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Date:  
07 December 2020

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Ref: LRP03PLA000 \_0218/20201126

Dear Mr. Sibaya

## RESUBMISSION OF LETHABO POWER STATION MONTHLY EMISSIONS REPORTS

Lethabo Power Station has resubmitted the monthly emissions reports for the period from November 2019 to September 2020. This letter serves as explanation for the need to resubmit the reports and key factors to be considered when interpreting the attached reports.

### Replacement of Particulate Matter Monitors

As part of a capital project, Lethabo Power Station replaced the emissions monitors for Particulate Matter (PM) during November 2019. Due to the Original Equipment Manufacturer (OEM) support which expired at the end of 2019. The exact dates of monitor replacements are as follow:

Unit	Monitor Replacement Date	Period Without PM Emissions Data
Unit 1	18 November 2019	18 November 2019 at 09:20, until 19 November 2019 at 14:50
Unit 2		
Unit 3		
Unit 4	14 November 2019	N/A – Unit was off during the time of replacement
Unit 5		
Unit 6		14 November 2019 at 09:54 until 16:19

Since the replacement dates above, the new monitors have been used for reporting purposes and the previous correlation curves were still valid at the time of monitor replacement. Although it was advised to have new correlation curves generated for the new monitors and correlation tests had to be redone. After the valid correlation curves were received the data had to be back fitted with valid correlation factors. It was noted in original monthly reports, as well as the Lethabo Power Station Annual Emissions Report for 2020 Financial Year, that the correlation tests used previously are invalid since the monitor replacement.

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### Conducting Correlation Tests and Implementation

The correlation test for Unit 1 and 2 were completed in December 2019 and the results were received on 27 February 2020 (Unit 1) and 2 March 2020 (Unit 2). Units 3 and 4 correlation tests were conducted in February 2020, and the reports were received in 23 May 2020 (Unit 3) and 27 June (Unit 4).

The correlation test for Unit 5 and Unit 6 took place in May 2020 and results for both Units were received on 30 June 2020. Delays in the correlation tests for Units 5 and 6 were attributed to the Units being off for outages for extended periods until February 2020 and April 2020 respectively. Thereafter COVID-19 lockdown restrictions caused additional delays to the test being conducted.

During verification of the correlation curves it was determined that the Units 4 and 6 correlations curves were not acceptable due to the coefficient factor not being within specification. Additionally, defects were identified on the new PM monitors and a decision was made redo to all PM correlations for all six units. The correlation tests were redone in July and August 2020 and the reports for second round of correlation tests were finalized and implemented in October 2020. Once the correlation tests were finalized, the station commenced with back fitting the data with valid curves.

### Gaseous Emissions Investigations

Challenges were experienced with gaseous monitor reliability since February 2020, mainly due to calibration gas not being available intermittently. The lack of calibration gas meant that proper calibration of the monitors could not occur as planned. The challenge of procuring calibration gas was experienced by multiple Eskom sites; however, the station was able to place a temporary order for the procurement of calibration gas to do calibration on the monitors. Numerous investigations have been launched to determine which times have been affected by the monitors that were not properly calibrated. The findings from these investigation results have been actioned and the affected data was corrected as recommended.

### Correlation Curve Validity and Back Fitting Rationale:

The table below reflects the previous and present gaseous and PM correlation dates and validity.

	<b>PM and Gaseous Correlation Curves Validity and Implementation as at 26 October 2020</b>					
	<b>Unit 1</b>	<b>Unit 2</b>	<b>Unit 3</b>	<b>Unit 4</b>	<b>Unit 5</b>	<b>Unit 6</b>
<b>Correlation 1 PM</b>	02/07/2018	17/08/2018	31/10/2019	22/06/2019	13/05/2018	22/06/2019
<b>Expiry</b>	02/07/2020	17/08/2020	31/10/2021	22/06/2021	13/05/2020	22/06/2021
<b>Validity</b>	Not Valid Due to PM Monitor change (Nov-19)	Not Valid Due to PM Monitor change (Nov-19)	Not Valid Due to PM Monitor change (Nov-19)	Not Valid Due to PM Monitor change (Nov-19)	Not Valid Due to PM Monitor change (Nov-19)	Not Valid Due to PM Monitor change (Nov-19)
<b>Implemented</b>	31/08/2018	05/10/2018	20/11/2019	31/07/2019	04/07/2018	12/07/2019
<b>Reference</b>	RSL285	RSL286	RSL345	RSL324	RSL274	RSL323

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<b>Correlation 2 PM</b>	10/12/2019	15/12/2019	20/02/2020	22/06/2019	20/05/2020	22/06/2019
<b>Expiry</b>	10/12/2022	15/12/2022	20/02/2022	22/06/2021	20/05/2022	22/06/2021
<b>Validity</b>	Valid	Valid	Valid	Not Valid Due to PM Monitor change (Nov-19)	Valid	Not Valid Due to PM Monitor change (Nov-19)
<b>Implemented 1</b>	12/03/2020	12/03/2020	-	-	-	-
<b>Implemented 2</b>	15/07/2020 (Reviewed curves using Eskom's Tool)	15/07/2020 (Reviewed curves using Eskom's Tool)	15/07/2020 (Reviewed curves using Eskom's Tool)		15/07/2020 (Reviewed curves using Eskom's Tool)	
<b>Reference</b>	RGND020(0)	RGND021(0)	RGND026(0)	RSL324	RGND031(0)	RSL323

<b>Correlation 1 Gaseous</b>	01/07/2018	16/08/2018	14/08/2018	24/04/2018	13/05/2018	10/06/2018
<b>Expiry</b>	01/07/2020	16/08/2020	14/08/2020	24/04/2020	13/05/2020	10/06/2020
<b>Validity</b>	Not Valid	Not Valid	Not Valid	Not Valid	Not Valid	Not Valid
<b>Implemented</b>	30/07/2018	29/10/2018	12/11/2018	04/06/2018	25/06/2018	20/08/2018
<b>Reference</b>	RSL282	RSL288	RSL290	RSL269	RSL272	RSL276

<b>Correlation 3 PM</b>	15/08/2020	07/08/2020	01/08/2020	26/07/2020	16/07/2020	21/07/2020
<b>Expiry</b>	15/08/2022	07/08/2022	01/08/2022	26/07/2022	16/07/2022	21/07/2022
<b>Validity</b>	Valid	Valid	Valid	Valid	Valid	Valid
<b>Implemented</b>	08/10/2020	08/10/2020	08/10/2020	08/10/2020	16/10/2020	08/10/2020
<b>Reference</b>	RSL370	RSL367	RSL365R1	RSL363R1	RSL359R3	RSL361R1

<b>Correlation 2 Gaseous</b>	15/08/2020	07/08/2020	01/08/2020	26/07/2020	16/07/2020	21/07/2020
<b>Expiry</b>	15/08/2022	07/08/2022	01/08/2022	26/07/2022	16/07/2022	21/07/2022
<b>Validity</b>	Valid	Valid	Valid	Valid	Valid	Valid
<b>Implemented</b>	16/10/2020	07/10/2020	07/10/2020	07/10/2020	07/10/2020	07/10/2020
<b>Reference</b>	RSL371	RSL368	RSL366	RSL364	RSL360	RSL362

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Based on the above implementation dates and change of monitors the following back fitting exercise was undertaken to ensure reported data is correlated correctly:

- Unit 1 Gaseous curves back fitted from 01/07/2020 to 16/10/2020 (09:55 AM) using curves from RSL371.

Reports affected: July 2020; August 2020; September 2020; October 2020)

Item	Old Curve	New Curve
Oxides of Nitrogen	$y=1.2185*x-32.5304$	$y=0.9811*x+34.305$
Sulphur Dioxide	$y=1.0503*x$	$y=1.026*x$
Carbon Monoxide	$y=1.1671*x+3.8652$	$y=0.9948*x-0.0062$
Carbon Dioxide	$y=0.9119*x$	$y=1.0156*x$
Oxygen	$y=0.9487*x$	$y=1.0698*x$
Velocity	$y=x$	$y=0.6706*x+7.9232$
Moisture	$y=x$	$y=0.9339*x$

- Unit 2 Oxygen curves back fitted from 01/11/20219 to 07/10/2020 (15:15 PM) using curves from RSL368. Due to issues with the Oxygen correlation curves it is recommended that back fitting of Oxygen data be done using curves from RSL368.

Reports affected: November 2019, December 2019; January 2020; February 2020; March 2020; April 2020; May 2020; June 2020; July 2020; August 2020; September 2020; October 2020

Item	Old Curve	New Curve
Oxygen	$y=1.408*x$	$y=1.0583*x$

- Unit 2 Gaseous curves back fitted from 16/08/2020 to 07/10/2020 (15:15 PM) using curves from RSL368.

Reports affected: August 2020; September 2020; October 2020

Item	Old Curve	New Curve
Oxides of Nitrogen	$y=1.0425*x+49.3013$	$y=1.0079*x+29.1776$
Sulphur Dioxide	$y=1.0354*x$	$y=1.0316*x$
Carbon Monoxide	$y=1.3611*x-28.5933$	$y=1.1025*x+26.3043$
Carbon Dioxide	$y=1.0698*x$	$y=1.0903*x$
Velocity	$y=x$	$y=1.4539*x-1.8744$
Moisture	$y=x$	$y=1.2962*x$

- Unit 3 Gaseous curves back fitted from 14/08/2020 to 07/10/2020 (15:15 PM) using curves from RSL366.

Reports affected: August 2020; September 2020; October 2020

Item	Old Curve	New Curve
Oxides of Nitrogen	$y=0.8459*x+35.4541$	$y=1.0646*x+19.9141$
Sulphur Dioxide	$y=0.9883x$	$y=1.0605*x$
Carbon Monoxide	$y=x$	$y=1.0364*x+7.0817$
Carbon Dioxide	$y=1.0225*x$	$y=0.9455*x$
Oxygen	$y=1.0002*x$	$y=1.0505*x$
Velocity	$y=x$	$y=0.4851*x+14.6883$
Moisture	$y=x$	$y=1.1852*x$

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- Unit 4 Gaseous curves back fitted from 24/04/2020 to 07/10/2020 using curves from RSL364. Reports affected: April 2020; May 2020; June 2020; July 2020; August 2020; September 2020; October 2020

Item	Old Curve	New Curve
Oxides of Nitrogen	$y=1.183*x-26.2333$	$y=1.1474*x-3.4711$
Sulphur Dioxide	$y=1.0051*x$	$y=1.0282*x$
Carbon Monoxide	$y=1.0699*x-13.504$	$y=1.2766*x-25.9368$
Carbon Dioxide	$y=0.9542*x$	$y=1.0822*x$
Oxygen	$y=1.1686*x$	$y=1.0236*x$
Velocity	$y=x$	$y=1.6122*x-11.3395$
Moisture	$y=x$	$y=1.1819*x$

- Unit 5 Gaseous curves back fitted from 13/05/2020 to 07/10/2020 using curves from RSL360. It is noted that the Moisture curve was incorrect and inflated during the time of the correlation. It was determined that an average of (6.4% H<sub>2</sub>O) will be used from the point of curve expiry until the test is redone. The order has already been place to redo this correlation. Reports affected: May 2020; June 2020; July 2020; August 2020; September 2020; October 2020

Item	Old Curve	New Curve
Oxides of Nitrogen	$y=1.0708*x$	$y=1.0025*x$
Sulphur Dioxide	$y=0.9824*x$	$y=1.0251*x$
Carbon Monoxide	$y=0.9084*x-3.1968$	$y=1.5634*x+15.3230$
Carbon Dioxide	$y=1.0039*x$	$y=1.015*x$
Oxygen	$y=1.1186*x$	$y=1.0698*x$
Velocity	$y=x$	$y=0.3782*x+17.909$
Moisture	$y=x$	$y=3.2336*x+0.0349$

- Unit 6 Oxygen curves back fitted from 01/11/2020 to 07/10/2020 (15:15 PM) using curves from RSL362. Due to issues with the Oxygen instrument was changed soon after the previous QAL 2 tests were done. The recommendation was to utilize a calculated curve due to this. For this reason, it was recommended that back fitting of Oxygen data be done using curves from RSL362. Reports affected: November 2019, December 2019; January 2020; February 2020; March 2020; April 2020; May 2020; June 2020; July 2020; August 2020; September 2020; October 2020

Item	Old Curve	New Curve
Oxygen	$y=x$	$y=1.1686x$

- Unit 6 Gaseous curves back fitted from 10/06/2020 to 07/10/2020 (15:15 PM) using curves from RSL362. Reports affected: June 2020; July 2020; August 2020; September 2020; October 2020

Item	Old Curve	New Curve
Oxides of Nitrogen	$y=1.4129*x+114.035$	$y=1.0959*x+0.6585$
Sulphur Dioxide	$y=1.0505*x$	$y=1.0105*x$
Carbon Monoxide	$y=x$	$y=x$
Carbon Dioxide	$y=1.0383*x$	$y=1.1272*x$
Velocity	$y=x$	$y=1.2482*x-2.8833$
Moisture	$y=x$	$y=1.1184*x$

## RESUBMISSION OF LETHABO POWER STATION MONTHLY EMISSIONS REPORTS

- Unit 1 PM curves back fitted from 18/11/2020 to 12/03/2020 (08:20 AM) using curves from RGND020(0) (Implementation 1).  
Reports affected: November 2019, December 2019; January 2020; February 2020; March 2020

Item	Old Curve	New Curve
Output 1	$y=6.0444*x-21.3859$	$y=10.2387*x-52.91$
Output 2	$y=40.2962*x-158.393$	$y=68.2582*x-284.99$

- Unit 2 PM curves back fitted from 18/11/2019 to 12/03/2020 (08:20 AM) using curves from RGND021(0) (Implementation 1).  
Reports affected: November 2019, December 2019; January 2020; February 2020; March 2020

Item	Old Curve	New Curve
Output 1	$y=6.708*x-26.9533$	$y=11.4509*x-39.52$
Output 2	$y=33.54*x-134.281$	$y=57.2545*x-222.74$

- Unit 3 PM curves back fitted from 18/11/2019 to 19/11/2020 using curves from RGND026(0).  
Reports affected: November 2019

Item	Old Curve	New Curve
Output 1	$y=11.8552*x-42.9435$	$y=16.57*x-68.913$
Output 2	$y=39.5172*x-153.592$	$y=54.3377*x-219.96$

- Unit 3 PM curves back fitted from 20/11/2020 to 15/07/2020 (10:10 AM) using curves from RGND026(0).  
Reports affected: November 2019, December 2019; January 2020; February 2020; March 2020; April 2020; May 2020; June 2020; July 2020

Item	Old Curve	New Curve
Output 1	$y=13.1908*x-52.7815$	$y=16.57*x-68.913$
Output 2	$y=37.1843*x-141.2112$	$y=54.3377*x-219.96$

- Unit 4 PM curves back fitted from 14/11/2019 to 08/10/2020 (10:00 AM) using curves from RSL363R1. (Note after the monitor change, the correlation test did not meet the requirements and could not be used. Due to this the back fitting was done from November 2019 to the next curve implementation)  
Reports affected: November 2019, December 2019; January 2020; February 2020; March 2020; April 2020; May 2020; June 2020; July 2020; August 2020; September 2020; October 2020

Item	Old Curve	New Curve
Output 1	$y=7.8865*x-27.5857$	$y=9.5164*x-38.7168$
Output 2	$y=26.2883*x-101.193$	$y=31.7214*x-127.5366$

- Unit 5 PM curves back fitted from 14/11/2020 to 15/07/2020 (10:40 AM) using curves from RGND031(0).  
Reports affected: November 2019, December 2019; January 2020; February 2020; March 2020; April 2020; May 2020; June 2020; July 2020

Item	Old Curve	New Curve
Output 1	$y=10.9526*x-47.1537$	$y=8.6012*x-31.658$
Output 2	$y=36.5087*x-149.378$	$y=28.627*x-111.67$

## RESUBMISSION OF LETHABO POWER STATION MONTHLY EMISSIONS REPORTS

- Unit 6 PM curves back fitted from 14/11/2020 to 08/10/2020 (10:00 AM) using curves from RSL362. (Note after the monitor change, the correlation test did not meet the requirements and was not used. Due to this the back fitting was done from November 2019 to the next curve implementation)

Reports affected: November 2019, December 2019; January 2020; February 2020; March 2020; April 2020; May 2020; June 2020; July 2020; August 2020; September 2020; October 2020

Item	Old Curve	New Curve
Output 1	$y=4.9333*x-19.2737$	$y=11.2651*x-46.9329$
Output 2	$y=25.1964*x-94.9214$	$y=37.5503*x-152.0737$

Other factors that affected the gaseous data especially include corrective actions stemming from investigations done on site relating to data integrity issues related to gaseous emissions. These findings and actions are summarized below:

	Finding	Action
Unit 4	<p>SO<sub>2</sub> and NO data: On 25<sup>th</sup> January 2020 the gas readings dropped to zero and it was later discovered that the air purge valve was closed on the common airline at the bottom of the smoke stack. The monitor does an auto zero correction every 12 hours and if the air is closed it will cause the values to drop to zero. It was rectified on 27<sup>th</sup> January 2020. The time frame where this happened is from 25<sup>th</sup> January 2020 12:11 to 27<sup>th</sup> January 2020 11:15.</p> <p>On 29<sup>th</sup> January a faulty gas calibration was done. The SO<sub>2</sub> made a big upward step and caused a few exceedances consequently. Due to the lack of available calibration gas the problem could only be rectified on 7th March 2020.</p> <p>Oxygen data: When Eskom Research Training and Development (RT&amp;D) did O<sub>2</sub> verifications in January they found the O<sub>2</sub>'s higher than what it is supposed to be and therefore their average of 6.18% were used from 29<sup>th</sup> January to 24<sup>th</sup> April. On 24<sup>th</sup> April RT&amp;D did a verification again and their average of 7.12% was used from then. Due to the unavailability of calibration gas and unverified gas the oxygen had to be corrected with the verified values.</p>	<p>1. O<sub>2</sub> Data:</p> <ul style="list-style-type: none"> <li>29<sup>th</sup> January to 24<sup>th</sup> April 2020 use 6.18% O<sub>2</sub>;</li> <li>25<sup>th</sup> April to 31<sup>st</sup> May 2020 use 7.12% O<sub>2</sub>.</li> </ul> <p>2. NO and SO<sub>2</sub> Data:</p> <ul style="list-style-type: none"> <li>The NO and SO<sub>2</sub> values should be removed from 25<sup>th</sup> January 2020 12:11 to 27<sup>th</sup> January 2020 11:15 due to the air purge valve that was closed.</li> </ul> <p>3. SO<sub>2</sub> Data:</p> <ul style="list-style-type: none"> <li>For 29<sup>th</sup>-31<sup>st</sup> January 2020 use the average for 1-28 January 2020;</li> <li>For 1<sup>st</sup>-29<sup>th</sup> February 2020 use the average of January and March which is 1<sup>st</sup>-28<sup>th</sup> January and 8<sup>th</sup>-31<sup>st</sup> March 2020.</li> <li>For 1<sup>st</sup>-7<sup>th</sup> March use the average of 8<sup>th</sup>-31<sup>st</sup> March 2020</li> </ul>

**RESUBMISSION OF LETHABO POWER STATION MONTHLY EMISSIONS REPORTS**

	<b>Finding</b>	<b>Action</b>
Unit 5	<p>Oxygen adjustments: On 23<sup>rd</sup> April 2020 RT&amp;D did gas verifications and saw that the O<sub>2</sub> readings were too high. An average of their values were calculated and it was 6.8%. Therefore, this value will be used from 1<sup>st</sup> April 2020 to 13<sup>th</sup> May 2020. Calibrations were not done as frequently as supposed to due to the lack of calibration gas. The monitors were calibrated on 13<sup>th</sup> May and QAL 2 tests were completed on the 16<sup>th</sup> July 2020</p>	<p>O<sub>2</sub> Data: The QAL2 test was due and was finished on 16<sup>th</sup> July 2020, therefore 6.8% is used from 1 April 2020 until 16<sup>th</sup> July 2020</p>
Unit 6	<p>SO<sub>2</sub> and NO adjustments: On 3<sup>rd</sup> April 2020 Unit 6 came back from an outage, but the gas monitor was removed during the outage to be used on Unit 3 that had a problem at the time. On 6<sup>th</sup> April 2020 the monitor was moved back to Unit 6. Therefore, no gas values were available from 3<sup>rd</sup> to 6<sup>th</sup> April 2020. It must be noted that only on 11<sup>th</sup> April 2020 the calibration coefficients were changed and therefore the monthly averages from the 12<sup>th</sup> April 2020 to 30<sup>th</sup> April 2020 must be used for the SO<sub>2</sub> and NO.</p> <p>There was a problem with the heater on the gas analyser that started on 16<sup>th</sup> May 2020. There was a loose wire on the SSR (solid state relay) that switched the heater off. That caused the process gas temperature values to go below 110°C which caused the monitor to go into a purge mode. When that happened all the gas values dropped to zero. It mainly happened during early morning hours when ambient temperatures were low. On 9<sup>th</sup> June the loose wire was found and corrected and that rectified the problem. The following dates and times are when that happened and will be removed from the reported data:</p> <p>Oxygen adjustments: When RT&amp;D did verifications on 22<sup>nd</sup> April they discovered that the O<sub>2</sub> measurements were reading higher and therefore the average of 6.13% was used for the period where no valid calibration was done due to the lack of calibration gas. This value is used from 3<sup>rd</sup> April to 27 May 2020.</p>	<p>O<sub>2</sub> Data:</p> <ul style="list-style-type: none"> <li>• Use 6.13% O<sub>2</sub> for 3 April 2020 to 27 May 2020</li> </ul> <p>NO and SO<sub>2</sub> Data</p> <ul style="list-style-type: none"> <li>• A monthly average for SO<sub>2</sub> and NO should be used for 3<sup>rd</sup>-11<sup>th</sup> April 2020. That means an average from 12<sup>th</sup>-30<sup>th</sup> April 2020 will replace the SO<sub>2</sub> and NO values for 3<sup>rd</sup>-11<sup>th</sup> April 2020.</li> <li>• Also, the heater tube had a loose wire that caused the heater to operate intermittently and therefore the following dates and times must be removed when these occurrences happened.             <ul style="list-style-type: none"> <li>○ 16 May 2020, 06:37-09:13;</li> <li>○ 24 May 2020, 06:58-12:33;</li> <li>○ 26 May 2020, 06:53-11:37;</li> <li>○ 27 May 2020, 03:56-10:11;</li> <li>○ 28 May 2020, 00:48-10:41;</li> <li>○ 29 May 2020, 03:09-09:17;</li> <li>○ 3 June 2020, 05:08-07:32;</li> <li>○ 4 June 2020, 02:41-10:58;</li> <li>○ 6 June 2020, 03:28-11:01;</li> <li>○ 7 June 2020, 01:08-13:18;</li> <li>○ 8 June 2020, 01:09-10:25;</li> <li>○ 9 June 2020, 03:24-11:56.</li> </ul> </li> </ul>



## **RESUBMISSION OF LETHABO POWER STATION MONTHLY EMISSIONS REPORTS**

Note on use of average for gaseous emission values, where it was required to utilize averages, it is the view of the station to take it as monitor unavailability (even if the monitor was reading and available, but the data was not reliable). This would ultimately adversely affect the percentage availability of the various monitors for that period, therefore the monitor availability for respective months were affected.

### **Backfitting Results**

A significant reduction of gaseous exceedances was observed after the back fitting exercise and the remaining exceedances are being investigated diligently.

Numerous additional PM exceedances were picked up during the back fitting exercise, some of which result in the station exceeding the 72 hours grace period during upset, maintenance, start up and shut down conditions. However, it should be noted the station was not observing the correct emission figures at the time as the monitors were not correlated for the monitors in use, as such the station could not act on emission excursion incurred during this period, as it was under the impression that the emissions were within acceptable limits. If the station was aware of such exceedances, it would have acted immediately to intervene with these emissions exceedances.

Lethabo Power Station remains committed to minimize emissions and continue to operate within the confine of legislative requirements.

Yours sincerely



Karabo Rakgolela  
**GENERAL MANAGER**

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04 December 2020

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Ref: LRP03PLA000 \_0181/20200408 Rev 01

Dear Mr. Sibaya

**LETHABO POWER STATION EMISSION MONTHLY REPORT FOR FEBRUARY 2020  
RESUBMISSION**

Please find attached Lethabo Power Station emission report for the month of February 2020.

Also attached ambient air quality monitoring report, complaints register and the fugitive dust fallout monitoring report for February 2020.

For any additional information please do not hesitate to contact us.

Yours sincerely



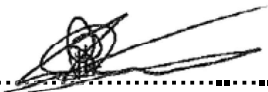
Karabo Rakgolela  
**GENERAL MANAGER**

	<b>Report</b>	<b>Lethabo Power Station</b>
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Report name:	<b>Lethabo Power Station February 2020 Emission Report - Resubmission</b>	Reference number:	<b>LRP03PLA000 _0181/20200408 Rev01</b>
		Document Type:	<b>Report</b>
		Area of Applicability:	<b>Environment</b>
		Report Date:	<b>November 2020</b>
		Classification:	<b>Controlled Disclosure</b>

**Signatures:**

**Compiled by:**

  
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**System Engineer**

**Verified by :**

  
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W de Klerk  
**Environmental Officer**

**Reviewed by:**

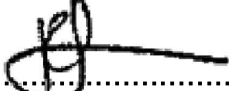
  
.....  
N Mazibuko  
**BPE Manager**

**Date:** 26/11/2020  
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**Date:** 2020-11-26  
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**Date:** 26/11/2020  
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**Reviewed by:**

  
.....  
C Govinden  
**PE Manager**

**Reviewed by:**

  
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L Nel  
**C&I Manager**

**Reviewed by:**

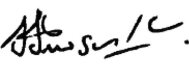
  
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M Hariram  
**Environmental Manager**

**Date:** 26/11/2020  
.....

**Date:** 2020-11-27  
.....

**Date:** 2020-12-03  
.....

**Approved by:**

  
.....  
H Sewsunker  
**Engineering Manager**

**Date:** 2020/12/03  
.....

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**STACK EMISSIONS REPORT**  
**LETHABO POWER STATION**

**Feb-20**

**1 PARTICULATE EMISSIONS**

**EMISSION RATE (ACTUAL EMISSION/MWh GENERATED - kg/MWh)**

<b>MONTH</b>	<b>UNIT 1</b>	<b>UNIT 2</b>	<b>UNIT 3</b>	<b>UNIT 4</b>	<b>UNIT 5</b>	<b>UNIT 6</b>	<b>STATION</b>
<b>MAR '19</b>	0.35	0.47	0.55	0.59	OFF	0.49	0.48
<b>APR '19</b>	0.18	0.23	0.51	0.38	OFF	0.45	0.34
<b>MAY '19</b>	0.23	0.24	0.81	0.34	OFF	0.33	0.37
<b>JUNE '19</b>	0.30	0.27	0.41	0.33	OFF	0.36	0.33
<b>JULY '19</b>	0.40	0.31	0.47	0.34	OFF	0.36	0.38
<b>AUG '19</b>	0.30	0.19	0.49	0.23	OFF	0.38	0.33
<b>SEPT '19</b>	0.31	0.17	0.46	OFF	OFF	0.35	0.32
<b>OCT '19</b>	0.35	0.24	0.48	OFF	OFF	0.45	0.38
<b>NOV '19</b>	0.31	0.47	0.37	OFF	OFF	0.59	0.43
<b>DEC '19</b>	0.58	0.48	0.51	OFF	OFF	0.77	0.59
<b>JAN '20</b>	0.42	0.52	0.62	0.25	OFF	0.73	0.49
<b>FEB '20</b>	0.56	0.46	0.67	0.29	0.27	OFF	0.47

## February-2020

Unit	Month Average (mg/Nm3)	Stack Average (mg/Nm3)	Limit (mg/Nm3)
UNIT 1	132.0	127.8	100
UNIT 2	102.0		100
UNIT 3	149.3		100
UNIT 4	64.0	85.7	100
UNIT 5	107.4		100
UNIT 6	OFF		100

LIGHT UP	4	5
Fires in (Time):	2020/02/04 02:50	2020/02/14 16:40
Synchronisation (Time):	2020/02/04 05:39:00	2020/02/16 16:28
Emissions below limit( Time):	2020/02/04 07:05	2020/02/17 21:05
Hours: Fires in to synchronisation	2:49:00	47:48:00
Hours: Synchronisation to < Limit:	1:26:00	28:37:00

SHUTDOWN	1	4	5	6
Beginning of Shutdown - Load < 300 MW (Time):	2020/02/26 00:00:00	2020/02/01 02:16:48	2018/10/10 15:23:39	2020/01/16 04:03:14
Shutdown (Time):	2020/02/26 17:51:00	2020/02/01 02:36:00	2018/10/10 15:23:39	2020/01/16 04:30:00
Duration (hh:mm:ss)	17:51:00	0:19:12	0:00:00	0:26:46
Reason	Boiler tube leak.	Turbine speed probe repairs	HP Steam pipe failure	IR Outage

Maintenance	1	1	1	3	3	3	3
Beginning of Maintenance (Time):	2020/02/07 00:28:00	2020/02/22 00:01:00	2020/02/23 00:01:00	2020/02/01 02:50:00	2020/02/02 00:05:00	2020/02/16 00:00:00	2020/02/29 00:01:00
Reason for Maintenance	LHO precip casing repairs	RHO precip casing repairs	LHO precip casing repairs	LHO precip casing repairs	LHI precip casing repairs	LHO precip casing repairs	RHI precip casing repairs
End (Time):	2020/02/08 01:16:00	2020/02/22 18:45:00	2020/02/23 17:39:00	2020/02/01 17:39:00	2020/02/02 16:30:00	2020/02/16 03:50:00	2020/02/29 18:14:00
Duration	24:48:00	18:44:00	17:38:00	14:49:00	16:25:00	3:50:00	18:13:00

### 3 FUEL BURNT

	FUEL OIL	FUEL	COAL	COAL	UNITS	BURN
MONTH	BURNT	LIMIT	BURNT	LIMIT	GEN	RATE
	kT	kT	kT	kT	MWh	(kg/GEN)
<b>MAR '19</b>	0.85	1.70	982.62	2000	1436944.26	0.72
<b>APR '19</b>	0.80	1.70	1106.98	2000	1662547.47	0.71
<b>MAY '19</b>	0.61	1.70	1190.67	2000	1828616.05	0.69
<b>JUNE '19</b>	0.34	1.70	1238.50	2000	1927881.61	0.68
<b>JULY '19</b>	0.46	1.70	1218.87	2000	1940766.10	0.66
<b>AUG '19</b>	0.52	1.70	984.18	2000	1604078.50	0.65
<b>SEP '19</b>	0.32	1.70	956.74	2000	1544561.03	0.65
<b>OCT '19</b>	0.18	1.70	1040.58	2000	1606075.12	0.68
<b>NOV '19</b>	0.30	1.70	986.57	2000	1516280.88	0.69
<b>DEC '19</b>	1.09	1.70	997.58	2000	1498774.18	0.71
<b>JAN '20</b>	1.08	1.70	1039.34	2000.00	1570187.37	0.71
<b>FEB '20</b>	1.03	1.70	1001.47	2000	1549398.31	0.69

### Particulate Emissions (Back Fitted Emissions)

Note: Nm<sup>3</sup> is at 273 K and 101.3 kPa, referenced to 10% O<sub>2</sub> on a dry basis

Date	U1	U2	U3	U4	U5	U6	Limit
01-Feb	123	81	312	238	OFF	OFF	100
02-Feb	152	91	497	OFF	OFF	OFF	100
03-Feb	141	101	121	OFF	OFF	OFF	100
04-Feb	114	98	138	OFF	OFF	OFF	100
05-Feb	301	94	114	64	OFF	OFF	100
06-Feb	405	101	165	59	OFF	OFF	100
07-Feb	169	84	193	69	OFF	OFF	100
08-Feb	170	87	111	80	OFF	OFF	100
09-Feb	87	47	106	OFF	OFF	OFF	100
10-Feb	60	88	117	34	OFF	OFF	100
11-Feb	69	123	179	59	OFF	OFF	100
12-Feb	49	102	164	48	OFF	OFF	100
13-Feb	83	96	103	61	OFF	OFF	100
14-Feb	106	91	126	73	OFF	OFF	100
15-Feb	91	51	108	61	OFF	OFF	100
16-Feb	65	82	198	96	OFF	OFF	100
17-Feb	72	106	152	90	263	OFF	100
18-Feb	117	107	86	60	12	OFF	100
19-Feb	126	125	105	39	60	OFF	100
20-Feb	162	162	86	50	81	OFF	100
21-Feb	147	91	83	38	107	OFF	100
22-Feb	168	80	75	35	75	OFF	100
23-Feb	293	109	81	38	140	OFF	100
24-Feb	69	142	159	51	181	OFF	100
25-Feb	39	154	86	44	76	OFF	100
26-Feb	52	136	96	58	125	OFF	100
27-Feb	OFF	119	106	53	177	OFF	100
28-Feb	OFF	126	146	59	49	OFF	100
29-Feb	OFF	86	320	46	49	OFF	100

### Particulate Emissions (Pre-Back Fitting)

Date	U1	U2	U3	U4	U5	U6	Limit
01-Feb	77	44	228	202	OFF	OFF	100
02-Feb	99	50	355	OFF	OFF	OFF	100
03-Feb	93	55	96	OFF	OFF	OFF	100
04-Feb	77	54	111	OFF	OFF	OFF	100
05-Feb	185	52	92	57	OFF	OFF	100
06-Feb	249	55	128	53	OFF	OFF	100
07-Feb	95	45	148	62	OFF	OFF	100
08-Feb	20	47	86	71	OFF	OFF	100
09-Feb	14	25	83	OFF	OFF	OFF	100
10-Feb	28	48	93	32	OFF	OFF	100
11-Feb	32	68	141	53	OFF	OFF	100
12-Feb	19	56	127	44	OFF	OFF	100
13-Feb	44	53	82	55	OFF	OFF	100
14-Feb	62	49	101	65	OFF	OFF	100
15-Feb	29	26	85	55	OFF	OFF	100
16-Feb	14	54	150	84	OFF	OFF	100
17-Feb	23	58	120	79	329	OFF	100
18-Feb	55	59	70	54	8	OFF	100
19-Feb	84	70	84	37	71	OFF	100
20-Feb	106	91	71	46	98	OFF	100
21-Feb	97	50	68	36	130	OFF	100
22-Feb	109	43	62	33	89	OFF	100
23-Feb	183	60	66	36	171	OFF	100
24-Feb	50	79	123	47	225	OFF	100
25-Feb	32	86	70	41	90	OFF	100
26-Feb	35	76	78	53	152	OFF	100
27-Feb	OFF	66	86	48	218	OFF	100
28-Feb	OFF	70	116	54	58	OFF	100
29-Feb	OFF	46	231	42	56	OFF	100

**Gaseous Emissions (Back Fitted Emissions)**

	Unit 1		Unit 2		Unit 3		Unit 4		Unit 5		Unit 6		Limit	
	Nox	Sox	Nox	Sox	Nox	SOx	Nox	Sox	Nox	Sox	Nox	SOx	Nox	SOx
01-Feb	811	2249	798	2616	780	2387	605	1474	OFF	OFF	OFF	OFF	1100	3500
02-Feb	736	2254	698	2648	807	2313	OFF	OFF	OFF	OFF	OFF	OFF	1100	3500
03-Feb	797	2263	844	2745	759	2403	OFF	OFF	OFF	OFF	OFF	OFF	1100	3500
04-Feb	784	2258	830	2856	835	2480	870	1483	OFF	OFF	OFF	OFF	1100	3500
05-Feb	765	2179	661	2708	838	2347	1004	1493	OFF	OFF	OFF	OFF	1100	3500
06-Feb	829	2189	837	2482	795	2357	992	1497	OFF	OFF	OFF	OFF	1100	3500
07-Feb	708	2199	1107	2745	829	2389	925	1500	OFF	OFF	OFF	OFF	1100	3500
08-Feb	884	2267	1128	2964	818	2545	877	1505	OFF	OFF	OFF	OFF	1100	3500
09-Feb	828	2154	873	2846	804	2437	776	1494	OFF	OFF	OFF	OFF	1100	3500
10-Feb	912	2172	971	2782	807	2419	776	1489	OFF	OFF	OFF	OFF	1100	3500
11-Feb	918	2152	1097	2766	830	2387	984	1492	OFF	OFF	OFF	OFF	1100	3500
12-Feb	882	2232	1025	2770	838	2410	872	1492	OFF	OFF	OFF	OFF	1100	3500
13-Feb	924	2127	1110	2721	846	2308	966	1495	OFF	OFF	OFF	OFF	1100	3500
14-Feb	915	2182	1086	2707	823	2334	954	1500	OFF	OFF	OFF	OFF	1100	3500
15-Feb	928	2161	1007	2854	820	2392	1120	1491	OFF	OFF	OFF	OFF	1100	3500
16-Feb	889	2199	1057	2726	860	2301	1083	1486	838	1575	OFF	OFF	1100	3500
17-Feb	927	2300	1118	2764	779	2720	1020	1497	767	1438	OFF	OFF	1100	3500
18-Feb	840	2278	1027	2776	641	2661	976	1494	631	1596	OFF	OFF	1100	3500
19-Feb	823	2136	986	2800	671	2451	1044	1499	779	1544	OFF	OFF	1100	3500
20-Feb	831	2142	923	2584	703	2403	1171	1499	874	1596	OFF	OFF	1100	3500
21-Feb	781	2092	930	2657	694	2404	1079	1497	823	1580	OFF	OFF	1100	3500
22-Feb	658	1957	935	2689	738	2447	1026	1497	805	1550	OFF	OFF	1100	3500
23-Feb	824	2006	806	2590	733	2373	879	1498	874	1578	OFF	OFF	1100	3500
24-Feb	866	2067	941	2634	731	2440	1163	1495	966	1600	OFF	OFF	1100	3500
25-Feb	843	2103	960	2569	753	2369	983	1493	901	1642	OFF	OFF	1100	3500
26-Feb	853	2305	978	2790	764	2703	988	1494	919	1726	OFF	OFF	1100	3500
27-Feb	OFF	OFF	958	2746	732	2738	950	1491	932	1624	OFF	OFF	1100	3500
28-Feb	OFF	OFF	1043	2556	726	2387	978	1501	843	1484	OFF	OFF	1100	3500
29-Feb	OFF	OFF	1101	2617	745	2393	1003	1498	776	1522	OFF	OFF	1100	3500

**Gaseous Emissions (Pre-Back Fitting)**

	Unit 1		Unit 2		Unit 3		Unit 4		Unit 5		Unit 6		Limit	
	Nox	Sox	Nox	Sox	Nox	SOx	Nox	Sox	Nox	Sox	Nox	SOx	Nox	SOx
01-Feb	811	2252	1023	3347	780	2387	780	3256	OFF	OFF	OFF	OFF	1100	3500
02-Feb	736	2254	846	3189	807	2313	OFF	OFF	OFF	OFF	OFF	OFF	1100	3500
03-Feb	797	2263	1057	3413	759	2403	OFF	OFF	OFF	OFF	OFF	OFF	1100	3500
04-Feb	784	2258	1055	3626	835	2480	968	3074	OFF	OFF	OFF	OFF	1100	3500
05-Feb	765	2179	822	3384	836	2343	1054	3012	OFF	OFF	OFF	OFF	1100	3500
06-Feb	829	2189	1076	3186	795	2357	1055	3060	OFF	OFF	OFF	OFF	1100	3500
07-Feb	708	2199	1472	3647	829	2389	1003	3122	OFF	OFF	OFF	OFF	1100	3500
08-Feb	884	2267	1495	3927	818	2545	967	3332	OFF	OFF	OFF	OFF	1100	3500
09-Feb	828	2154	1202	3919	804	2437	872	3214	OFF	OFF	OFF	OFF	1100	3500
10-Feb	912	2172	1278	3662	807	2419	943	3206	OFF	OFF	OFF	OFF	1100	3500
11-Feb	918	2152	1468	3701	830	2387	1078	3131	OFF	OFF	OFF	OFF	1100	3500
12-Feb	882	2232	1383	3741	838	2410	963	3137	OFF	OFF	OFF	OFF	1100	3500
13-Feb	924	2127	1476	3621	846	2308	1068	3064	OFF	OFF	OFF	OFF	1100	3500
14-Feb	915	2182	1435	3578	823	2334	1018	3049	OFF	OFF	OFF	OFF	1100	3500
15-Feb	928	2161	1352	3831	820	2392	1205	3037	OFF	OFF	OFF	OFF	1100	3500
16-Feb	889	2199	1450	3740	860	2301	1204	3128	OFF	OFF	OFF	OFF	1100	3500
17-Feb	927	2301	1474	3643	778	2718	1091	3051	OFF	OFF	OFF	OFF	1100	3500
18-Feb	840	2278	1349	3643	641	2661	1047	3041	OFF	OFF	OFF	OFF	1100	3500
19-Feb	823	2136	1287	3654	671	2451	1153	2934	OFF	OFF	OFF	OFF	1100	3500
20-Feb	831	2142	1195	3343	703	2403	1251	2978	879	1625	OFF	OFF	1100	3500
21-Feb	781	2092	1216	3471	694	2404	1160	2974	823	1580	OFF	OFF	1100	3500
22-Feb	658	1957	1237	3555	738	2447	1132	2975	805	1550	OFF	OFF	1100	3500
23-Feb	824	2006	1109	3558	733	2373	997	2965	874	1578	OFF	OFF	1100	3500
24-Feb	866	2067	1304	3646	731	2440	1270	2994	966	1600	OFF	OFF	1100	3500
25-Feb	843	2103	1337	3570	753	2369	1076	2860	901	1642	OFF	OFF	1100	3500
26-Feb	853	2305	1361	3879	764	2703	1061	3183	919	1726	OFF	OFF	1100	3500
27-Feb	OFF	OFF	1338	3828	732	2738	1043	3042	932	1624	OFF	OFF	1100	3500
28-Feb	OFF	OFF	1430	3513	726	2387	1064	2933	843	1484	OFF	OFF	1100	3500
29-Feb	OFF	OFF	1497	3557	745	2393	1086	3038	776	1522	OFF	OFF	1100	3500



5 REMARKS

UNIT	MWLOSS	REASON	ACTUALSTARTDATE	ACTUALENDDATE
1	80	EF:Precip casing manual rapping.	2020/02/01 00:06:00	2020/02/01 02:36:00
1	80	Manual rapping	2020/02/03 00:00:00	2020/02/03 02:58:00
1	80	Manual Rapping	2020/02/04 01:26:00	2020/02/04 03:28:00
1	80	Manual rapping.	2020/02/06 00:52:00	2020/02/06 03:27:00
1	80	Manual rapping	2020/02/06 09:21:00	2020/02/06 12:58:00
1	80	AM: LHO precip casing repairs	2020/02/07 00:28:00	2020/02/08 01:16:00
1	180	High stack emmissions	2020/02/21 00:49:00	2020/02/21 04:14:00
1	80	RHO precip casing repairs.	2020/02/22 00:01:00	2020/02/22 18:45:00
1	80	LHO casing repairs	2020/02/23 00:01:00	2020/02/23 17:39:00
1	593	AM: Boiler tube leak.	2020/02/26 17:51:00	2020/02/29 23:59:59
2	100	RHI casing ash conveyer belt(22WX12) damaged	2020/02/23 03:26:00	2020/02/28 13:07:00
3	118	AM: LHO Precip casing repairs.	2020/02/01 02:50:00	2020/02/01 17:39:00
3	118	AM: LHI Precip casing repairs.	2020/02/02 00:05:00	2020/02/02 16:30:00
3	71	High stack emissions	2020/02/03 09:14:00	2020/02/03 10:12:00
3	171	High stack emissions	2020/02/03 10:12:00	2020/02/03 17:17:00
3	171	EF:High stack emissions.	2020/02/04 00:19:00	2020/02/04 04:20:00
3	71	EF:High stack emissions	2020/02/04 11:36:00	2020/02/04 16:06:00
3	171	EF: High stack emission	2020/02/04 19:44:00	2020/02/04 20:32:00
3	171	EF:High stack emissions.	2020/02/05 00:33:00	2020/02/05 03:56:00
3	71	Manual rapping	2020/02/06 00:52:00	2020/02/06 03:27:00
3	71	Manual rapping	2020/02/07 00:23:00	2020/02/07 05:34:00
3	71	AM: Manual rapping	2020/02/08 00:11:00	2020/02/08 02:57:00
3	71	EF:High stack emissions.	2020/02/08 08:56:00	2020/02/08 17:54:00
3	71	AM: Manual rapping	2020/02/09 00:00:00	2020/02/09 03:00:00
3	171	High stack emissions	2020/02/10 00:42:00	2020/02/10 04:29:00
3	171	EM:High stack emissions.	2020/02/12 04:20:00	2020/02/12 05:12:00
3	171	EF: High stack emissions	2020/02/13 00:15:00	2020/02/13 05:18:00
3	171	EF:High stack emissions.	2020/02/13 19:52:00	2020/02/14 05:07:00
3	71	Ash plant standing.	2020/02/14 05:07:00	2020/02/14 21:20:00
3	171	EF:High stack emissions.	2020/02/14 21:20:00	2020/02/15 16:48:00
3	171	EF: High stack emissions	2020/02/15 20:34:00	2020/02/16 00:00:00
3	71	LHO casing repairs	2020/02/16 00:00:00	2020/02/16 03:50:00
3	171	High stack emissions	2020/02/17 01:01:00	2020/02/17 06:02:00
3	171	AM: High stack emissions.	2020/02/18 00:25:00	2020/02/18 05:06:00
3	24	EF: Correlation measurement	2020/02/18 23:59:00	2020/02/19 06:00:00
3	50	EF: High stack emissions	2020/02/19 11:25:00	2020/02/19 17:07:00
3	100	EF Emission correlations	2020/02/20 00:20:00	2020/02/20 05:54:00
3	128	EF: High stack emissioms	2020/02/25 23:59:00	2020/02/26 04:36:00
3	128	EF: High stack emissions	2020/02/26 23:46:00	2020/02/27 05:26:00
3	171	EF: High stack emissions	2020/02/28 00:32:00	2020/02/28 05:01:00
3	71	AM: RHI precip casing repairs	2020/02/29 00:01:00	2020/02/29 18:14:00
4	118	AM: Emissions monitoring crrelations measurements	2020/02/06 23:38:00	2020/02/07 04:39:00
4	593	Physical overspeed test	2020/02/08 22:43:00	2020/02/09 01:08:00

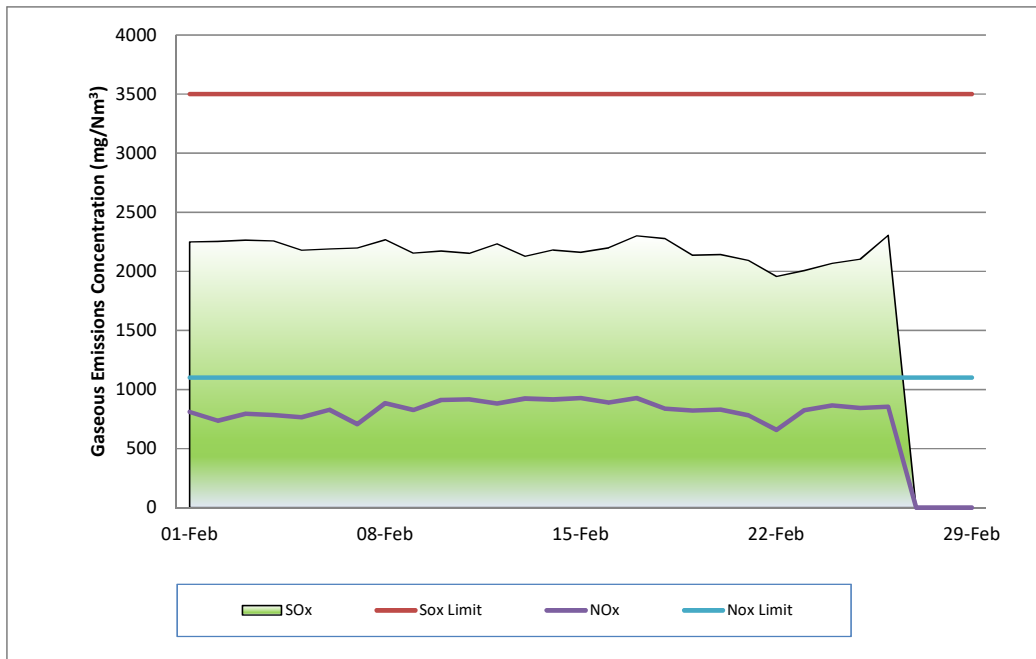
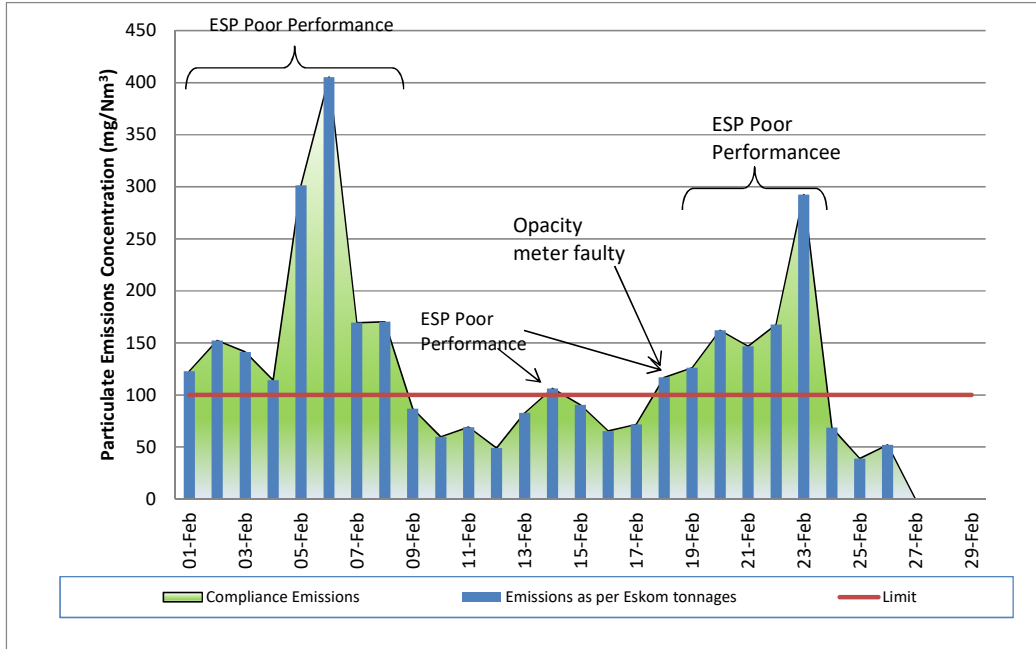
4	118	Emissions monitoring correlations measurements.	2020/02/12 00:08:00	2020/02/12 02:20:00
4	218	Emissions monitoring correlations measurements	2020/02/12 22:30:00	2020/02/13 05:09:00
5	593	HP Steam pipe failure	2020/02/01 00:00:00	2020/02/16 16:28:00
5	218	High stack emissions.	2020/02/25 09:51:00	2020/02/25 17:20:00
5	118	EF: High stack emissions.	2020/02/25 17:20:00	2020/02/25 18:27:00
5	218	EF: High stack emissions.	2020/02/25 18:27:00	2020/02/25 21:07:00
5	238	EF: High stack emissions.	2020/02/25 21:07:00	2020/02/25 23:55:00
5	218	EF: High stack emissions	2020/02/25 23:55:00	2020/02/26 05:39:00
5	218	EF: High stack emissions	2020/02/27 00:11:00	2020/02/27 05:13:00
5	108	High stack emissions	2020/02/27 09:34:00	2020/02/27 13:25:00
5	218	Ef: High stack emissions	2020/02/28 00:00:00	2020/02/29 06:07:00
5	218	High stack emissions	2020/02/29 10:03:00	2020/02/29 18:55:00
6	593	IR	2020/02/01 00:00:00	2020/02/29 23:59:59

PM Exceedances		
U1.	LHO • F5 off RHO • F4 off RHI • F2 tripping on undervoltage • F6 CE rapper not running • 5 high hopper levels – MMS reported DHP is in service, busy with back logging	01-Feb
U1.	• LHO F5 OFF, EMS confirmed internal fault, awaiting plant. • RHI	02-Feb
U1.	• LHO F5 OFF, EMS confirmed internal fault, awaiting plant.	03-Feb
U1.	ESP Poor Performance	04-Feb
U1.	ESP Poor Performance	05-Feb
U1.	RHI ESP Poor Performance	06-Feb
U1.	ESP Poor Performance	07-Feb
U1.	ESP Poor Performance	08-Feb
U1.	ESP Poor Performance	14-Feb
U1.	Unit 1: On the 18/02/2020 an Exceedance was noted. This was not a true exceedance as the opacity meters were faulty during this time. It was decided to removed the data for that day (08:10-11:25) and the average would be considered.	18-Feb
U1.	ESP Poor Performance	18-Feb
U1.	ESP Poor Performance	19-Feb
U1.	ESP Poor Performance	20-Feb
U1.	Casings performing poorly	21-Feb
U1.	ESP Poor Performance	22-Feb
U1.	ESP Poor Performance	23-Feb

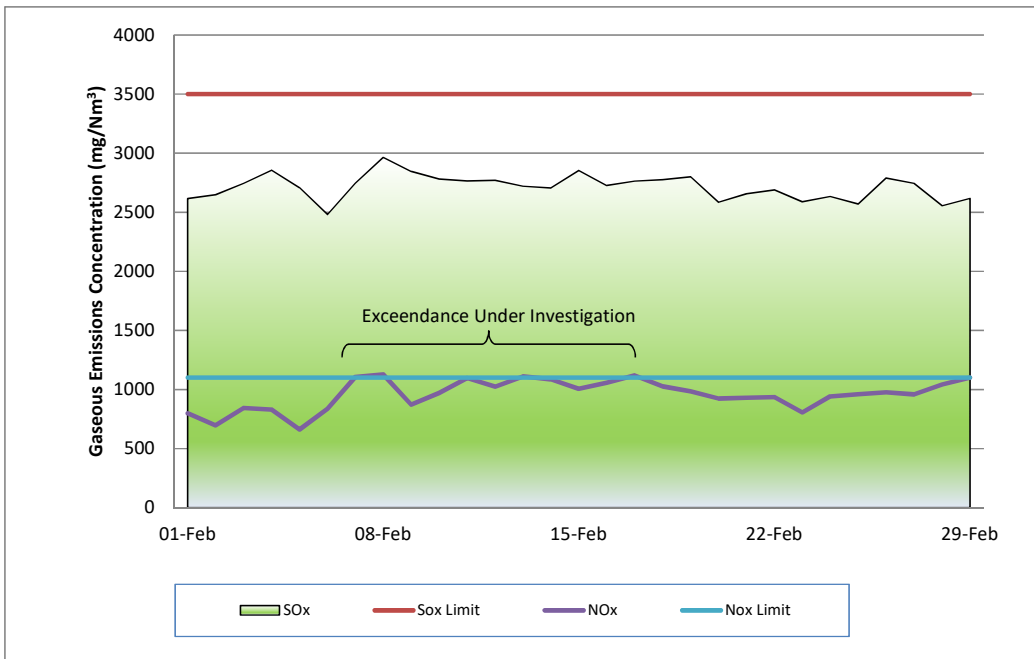
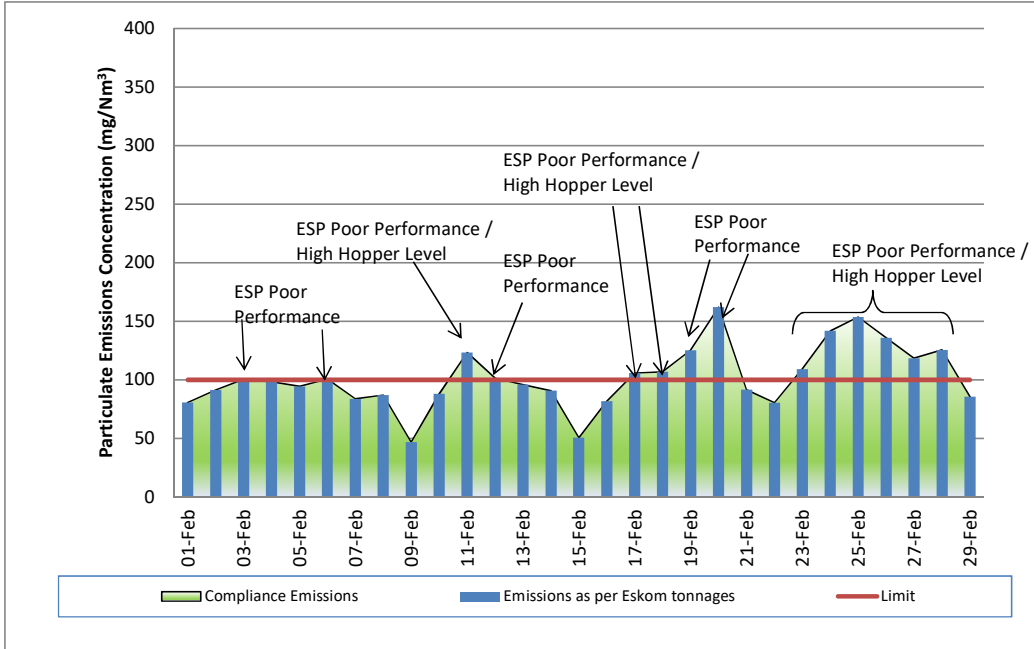
U2.	ESP Poor Performance	03-Feb
U2.	LHO • F5 Performing poorly – excessive sparking and arcing • F5 DE rapper has mechanical fault.	06-Feb
U2.	LHI • F3 arcing and sparking, EMS to attend RHI • F2 Off, Ops to check why field is off • 12WX41 Hopper 6 high level indication.	11-Feb
U2.	ESP Poor Performance	12-Feb
U2.	ESP Poor Performance / High Hopper Levels	17-Feb
U2.	ESP Poor Performance / High Hopper Levels	18-Feb
U2.	ESP Poor Performance	19-Feb
U2.	• RHI 2 off • LHO 7, RHO 4 awaiting plant • High hopper levels - MMASH – backlogging in progress	20-Feb
U2.	ESP Poor Performance / High Hopper Levels	23-Feb
U2.	ESP Poor Performance / High Hopper Levels	24-Feb
U2.	ESP Poor Performance / High Hopper Levels	25-Feb
U2.	ESP Poor Performance	26-Feb
U2.	ESP Poor Performance / High Hopper Levels	27-Feb
U2.	ESP Poor Performance / High Hopper Levels	28-Feb
U3.	LHO Casing Outage	01-Feb
U3.	LHI Casing Outage	02-Feb
U3.	• Ops reported 13wx11 hopper 4 blocked,	03-Feb
U3.	ESP Poor Performance	04-Feb
U3.	• RHO • F3 Comms fault, switched off due to high hopper level RHI, RHO and LHI performing poorly	05-Feb
U3.	ESP Poor Performance	06-Feb
U3.	ESP Poor Performance	07-Feb
U3.	Number of high hopper level alarm on DHP, total of 6, LHO • F3 Comms fault • F2 Comms fault RHO • F4 High level indicator and comms fault.	08-Feb
U3.	ESP Poor Performance / High Hopper Levels	09-Feb
U3.	ESP Poor Performance / High Hopper Levels	10-Feb
U3.	ESP Poor Performance	11-Feb
U3.	ESP Poor Performance	12-Feb
U3.	Four high hopper levels 60% load correlation test to be done tonight 22:00 – 05:00 tomorrow Poor ESP Performance	13-Feb
U3.	ESP Poor Performance	14-Feb
U3.	ESP Poor Performance	15-Feb

U3.	Emissions exceeded due to casing outage	16-Feb
U3.	ESP Poor Performance and Exceeded due to correlation test @ 100% load	17-Feb
U3.	ESP Poor Performance	19-Feb
U3.	SO3 plant challenges: SO3 plant tripped due to out side plant changing common plant pumps.	24-Feb
U3.	ESP Poor Performance	27-Feb
U3.	Dust handling plant defects	28-Feb
U3.	LHI Casing outage	29-Feb
U4.	Unit Shut Down	01-Feb
U5.	Unit Light Up	17-Feb
U5.	Turbine overspeed test: Unit off load for test and SOL 04h13	21-Feb
U5.	SO3 plant not in service	23-Feb
U5.	SO3 plant start up challenges	24-Feb
U5.	SO3 PLANT SULPHUR CONTROL V/V FAILS TO OPERATE	26-Feb
U5.	SO3 plant shutdown due to gasket leak on combustion air valve.	27-Feb
<b>NOX Exceedances</b>		
U2.	Exceedance Under Investigation	07-Feb
U2.	Exceedance Under Investigation	08-Feb
U2.	Exceedance Under Investigation	13-Feb
U2.	Exceedance Under Investigation	17-Feb
U2.	Exceedance Under Investigation	29-Feb
U4.	Additional contributors besides monitor unreliability - the simultaneous refurbishment of all 36 burners and two top mills in operation.	15-Feb
U4.	Additional contributors besides monitor unreliability - the simultaneous refurbishment of all 36 burners and two top mills in operation.	20-Feb
U4.	Additional contributors besides monitor unreliability - the simultaneous refurbishment of all 36 burners and two top mills in operation.	24-Feb
<b>SOX Exceedances</b>		

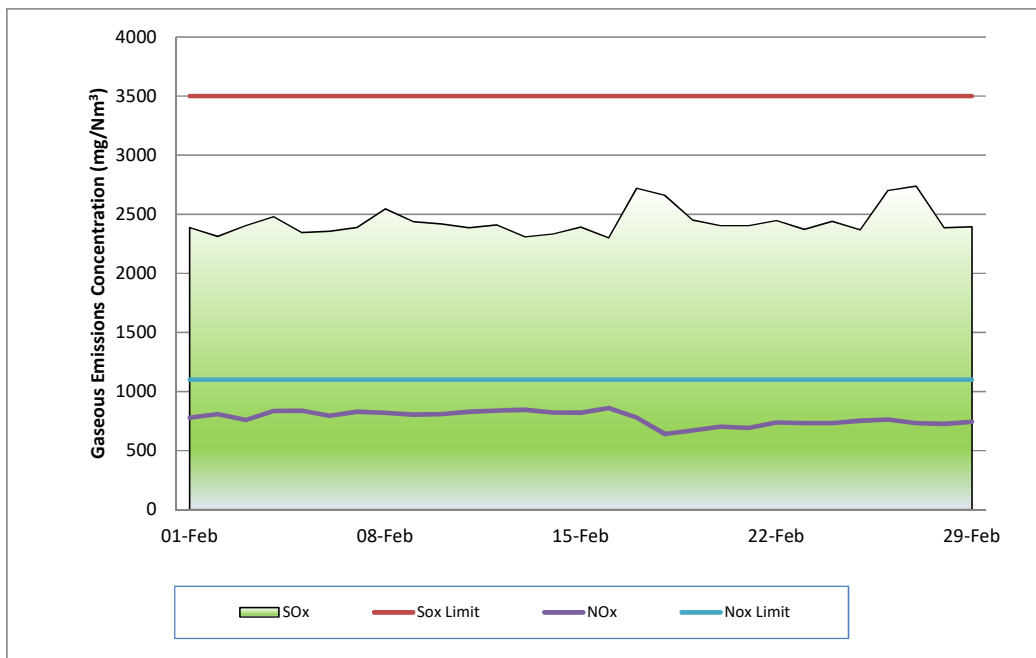
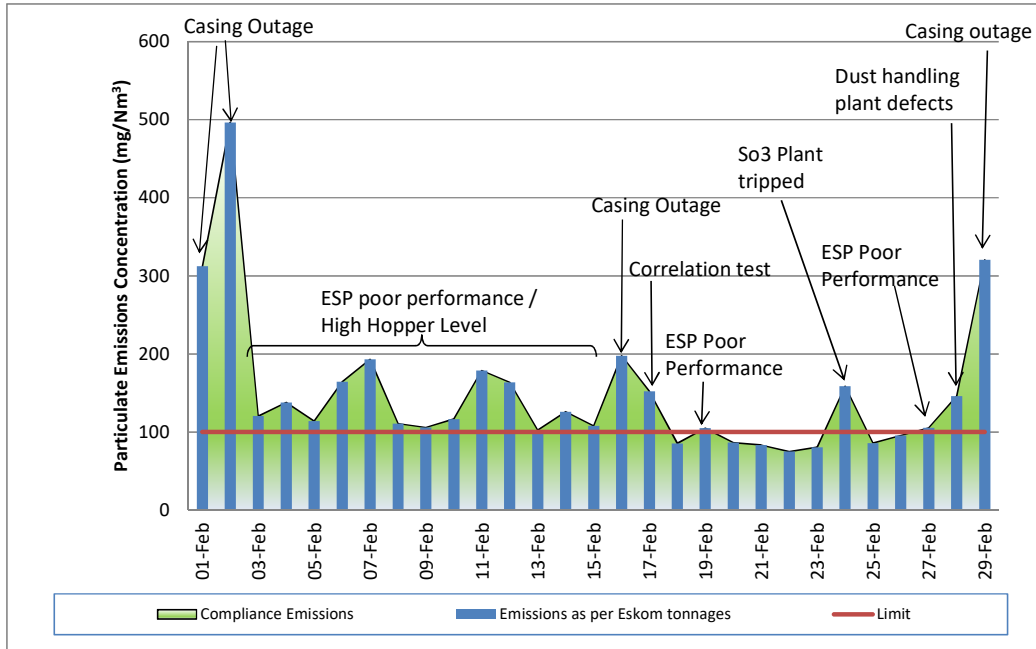
### UNIT 1 Particulate Matter and Gaseous Emission Performance February-2020



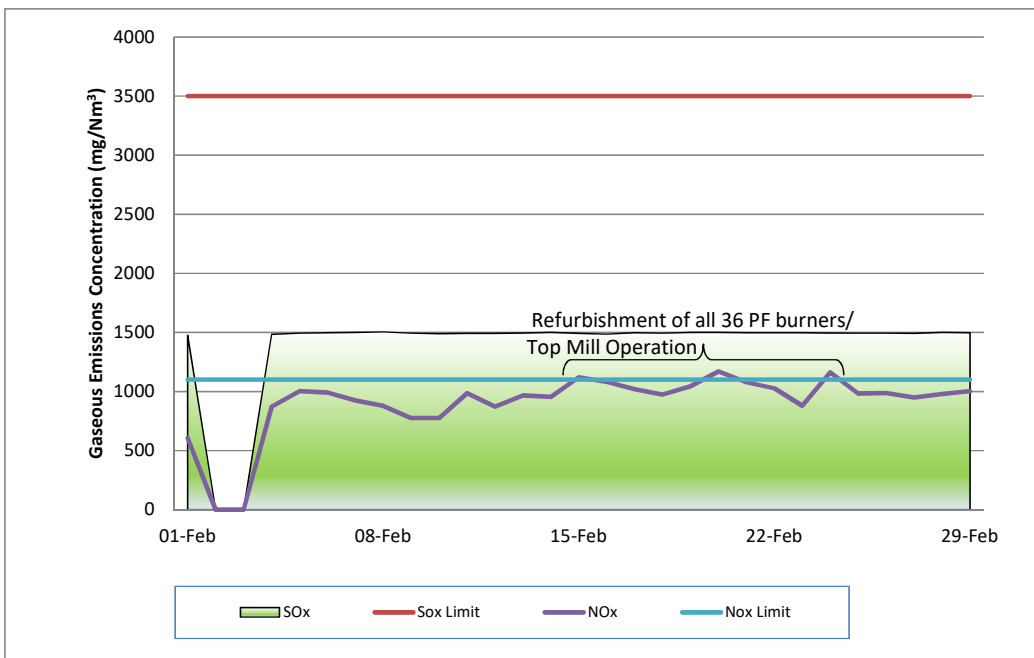
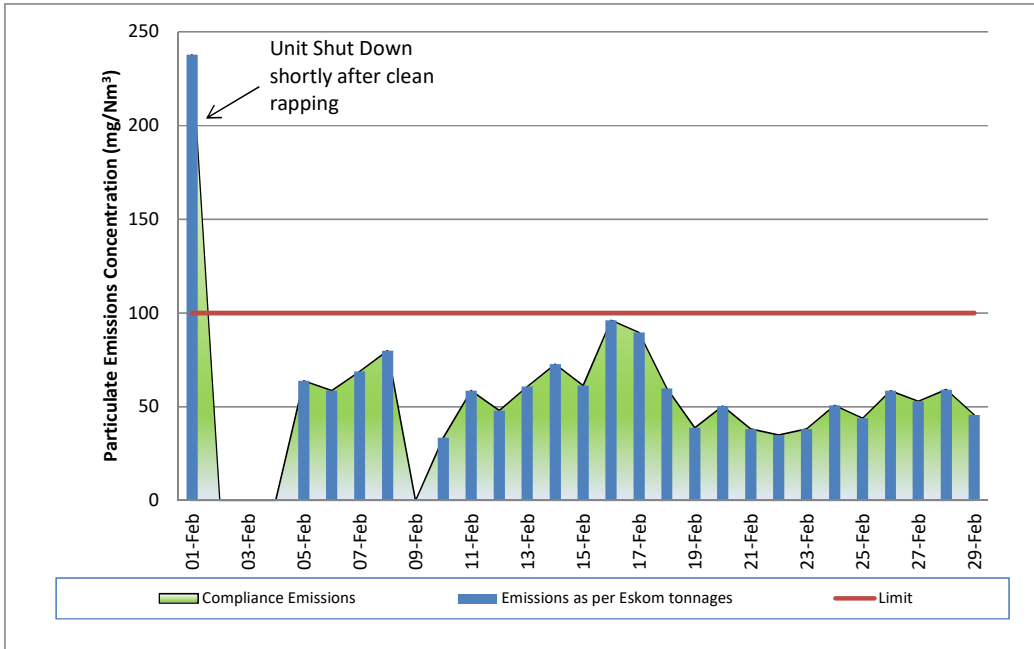
## UNIT 2 Particulate Matter and Gaseous Emission Performance February-2020



### UNIT 3 Particulate Matter and Gaseous Emission Performance February-2020

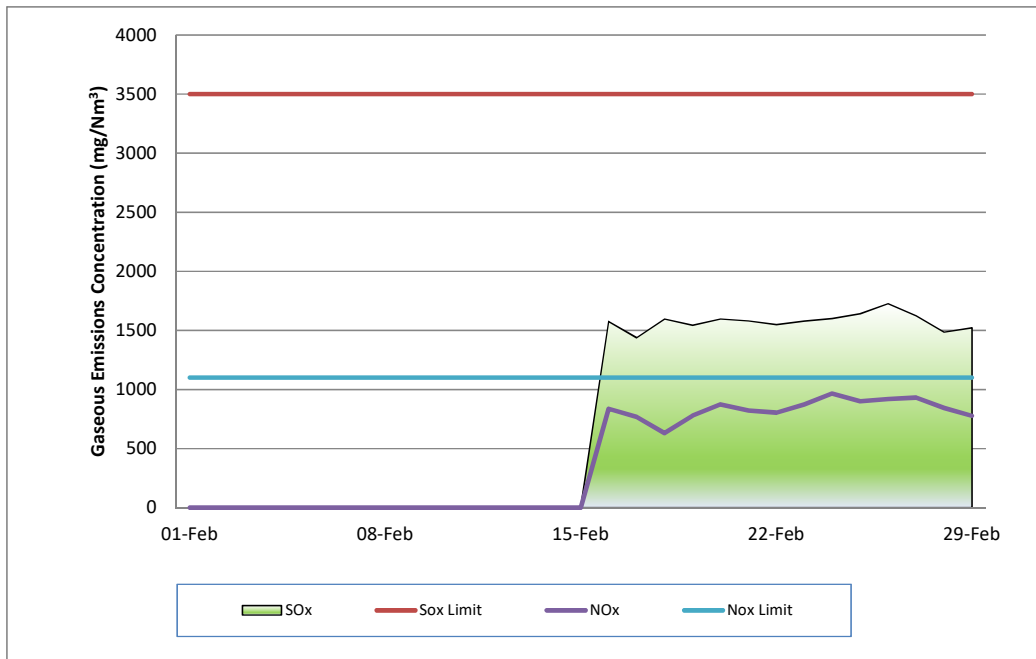
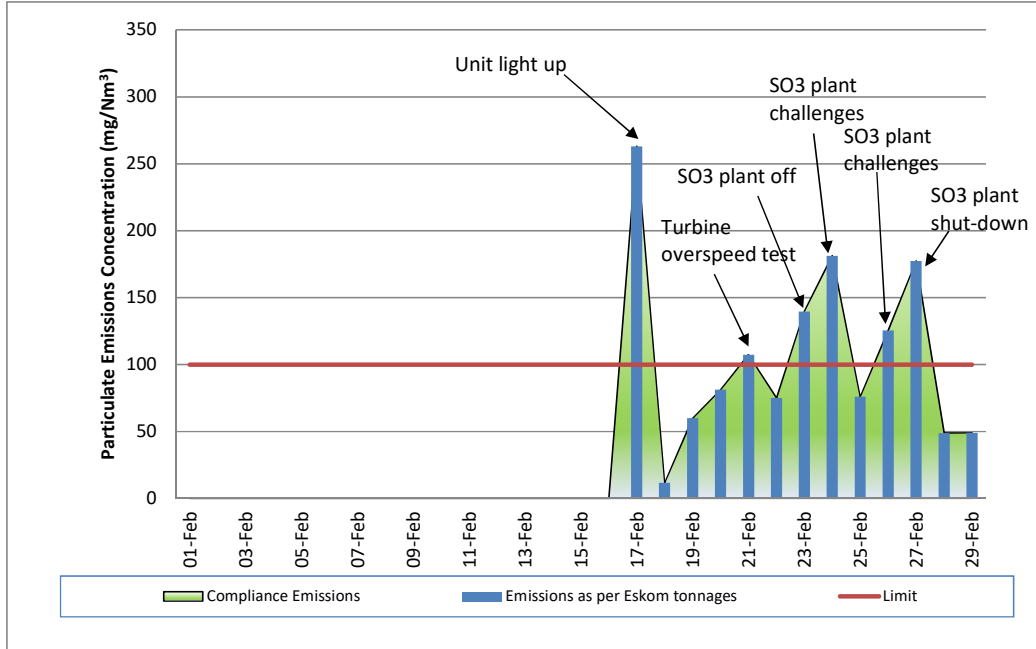


### UNIT 4 Particulate Matter and Gaseous Emission Performance February-2020

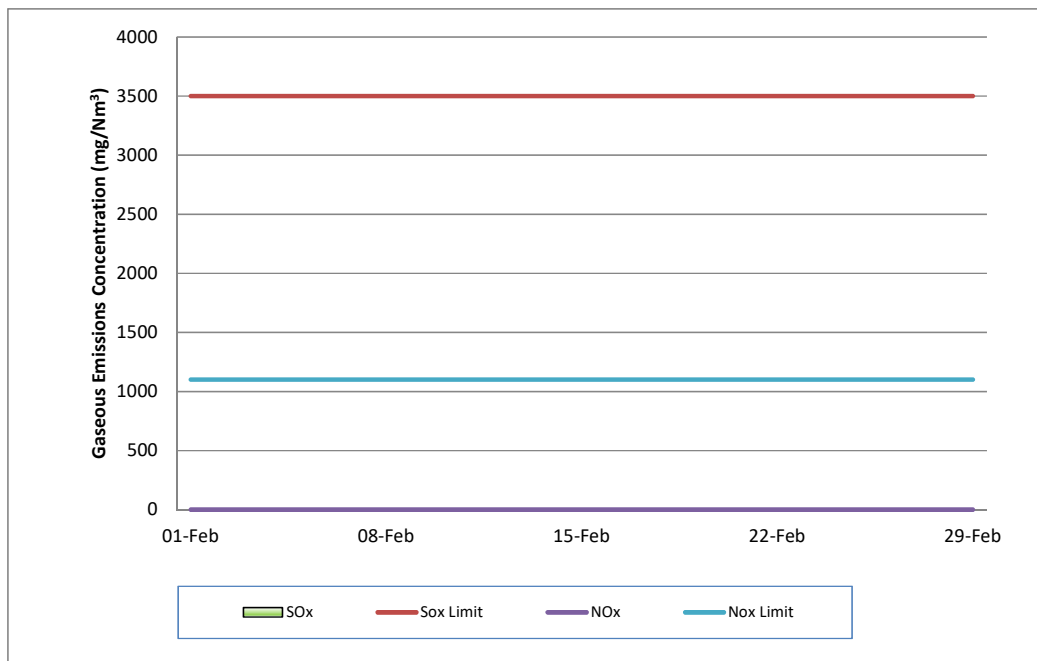
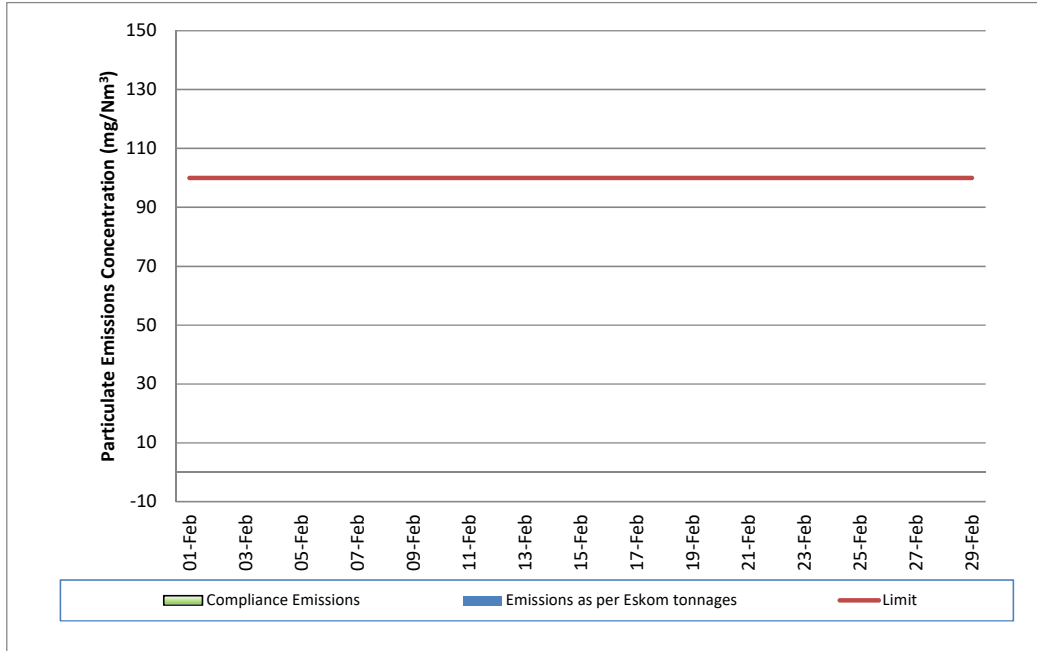




### UNIT 5 Particulate Matter and Gaseous Emission Performance February-2020



**UNIT 6 Particulate Matter and Gaseous Emission Performance  
February-2020**





### Particulate Emission Monitors

Availability						
	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Apr-19	99.31%	99.20%	98.69%	100.00%	OFF	100.00%
May-19	100.00%	100.00%	99.79%	100.00%	OFF	100.00%
Jun-19	99.86%	99.85%	98.47%	100.00%	OFF	97.27%
Jul-19	96.91%	97.08%	98.28%	97.70%	OFF	99.46%
Aug-19	98.19%	99.85%	100.00%	92.42%	OFF	98.26%
Sep-19	95.99%	99.28%	98.75%	OFF	OFF	98.51%
Oct-19	98.07%	100.00%	99.87%	OFF	OFF	98.66%
Nov-19	95.14%	95.00%	95.83%	OFF	OFF	77.98%
Dec-19	91.40%	100.00%	96.61%	OFF	OFF	68.55%
Jan-20	91.53%	98.92%	98.73%	99.81%	OFF	63.53%
Feb-20	75.98%	99.43%	98.42%	98.91%	99.68%	OFF
Mar-20						

### Gaseous Emission Monitors

Availability												
Month	Unit 1		Unit 2		Unit 3		Unit 4		Unit 5		Unit 6	
	SO <sub>x</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NO <sub>x</sub>
Apr-19	99.86%	100.00%	99.84%	100.00%	99.84%	99.53%	100.00%	100.00%	OFF	OFF	100.00%	99.75%
May-19	99.19%	99.60%	99.31%	99.58%	99.31%	0.00%	99.70%	99.85%	OFF	OFF	99.86%	99.86%
Jun-19	99.72%	99.86%	97.84%	97.84%	43.19%	43.19%	100.00%	100.00%	OFF	OFF	95.69%	95.69%
Jul-19	96.55%	96.41%	96.37%	96.37%	98.06%	98.06%	96.94%	96.94%	OFF	OFF	99.87%	99.87%
Aug-19	96.10%	95.97%	99.55%	99.55%	99.87%	99.87%	85.98%	85.98%	OFF	OFF	93.75%	93.91%
Sep-19	95.98%	96.13%	99.17%	99.31%	99.31%	99.31%	OFF	OFF	OFF	OFF	90.95%	90.80%
Oct-19	97.41%	97.41%	100.00%	100.00%	100.00%	100.00%	OFF	OFF	OFF	OFF	100.00%	100.00%
Nov-19	98.75%	98.75%	98.61%	98.75%	99.79%	96.45%	OFF	OFF	OFF	OFF	99.81%	99.81%
Dec-19	99.33%	99.33%	99.13%	99.13%	99.23%	99.23%	OFF	OFF	OFF	OFF	92.61%	92.61%
Jan-20	99.64%	99.64%	100.00%	100.00%	100.00%	99.90%	78.95%	90.79%	OFF	OFF	100.00%	99.20%
Feb-20	99.84%	99.84%	96.55%	98.71%	98.85%	98.71%	0.00%	99.49%	85.71%	85.71%	0.00%	0.00%
Mar-20												

Oxygen						
	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Apr-19	100.00%	99.73%	99.84%	100.00%	OFF	100.00%
May-19	84.81%	99.44%	100.00%	99.70%	OFF	99.86%
Jun-19	99.86%	97.84%	99.58%	100.00%	OFF	95.42%
Jul-19	96.41%	96.24%	98.19%	97.08%	OFF	99.73%
Aug-19	96.77%	99.26%	99.87%	85.98%	OFF	93.91%
Sep-19	96.28%	99.17%	99.31%	OFF	OFF	90.95%
Oct-19	97.41%	100.00%	100.00%	OFF	OFF	99.46%
Nov-19	98.75%	100.00%	99.79%	OFF	OFF	99.81%
Dec-19	99.19%	98.94%	99.10%	OFF	OFF	100.00%
Jan-20	99.64%	99.19%	100.00%	82.95%	OFF	99.20%
Feb-20	99.84%	99.07%	98.85%	0.00%	67.86%	0.00%
Mar-20						

**Notes**

Unit 1: Unit 1: On the 18/02/2020 a PM Exceedance was noted. This was not a true exceedance as the opacity meters were faulty during this time. It was decided to removed the data for that day (08:10-11:25) and the average would be considered.

Unit 2:

SOx and NOx exceedances

The issue of the correlation curve for oxygen has been resolved and data back fitted accordingly, this resulted in most of the exceedances no longer being exceedances.

The remaining NOx exceedances on 7th - 8th February 2020; 13th February 2020 17th February 2020 and 29th February 2020 are seen as exceedances (under investigation) and will be reported as contraventions.

Unit 4:

The following Adjustments were made:

For O2:

- 1st February 2020 to 29th February used a value 6.18% O2 based on verifications done by Research, Testing and Development division. This was due to the monitor being calibrated incorrectly resulting in questionable readings during this period.

For SO2

- For 1-29 February 2020 the average of January 2020 (1-28 January 2020) and March 2020 (8-31 March 2020) was used.

This resulted in the removal of a number of NOx exceedances on Unit 4. The remaining exceedances that were noted are on the 15th February 2020; 20th February 2020 and 24th February 2020 (investigation will be revised) and remaining will be reported as contraventions if not already reported.

Note on the use of average values:

It is noted that, where it was required to utilize averages, it is the view of the station to take it as as monitor unavailability (even if the monitor was reading and available, but the data was not reliable). This would ultimately adversely affect the percentage availability of the various monitors for that period.

The additional contributors besides the monitor unreliability:

All 36 PF burners were refurbished on Unit 4 during its outage to improve combustion. The refurbishment of all the burners simultaneously has a major impact on the combustion process, which improves the heat released and absorbed in the furnace. This directly influences the NOx produced.

The OEM performed an assessment on the burners to determine the amount of NOx produced after the refurbishment. The results from the assessment indicates that the expected NOx could vary between 904mg/Nm<sup>3</sup> and 1166mg/Nm<sup>3</sup> which is already higher than the limit of 1100mg/Nm<sup>3</sup>.

The production of NOx is increased when operating with high air flows and high temperatures. When the units are operated with top mills in service, the already high NOx (from after the refurbishment) is further increased which results in exceedance of the NOx limit of 1100mg/Nm<sup>3</sup>. The unit operated with two top mills in service on these days

**Unit 1-6: Back Fitting of Valid Correlated Data**

Correlation Tests have been redone and implemented. Back Fitting was required based on correlation validity and implementation for the 2020 calendar year. Based on the back fitting exercise new exceedance in some cases would be added and some existing exceedances would be removed. This was the case for both Gaseous and Particulate matter emissions.

It is also noted that if the number of new exceedance days add up to greater than the allowable grace periods, it will be reported as contraventions. These would not have been reported and investigated as Section 30 incidents as the events were not known to the station at the time. These new contraventions will be reported and investigated promptly. The following contraventions are noted:

Unit 1: 1st - 7th February 2020 and 18th - 23rd February 2020, PM Exceedances lasting more than 72 hour

Unit 2: 17th - 20th February 2020 and 23rd - 28th February 2020, PM Exceedances lasting more than 72 hour

Unit 3: 1st - 17th February 2020, PM Exceedances lasting more than 72 hour

ESP Efficiency (%)						
	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
<b>Apr-19</b>	99.999%	99.999%	99.998%	99.998%	OFF	99.998%
<b>May-19</b>	99.999%	99.999%	99.996%	99.998%	OFF	99.998%
<b>Jun-19</b>	99.999%	99.999%	99.998%	99.998%	OFF	99.998%
<b>Jul-19</b>	99.998%	99.998%	99.998%	99.998%	OFF	99.998%
<b>Aug-19</b>	99.998%	99.999%	99.997%	99.999%	OFF	99.998%
<b>Sep-19</b>	99.998%	99.999%	99.998%	OFF	OFF	99.998%
<b>Oct-19</b>	99.998%	99.999%	99.998%	OFF	OFF	99.998%
<b>Nov-19</b>	99.868%	99.785%	99.833%	OFF	OFF	99.729%
<b>Dec-19</b>	99.767%	99.787%	99.782%	OFF	OFF	99.654%
<b>Jan-20</b>	99.825%	99.768%	99.727%	99.086%	OFF	99.662%
<b>Feb-20</b>	99.998%	99.999%	99.997%	99.999%	99.998%	OFF
<b>Mar-20</b>						

