	0	28
YTD	108	14	28	6	60

### 5. DISCUSSION

#### Unit 1:

The SO<sub>3</sub> flue gas conditioning plant tripped frequently as from the 4<sup>th</sup> January 2019 due to steam ingress into the sulphur line. The sulphur line was completely drained on the 29<sup>th</sup> January 2019 which improved the situation.

The unit tripped on the 12<sup>th</sup> January 2019 at 05:50 on turbine inlet differential temperature protection. The unit returned to service on the 12<sup>th</sup> January 2019 at 13:58.

The unit experienced a substantial number of full hoppers due to dust handling plant failures. This resulted in the particulate emissions exceeding the AEL limit as from the 26<sup>th</sup> January 2018. The plant failed to recover before a catastrophic failure of the slurry pumping station roof, resulting in a total shut down of the dust handling plant. The precipitator internals were damaged because of the high hopper levels requiring a shut down for repairs. See section 9 of this report for more details.

#### Unit 2:

The unit experienced full dust hoppers following the failure at the slurry plant on the . As a result, the particulate emissions increased. The right hand precipitator suffered internal damage because of the high hopper levels requiring a shut down for repairs.

#### Unit 3:

The unit tripped on the 28<sup>th</sup> December 2018 at 20:06 when the boiler hydrastep protection malfunctioned. The unit remained off load for turbine barring gear repairs. The opportunity was utilised to carry out minor precipitator repairs.

The unit returned to service on the 1<sup>st</sup> January 2019 at 15:51.

The unit tripped on the 1<sup>st</sup> January 2019 at 23:12, returned to service on the 2<sup>nd</sup> January 2019 at 04:45 with one draught group available.

The unit was taken off load on the 3<sup>rd</sup> January 2019 at 22:41 due to the low load condition and to which required the continuous support of fuel oil burners. The unit returned to service on the 12<sup>th</sup> January 2019 at 09:24. The opportunity was utilised to carry out minor precipitator repairs.

The SO<sub>3</sub> flue gas conditioning plant tripped several times on converter temperature protection due to sulphur flow fluctuation. The plant was returned to normal on the 22<sup>nd</sup> January 2019. The dust handling plant tripped on high silo level on the 29<sup>th</sup> January 2019 when the slurry plant pumping station failed.

**Unit 4:**

The unit was taken off load on the 30<sup>th</sup> December 2018 at 22:13 for precipitator repairs. The unit was called back before effective repairs could be carried out and returned to service on the 2<sup>nd</sup> January 2019 at 22:49

The unit continued suffering with precipitator field failures due to full dust hoppers. The dust handling plant failed to recover the full hoppers although the emissions periodically reduced to below the AEL limit.

The above field failures resulted in exceedance of the AEL limit. The unit continued operating under a section 30.

**Unit 5:**

The unit experienced a few precipitator field failures due to full dust hoppers during the latter part of the month.

The SO<sub>3</sub> flue gas conditioning plant tripped a few times during the month.

The unit was taken off load on the 16<sup>th</sup> January 2019 at 16:07 for boiler tube leak repairs. The unit returned to service on the 23<sup>rd</sup> January 2019 at 05:18. The opportunity was utilised to carry out minor precipitator repairs.

The unit tripped on the 24<sup>th</sup> January 2019 at 14:28 when a turbine control card malfunctioned.

The unit returned to service on the 25<sup>th</sup> January 2019 at 02:08.

The dust handling plant tripped on high silo level when the slurry plant pumping station failed. See section 9 of this report for details.

**Unit 6:**

The particulate emissions reduced drastically as from the 3<sup>rd</sup> January 2019 when some of the precipitator fields returned to service following full dust hopper incident. The field failures however increased as from the 23<sup>rd</sup> January 2019 and the AEL limit was exceeded as from the 27<sup>th</sup> January 2019. Recovery of the hopper levels was in progress when the slurry plant pumping station failed.

**SO<sub>3</sub> common Plant:**

The SO<sub>3</sub> common plant availability was high for the month of January 2019.

**Gas Emissions:**

The availability of the CEMS was good for the month of January 2019.

The gas emissions measured by the CEMS was well below the AEL limit for the duration of the month.

**General:**

The coal quality supplied to the station remained generally poor during the month, impacting negatively on the particulate emissions. A further periodic deterioration in coal quality resulted in a change in dust quality and full dust hoppers leading to precipitator field failures.

The change in coal quality negatively impacted on the dust handling plant due to the change in dust particle size and density.

**6. LIGHT UP:**

Unit:	3	
Fires in:	08:25	1 January 2019
Synchronisation:	15:51	1 January 2019
Emissions below Limit:	22:25	1 January 2019
Fires in to synchronisation:	7:26	Hours
Synchronisation to < Limit:	6:34	Hours

Unit:	3	
Fires in:	01:00	2 January 2019
Synchronisation:	04:45	2 January 2019
Emissions below Limit:	23:47	3 January 2019
Fires in to synchronisation:	3:45	Hours
Synchronisation to < Limit:	43:02	Hours

Unit:	4	
Fires in:	16:45	2 January 2019
Synchronisation:	23:12	2 January 2019
Emissions below Limit:	13:04	3 January 2019
Fires in to synchronisation:	6:27	Hours
Synchronisation to < Limit:	13:53	Hours

Unit:	3	
Fires in:	19:56	11 January 2019
Synchronisation:	09:24	12 January 2019
Emissions below Limit:	22:47	13 January 2019
Fires in to synchronisation:	13:28	Hours
Synchronisation to < Limit:	24:00	Hours

Unit:	1	
Fires in:	08:20	12 January 2019
Synchronisation:	13:58	12 January 2019
Emissions below Limit:	22:47	13 January 2019
Fires in to synchronisation:	5:38	Hours
Synchronisation to < Limit:	32:49	Hours

**7. GRAPHS:**

See attached graphs

**8. COMPLAINTS**

Name of complainant	Date	Description of complaint	Action taken
No Complaints			

## 9. NOTIFICATION OF CONTRAVENTION OF EMISSION LICENCE CONDITIONS

<i>Date</i>	31 January 2019
<i>Power Station Unit(s)</i>	Matla Power Station – Unit 5
<i>Date of incident Time of incident</i>	Start date and time: 29 January 2019 at 23:59 End date:
<i>Nature of incident</i>	Extended start-up <input type="checkbox"/> On-line maintenance <input type="checkbox"/> Extended shut-down <input type="checkbox"/> Upset condition <input checked="" type="checkbox"/>
<i>Emission limit exceedance</i>	The 48 hour allowable period for an upset condition was exceeded on unit 5 at Matla Power Station - Particulate emission limit of 100mg/Nm <sup>3</sup>
<i>Details of incident</i>	The unit experienced frequent dust handling line blockages as from the 27 <sup>th</sup> January 2019 at 05:05. This phenomena continued to the 29 <sup>th</sup> January 2019 when the 48 hour grace period expired. Furthermore, on the 29 <sup>th</sup> January 2019 at 02:25, the slurry plant experienced a catastrophic failure making the dust handling plant unavailable, further increasing hopper levels and field failures.
<i>Risks posed by the incident to public health, safety and property</i>	The prevailing ambient concentrations of PM <sub>10</sub> presents a significant risk to human health given that there are sustained, elevated concentrations with continued non-compliance with both shorter and longer averaging periods. The contribution of the power station to that health risk is however negligible
<i>Toxicity of substance or by-products released by the incident</i>	The particulate emission from the power station is ash and not carcogenic. The particulate levels currently emitted by the power station will be sufficiently dispersed so that by the time they are inhaled to have negligible health impacts
<i>Mitigation to avoid or minimize the incident effects on public health and the environment</i>	The unit load was reduced to minimum whenever the system allowed
<i>Compiler and contact details</i>	
<i>Responsible manager and contact details</i>	



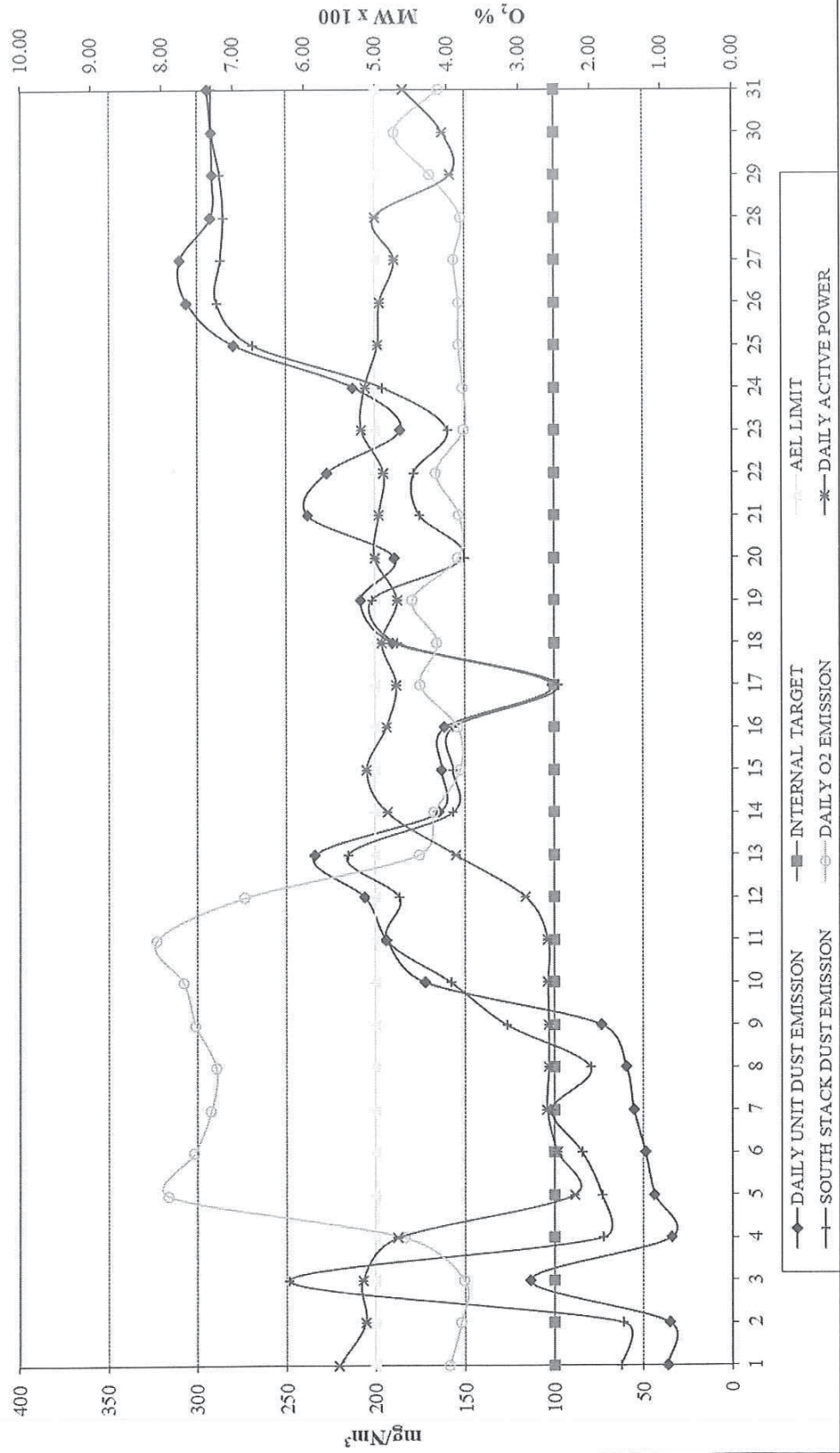
<i>Date</i>	31 January 2019
<i>Power Station Unit(s)</i>	Matla Power Station – Unit 6
<i>Date of incident Time of incident</i>	Start date and time: 29 January 2019 at 08:00 End date:
<i>Nature of incident</i>	Extended start-up <input type="checkbox"/> On-line maintenance <input type="checkbox"/> Extended shut-down <input type="checkbox"/> Upset condition <input checked="" type="checkbox"/>
<i>Emission limit exceedance</i>	The 48 hour allowable period for an upset condition was exceeded on unit 6 at Matla Power Station - Particulate emission limit of 100mg/Nm <sup>3</sup>
<i>Details of incident</i>	The unit experienced several dust handling plant failures such as K-Pump, line blockages, etc. as from the 27 <sup>th</sup> January 2019. This resulted in full dust hoppers and precipitator field failures resulting in elevated particulate emissions, recovery of the dust plant continued but on the 29 <sup>th</sup> January 2019 at 02:25, the slurry plant experienced a catastrophic failure making the dust handling plant unavailable, further increasing hopper levels and field failures.
<i>Risks posed by the incident to public health, safety and property</i>	The prevailing ambient concentrations of PM <sub>10</sub> presents a significant risk to human health given that there are sustained, elevated concentrations with continued non-compliance with both shorter and longer averaging periods. The contribution of the power station to that health risk is however negligible
<i>Toxicity of substance or by-products released by the incident</i>	The particulate emission from the power station is ash and not carcinogenic. The particulate levels currently emitted by the power station will be sufficiently dispersed so that by the time they are inhaled to have negligible health impacts
<i>Mitigation to avoid or minimize the incident effects on public health and the environment</i>	The unit load was reduced to minimum whenever the system allowed
<i>Compiler and contact details</i>	
<i>Responsible manager and contact details</i>	

**BOILER PLANT ENGINEERING**

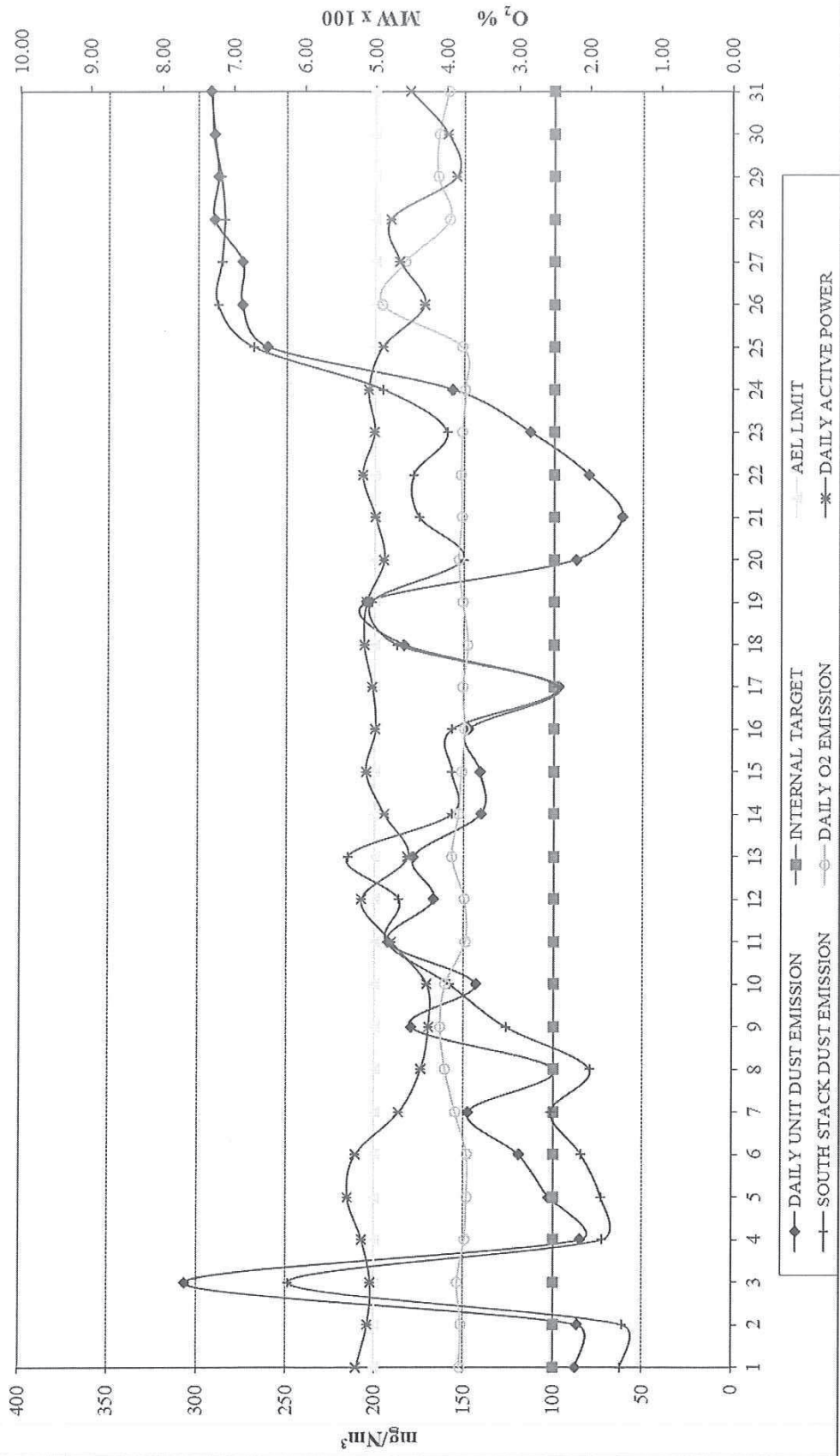
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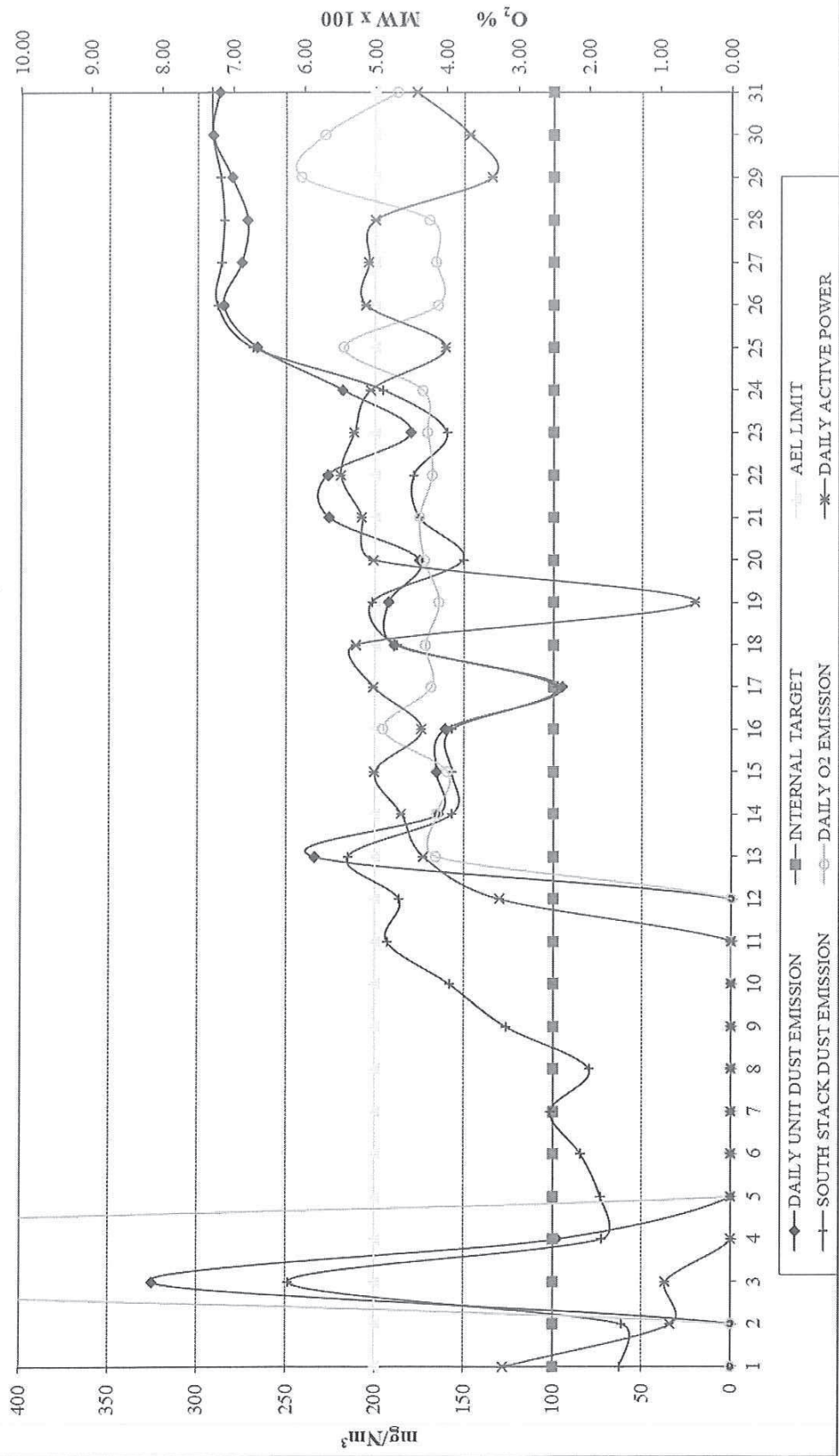
**MATLA POWER STATION  
UNIT 1 DUST EMISSION REPORT  
JANUARY 2019**



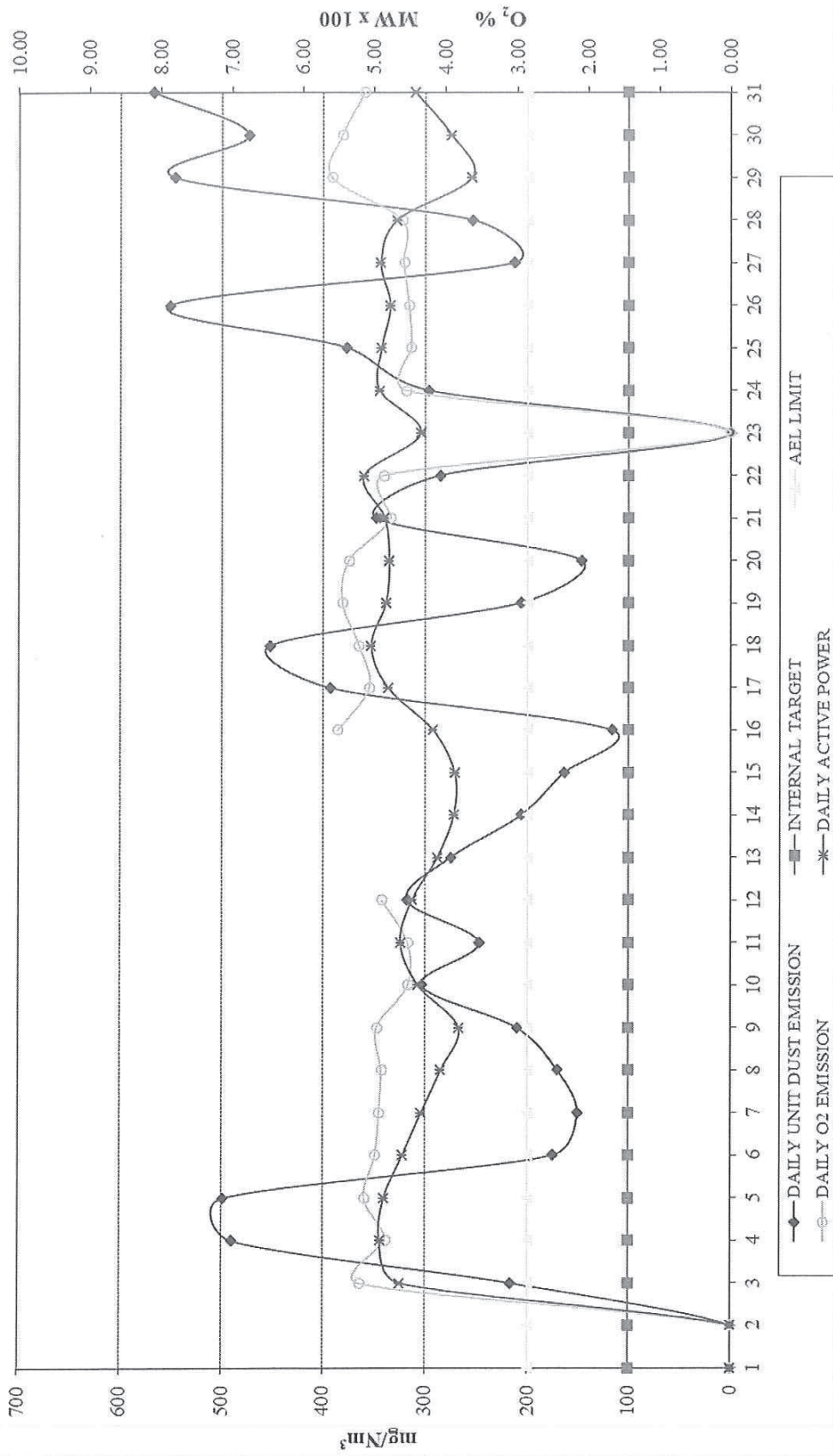
**MATLA POWER STATION  
UNIT 2 DUST EMISSION REPORT  
JANUARY 2019**



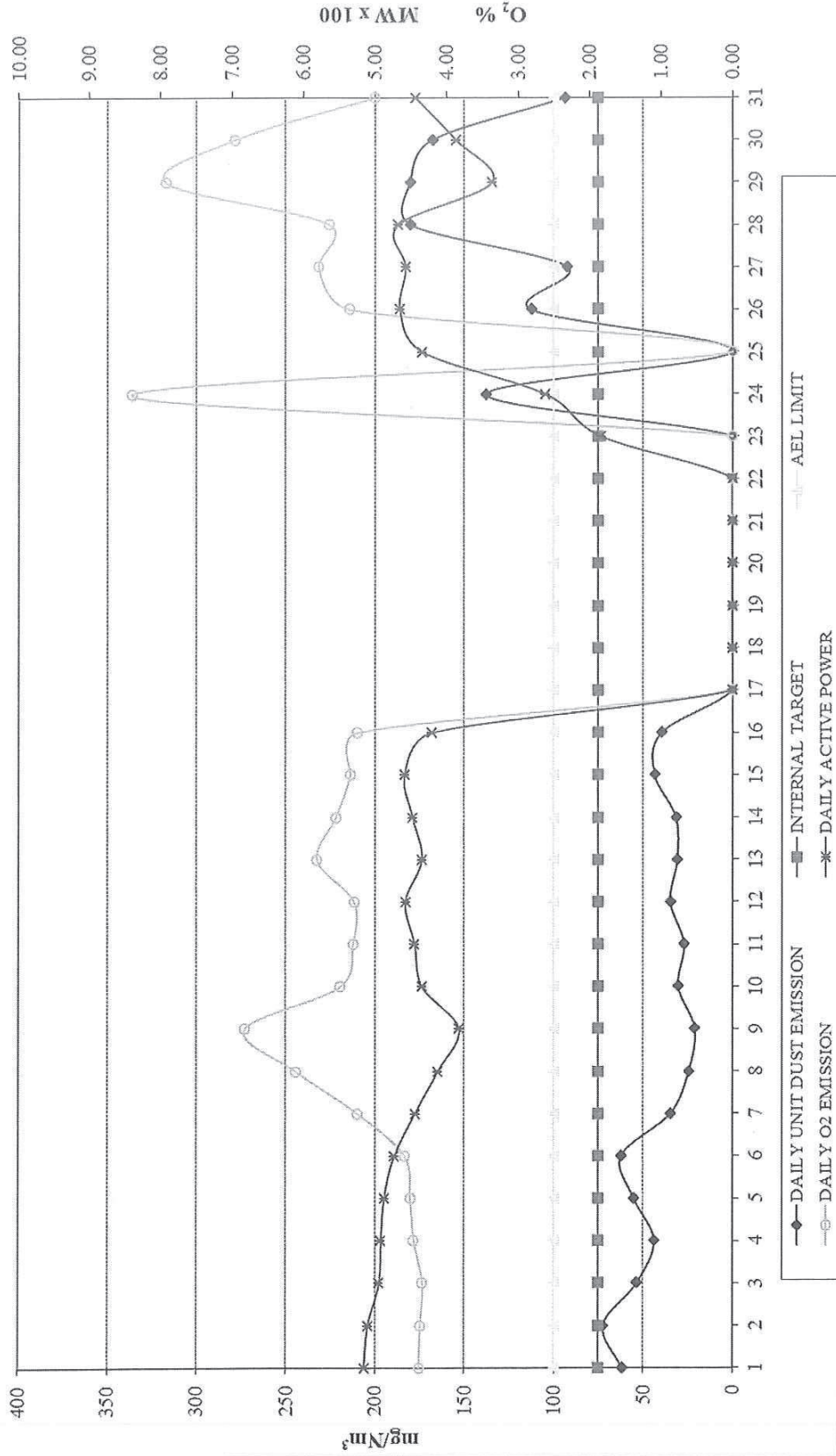
**MATLA POWER STATION  
UNIT 3 DUST EMISSION REPORT  
JANUARY 2019**



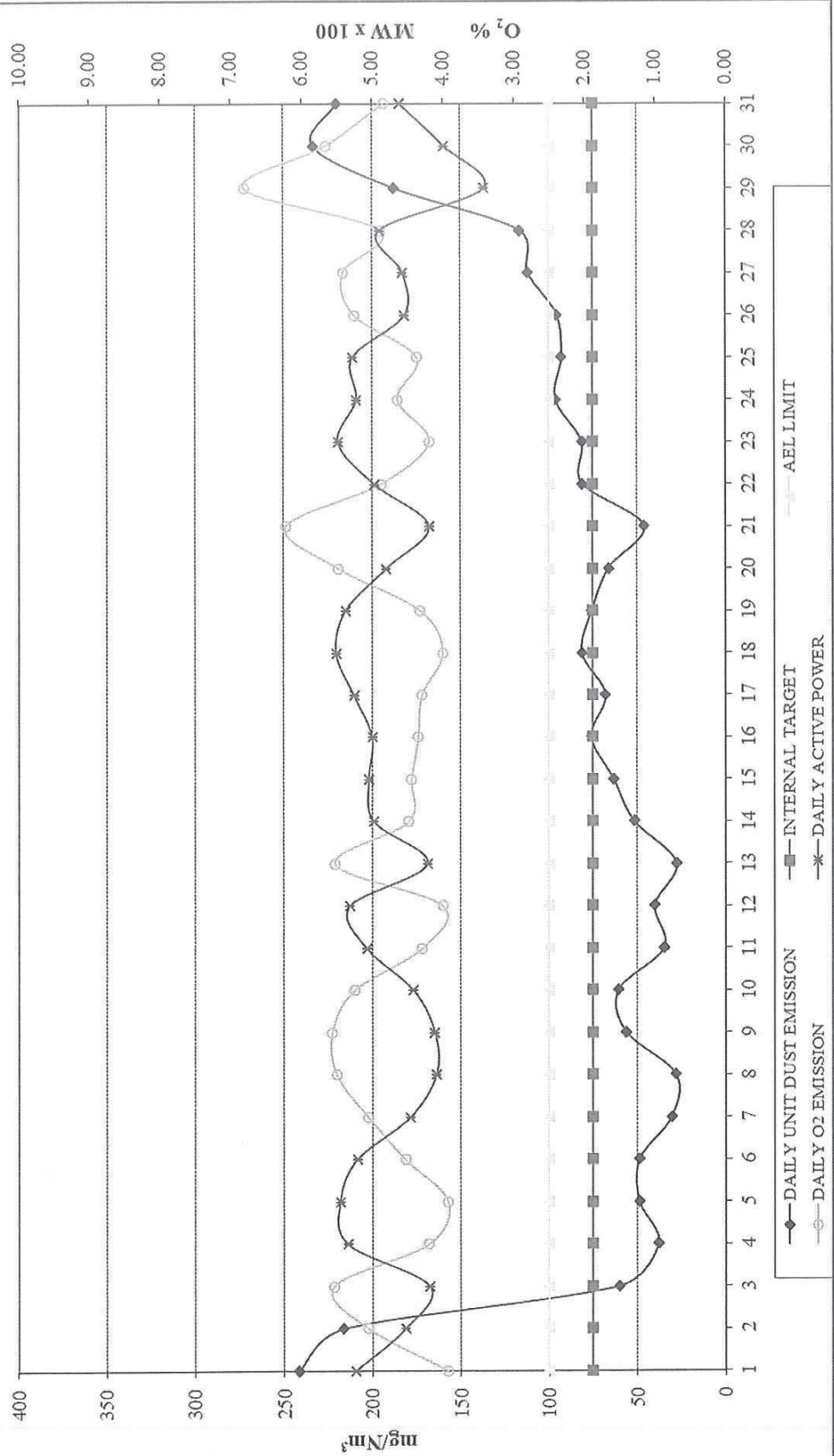
**MATLA POWER STATION  
UNIT 4 DUST EMISSION REPORT  
JANUARY 2019**



**MATLA POWER STATION  
UNIT 5 DUST EMISSION REPORT  
JANUARY 2019**

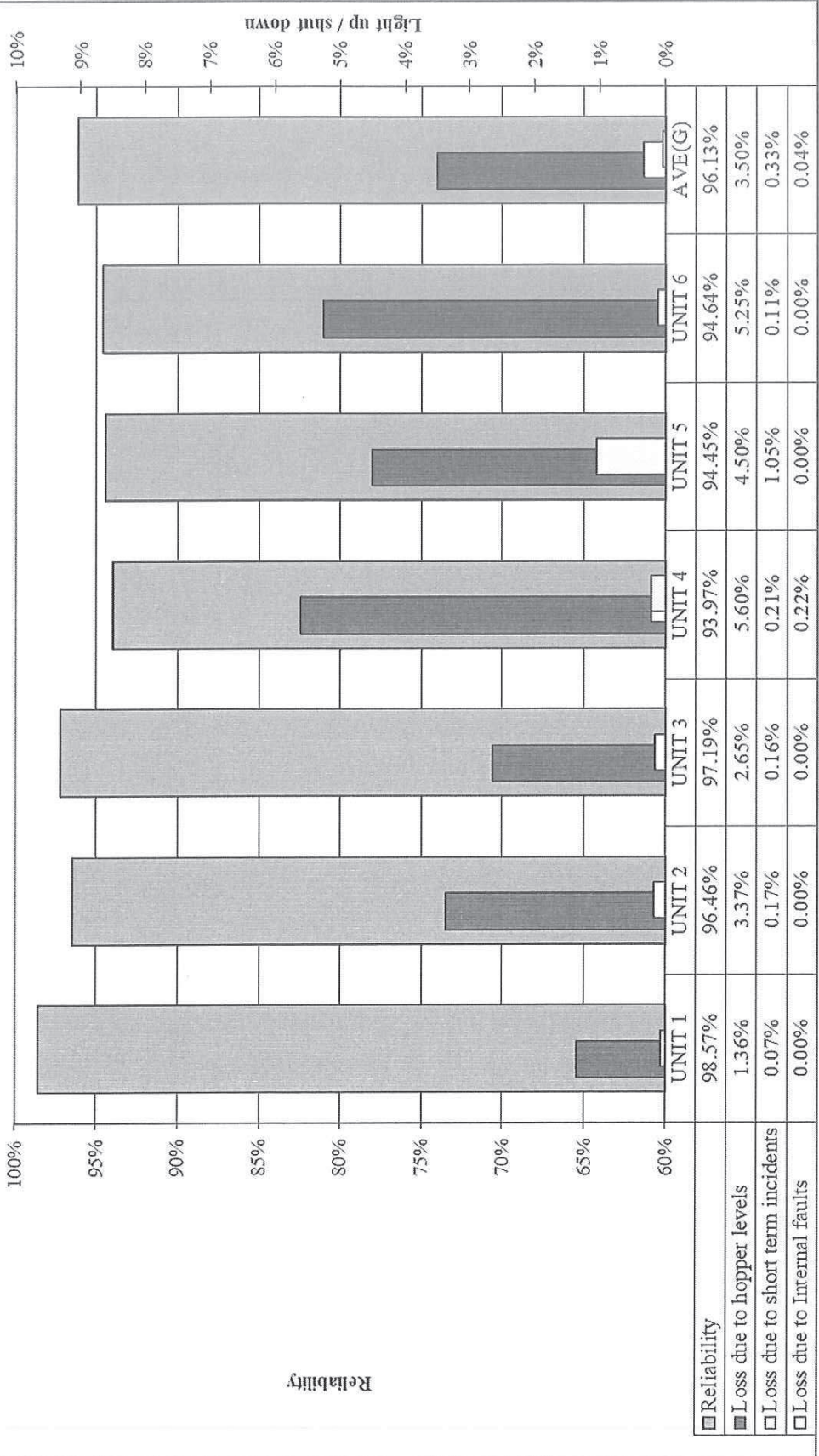


**MATLA POWER STATION  
UNIT 6 DUST EMISSION REPORT  
JANUARY 2019**

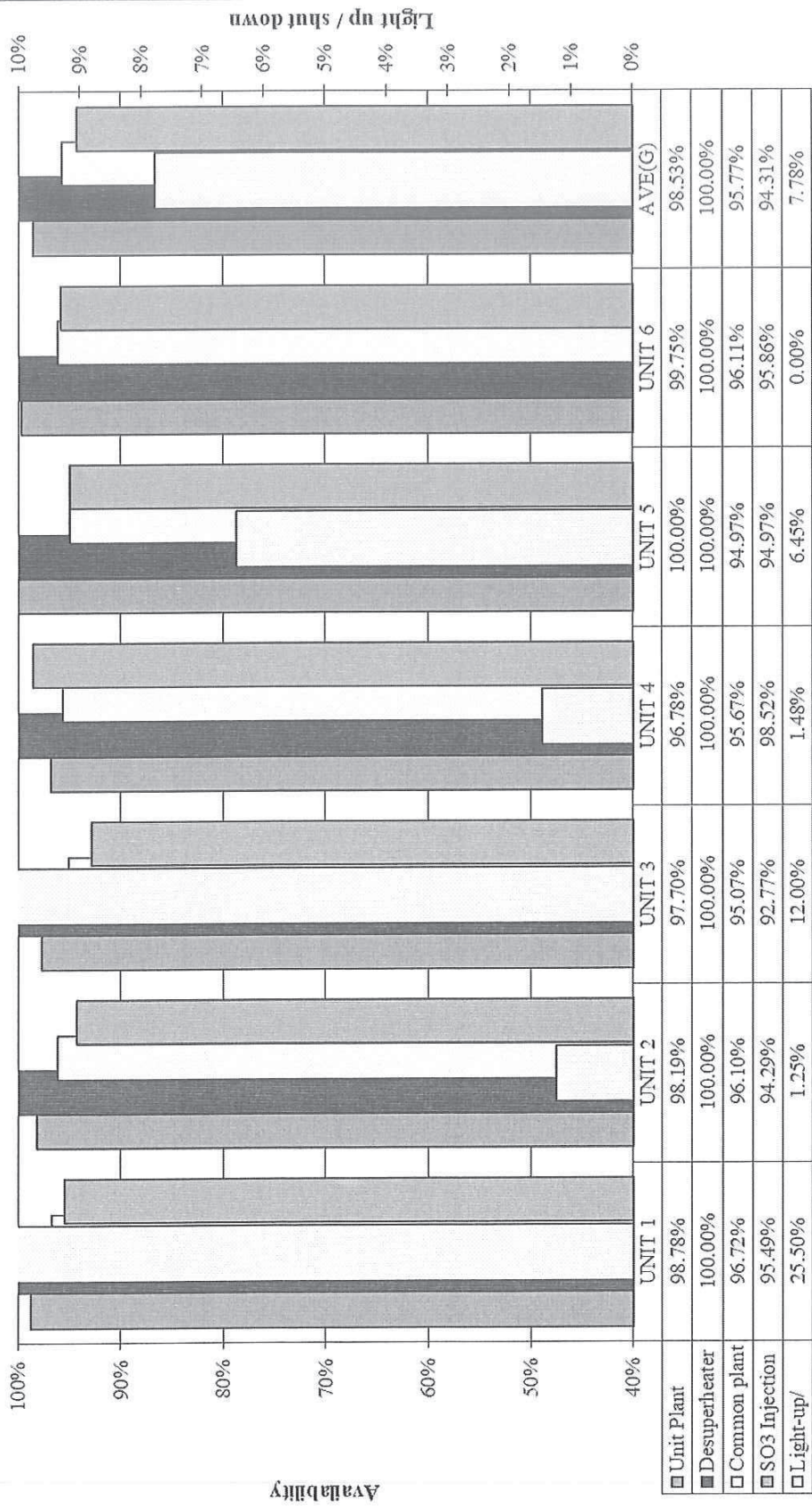




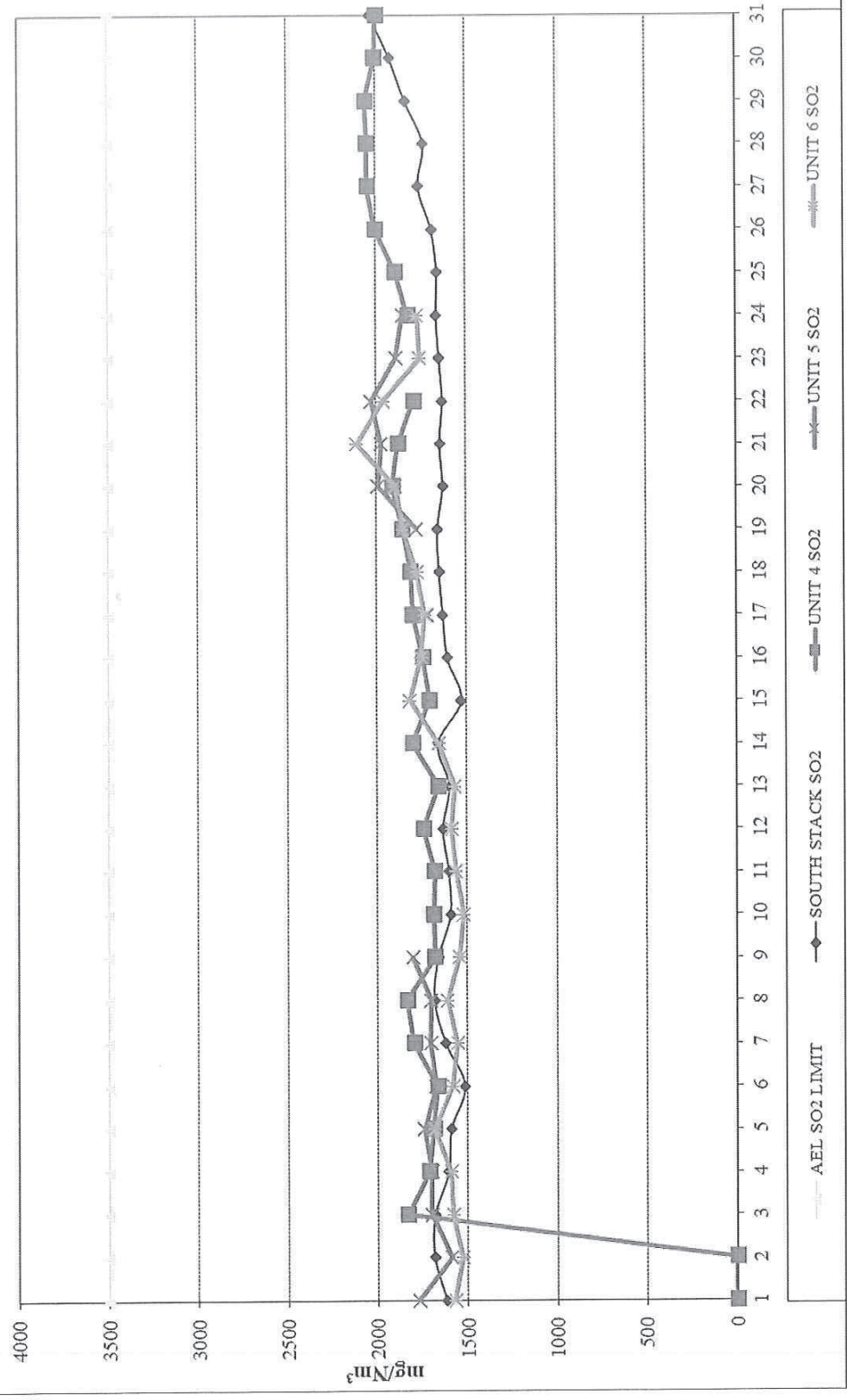
**MATLA POWER STATION  
PRECIPITATOR RELIABILITY  
JANUARY 2019**



**MATLA POWER STATION  
SO<sub>3</sub> PLANT AVAILABILITY  
JANUARY 2019**



**MATLA POWER STATION  
SMOKE STACK SO<sub>2</sub> EMISSION REPORT  
JANUARY 2019**



**MATLA POWER STATION  
SMOKE STACK NO<sub>2</sub> EMISSION REPORT  
JANUARY 2019**

