



**Ms Nompumelelo Simelane**  
Nkangala District Municipality  
PO Box 437  
Middleburg  
1050

Date:

*April 2024*

Enquiries: Lesiba Kgobe  
Tel: +27 13 699 7817

Ref: *Kusile Power Station AEL (17/4/AEL/MP311/12/01)*

Dear Ms. Simelane

**KUSILE POWER STATION'S MONTHLY EMISSIONS REPORT FOR OCTOBER 2023 REV 2**

Resubmission of monthly emissions report for October 2023. Please take note that Unit 2 was off due to flue gas duct collapse incident that occurred in Oct 2022.

Hoping the above will meet your satisfaction.

Yours sincerely

Christopher Nani  
**ACTING GENERAL MANAGER**  
DATE: *25/4/2024*

# 1. KUSILE POWER STATION MONTHLY EMISSIONS REPORT: Atmospheric Emission License 17/4/AEL/MP311/12/01



## 2 Raw Materials and Products

| Raw Materials and Products | Raw Material Type         | Units  | Max Permitted Consumption Rate    | Consumption Rate Oct-2023           |
|----------------------------|---------------------------|--------|-----------------------------------|-------------------------------------|
|                            | Coal                      | Tons   | 1 818 083                         | 477 181                             |
|                            | Fuel Oil                  | Tons   | 5 533                             | 3751.202                            |
|                            | Limestone                 | Tons   | 72 917                            | 4620                                |
|                            |                           |        |                                   |                                     |
| Production Rates           | Product / By-Product Name | Units  | Max Production Capacity Permitted | Indicative Production Rate Oct-2023 |
|                            | Energy                    | GWh    | 3 321.216                         | 897.577                             |
|                            | Ash                       | Tons   | 663 583                           | 125 355.441                         |
|                            | Gypsum                    | Tons   | 129 250                           | 2 587.20                            |
|                            | RE PM                     | kg/MWh | not specified                     | 0.163                               |
|                            | RE SO <sub>2</sub>        | kg/MWh | not specified                     | 6.331                               |

## 3 Energy source characteristics

| Fuel Characteristic | Units | Stipulated Range | Monthly Average Content |
|---------------------|-------|------------------|-------------------------|
| Coal Sulphur        | %     | 1.3              | 0.660                   |
| Ash in Coal         | %     | 38               | 26.270                  |
| Ash in FO           | %     | 0.02             | 0.010                   |

#### 4 Emissions Limits (mg/Nm<sup>3</sup>)

| Associated Unit/Stack | PM | SO <sub>2</sub> | NO <sub>x</sub> |
|-----------------------|----|-----------------|-----------------|
| East                  | 50 | 3500            | 750             |
| West                  | 50 | 1000            | 750             |

#### 5 Abatement Technology (%)

| Associated Unit/Stack | Technology Type | Efficiency Oct-2023 | Utilisation Oct - 2023 | Technology Type | Efficiency Oct-2023 | Utilisation Oct - 2023 |
|-----------------------|-----------------|---------------------|------------------------|-----------------|---------------------|------------------------|
| Unit 1                | FFP             | 99.739%             | 100%                   | FGD             | Out of service      | Out of service         |
| Unit 2                | FFP             | Off                 | Off                    | FGD             | Out of service      | Out of service         |
| Unit 3                | FFP             | 99.855%             | 100%                   | FGD             | Out of service      | Out of service         |
| Unit 4                | FFP             | 99.982%             | 100%                   | FGD             | 99.925%             | 100%                   |

Note: Both the FFP and FGD does not have bypass mode operation, hence plant 100% Utilised.

#### 6. Monitoring reliability (%)

| Associated Unit/Stack | PM    | SO <sub>2</sub> | NO    |
|-----------------------|-------|-----------------|-------|
| Unit 1                | 100.0 | 100.0           | 100.0 |
| Unit 2                | Off   | Off             | Off   |
| Unit 3                | 80.1  | 100.0           | 100.0 |
| Unit 4                | 100.0 | 97.2            | 100.0 |

#### 7. Emissions Performance

Table 7.1: Monthly tonnages for the month of October - 2023

| Associated Unit/Stack | PM    | SO <sub>2</sub> | NO <sub>x</sub> |
|-----------------------|-------|-----------------|-----------------|
| Unit 1                | 53.4  | 1 730           | 382             |
| Unit 2                | Off   | Off             | Off             |
| Unit 3                | 67.4  | 3 831           | 997             |
| Unit 4                | 5.9   | 121             | 645             |
| SUM                   | 126.7 | 5 682           | 2 025           |



Table 7.2: Operating days in compliance to PM AEL Limit - October 2023

| Associated Unit/Stack | Normal    | Grace    | Section 30 | Contravention | Total Exceedance | Average PM (mg/Nm³) |
|-----------------------|-----------|----------|------------|---------------|------------------|---------------------|
| Unit 1                | 1         | 3        | 0          | 9             | 12               | 66.0                |
| Unit 2                | Off       | Off      | Off        | Off           | Off              | Off                 |
| Unit 3                | 27        | 3        | 0          | 0             | 3                | 28.5                |
| Unit 4                | 23        | 0        | 0          | 0             | 0                | 4.4                 |
| <b>SUM</b>            | <b>51</b> | <b>6</b> | <b>0</b>   | <b>9</b>      | <b>15</b>        |                     |

Table 7.3: Operating days in compliance to SO<sub>2</sub> AEL Limit – October 2023

| Associated Unit/Stack | Normal    | Grace    | Section 30 | Contravention | Total Exceedance | Average SO <sub>2</sub> (mg/Nm³) |
|-----------------------|-----------|----------|------------|---------------|------------------|----------------------------------|
| Unit 1                | 16        | 0        | 0          | 0             | 0                | 1 639.1                          |
| Unit 2                | Off       | Off      | Off        | Off           | Off              | Off                              |
| Unit 3                | 31        | 0        | 0          | 0             | 0                | 1 560.1                          |
| Unit 4                | 25        | 0        | 0          | 0             | 0                | 82.3                             |
| <b>SUM</b>            | <b>72</b> | <b>0</b> | <b>0</b>   | <b>0</b>      | <b>0</b>         |                                  |

Table 7.4: Operating days in compliance to NO<sub>x</sub> AEL Limit – October 2023

| Associated Unit/Stack | Normal    | Grace    | Section 30 | Contravention | Total Exceedance | Average NO <sub>x</sub> (mg/Nm³) |
|-----------------------|-----------|----------|------------|---------------|------------------|----------------------------------|
| Unit 1                | 16        | 0        | 0          | 0             | 0                | 367.7                            |
| Unit 2                | Off       | Off      | Off        | Off           | Off              | Off                              |
| Unit 3                | 31        | 0        | 0          | 0             | 0                | 403.4                            |
| Unit 4                | 25        | 0        | 0          | 0             | 0                | 455.9                            |
| <b>SUM</b>            | <b>72</b> | <b>0</b> | <b>0</b>   | <b>0</b>      | <b>0</b>         |                                  |

Table 7.5: Legend Description





| Condition     | Colour  | Description  |
|---------------|---|--|
| Normal        |  | Emissions below Emission Limit Value (ELV)                       |
| Grace         |  | Emissions above the ELV during grace period                      |
| Section 30    |  | Emissions above ELV during a NEMA S30 incident                   |
| Contravention |  | Emissions above ELV but outside grace or S30 incident conditions |

Figure 1: Kusile Unit 1 PM Emissions - October 2023

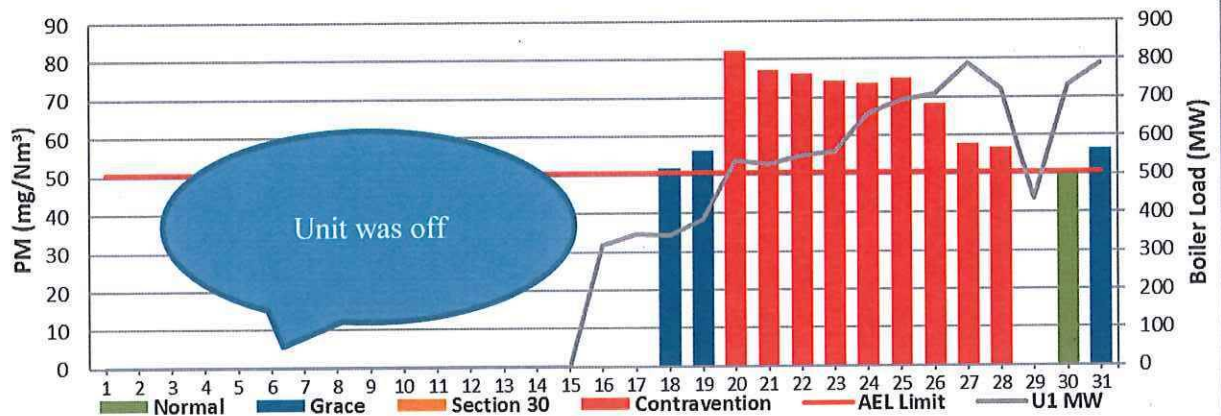


Figure 2: Kusile Unit 3 PM Emissions - October 2023

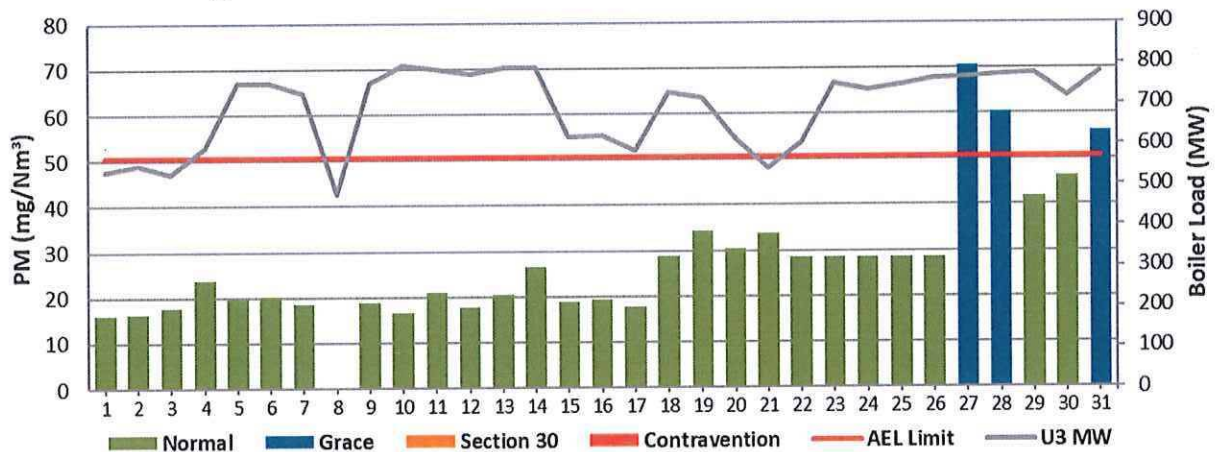
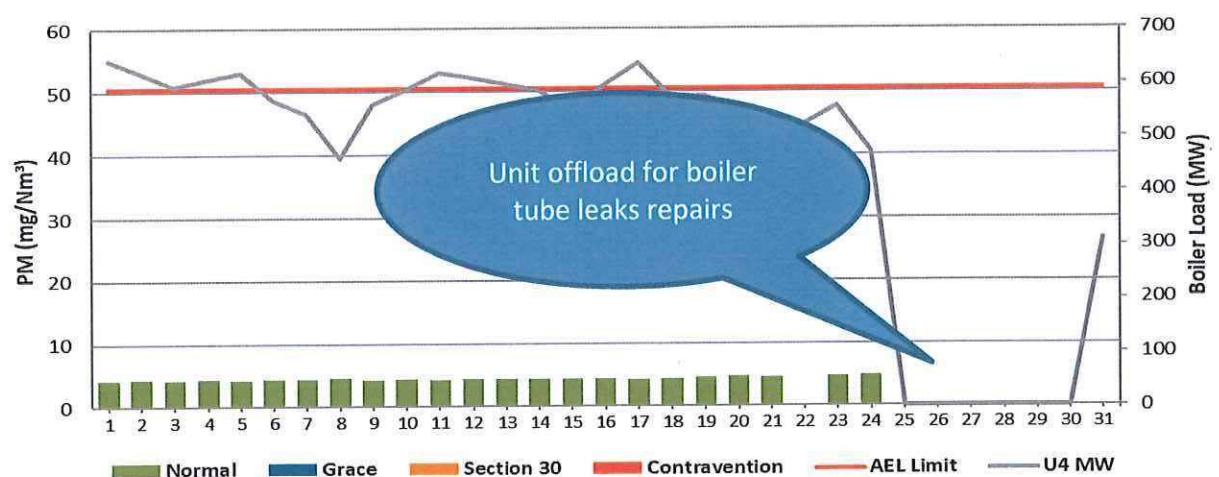
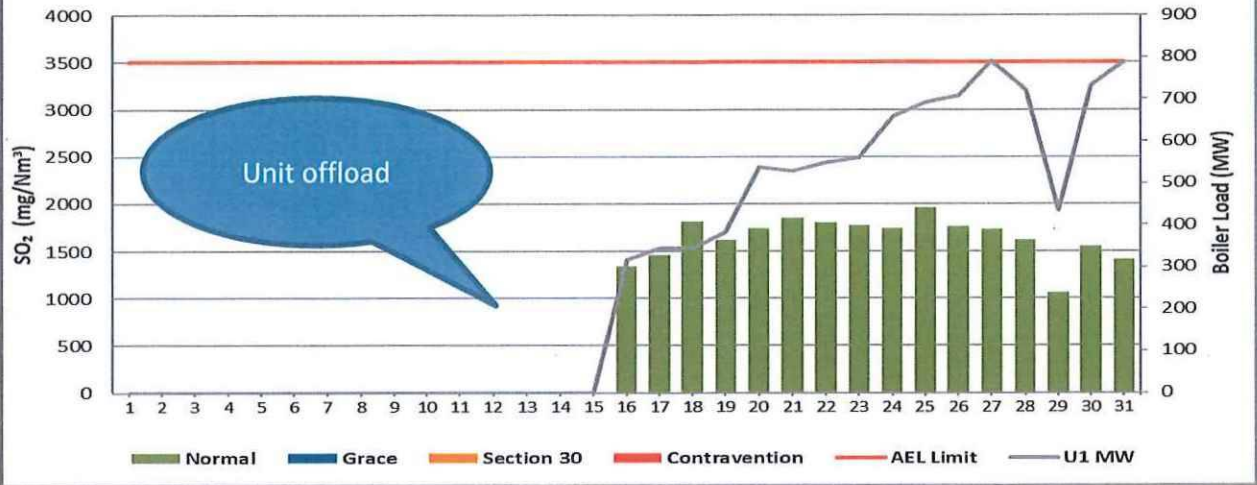


Figure 3: Kusile Unit 4 PM Emissions - October 2023

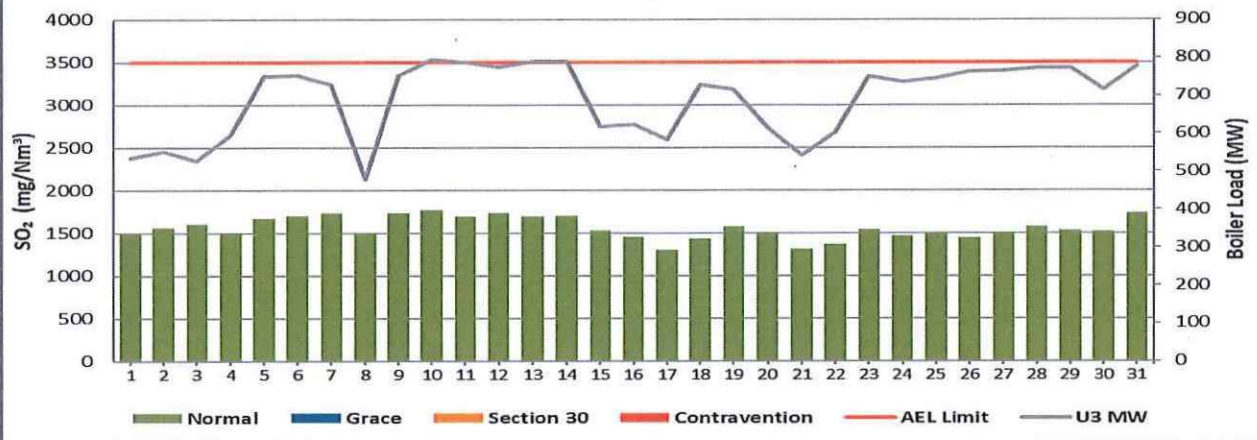




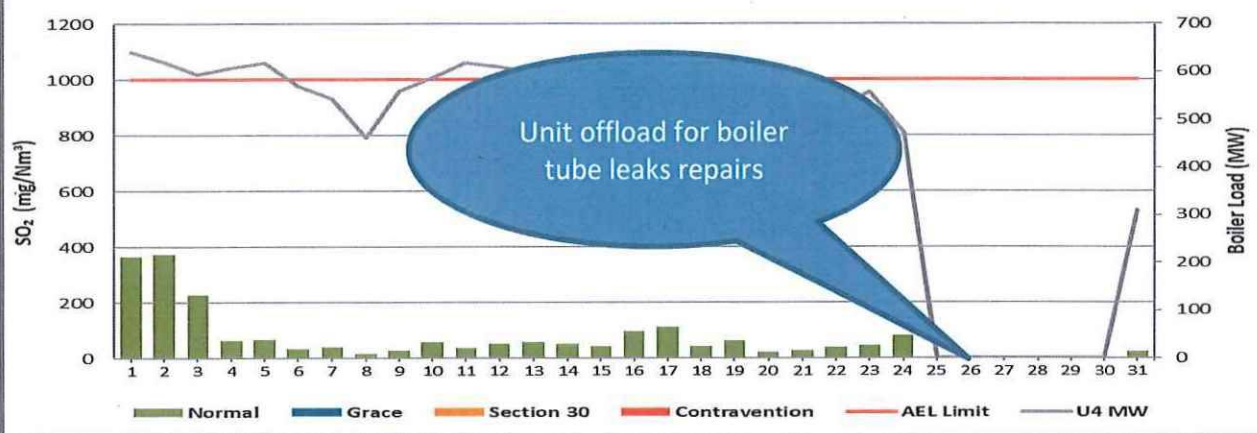
**Figure 4: Kusile Unit 1 SO<sub>2</sub> Emissions - October 2023**



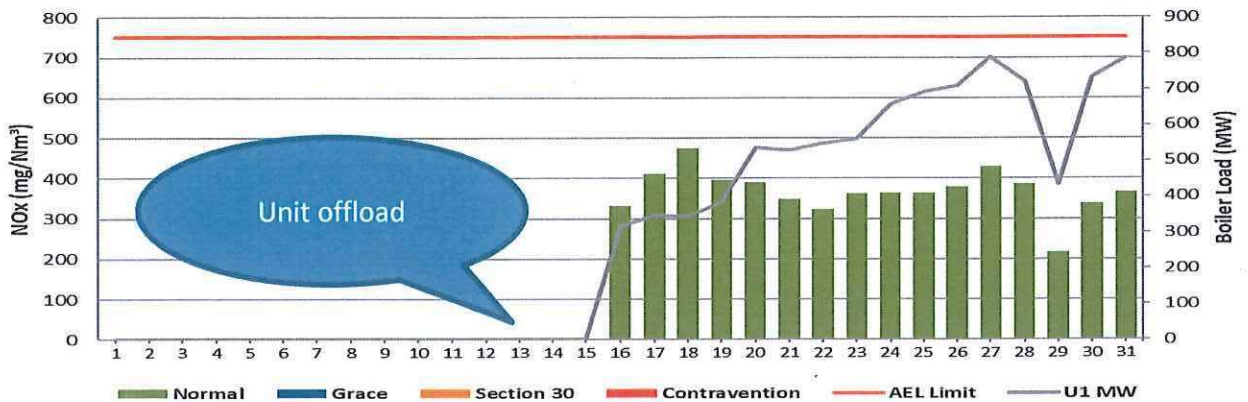
**Figure 5: Kusile Unit 3 SO<sub>2</sub> Emissions - October 2023**



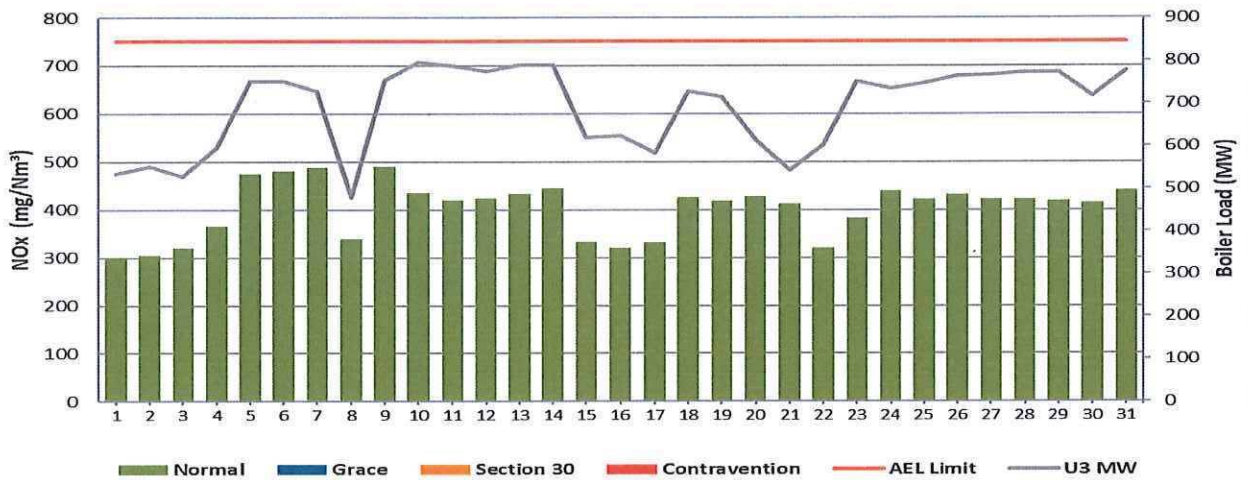
**Figure 6: Kusile Unit 4 SO<sub>2</sub> Emissions - October 2023**



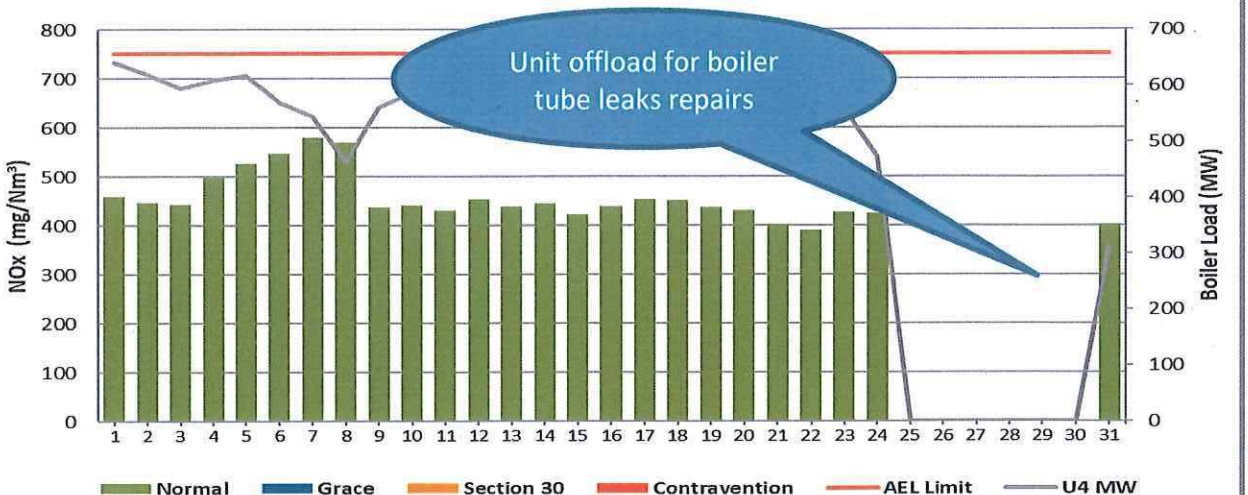
**Figure 7: Kusile Unit 1 NOx Emissions - October 2023**



**Figure 8: Kusile Unit 3 NOx Emissions - October 2023**



**Figure 9: Kusile Unit 4 NOx Emissions - October 2023**





## 8. Shut down and Light up information

| Unit No. 1                               | Event 1       |               | Event 2               |                       | Event 3     |             |
|--|---------------|---------------|-----------------------|-----------------------|-------------|-------------|
| Breaker Open (BO)                        | BO previously | BO previously | 3:25 am               | 2023/10/19            | 10:30 am    | 2023/10/28  |
| Draught Group (DG) Shut Down (SD)        | n/a           | n/a           | DG did not trip or SD | DG did not trip or SD | 10:30 pm    | 2023/10/28  |
| BO to DG SD (duration)                   | n/a           | DD:HH:MM      | n/a                   | DD:HH:MM              | 28:22:30    | DD:HH:MM    |
| Fires in time                            | 3:35 am       | 2023/10/17    |                       |                       | 11:00 pm    | 2023/10/28  |
| Synch. to Grid (or BC)                   | 1:55 pm       | 2023/10/17    |                       |                       | 3:10 pm     | 2023/10/29  |
| Fires in to BC (duration)                | 00:10:20      | DD:HH:MM      |                       | DD:HH:MM              | 00:16:10    | DD:HH:MM    |
| Emissions below limit from BC (end date) | not > limit   | not > limit   |                       |                       | not > limit | not > limit |
| Emissions below limit from BC (duration) | n/a           | DD:HH:MM      |                       | DD:HH:MM              | n/a         | DD:HH:MM    |

| Unit No. 3                               | Event 1 |          | Event 2               |                       | Event 3     |             |
|--|---------|----------|-----------------------|-----------------------|-------------|-------------|
| Breaker Open (BO)                        |         |          | 12:35 pm              | 2023/10/07            | 10:15 am    | 2023/10/15  |
| Draught Group (DG) Shut Down (SD)        |         |          | DG did not trip or SD | DG did not trip or SD | 11:10 am    | 2023/10/15  |
| BO to DG SD (duration)                   |         | DD:HH:MM | n/a                   | DD:HH:MM              | 00:00:55    | DD:HH:MM    |
| Fires in time                            |         |          |                       |                       | 12:25 pm    | 2023/10/15  |
| Synch. to Grid (or BC)                   |         |          |                       |                       | 4:35 pm     | 2023/10/15  |
| Fires in to BC (duration)                |         | DD:HH:MM |                       | DD:HH:MM              | 00:04:10    | 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    |



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| Unit No. 4                               | Event 1               |                       | Event 2  |            |
|--|-----------------------|-----------------------|----------|------------|
| Breaker Open (BO)                        | 5:35 pm               | 2023/10/21            | 4:55 am  | 2023/10/24 |
| Draught Group (DG) Shut Down (SD)        | DG did not trip or SD | DG did not trip or SD | 7:25 am  | 2023/10/25 |
| BO to DG SD (duration)                   | n/a                   | DD:HH:MM              | 01:02:30 | DD:HH:MM   |
| Fires in time                            |                       |                       |          |            |
| Synch. to Grid (or BC)                   |                       |                       |          |            |
| Fires in to BC (duration)                |                       | DD:HH:MM              |          | DD:HH:MM   |
| Emissions below limit from BC (end date) |                       |                       |          |            |
| Emissions below limit from BC (duration) |                       | DD:HH:MM              |          | DD:HH:MM   |

## 9. Complaints

| Date and time complaint was received                 | Complaint received | Source code name | Root cause analysis | Calculation of impact/emissions associated with incidents and dispersion modelling of pollutants where applicable. | Measures implemented or to be implemented to prevent recurrence | Date by which measures will be implemented |
|--|--------------------|------------------|---------------------|--|---|--|
| No complaints reported for the month of October 2023 |                    |                  |                     |  |   |  |

## 10. Sec 30 incident or legal contravention register

To be completed in the case of a Sec 30 incident or a legal contravention

| Unit no | Incident start date | Incident end date | Incident cause   | Remedial actions   | Sec 30 notification report sent | Date DFFE Acknowledged | Date DFFE Accepted  | Comments/Ref No                        |
|---------|---------------------|-------------------|--|--|---------------------------------|------------------------|---|--|
| Unit 1  | 20/10/2023          | 28/10/2023        | <ul style="list-style-type: none"><li>Only indicative values were available resulting in the station unable to activate the high dust emission response procedure, due lack correlated data.</li><li>The first 1000-1200 operational hours are associated with high emissions. The material fibres for the installed bag set are 100% PPS and did not assist with the reduction of PM that is provided by the PI or P84 fibre.</li><li>PM concentration is affected by cleaning system parameters and exposure to high DP.</li><li>Online cell inspection was ongoing based on cell dust flow meters trends. This was effective in reducing dust from damaged bags but ineffective in reducing high dust concentrations associated with bleed through.</li></ul> | <ul style="list-style-type: none"><li>Spot checks are to be done on units during the next CEMS installation while awaiting correlations for implementation of a preliminary curve. This will allow for the operator to have values to monitor and action while awaiting test.</li><li>Cleaning system setting DP used to start the pulse cleaning will be increased to 1.5kPa from 1.3kPa for a new bag set. In addition to this, the maximum pulse cleaning pressure setting will be limited to 500kPa instead of 600kPa to prevent disturbance of the primary ash cake.</li><li>The specification for the PPS shall be that used at Kusile going forward will include the PI or P84 fibre final layer.</li><li>Online bag replacements shall continue as required by the system for PM concentration management.</li></ul> | Not applicable                  |                        | Exceedances not reported as Sec 30 incidents. The exceedances were noted after retrofitting of data and therefore reported as legal contraventions. | Refer to attached investigation report |