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Date:  
 15 February 2023

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

Dear Ms Nembilwi

### **KRIEL POWER STATION'S MONTHLY STACK EMISSIONS REPORT FOR THE MONTH OF DECEMBER 2022**

This serves as the monthly report required in terms of Section 7.4 in Kriel Power Station's Atmospheric Emission License 17/4/AEL/MP312/11/09. The emissions are for the month of December 2022. Verified emissions of particulates matter, SO<sub>2</sub> and NO<sub>x</sub> (as NO<sub>2</sub>) are also included.

#### **Raw Materials and Products**

**Table 1:** Quantity of Raw Materials and Products used/produced for the month of December 2022

Raw Materials and Products used	Raw Material Type	Units	Maximum Permitted Consumption / Rate (Quantity)	Consumption / Rate in Month of December 2022
	Coal	Tons/month	1 227 600	476 706.00
	Fuel Oil	Tons/month	5 000	2 780.79
Production Rates	Product/ By-Product Name	Unit	Maximum Production Capacity Permitted (Quantity)	Production Rate in Month of December 2022
	Ash	Tons/month	not specified	818.8
	RE PM	kg/MWh	not specified	0.39

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## Abatement Technology

**Table 2:** Abatement Equipment Control Technology for December 2022.

Associated Unit/Stack	Technology Type	Actual Efficiency (%)	Utilisation
		December 2022	December 2022
Unit 1	ESP	99.65%	65.4%
Unit 2	ESP	99.56%	88.6%
Unit 3	ESP	99.33%	7.1%
Unit 4	ESP	98.63%	22.6%
Unit 5	ESP	99.13%	90.4%
Unit 6	ESP	99.04%	70.5%

## Energy Source Characteristics

**Table 3:** Energy Source Material Characteristics for the month of December 2022





Characteristic	Stipulated Range (Unit)	Monthly Average Content
Sulphur Content	0.6-1.2 (%)	0.73
Ash Content	21-36 (%)	24.68

## Monthly Monitor Reliability

Associated Unit/Stack	PM (%)	SO <sub>x</sub> (%)	NO <sub>x</sub> (%)
North	83.32	92.99	95.99
South	81.52	100.00	100.00

## Emissions Reporting

**Table 6.5: Graph 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

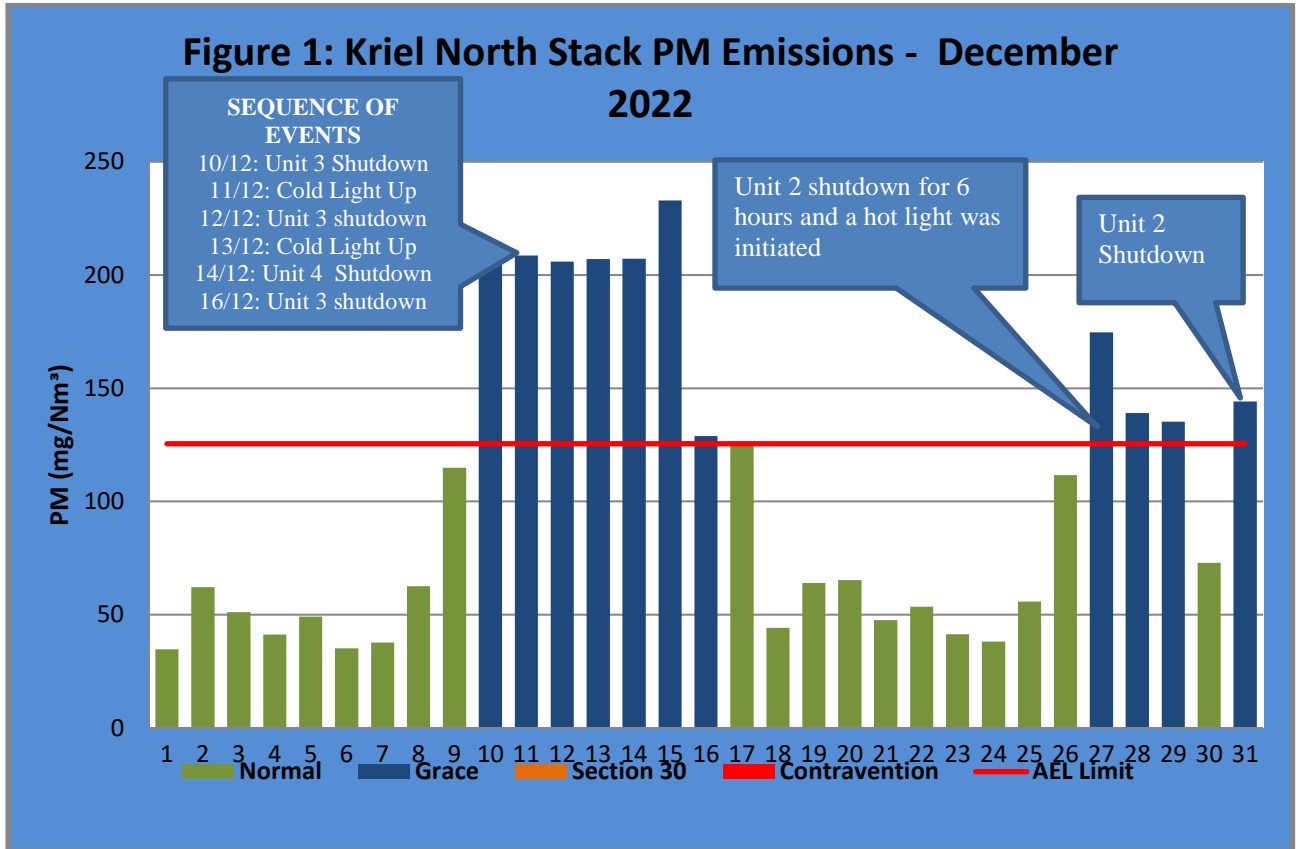


Figure 1: PM emissions for the month of December 2022 against emission limit for the North Stack. Monthly average was 103.2 mg/Nm<sup>3</sup>

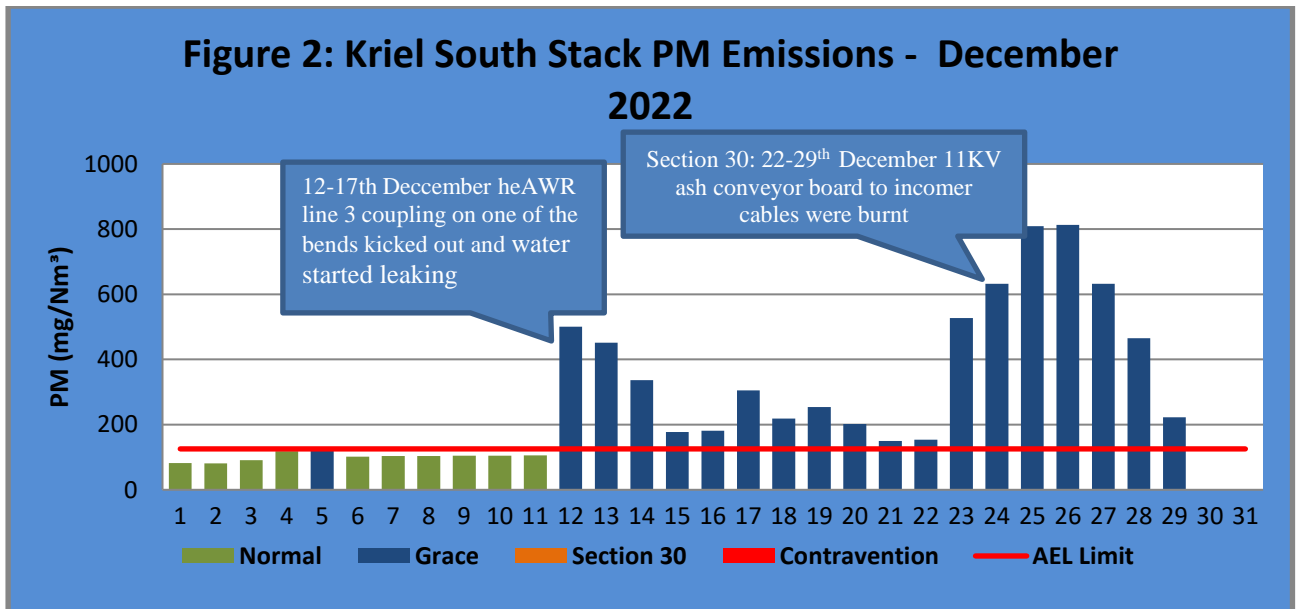


Figure 2: PM emissions for the month of December 2022 against emission limit for the South Stack. Monthly average was 281.3 mg/Nm<sup>3</sup>

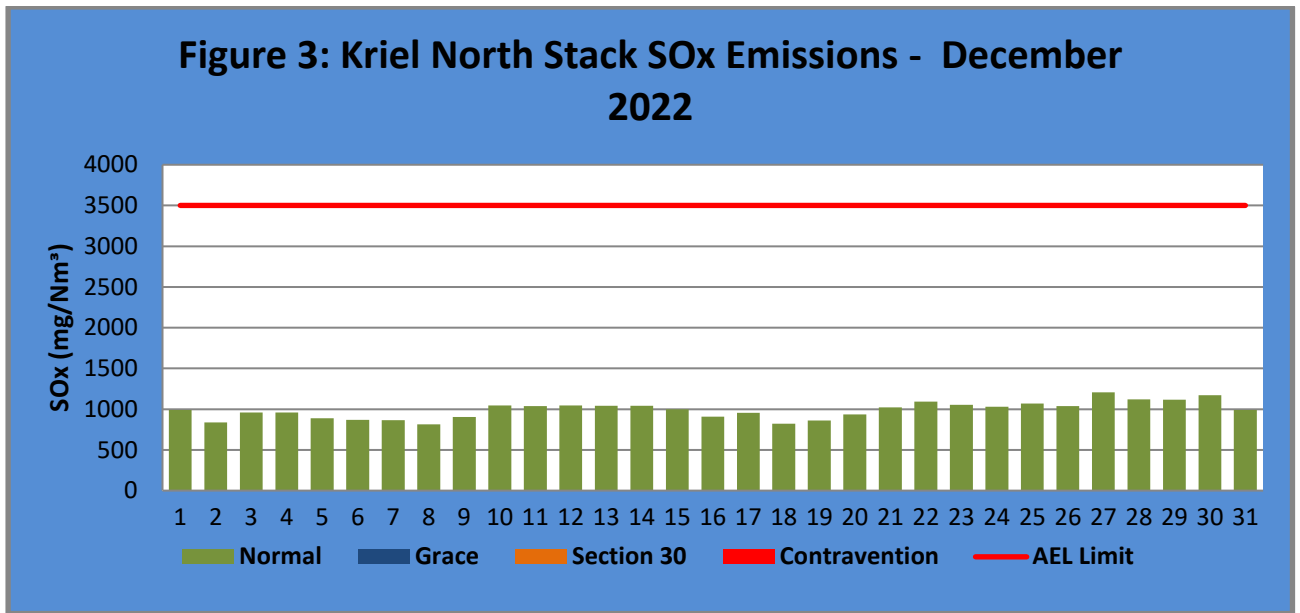


Figure 3. SO<sub>2</sub> emissions for the month of December 2022 against emission limit for the North Stack. The SO<sub>x</sub> Limit is 3500mg/Nm<sup>3</sup>.

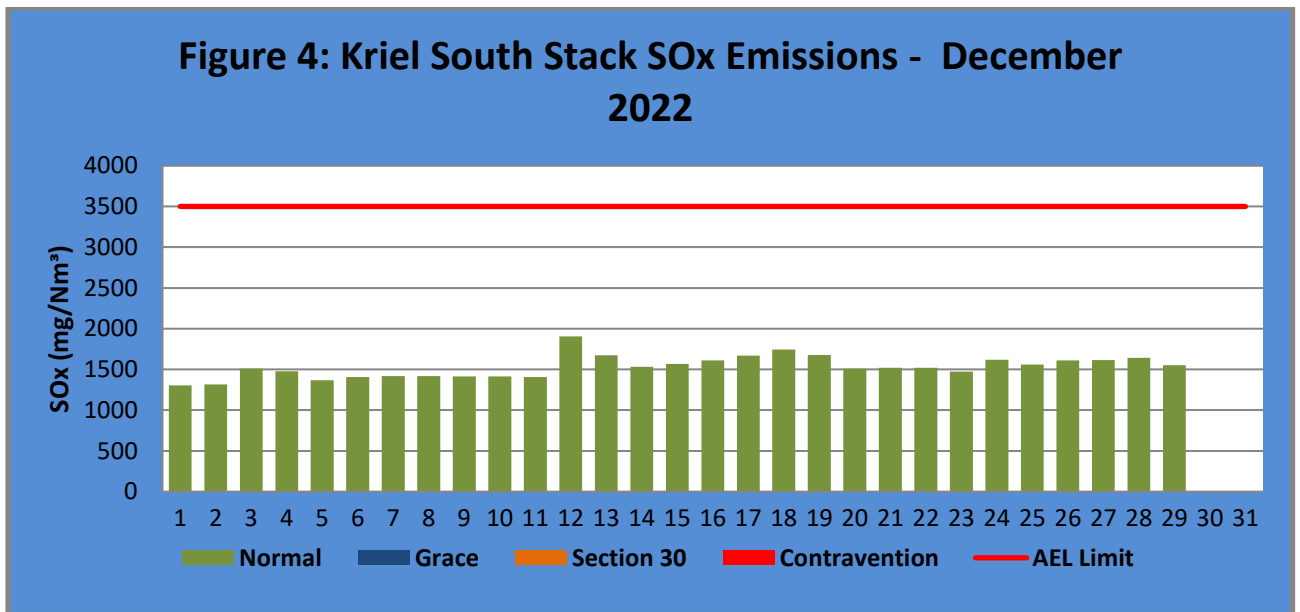


Figure 4. SO<sub>2</sub> emissions for the month of December 2022 against emission limit for the South Stack. The SO<sub>x</sub> Limit is 3500mg/Nm<sup>3</sup>.

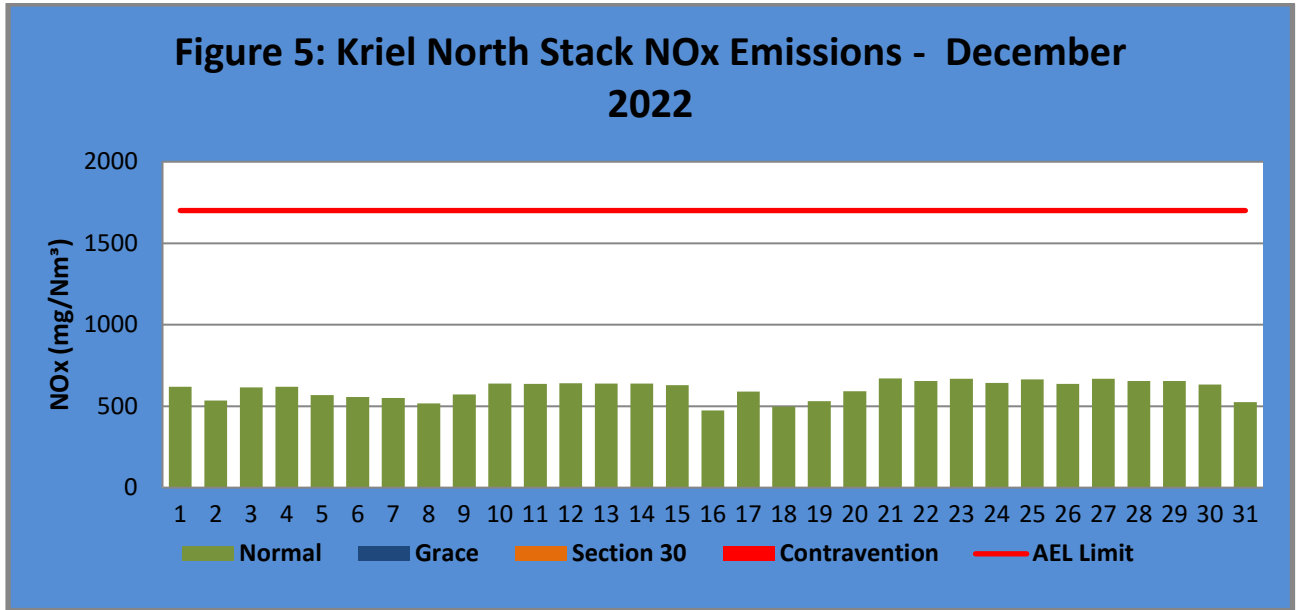


Figure 5. NO<sub>x</sub> emissions for the month of December 2022 against emission limit for the North Stack. The NO<sub>x</sub> Limit is 1600mg/Nm<sup>3</sup>.

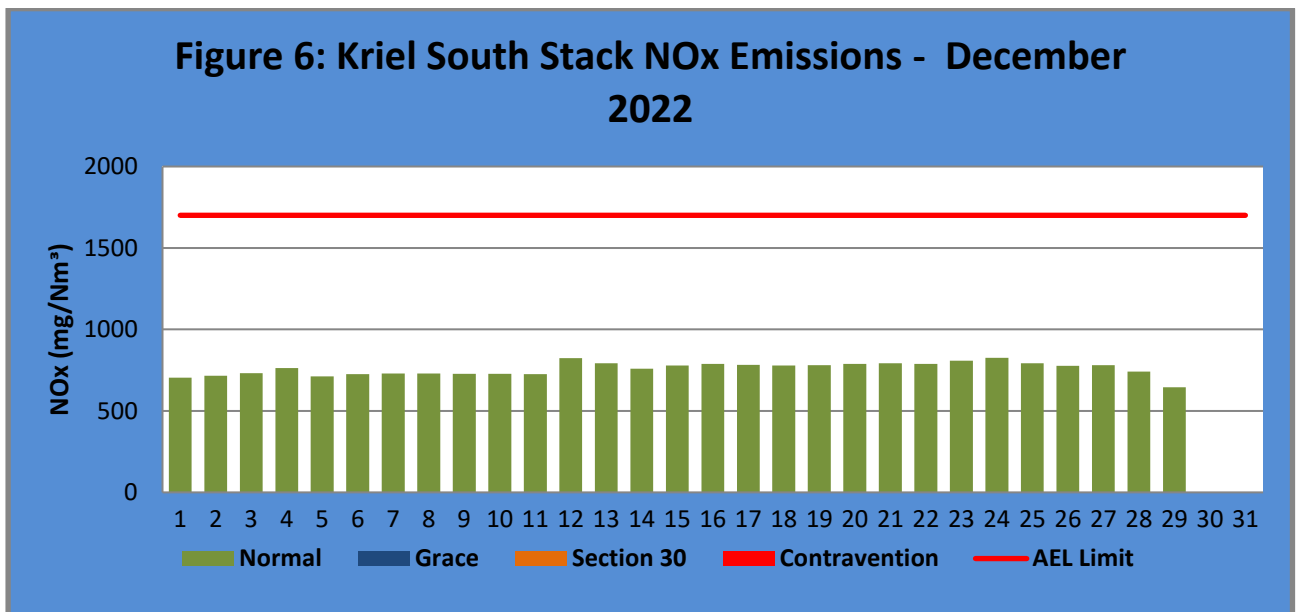


Figure 6. NO<sub>x</sub> emissions for the month of December 2022 against emission limit for the South Stack. The NO<sub>x</sub> Limit is 1600mg/Nm<sup>3</sup>.

Table 4: Monthly tonnages for the month December 2022

Unit	PM (tons)	SO <sub>2</sub> (tons)	NO <sub>2</sub> (tons)
SUM	818.8	5 278.3	2 889.8

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

Table 5.1: Operating days in compliance to PM AEL Limit – December 2022

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Monthly Limit Exceedance	Average PM (mg/Nm <sup>3</sup> )
North	20	11	0	0	11	103.2
South	10	19	0	0	19	281.3

Table 5.2: Operating days in compliance to SOx AEL Limit - December 2022

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average SOx (mg/Nm <sup>3</sup> )
North	31	0	0	0	0	989.6
South	29	0	0	0	0	1 533.0

Table 5.3: Operating days in compliance to NOx AEL Limit – December 2022

Associated Unit/Stack	Normal	Grace	Section 30	Contravention	Total Exceedance	Average NOx (mg/Nm <sup>3</sup> )
North	31	0	0	0	0	604.2
South	29	0	0	0	0	759.1

**Light up information**

**Table 6: PM Start-up information for the month of December 2022**

North Stack	Event 1		Event 2		Event 3		Event 4	
Unit No.	Unit 1		Unit 2		Unit 2		Unit 2	
Breaker Open (BO)	12:20 am	2022/12/07	10:10 am	2022/12/14	9:25 pm	2022/12/23	2:50 am	2022/12/03
Draught Group (DG) Shut Down (SD)	5:20 am	2022/12/08	10:40 pm	2022/12/14	9:45 pm	2022/12/23	3:30 am	2022/12/03
BO to DG SD (duration)	01:05:00	DD:HH:MM	00:12:30	DD:HH:MM	00:00:20	DD:HH:MM	00:00:40	DD:HH:MM
Fires in time	12:40 pm	2022/12/11	8:40 pm	2022/12/18	4:25 am	2022/12/24	4:45 am	2022/12/04
Synch. to Grid (or BC)	4:05 am	2022/12/12	12:00 pm	2022/12/19	10:15 am	2022/12/24	9:25 am	2022/12/04
Fires in to BC (duration)	00:15:25	DD:HH:MM	00:15:20	DD:HH:MM	00:05:50	DD:HH:MM	00:04:40	DD:HH:MM
Emissions below limit from BC (end date)	not > limit	not > limit	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	n/a	DD:HH:MM

North Stack	Event 1		Event 2		Event 3		Event 4	
Unit No.	Unit 2		Unit 2		Unit 2		Unit 3	
Breaker Open (BO)	2:50 am	2022/12/03	12:55 am	2022/12/28	12:45 am	2022/12/30	BO previously	BO previously
Draught Group (DG) Shut Down (SD)	3:30 am	2022/12/03	10:25 am	2022/12/30	1:20 am	2022/12/30	n/a	n/a
BO to DG SD (duration)	00:00:40	DD:HH:MM	02:09:30	DD:HH:MM	00:00:35	DD:HH:MM	n/a	DD:HH:MM
Fires in time	4:45 am	2022/12/04	7:50 am	2022/12/28			12:25 am	2022/12/13
Synch. to Grid (or BC)	9:25 am	2022/12/04	3:35 pm	2022/12/28			12:00 am	2022/12/14
Fires in to BC (duration)	00:04:40	DD:HH:MM	00:07:45	DD:HH:MM		DD:HH:MM	00:23:35	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		DD:HH:MM	n/a	DD:HH:MM

South Stack	Event 1		Event 2		Even 3		Event 4	
Unit No.	Unit 4		Unit 6		Unit 6		Unit 4	
Breaker Open (BO)					1:40 am	2022/12/05	1:30 am	2022/12/10
Draught Group (DG) Shut Down (SD)					2:30 pm	2022/12/05	7:25 am	2022/12/11
BO to DG SD (duration)		DD:HH:MM		DD:HH:MM	00:12:50	DD:HH:MM	01:05:55	DD:HH:MM
Fires in time	1:55 am	2022/12/06	12:05 am	2022/12/02	2:30 pm	2022/12/08	1:00 pm	2022/12/21
Synch. to Grid (or BC)	8:05 pm	2022/12/08	5:40 am	2022/12/02	12:20 am	2022/12/11	6:40 am	2022/12/22
Fires in to BC (duration)	02:18:10	DD:HH:MM	00:05:35	DD:HH:MM	02:09:50	DD:HH:MM	00:17:40	DD:HH:MM
Emissions below limit from BC (end date)		#N/A	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	n/a	DD:HH:MM

South Stack	Event 1		Event 2		Even 3	
Unit No.	Unit		Unit		Unit 6	
Breaker Open (BO)	10:05 pm	2022/12/20	9:10 pm	2022/12/25	12:20 am	2022/12/29
Draught Group (DG) Shut Down (SD)	5:35 am	2022/12/21	10:25 am	2022/12/26	11:05 am	2022/12/29
BO to DG SD (duration)	00:07:30	DD:HH:MM	00:13:15	DD:HH:MM	00:10:45	DD:HH:MM
Fires in time					3:15 am	2023/01/01
Synch. to Grid (or BC)					8:50 pm	2023/01/01
Fires in to BC (duration)		DD:HH:MM		DD:HH:MM	00:17:35	DD:HH:MM
Emissions below limit from BC (end date)					not > limit	not > limit
Emissions below limit from BC (duration)		DD:HH:MM		DD:HH:MM	n/a	DD:HH:MM



### Complaints Register

**Table 9:** Complaints for the month of December 2022.

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 December 2022.					

#### General

The particulate matter (PM10) emissions on the North Common Stack were within the **monthly limit**; North stack recorded the monthly PM10 average emissions figure of **103.2 mg/Nm<sup>3</sup>** while South Common Stack exceeded the **monthly limit** and recorded PM10 monthly average figure of **281.3 mg/Nm<sup>3</sup>**. The gaseous (NO<sub>x</sub> & SO<sub>x</sub>) emissions on the north and south common stack were also within the **daily limit** during the month of December 2022; refer to graphs above.

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

Kriel Power Station's List of NEMA Section 30 Incidents for 2022/2023 Financial Year

Month	Description of Section 30 Incidents - including the reference number	Root Cause (s)	Status of S30 Incident with DEFF (open or closed)	Remarks
April-2022	None			
December - 2022	None			
December - 2022	None			
December - 2022	None			
Aug - 2022	None			
Sep - 2022	None			
Oct - 2022	None			
Nov - 2022	Upset condition in units 4, 5 & 6 exceeded 48hours grace period.	Unit 5-A malfunction on one of the converter electronics cards	Open	
Dec - 2022				
Jan - 2023				
Feb - 2023				
Mar - 2023				