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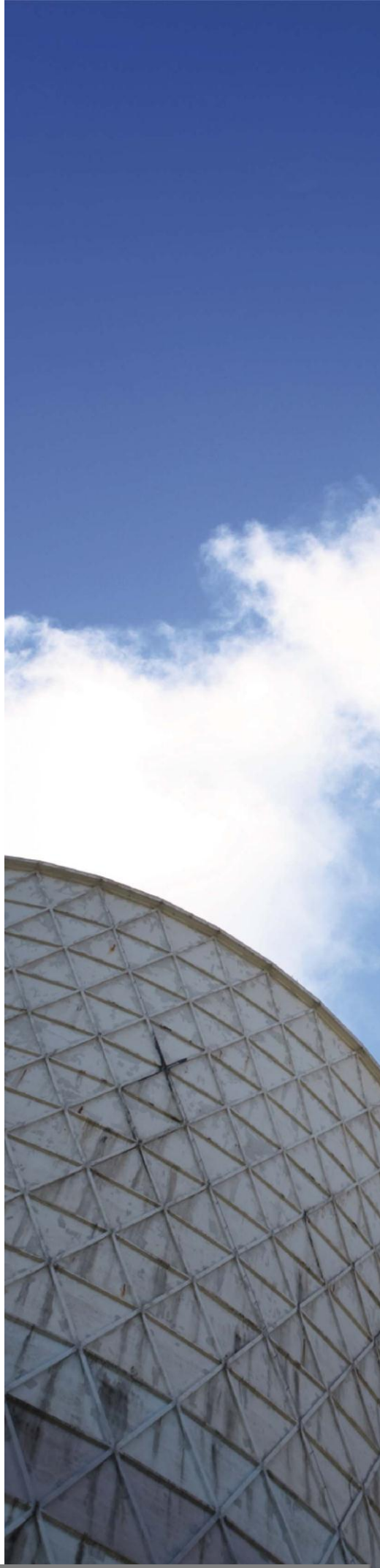

REPORT

STRATFORD COAL MINE PRP – U3 OVERBURDEN HANDLING IN ADVERSE WEATHER – REPORT ON ACTIONS AND RESULTS

Stratford Coal Pty Ltd

Job No: **8444**

14 August 2014

PROJECT TITLE:	Stratford Coal Mine PRP – U3 Overburden handling in Adverse Weather – REPORT ON ACTIONS AND RESULTS
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1 INTRODUCTION

Stratford Coal Pty Ltd (SCPL) holds Environmental Protection Licence (EPL) 5161 for the Stratford Coal Mine and EPL 11745 for the Bowens Road North Project (collectively referred to as SCM). Condition U3 of EPL 5161 and U2 of EPL 11745 (*Particulate Matter Control Best Practice Implementation - Disturbing and Handling Overburden under Adverse Weather Conditions)* requires SCM to alter or cease the use of equipment on overburden and loading dumping overburden during adverse weather conditions.

The licence must:

- Monitor operational activities (location and intensity of overburden handling activities) to determine if adverse conditions will result in unacceptable dust levels beyond the site boundary.
- Measure the dust (PM_{10}) concentration at Stratford Village to determine if adverse conditions are resulting in elevated dust concentrations beyond the site boundary and also to determine if the alteration / cessation decreased these dust levels.
- Document the actions taken and the resultant dust levels.

The purpose of this report is to report on actions completed by SCM under "adverse conditions" and the resultant dust levels beyond the site boundary.

This is achieved as follows:

- Review meteorological data and identify when adverse conditions occurred (based on trigger levels being breached).
- Review procedural response for adverse conditions.
- Review continuous monitoring data (TEOM) during adverse weather and after the procedural response.
- Determine if adverse conditions are resulting in unacceptable dust levels beyond the site boundary.

2 REVIEW OF METEOROLOGY

Adverse conditions for unacceptable dust levels beyond the site boundary were identified in **Pacific Environment (2013)** as follows:

- Investigation Level - wind speed ≥ 6 m/s
- Action Level - wind speed ≥ 7 m/s.

These triggers levels are used in a Trigger Action Response Plan (TARP) for overburden handling during adverse weather, for critical locations of SCM. During the period from the 22 March 2013 to the 30 June 2014 the trigger levels were exceeded on an hourly average basis approximately 7% of the time (see **Table 2.1**).

Table 2.1: Percentage of trigger level wind speed occurance

Trigger level	Percentage of period
Investigation (≥6 m/s)	6.2%
Action (≥ 7 m/s)	0.98%

Figure 2-1 shows the distribution of the winds per hour for the analysis period. It is apparent that lower winds occur more frequently during night and higher wind speeds are almost non-existent.

The analysis shows that the wind speed trigger levels are typically breached during afternoon periods.

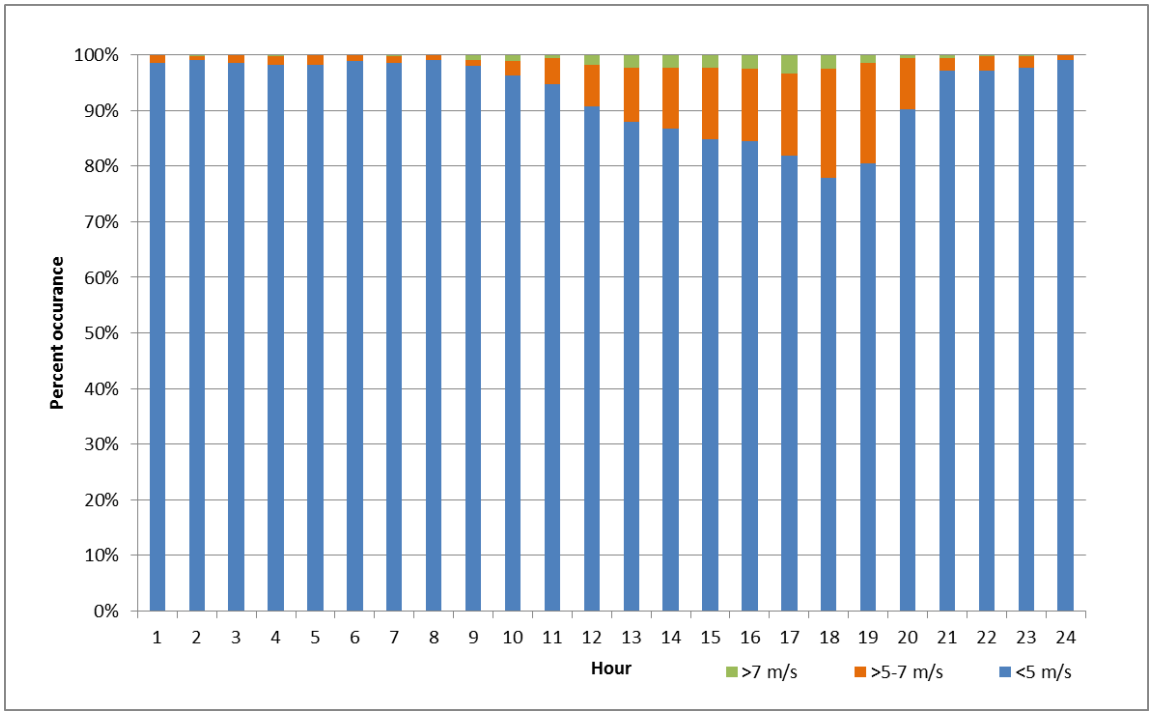

Figure 2-1: Diurnal distribution of wind speeds for the period – 1/07/2013 – 30/06/2014

3 RESULTANT DUST CONCENTRATION

The dust concentration during adverse conditions is measured at the TEOM located to the west of SCM. A time series of the 1-hour average PM_{10} concentration, during adverse conditions, is presented in **Figure 3-1**. The period of analysis in **Figure 3-1** is limited to adverse conditions, shown by the corresponding plotted wind speed, all of which are >7m/s. Periods when winds >7m/s are blowing from the SCM towards the TEOM are shown with a blue dot. A number of spikes are apparent in the data, some of which correspond to winds blowing from the SCM towards the TEOM (the blue dots).

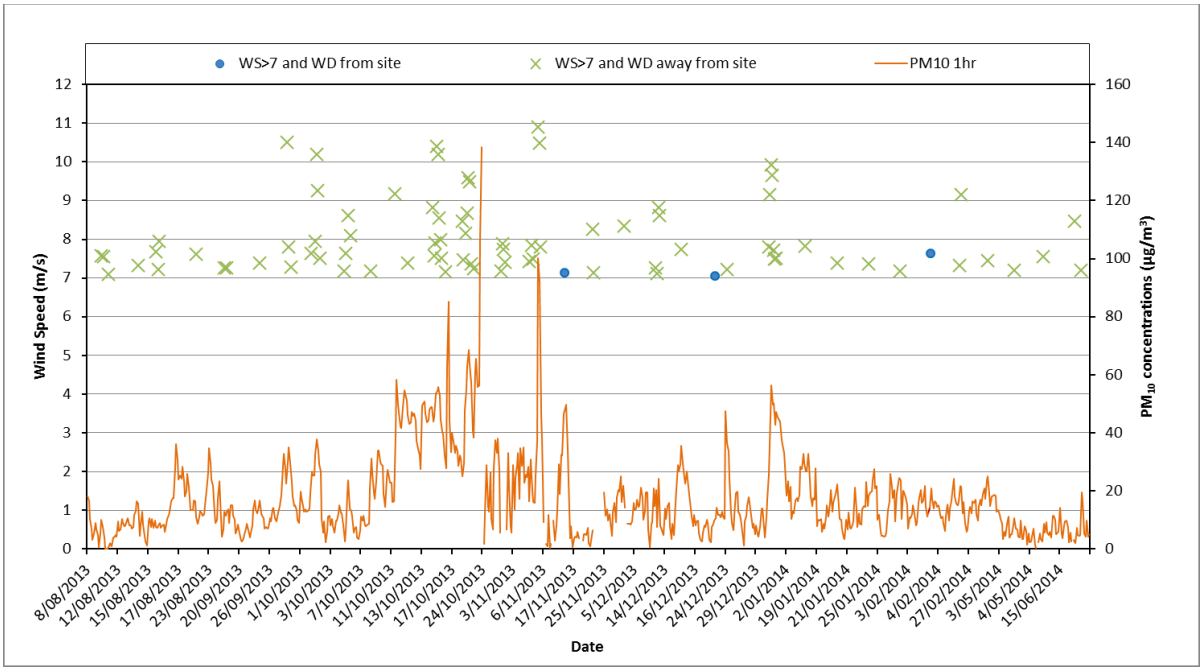

Figure 3-1: Wind speed and PM_{10} concentrations for day when the wind speed exceeded 7 m/s

The first three noticeable peaks in the data occur on 13 October 2013, 17 October 2013 and 3 November 2013. On these days, winds speeds were >7m/s (for certain hours), however the wind was not blowing from SCM towards the TEOM. The recorded PM_{10} concentrations on these days were not a result of operations at SCM. On 17 October 2013 , there was heavy smoke in the valley due to bushfires. Also, on the evening of 17 October 2013 a southerly change caused heavy smoke from the Medowie bushfires to blow north into the Gloucester Valley with smoke remaining in the valley for most of the following day (18 October 2013).

Similarly, the peak on 3 November 2013 was not a result of operations at SCM. The peak PM_{10} concentrations occur when winds were blowing from a southerly direction and therefore not transporting dust from SCM. Furthermore, SCM is a day time operation with no overburden handling during night-time hours (when the peak occurs) as shown in **Figure 3-2**. At no time was wind blowing from SCM towards the TEOM. The resultant 24-hour PM_{10} concentration was 32.7 µg/m³ (green dashed line).

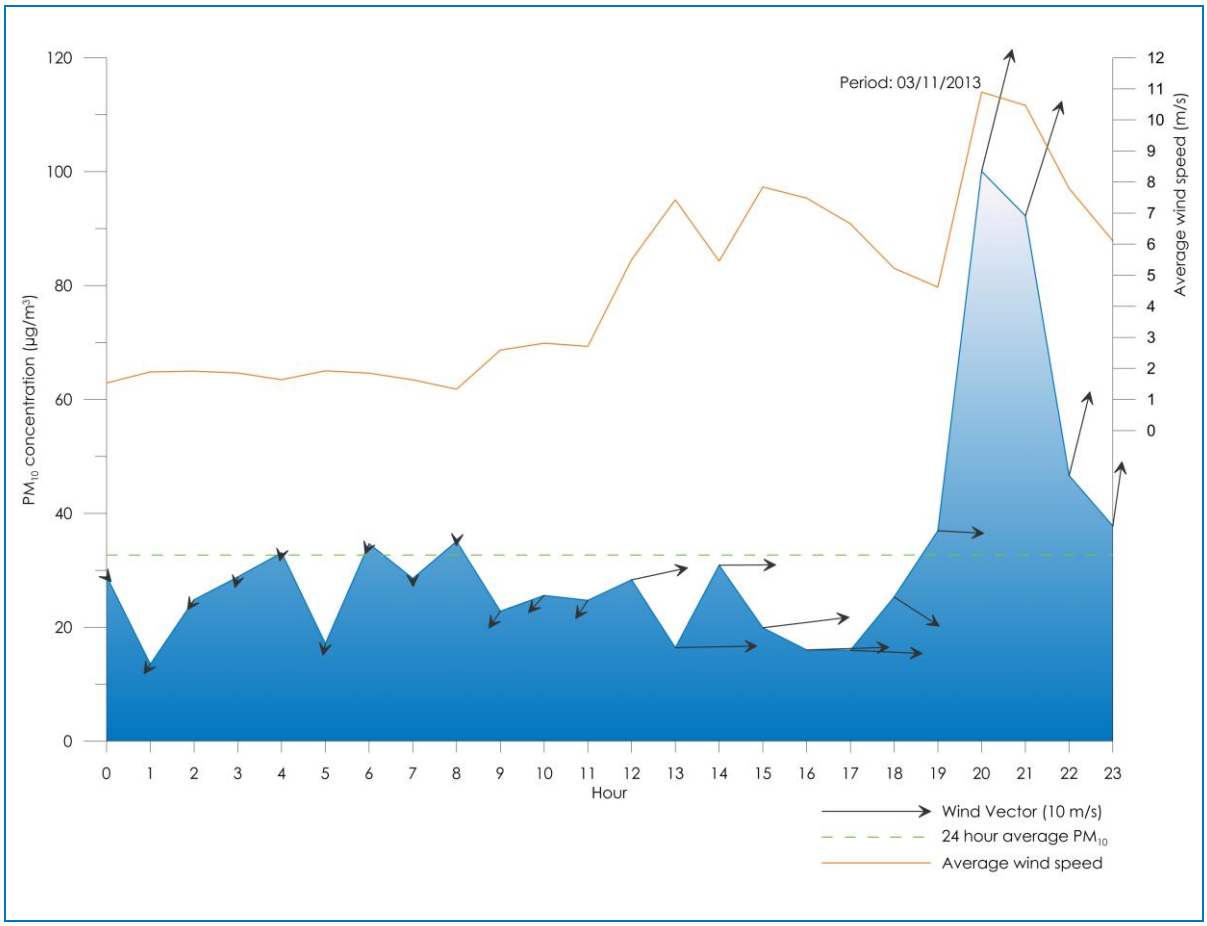

Figure 3-2: Daily variations of PM_{10} concentration and winds across day when action level was triggered – 3/11/2013

Three days later, on 6 November 2013 a smaller peak occurs when winds are blowing from SCM towards the TEOM. **Figure 3-3** shows a time series for this day, showing the vector wind direction, wind speed and PM_{10} concentration. The peak 1 hour PM_{10} concentrations correspond to a >7m/s wind blowing from the SCM towards the TEOM, as shown by the wind vector arrow.

However, 1 hour PM_{10} concentrations then fall, despite wind continuing to blow in the same direction, although wind speeds also decrease. The resultant 24-hour PM_{10} concentration was 36.7 µg/m^3 (green dashed line).

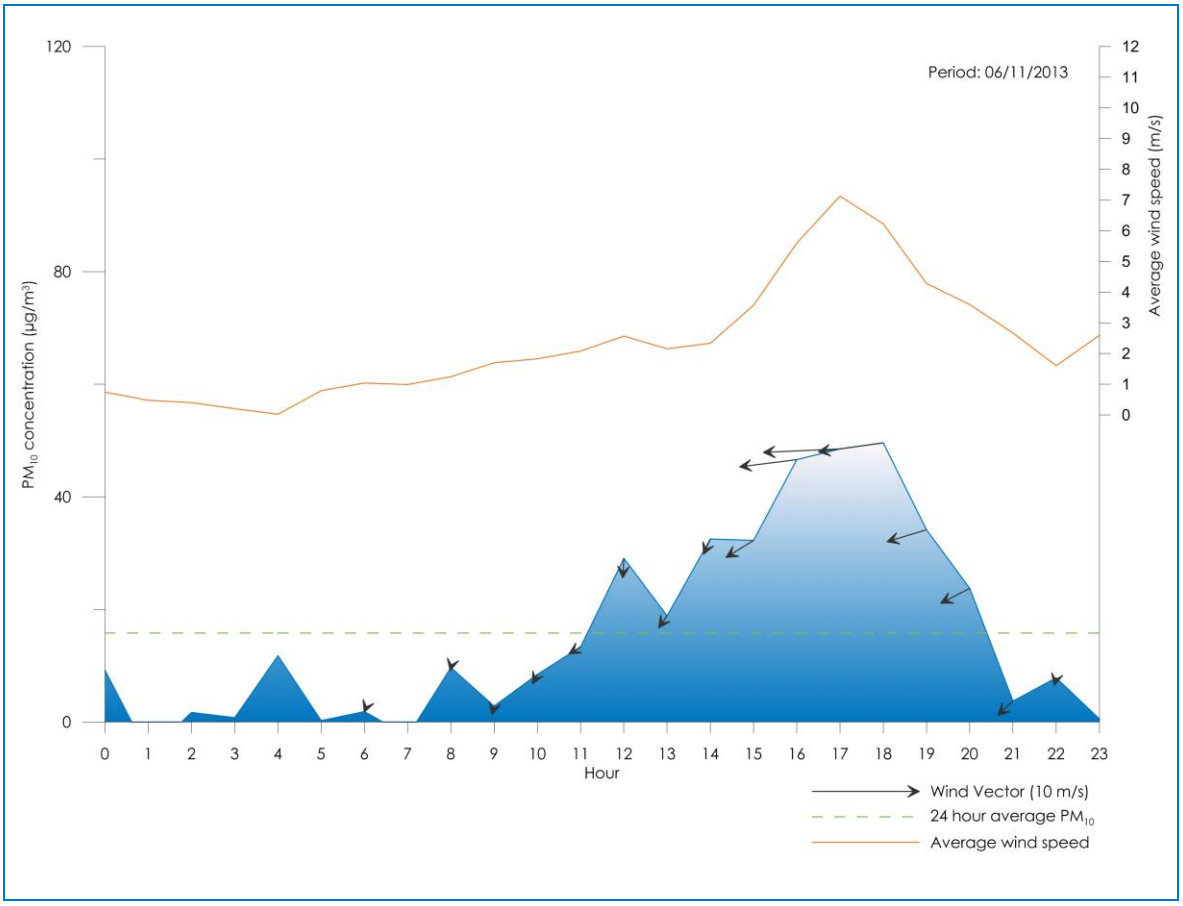

Figure 3-3: Daily variations of PM_{10} concentration and winds across day when action level was triggered – 6/11/2013

On the 16 December 2013, winds were blowing from SCM towards the TEOM for most of the day. **Figure 3-4** shows a time series for this day, showing the vector wind direction, wind speed and PM_{10} concentration.

The PM_{10} concentrations are low and peak wind speeds (>7m/s) blowing from the SCM towards the TEOM do not result in peak 1-hour PM_{10} concentrations. The resultant 24-hour PM_{10} concentration was 8.5 µg/m^3.

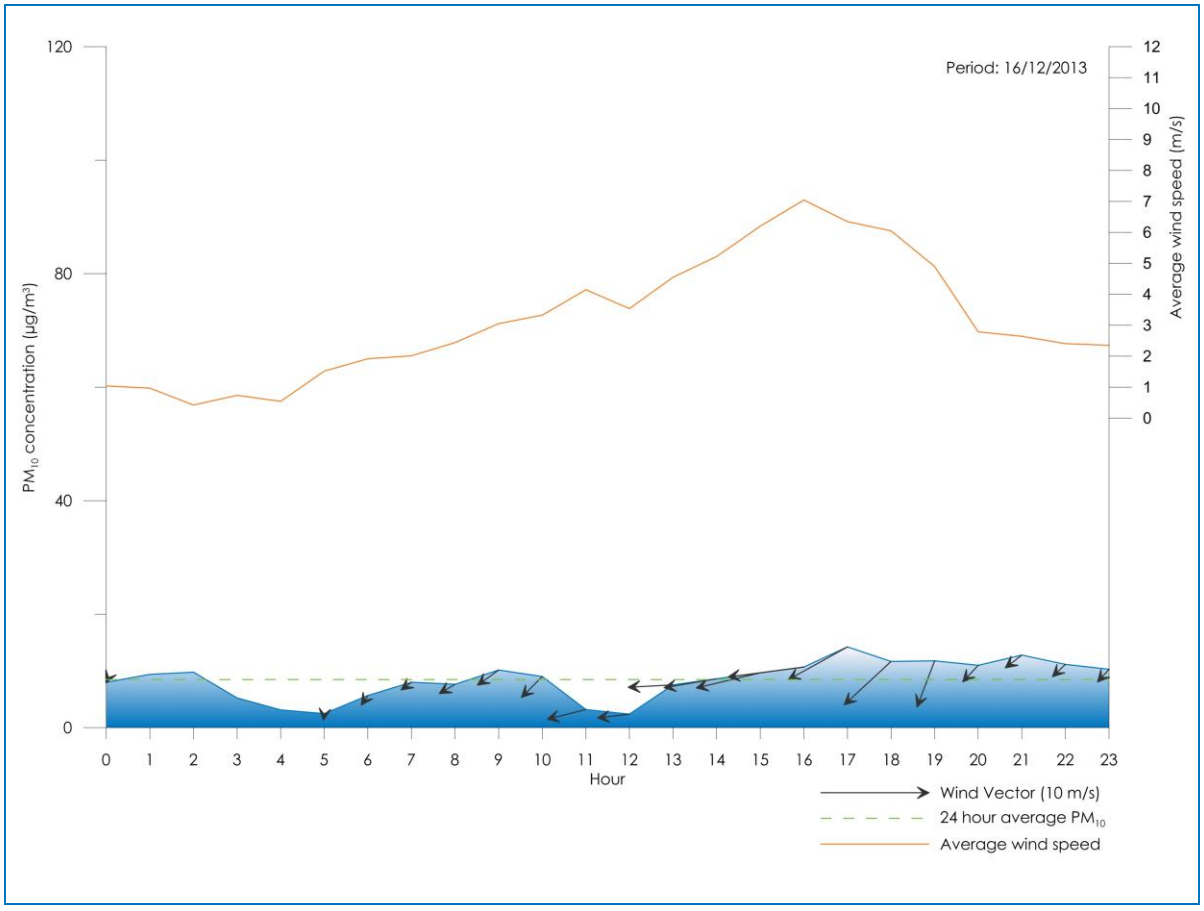

Figure 3-4: Daily variations of PM_{10} concentration and winds across day when action level was triggered – 16/12/2013

The final day when winds were blowing east from SCM towards the TEOM was the 3 February 2014. **Figure 3-5** shows a time series for this day, showing the vector wind direction, wind speed and PM_{10} concentration.

PM_{10} concentrations are low and only one of the 1-hour peaks corresponds to a period when wind is blowing from the SCM towards the TEOM, as shown by the wind vector arrow. The resultant 24-hour PM_{10} concentration was 15.8 µg/m³ (green dashed line).

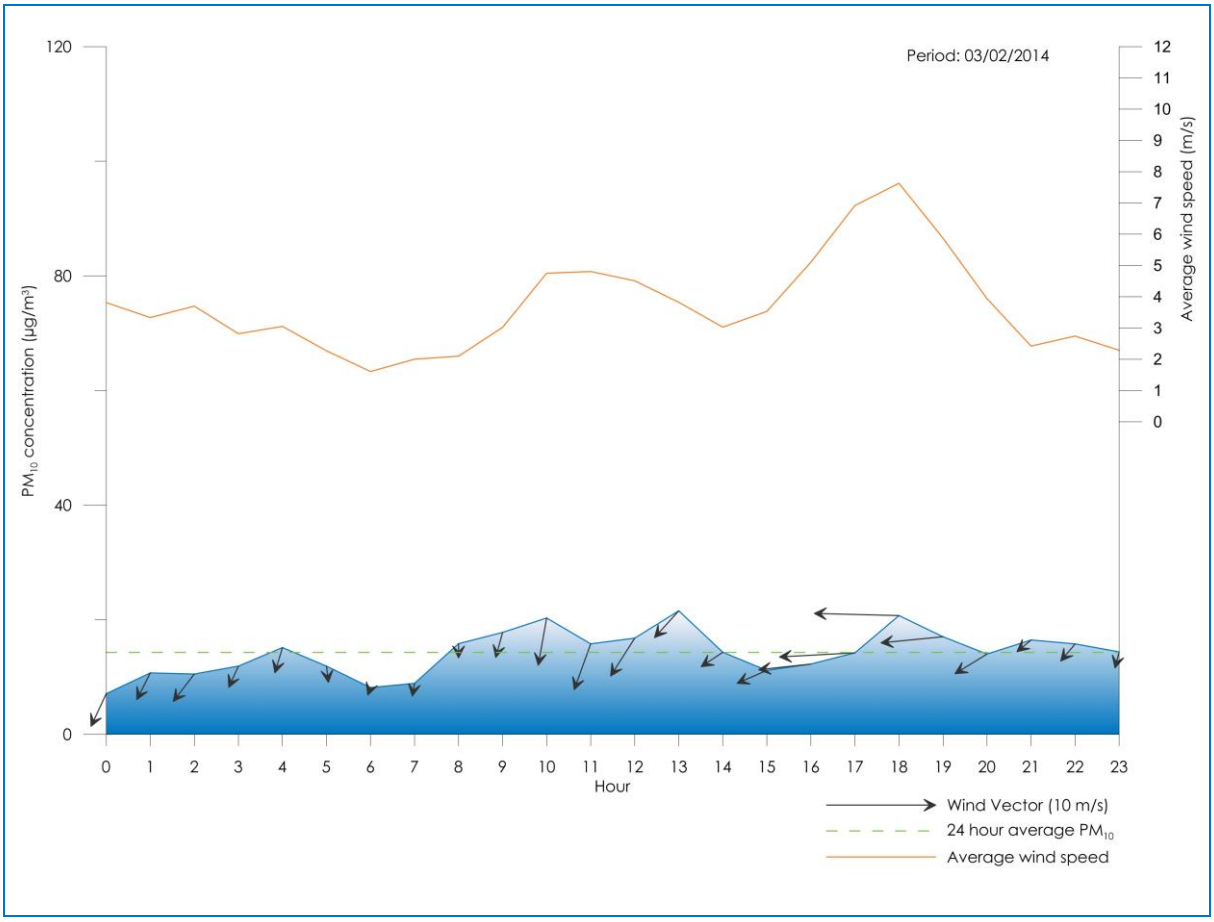

Figure 3-5: Daily variations of PM_{10} concentration and winds across day when action level was triggered – 03/02/2014

4 ACTIONS TAKEN DURING ADVERSE CONDITIONS

As outlined in the Air Quality and Greenhouse Gas Management Plan (**Gloucester Coal, 2011**), SCM has a number of reactive measures for dust control, based on dust monitoring or visual observation.

The same reactive measures for overburden handling are used in response to an "adverse weather" trigger and include the following steps:

- The Mine Manager and/or Environmental Officer will determine if excessive dust is being generated.
- The Mine Manger and/or Environmental Officer will issue an instruction for the particular mining activity causing the excessive generation of dust to cease immediately.
- The Environmental Officer will assess what additional mitigation measures can be applied, including intensive watering of the exposed or active surfaces, reducing the intensity of the activity. This assessment will include consideration of direction in relation to receptors and off-site impacts.
- If the Environmental Officer is not satisfied that the additional measures will reduce dust emissions to an acceptable level (due to the prevailing weather conditions) the activity will not recommence until the additional measures have been implemented and/or more favourable weather conditions occur.
- The Environmental Officer will be responsible for monitoring the activity once it recommences to measure the effectiveness of control measures and to ensure dust emissions are acceptable.

Based on the resultant dust concentrations recorded by the TEOM (24-hour average) the actions taken by SCM, in response to adverse weather are considered appropriate.

5 CONCLUSION

A review of meteorological data for SCM identifies a small percentage of time when adverse conditions for overburden handling occur. A review of the resultant dust levels during these conditions indicate that although short term peaks are observed, concentrations generally decrease immediately afterwards and the resultant 24-hour average PM_{10} concentration does not exceed compliance criteria.

From the investigation into dust levels during adverse weather conditions it appears peak PM_{10} concentrations are generally not related to mine operations and influenced by external factors. Analysis of the 1 hour PM_{10} concentration data shows little relationship with wind direction and no clear signal from SCM.

Going forward, SCM will document the procedural response measures, undertaken during adverse conditions, as part of the TARP for overburden handling during adverse weather.

6 REFERENCES

Gloucester Coal (2011). Stratford Mining Complex Air Quality and Greenhouse Gas Management Plan, May 2011.

Pacific Environment, (2013), Stratford Coal Mine PRP U3 – Identification of adverse weather conditions for overburden handling, Stratford Coal Pty Ltd.