

Adelaide Brighton Cement Birkenhead Works. Licence Number: 1126

**BIRKENHEAD QUARTERLY STACK
MONITORING REPORT**

July-September 2016

Version: 1

Submitted: 31st October 2016

EPA LICENCE NO: 1126

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Quarterly Report July-September 2016

Monitoring Objective

The aim of the Quarterly Stack Monitoring Report is to identify and report on emissions to compare actual emissions from Adelaide Brighton Cement Birkenhead Works against the Environment Protection (Air Quality) Policy 1994, Authorisation 1126 and Exemption Authorisation 12368. Furthermore the aim of the report is to continuously monitor and provide reasons for the particulate emissions exceeding reporting limits in order to establish key areas where opportunities lie for process and mechanical improvements to reduce the level of stack dust emissions from the site.

Monitoring Plan

Monitoring of stacks 4A and 4B on the Birkenhead site is performed using Durag Dust and Opacity Meters. These meters provide a continuous % opacity and this is converted to mg/Nm^3 using a calibration curve. The results are then summarized as one hourly averages based on 10 minute averages for the purpose of this report.

The license that Adelaide Brighton Cement operates under in regard to stack emissions is summarized below.

Environment Protection (Air Quality) Policy

- Schedule 1 (1) - limit of $250\text{mg}/\text{Nm}^3$ stack 4A and 4B
- Exemptions License
 - Kiln or calciner light up &/or purge – max 10 minutes
 - Level 3 combustibles trip – max 5 minutes
 - Power failure – duration of emergency situation

Adelaide Brighton Cement Birkenhead Works. Licence Number: 1126

- Stack emissions testing for calibration of opacity meter – provided that an EPA authorised officer is on site
- Reporting Levels
 - All emissions in excess of 80 mg/m³ (Stack 4B) and 150 mg/m³ (Stack 4A)

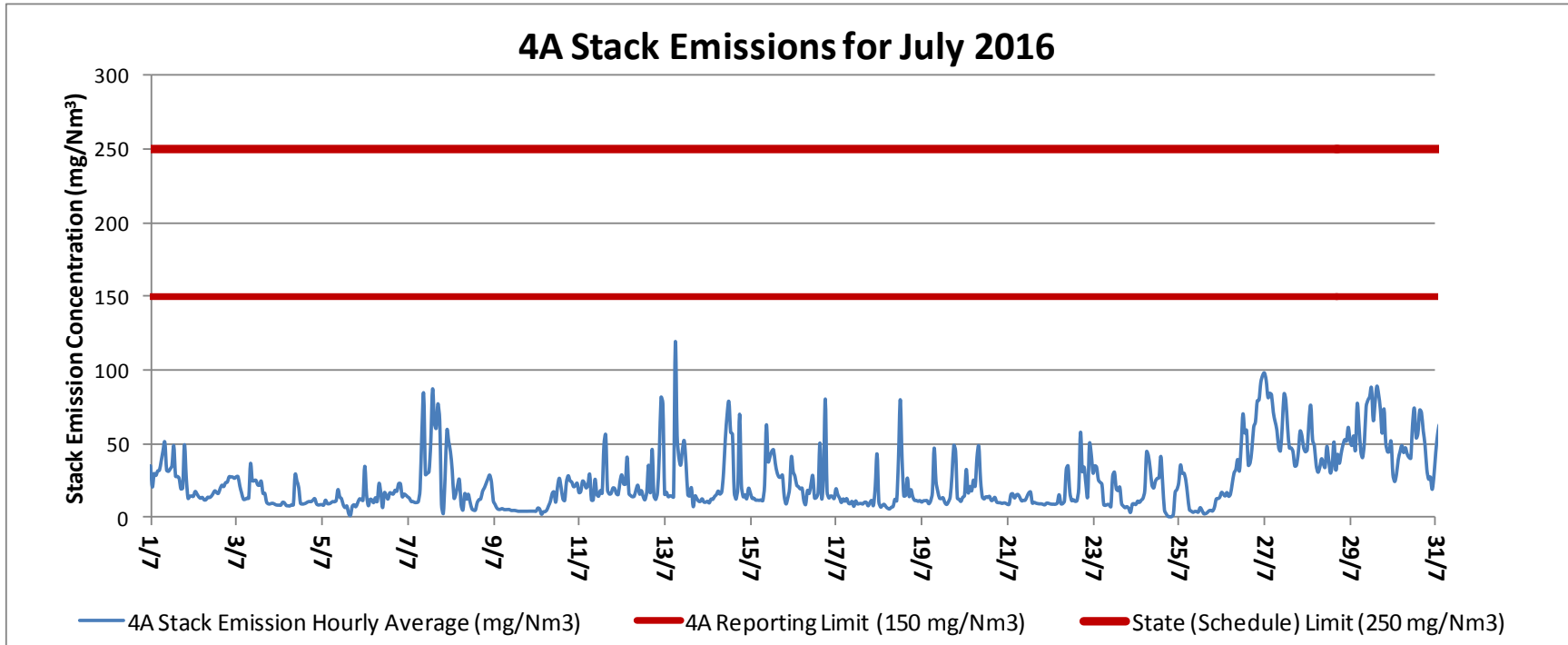
The Environmental Protection Authority (EPA) must be notified as soon as practicably possible of all emissions in excess of the Schedule 1 (1) limit or reporting limit and cause as well as remedial actions must be communicated. Where particulate emissions exceed the Schedule 1(1) limit and the cause is not explicitly covered by the exemptions an investigation will be carried out by the EPA to ensure that ABC Birkenhead has taken all reasonable and practicable measures to reduce the emissions.

Monitoring Results

Presentation of Results

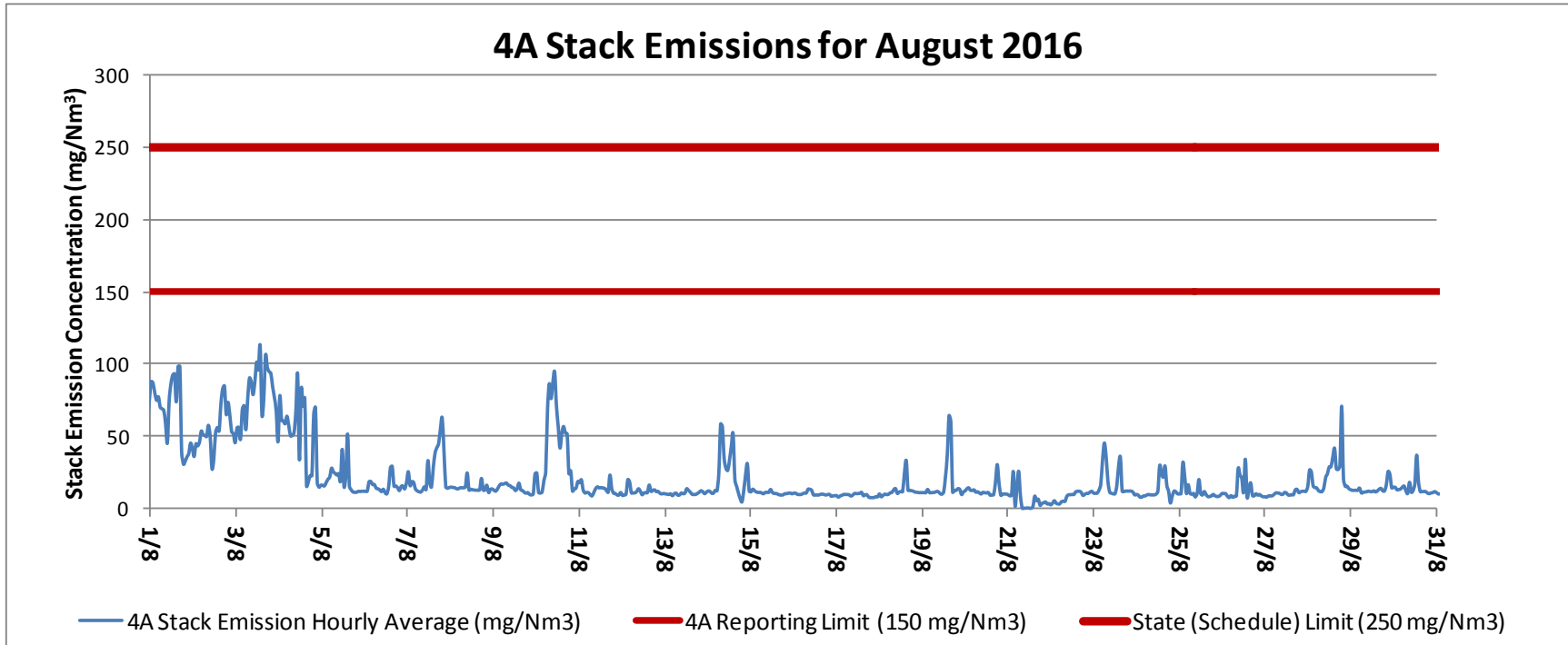
The graphs on the following pages detail the hourly averages of 10 minute averages of stack emissions from 4A and 4B stacks by month. The tables below each chart show the results of RCA (root cause analysis) that was undertaken for plant stoppages resulting in emissions above either the reporting limit or the Air Quality Policy Schedule 1 (1) limit on an hourly average.

Adelaide Brighton Cement Birkenhead Works. Licence Number: 1126



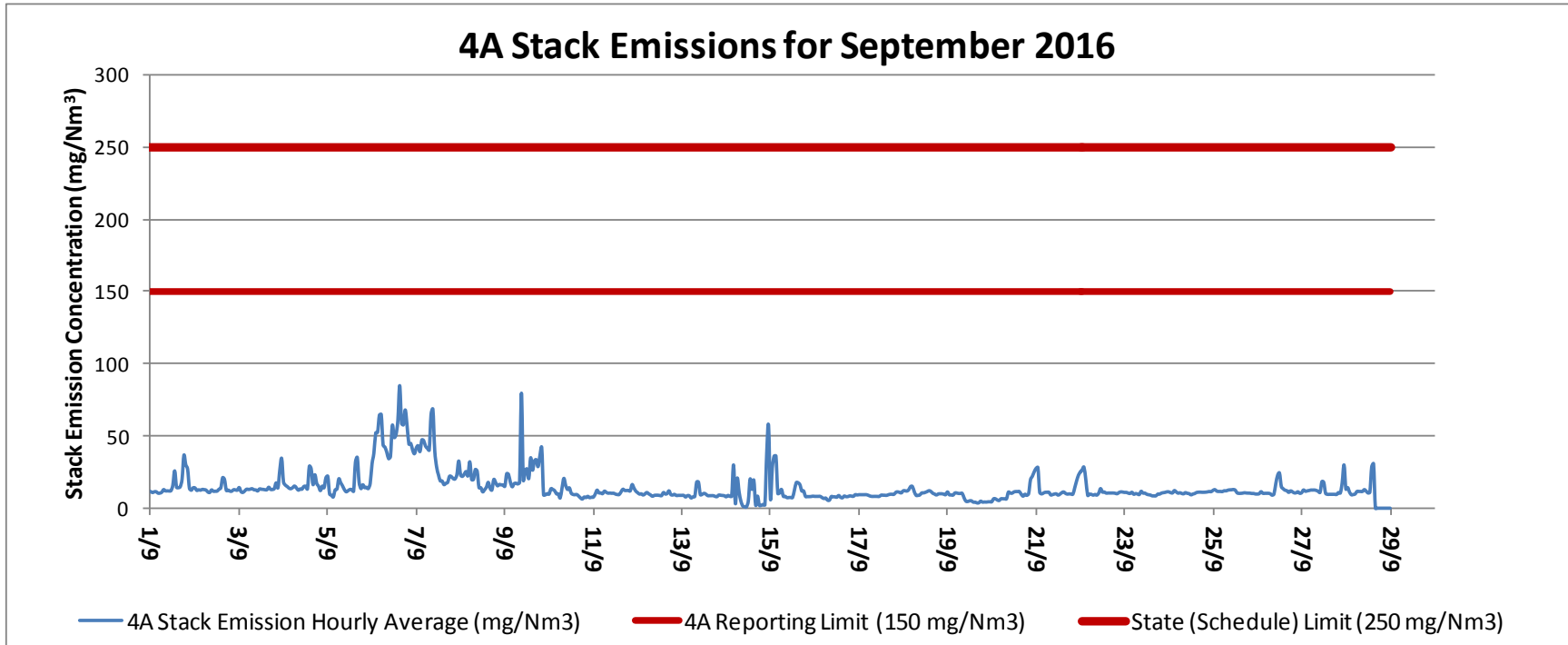
Tag	RCA Number	Description

Adelaide Brighton Cement Birkenhead Works. Licence Number: 1126



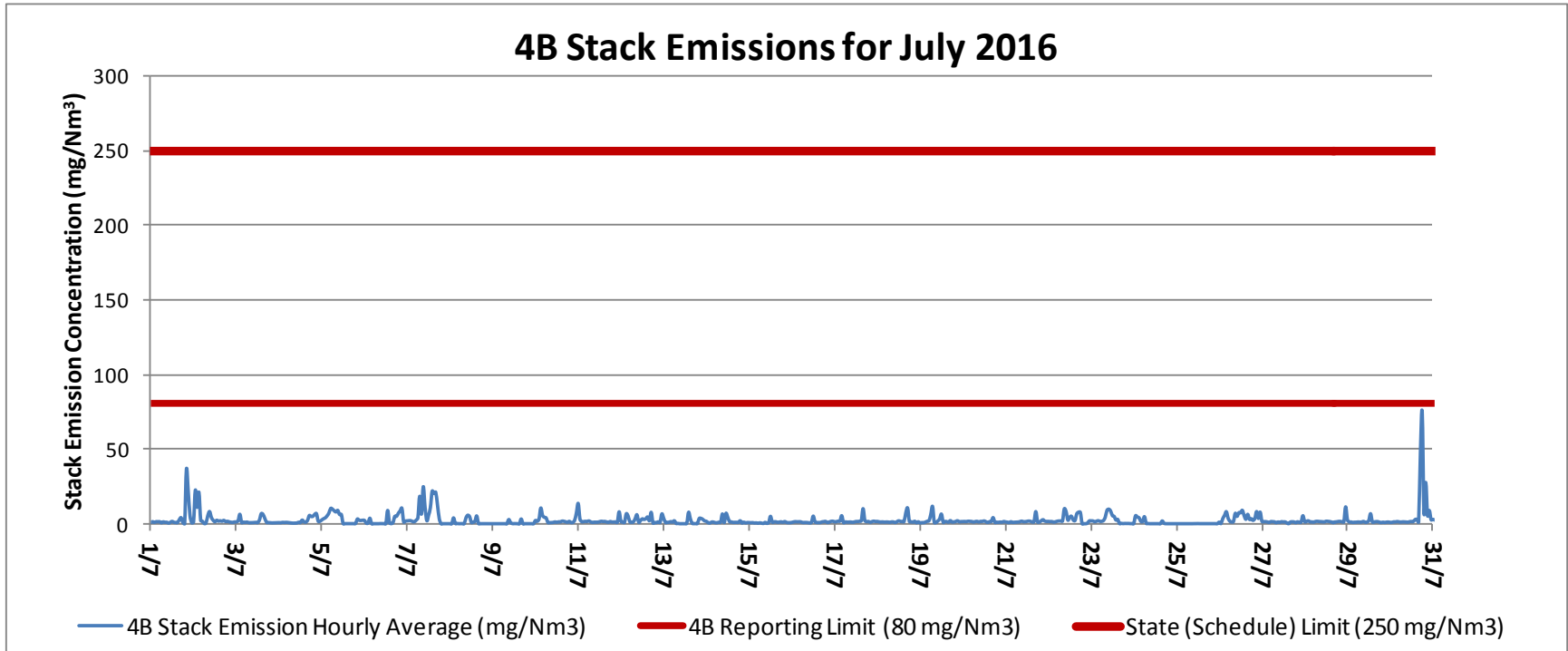
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Adelaide Brighton Cement Birkenhead Works. Licence Number: 1126



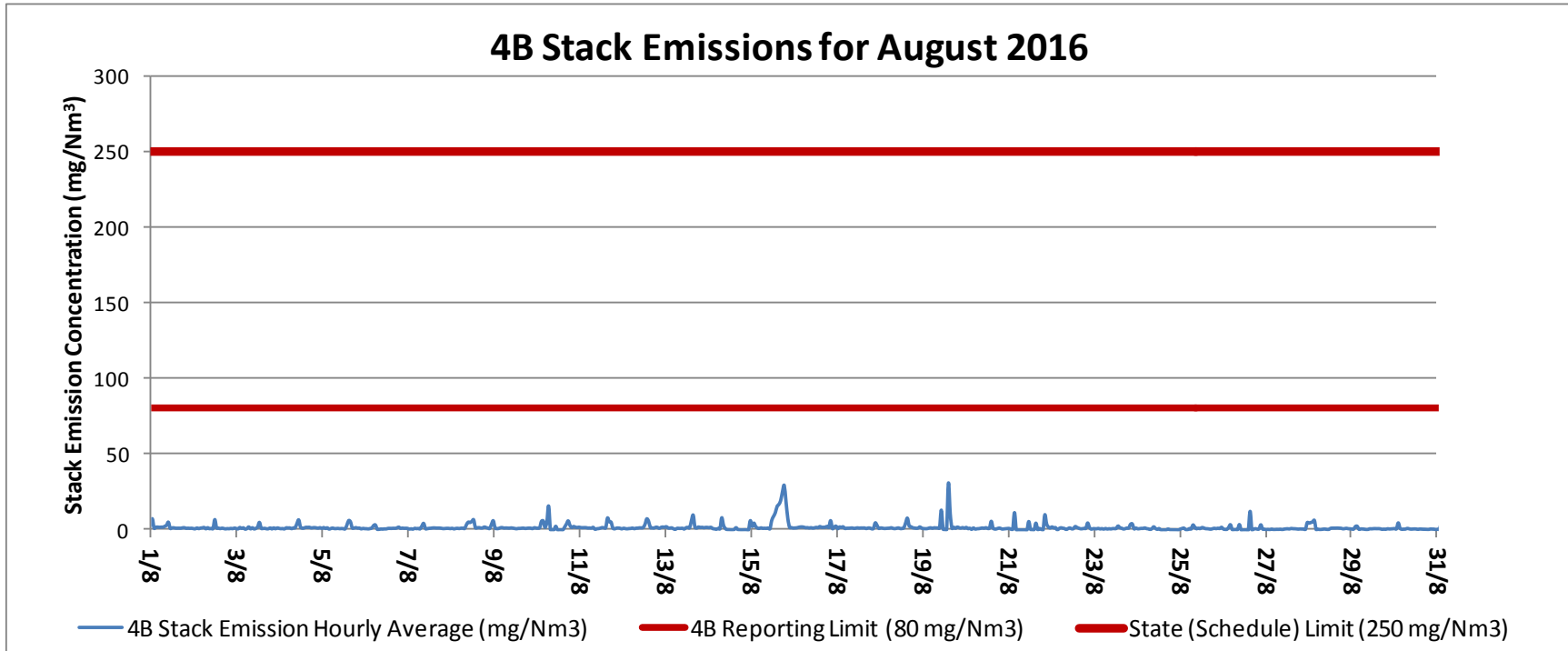
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Adelaide Brighton Cement Birkenhead Works. Licence Number: 1126



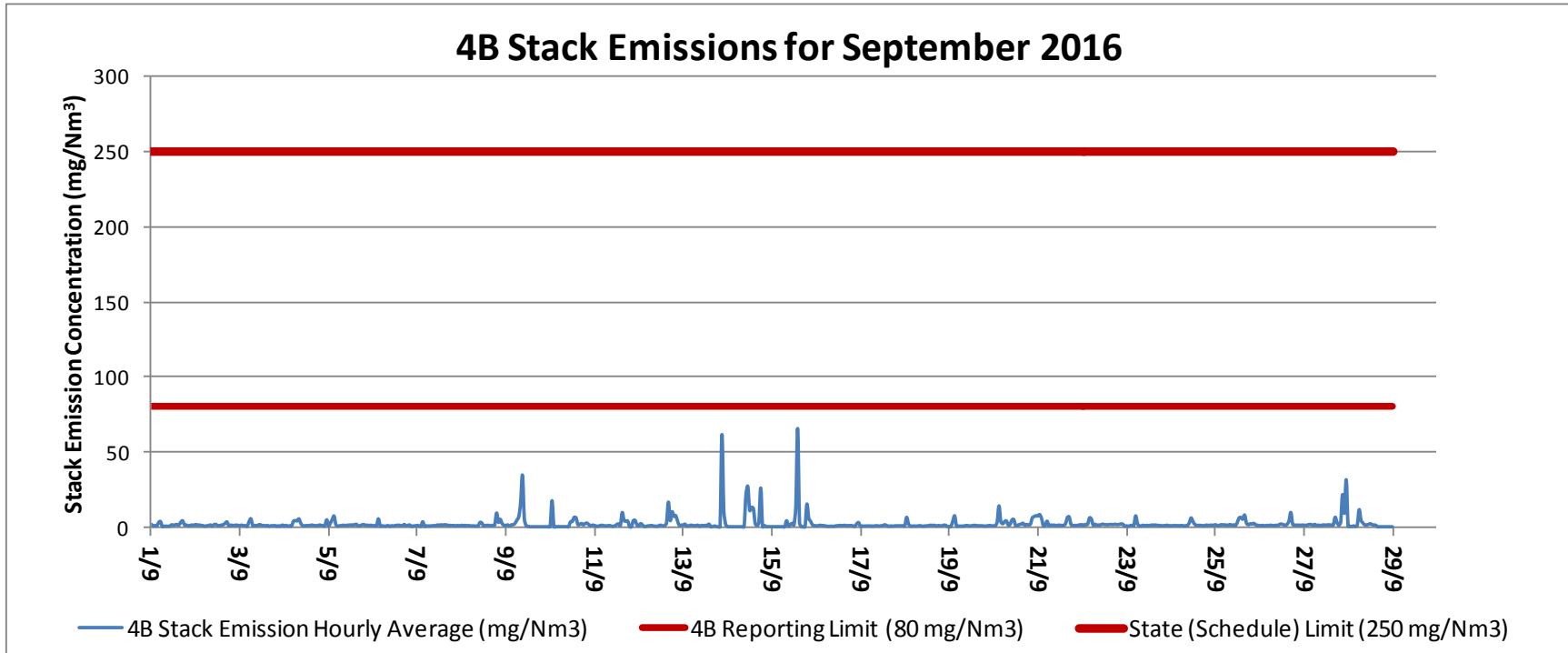
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Adelaide Brighton Cement Birkenhead Works. Licence Number: 1126



Tag	RCA Number	Description

Adelaide Brighton Cement Birkenhead Works. Licence Number: 1126



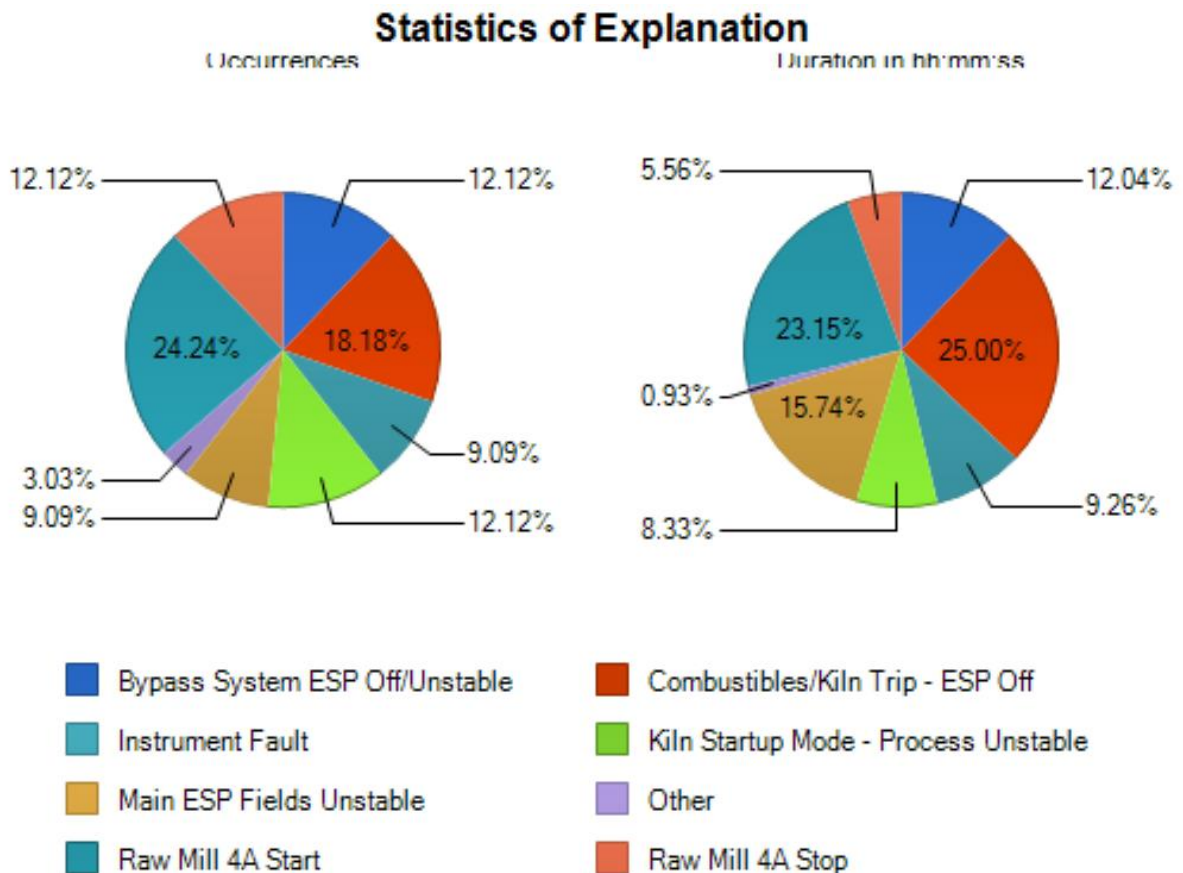
Tag	RCA Number	Description

Short Term Report Summary

1. Short Term Excursions above 250mg/Nm³

In addition to hourly averages shown earlier in the report short term excursions above 250mg/Nm³ are reported during the period to the EPA. Below is a pie chart of the causes on both 4A and 4B stack.

4A Greater Than 250mg/Nm³ Emissions Qtr 3 2016



4A Stack Pie Chart of causes over 250 mg/Nm³ in terms of number of occurrences and total time

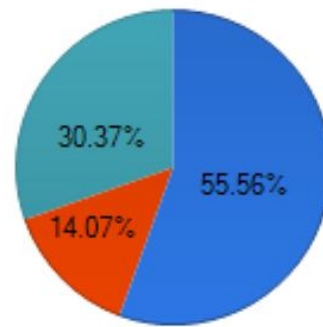
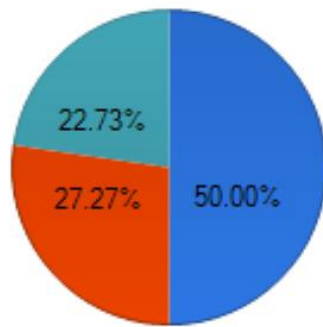
Total number of occurrences =33; total time 18 minutes 0 seconds

4B Greater Than 250mg/Nm³ Emissions Qtr 3 2016

Statistics of Explanation

(Occurrences)

(Duration in hh:mm:ss)



- Calciner Startup Mode - Process Unstable
- Calciner System Purge - ESP Unstable
- Calciner Trip - Process Unstable

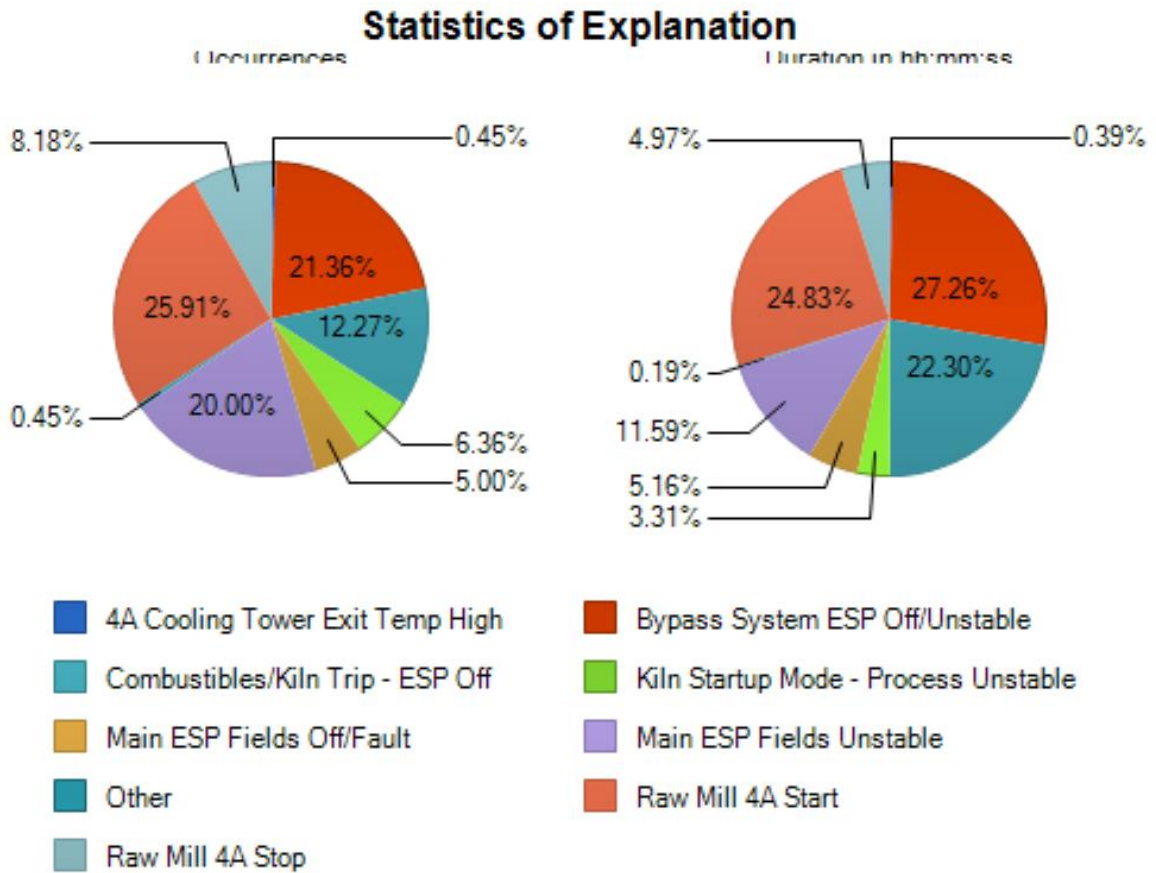
4B Stack Pie Chart of causes over 250 mg/Nm³ in terms of number of occurrences and total time

Total number of occurrences = 22; total time 22 minutes 30 seconds

2. Causes of reporting limit excursions

Stack emissions greater than 150 mg/Nm³ (4A Stack) and 80 mg/Nm³ (4B Stack) are reported to the EPA on a weekly basis. A pie chart and the total time are presented. Below are pie charts for 4A and 4B stack for the three month period; and also the total time charts up until the end of September 2016.

4A Greater Than 150mg/Nm³ Emissions Qtr 3 2016

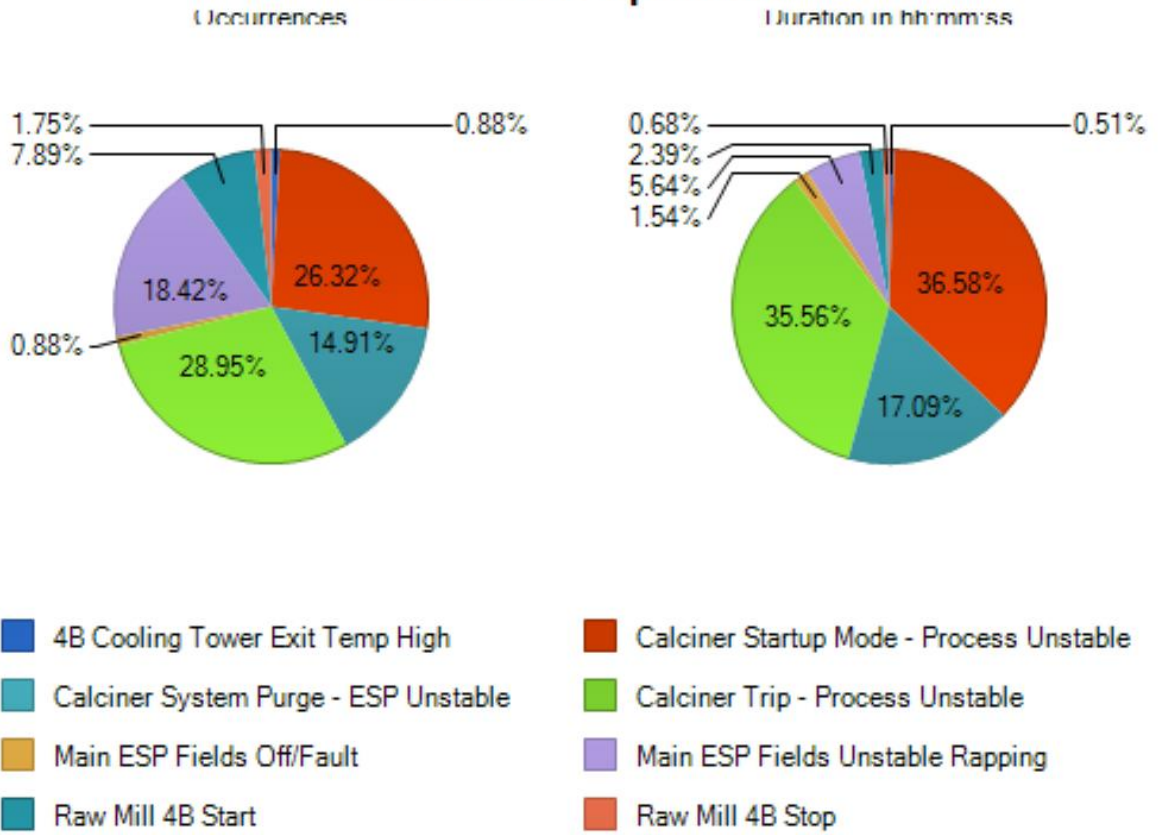


4A Stack Pie Chart of causes over 150 mg/Nm³ in terms of number of occurrences and total time

Total number of occurrences = 220; total time 2 hours 51 minutes 10 seconds

4B Greater Than 80mg/Nm³ Emissions Qtr 3 2016

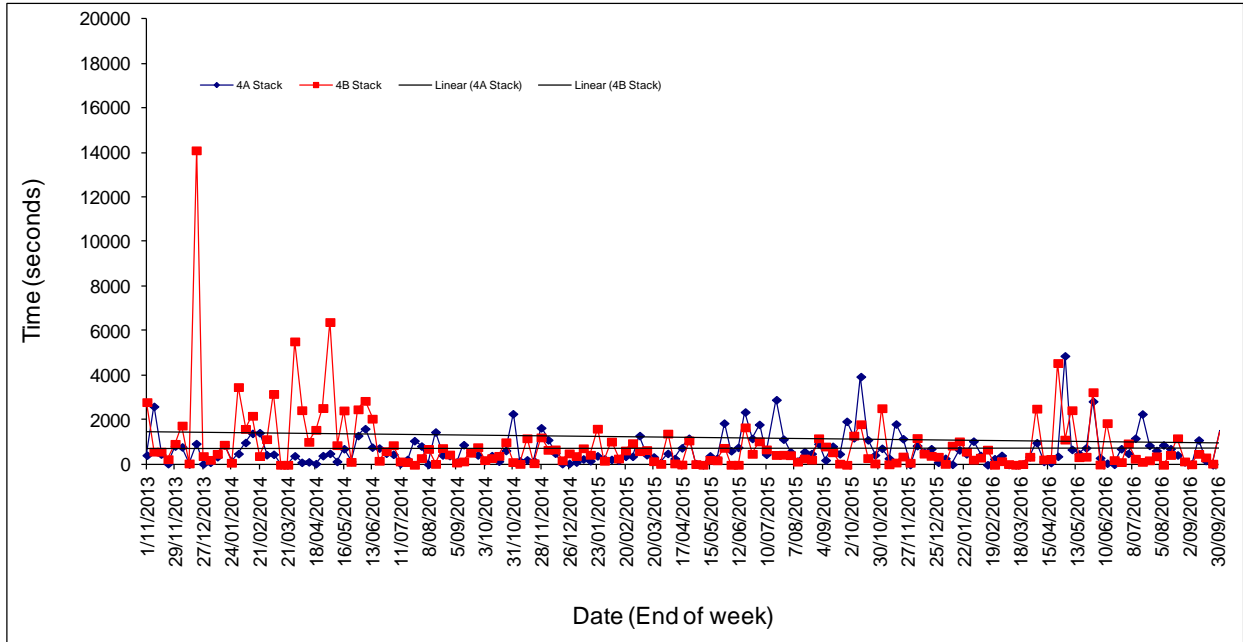
Statistics of Explanation



4B Stack Pie Chart of causes over 80mg/Nm³ in terms of number of occurrences and total time

Total number of occurrences = 114; total time 1 hours 37 minutes 30 seconds

Adelaide Brighton Cement Birkenhead Works. Licence Number: 1126



Tracking total time for stack emissions greater than the reporting levels of $150\text{mg}/\text{Nm}^3$ on 4A stack and $80\text{mg}/\text{Nm}^3$ on 4B stack.

Monitoring Results – Quality Assurance / Quality Control Evaluation

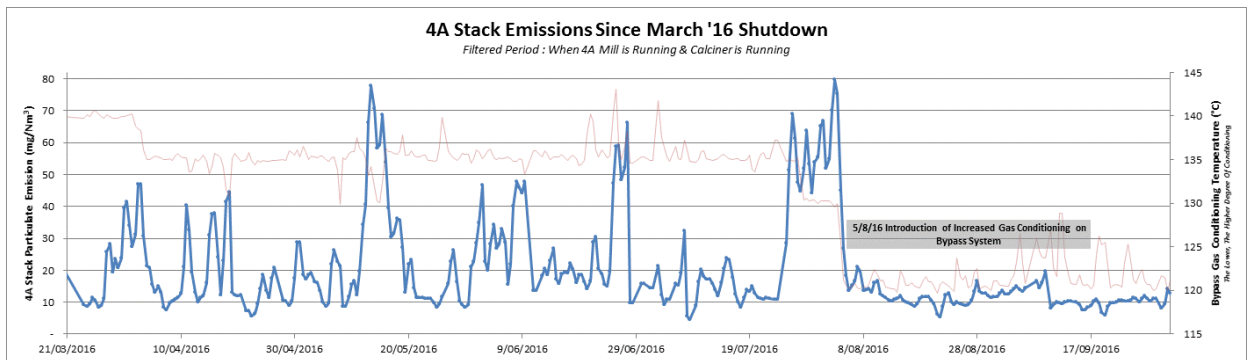
The data shown in the graphs above was calculated using an opacity curve generated by a number of iterations of spot testing by Axiom Air whom are accredited for compliance with ISO/IEC 17025. The opacity meters are also calibrated daily and via regular planned maintenance as per the suppliers' standard.

Process Improvement for the Quarter

As part of our continuous improvement commitment the emissions reduction team formed last year has continued to work on new and existing projects to mitigate emissions, including:

Bypass Operation Optimisation

The Birkenhead technical and operations team have been analyzing the operation of the bypass system over the past 12 months to investigate how the environment footprint can be minimized as much as possible. The outcome of this investigation was an improvement on the gas conditioning bypass system, which was intended to increase the collection efficiency of the bypass electrostatic precipitator.



The graph above shows the dramatic improvement from the changes made on 5/8/16. The blue line represents the particulate emissions measured on 4A stack, while the red line indicates the bypass temperature control (high resolution version in attachments). The emissions on 4A stack have dropped considerably, and the process is more resilient to disturbances. The change observed has greatly contributed to future project plans for emissions reduction on site.

Conclusion

There were no incidents above 250mg/Nm³ for a one hour average on 4A or 4B stack in the quarter. There were no incidents above 150 mg/Nm³ on 4A stack or 80 mg/Nm³ on 4B stack for a one hour average in the quarter. A process of review and improvement (including root cause analysis) is utilized to reduce these situations, thereby reducing the number of occurrences of emissions greater than 250 mg/Nm³. Ongoing significant emission reductions have continued for the quarter as a result of improvements made to the process.

Adelaide Brighton Cement Birkenhead Works. Licence Number: 1126

Appendix A

See attached PDF files.



4A LVL 3 Q3.pdf



4A LVL 4 Q3.pdf



4B LVL 2 Q3.pdf



4B LVL 3 Q3.pdf



Bypass Performance
since start 2016.pdf