Eskom

**Ms Mpho Nembilwi**
Nkangala District Municipality
PO BOX 437
MIDDLEBURG
1050

Date:
21 May 2020

Enquiries:
Livhuwani Tshilate
017 615 2317

Ref*:* 17/4/AEL/MP312/11/09

Dear Ms Nembilwi

**KRIEL POWER STATION'S MONTHLY STACK EMISSIONS REPORT FOR THE MONTH OF APRIL 2020**

This serves as the monthly report required in terms of Section 7.2.1 in Kriel Power Station's Atmospheric Emission License 17/4/AEL/MP312/11/09. The emissions are for the month of April 2020. Verified emissions of particulates matter, $SO_2$ and $NO_x$ (as $NO_2$) are also included.

**Raw Materials and Products**

**Table 1:** Quantity of Raw Materials and Products used/produced for the month of April 2020

| Raw Materials and Products used | Raw Material Type | Units | Maximum Permitted Consumption / Rate (Quantity) | Consumption / Rate in Month of April 2020 |
|---|---|---|---|---|
| | Coal | Tons/month | 1 227 600 | 542 060.90 |
| | Fuel Oil | Tons/month | 5 000 | 7 109.77 |
| | | | | |
| **Production Rates** | **Product/ By-Product Name** | **Unit** | **Maximum Production Capacity Permitted (Quantity)** | **Production Rate in Month of April 2020** |
| | Ash | Tons/month | not specified | 381.1 |
| | RE PM | kg/MWh | not specified | 0.31 |

1/…

**Abatement Technology**

**Table 2:** Abatement Equipment Control Technology for April 2020.

| Associated Unit/Stack | Technology Type | Actual Efficiency (%) April 2020 |
|---|---|---|
| Unit 1 | ESP | 100.0 |
| Unit 2 | ESP | 100.0 |
| Unit 3 | ESP | 96.7 |
| Unit 4 | ESP | 92.5 |
| Unit 5 | ESP | 0.0 (extended outage) |
| Unit 6 | ESP | 92.5 |

**Energy Source Characteristics**

**Table 3:** Energy Source Material Characteristics for the month of April 2020

| Characteristic | Stipulated Range (Unit) | Monthly Average Content |
|---|---|---|
| **Sulphur Content** | 0.6-1.2 (%) | 0.75 |
| **Ash Content** | 21-36 (%) | 25.08 |

**Monthly Monitor Reliability**

| Associated Unit/Stack | PM (%) | SOx (%) | NOx (%) |
|---|---|---|---|
| North | 97% | 100% | 100% |
| South | 99% | 100% | 31.7% - Monitor was faulty from 1st to 21st of April 2020. |

**Emissions Reporting**

| GRAPH LEGEND | |
|---|---|
| | **Final daily emissions average in mg/Nm3 released within a particular day** |
| | **Final monthly emissions average in mg/Nm3 released within the whole month** |
| | **Emissions limit as per the AEL** |

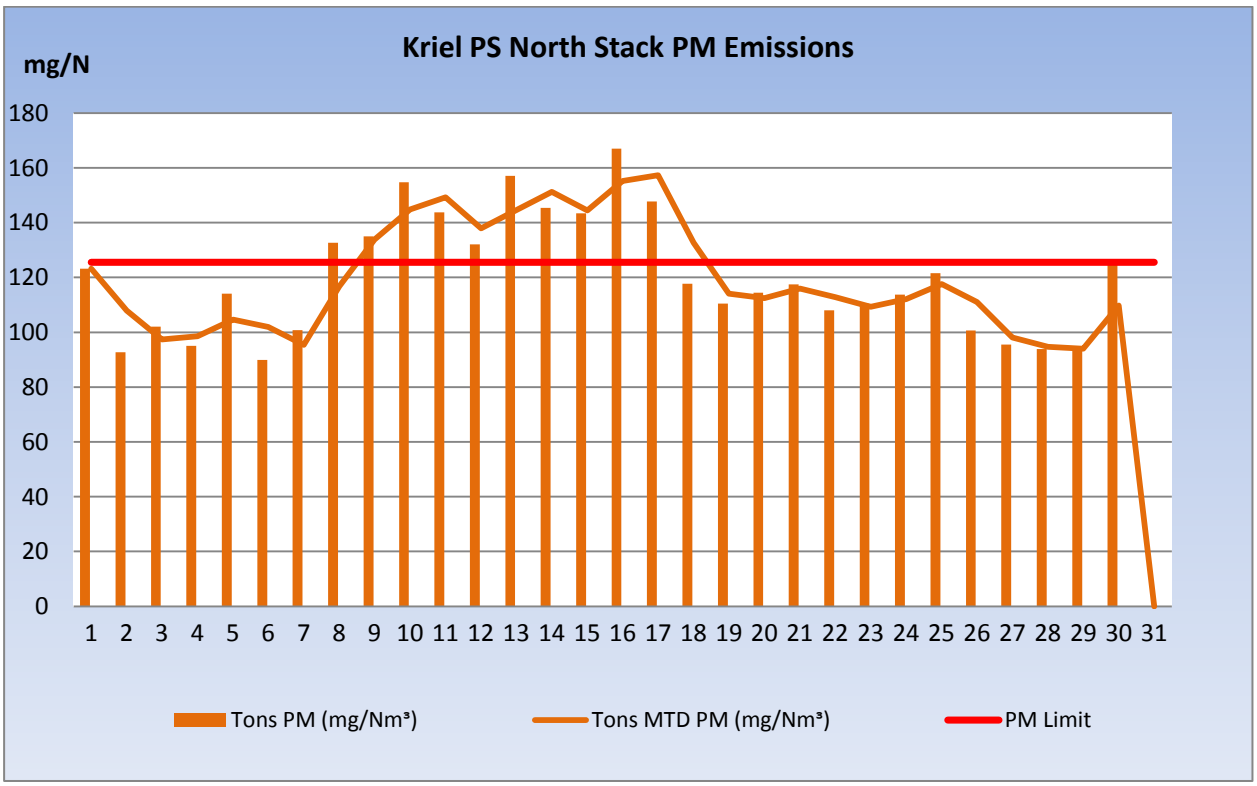


***Figure 1: PM emissions (daily averages) for the month of April 2020 against emission limit for the North Stack***

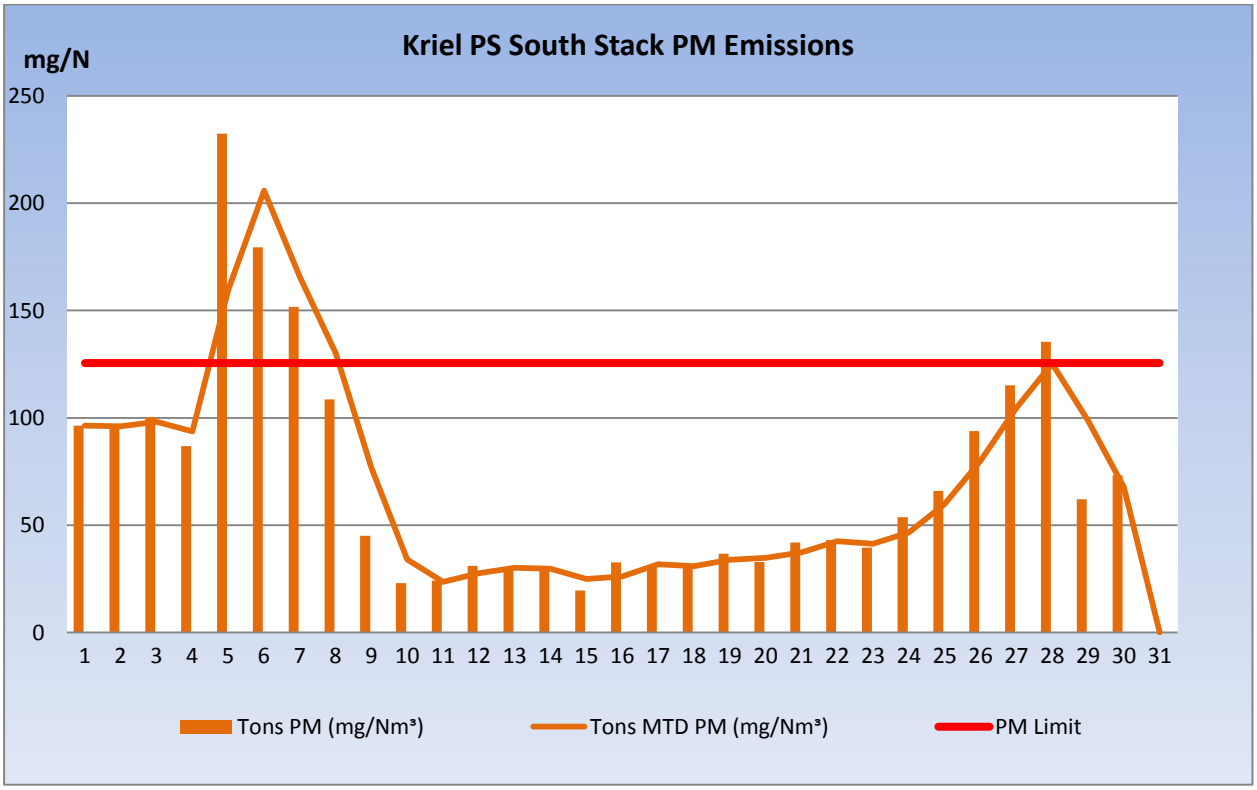


***Figure 2: PM emissions (daily averages) for the month of April 2020 against emission limit for the South Stack***

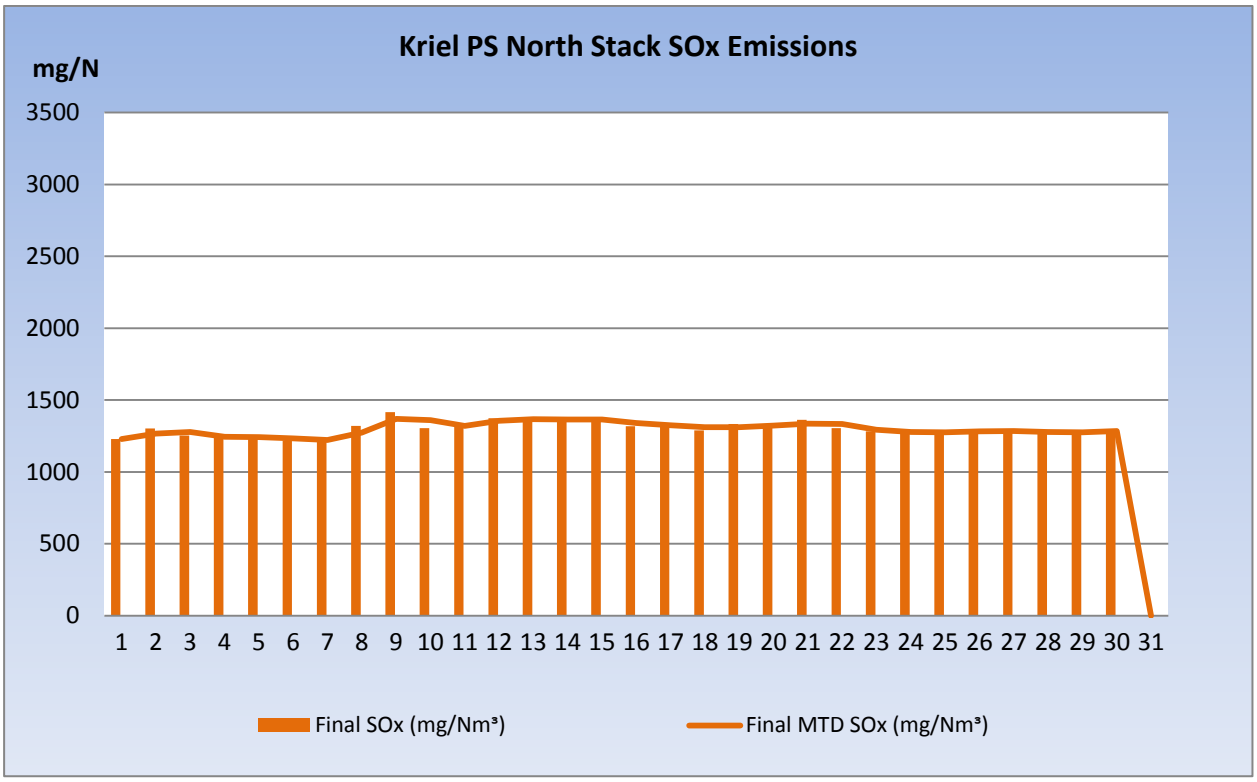


***Figure 3. SO2 emissions (daily averages) for the month of April 2020 against emission limit for the North Stack. The SOx Limit is 3500mg/Nm3.***

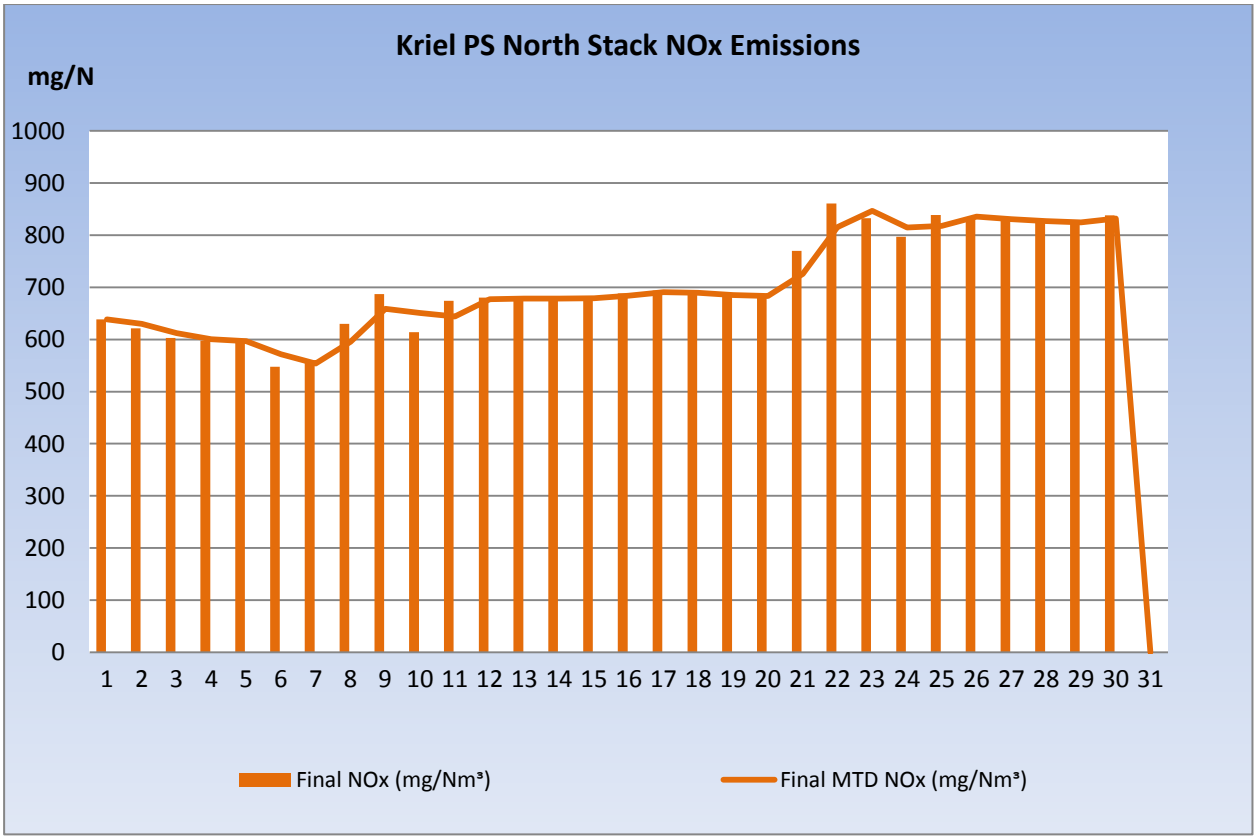


***Figure 4. NO2 emissions (daily averages) for the month of April 2020 against emission limit for the North Stack. The NOx Limit is 1600mg/Nm3.***

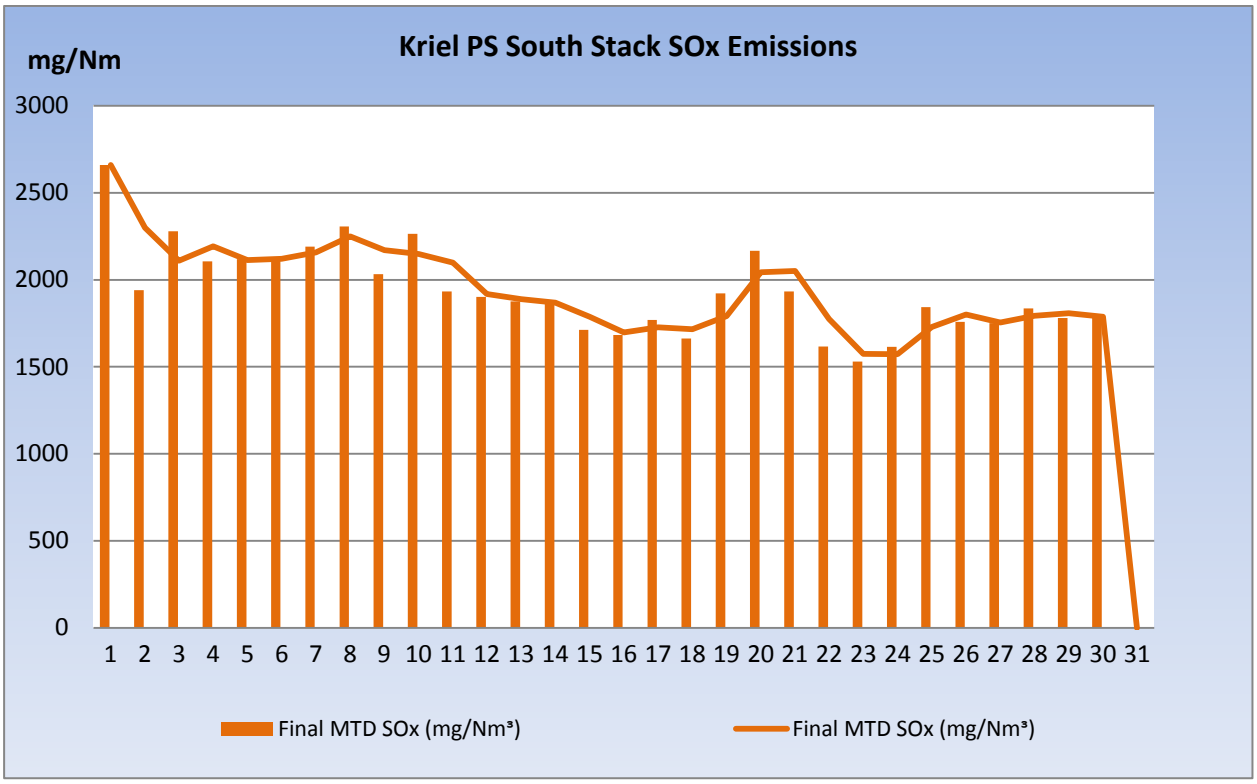


***Figure 5. SO2 emissions (daily averages) for the month of April 2020 against emission limit for the South Stack. The SOx Limit is 3500mg/Nm3.***

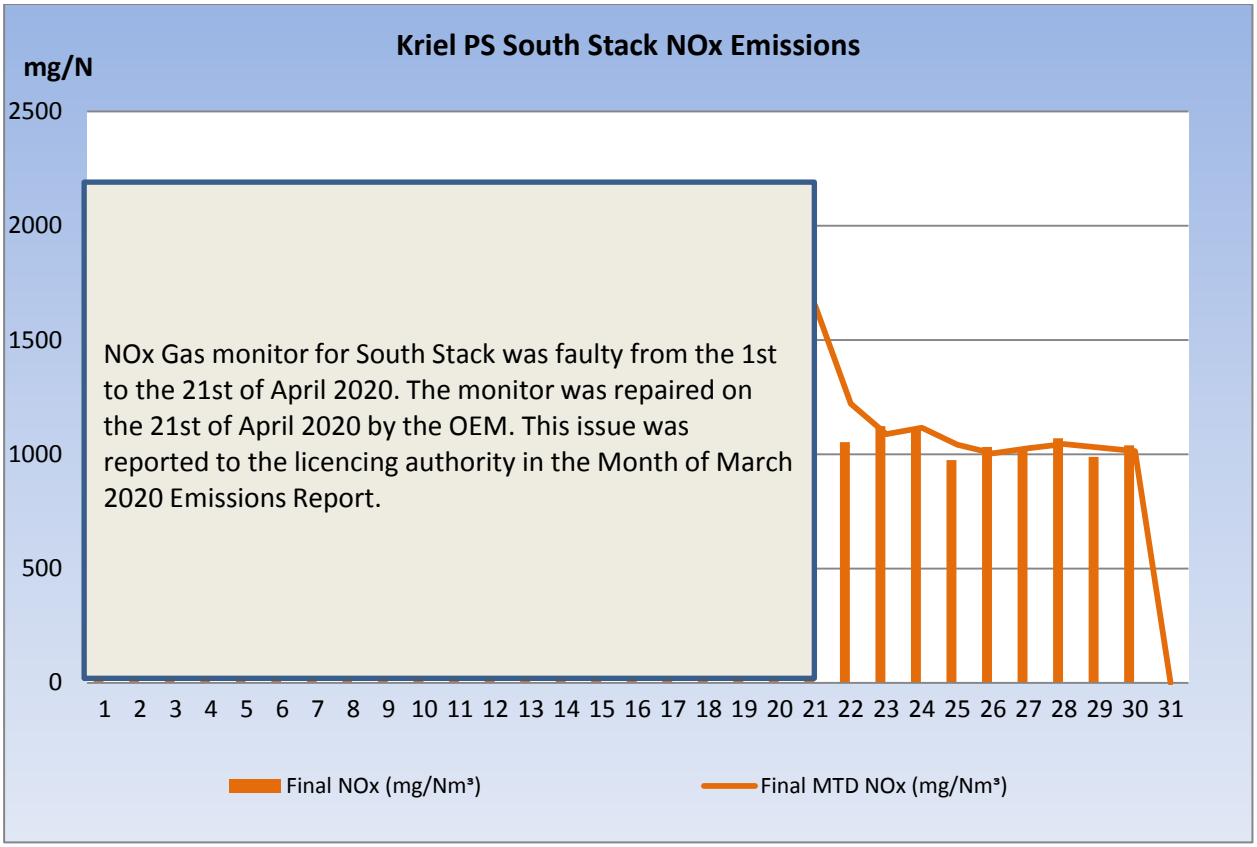


***Figure 6. NO2 emissions (daily averages) for the month of April 2020 against emission limit for the South Stack. The NOx Limit is 1600mg/Nm3.***

**Table 4:** Monthly tonnages for the month April 2020

| Unit | PM (tons) | $SO_2$ (tons) | $NO_2$ (tons) |
|---|---|---|---|
| SUM | 381.1 | 6210.4 | 4315.7 |

**Table 5:** Each unit and respective days operating under normal operation and section 30 days respectively

| | Operating Days (DD:HH:MM) | | |
|---|---|---|---|
| **Unit** | **Normal operation** | **Under S 30** | **Unit off load** |
| **1** | 23:14:40 | 00:00:00 | 06:09:20 |
| **2** | 19:23:40 | 00:00:00 | 10:00:20 |
| **3** | 25:13:20 | 00:00:00 | 04:10:40 |
| **4** | 30:00:00 | 00:00:00 | 00:00:00 |
| **5** | 03:14:30 | 00:00:00 | outage |
| **6** | 19:22:55 | 00:00:00 | 10:01:05 |

**Light up information**

**Table 6:** PM Start-up information for the month of April 2020

| **North Stack** | ***Event 1*** | | ***Event 2*** | | ***Event 3*** | | ***Event 4*** | |
|---|---|---|---|---|---|---|---|---|
| **Unit No.** | *Unit 3* | | *Unit 1* | | *Unit 2* | | *Unit 3* | |
| **Fires in** | *04:35 AM* | *2020/04/04* | *10:50 PM* | *2020/04/06* | *12:05 AM* | *2020/04/14* | *10:10 PM* | *2020/04/06* |
| **Synchronisation with Grid** | *12:10 PM* | *2020/04/04* | *09:15 AM* | *2020/04/07* | *09:30 PM* | *2020/04/14* | *01:10 PM* | *2020/04/07* |
| **Emissions below limit from Sync (Date and Time)** | | | | | | | | |
| **Fires in to synchronization** | *00:07:35* | Hrs (dd:hh:mm) | *00:10:25* | Hrs (dd:hh:mm) | *00:21:25* | Hrs (dd:hh:mm) | *00:15:00* | Hrs (dd:hh:mm) |
| **Synchronization to < limit (Duration** | *did not go above limit* | Hrs (dd:hh:mm) | *did not go above limit* | Hrs (dd:hh:mm) | *did not go above limit* | Hrs (dd:hh:mm) | *did not go above limit* | Hrs (dd:hh:mm) |

| North Stack …cont. | Event 5 | | Event 6 | |
|---|---|---|---|---|
| Unit No. | Unit 2 | | Unit 2 | |
| Fires in | 11:35 PM | 2020/04/19 | 01:05 AM | 2020/04/29 |
| Synchronisation with Grid | 08:50 AM | 2020/04/20 | 11:45 AM | 2020/04/29 |
| Emissions below limit from Sync | | | | |
| Fires in to synchronization | | Hrs (dd:hh:mm) | 00:10:40 | Hrs (dd:hh:mm) |
| Synchronization to < limit | did not go above limit | Hrs (dd:hh:mm) | did not go above limit | Hrs (dd:hh:mm) |

| South Stack | Event 1 | | Event 2 | |
|---|---|---|---|---|
| Unit No. | Unit 5 | | Unit 5 | |
| Fires in | 10:05 AM | 2020/04/03 | 01:45 AM | 2020/04/06 |
| Synchronisation with Grid | 10:50 PM | 2020/04/03 | 12:10 PM | 2020/04/06 |
| Emissions below limit from Sync | | | | |
| Fires in to synchronization | 00:12:45 | Hrs (dd:hh:mm) | 00:10:25 | Hrs (dd:hh:mm) |
| Synchronization to < limit | did not go above limit | Hrs (dd:hh:mm) | did not go above limit | Hrs (dd:hh:mm) |

| South Stack …cont. | Event 3 | | Event 4 | | Event 5 | |
|---|---|---|---|---|---|---|
| Unit No. | Unit 6 | | Unit 6 | | Unit 6 | |
| Fires in | 07:20 AM | 2020/04/18 | 10:45 AM | 2020/04/22 | 10:45 AM | 2020/04/22 |
| Synchronisation with Grid | 04:25 PM | 2020/04/18 | 07:00 PM | 2020/04/23 | 07:00 PM | 2020/04/23 |
| Emissions below limit from Sync | | | | | | |
| Fires in to synchronization | 00:09:05 | Hrs (dd:hh:mm) | 01:08:15 | Hrs (dd:hh:mm) | 01:08:15 | Hrs (dd:hh:mm) |
| Synchronization to < limit | did not go above limit | Hrs (dd:hh:mm) | did not go above limit | Hrs (dd:hh:mm) | did not go above limit | Hrs (dd:hh:mm) |

**Table 7**. Point Source emissions released during start-up (fires-in) for the month of April-2020 in mg/Nm3

| North Stack Emission Average from Fires-in to Synchronisation (Date and Time) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Unit** | **Fires-In** | | **Synchronisation** | | **PM** | **$SO_2$** | **$NO_x$** |
| Unit 3 | 2020/04/04 | 04:35 AM | 2020/04/04 | 12:10 PM | 440.3 | 829.2 | 391.5 |
| Unit 1 | 2020/04/06 | 10:50 PM | 2020/04/07 | 09:15 AM | 403.8 | 843.7 | 363.0 |
| Unit 2 | 2020/04/14 | 12:05 AM | 2020/04/14 | 09:30 PM | 488.7 | 1135.1 | 567.9 |
| Unit 3 | 2020/04/06 | 10:10 PM | 2020/04/07 | 01:10 PM | 397.0 | 871.2 | 384.7 |
| Unit 2 | 2020/04/19 | 11:35 PM | 2020/04/20 | 08:50 AM | 327.0 | 1118.8 | 546.1 |
| Unit 2 | 2020/04/29 | 01:05 AM | 2020/04/29 | 11:45 AM | 303.0 | 1138.1 | 729.4 |

| South Stack Emission Average from Fires-in to Synchronisation (Date and Time) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Unit** | **Fires-In** | | **Synchronisation** | | **PM** | **$SO_2$** | **$NO_x$** |
| Unit 5 | 2020/04/03 | 10:05 AM | 2020/04/03 | 10:50 PM | 94.3 | 1959.9 | 2105.2 |
| Unit 5 | 2020/04/06 | 01:45 AM | 2020/04/06 | 12:10 PM | 71.3 | 1594.2 | 1740.1 |
| Unit 6 | 2020/04/18 | 07:20 AM | 2020/04/18 | 04:25 PM | 404.4 | 1100.8 | 1811.1 |
| Unit 6 | 2020/04/22 | 10:45 AM | 2020/04/23 | 07:00 PM | 162.7 | 1483.1 | 802.7 |
| Unit 6 | 2020/04/22 | 10:45 AM | 2020/04/23 | 07:00 PM | 162.7 | 1483.1 | 802.7 |

**Table 8**. Point Source emissions released during Shut-down (SD) for the month of April-2020 in mg/Nm3

| North Stack Emission Average Breaker Open (BO) to Draft Group Shut Down (SD) (Date & Time) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Unit** | **Breaker Open** | | **DG SD** | | **PM** | **$SO_2$** | **$NO_x$** |
| Unit 3 | 2020/04/01 | 06:25 AM | 2020/04/01 | 11:45 PM | 71.1 | 886.4 | 416.0 |
| Unit 2 | 2020/04/10 | 01:15 PM | 2020/04/10 | 01:40 PM | 299.8 | 1132.0 | 523.2 |
| Unit 2 | 2020/04/16 | 08:05 PM | 2020/04/17 | 09:40 AM | 139.7 | 906.0 | 486.1 |
| Unit 2 | 2020/04/27 | 12:10 AM | 2020/04/27 | 09:10 PM | 270.5 | 800.8 | 492.5 |
| Unit 2 | 2020/04/27 | 09:10 PM | 2020/04/29 | 01:05 AM | 163.0 | 1215.5 | 771.9 |

| South Stack Emission Average Breaker Open (BO) to Draft Group Shut Down (SD) (Date & Time) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Unit** | **Breaker Open** | | **DG SD** | | **PM** | **$SO_2$** | **$NO_x$** |
| Unit 5 | 2020/04/05 | 10:15 PM | 2020/04/06 | 09:45 AM | 77.7 | 1625.2 | 1706.0 |
| Unit 5 | 2020/04/05 | 10:15 PM | 2020/04/05 | 11:20 PM | 121.1 | 1692.3 | 1762.5 |
| Unit 5 | 2020/04/08 | 03:20 AM | 2020/04/08 | 11:00 PM | 53.3 | 1584.9 | 1669.2 |
| Unit 6 | 2020/04/09 | 09:15 AM | 2020/04/09 | 10:20 PM | 98.2 | 1048.7 | 1609.7 |

**Complaints Register**

**Table 9**: Complaints for the month of April 2020.

| Source Code/ Name | Root Cause Analysis | Calculation of Impacts/ emissions associated with the incident | Dispersion modeling of pollutants where applicable | Measures implemented to prevent reoccurrence | Date by which measure will be implemented |
|---|---|---|---|---|---|
| There was no complaint related to air quality received during the month of April 2020. | | | | | |

**General**

The particulate matter (PM10) emissions on the north and south common stacks were within the **monthly limit** during the month of April 2020; North stack recorded the monthly PM10 average emissions figure of **120mg/Nm3** while south stack recorded PM10 monthly average figure of **71mg/Nm3**. The gaseous (NOx & SOx) emissions on the north and south common stacks were also within the **daily limit** during the month of April 2020; refer to graphs above.

As reported in the March 2020 monthly emissions report, NOx Emissions Monitor for south stack was unavailable from the 1st of April to 21st of April 2020 due to a defect. Refer to a summary below for the feedback with regard to south stack NOx monitor.

Fuel oil limit of 5000 tons/month was exceeded during the month of April 2020 due to a number of units' light-ups. This matter has been reported to the licencing authority.

NB: The rest of the information demonstrating compliance with the emission license conditions is supplied in the annual emission reports sent to your office.

Progress Feedback: NOx Online Gaseous Emissions Monitor Failure for south stack

Kriel Power Station is pleased to inform the licencing authority that the NOx monitor defect on the south stack has been repaired on the 21st of April 2020 by the OEM. The aforementioned defect was found to have been caused by a probe which was fully blocked with dust. The probe was cleaned and calibrated.

Kriel Power Station's List of NEMA Section 30 Incidents for 2020/2021 Financial Year

| Month | Description of Section30 Incidents - including the reference number | Root Cause (s) | Status of S30 Incident with DEFF (open or closed) | Remarks |
|---|---|---|---|---|
| **April - 2020** | No section 30 incident reported. | | | No event to report. |
| **May - 2020** | | | | |
| **June - 2020** | | | | |
| **July - 2020** | | | | |
| **Aug - 2020** | | | | |
| **Sep - 2020** | | | | |
| **Oct - 2020** | | | | |
| **Nov - 2020** | | | | |
| **Dec - 2020** | | | | |
| **Jan - 2021** | | | | |
| **Feb - 2021** | | | | |
| **Mar - 2021** | | | | |