Brooklyn air quality update – road sealing

EPA VICTORIA | Environment Protection Authority Victoria

Summary

Since works began to seal two roads within the Brooklyn Industrial Precinct (BIP) during autumn 2015, there has been a noticeable reduction in the number of days exceeding the PM10 standard. The frequency of PM10 exceedences at Brooklyn is now at record low levels since we began monitoring there in 2009. This result is particularly pleasing considering it has occurred during the driest period since we have been monitoring, and dry conditions are more conducive to PM10 exceedences. In other words, we couldn't have asked for much better, drier conditions than what we have experienced over the past few months to test whether the road sealing has improved Brooklyn's air quality – and so far every indication is that the road sealing has improved Brooklyn's air quality.

Even though Brooklyn's air quality improved considerably during 2015, more days still exceeded the PM10 air quality standard in Brooklyn during 2015 than anywhere else monitored by EPA in Victoria. This shows that more actions will be required to further improve Brooklyn's air quality during 2016. But even these actions will be more targeted thanks to the road sealing, with anecdotal evidence from Environment Protection Officers indicating that detecting off-site dust impacts from business within the BIP is easier since the roads have been sealed.

A full report evaluating the effectiveness of the road sealing is scheduled to be published during April 2016 as planned in the Brooklyn project plan for 2015-16. The full report will take into account the whole summer period, and the findings in this initial update document are considered to be interim findings until the full report is published in April.

Road sealing

Works to seal Bunting and Jones Roads were completed on the 4th of October 2015. The works took approximately five months to complete and speed limits were applied to these roads while the works were being completed.

Air quality improvements in Brooklyn since the road sealing

Prior to the road sealing, EPA recorded at least 28 days exceeding the PM10 standard in Brooklyn each calendar year since 2010 (the first full calendar year of monitoring), except for the extremely wet year of 2011 that was the wettest year in the region since 1978.

Only 11 days exceeded the PM10 standard during 2015, which was fewer than half the number of days that had exceeded the standard in previous years and is shown in Figure 1. The reduction in PM10 exceedences during 2015 was particularly positive given it was the driest year since we began monitoring PM10 in Brooklyn (also shown in Figure 1).

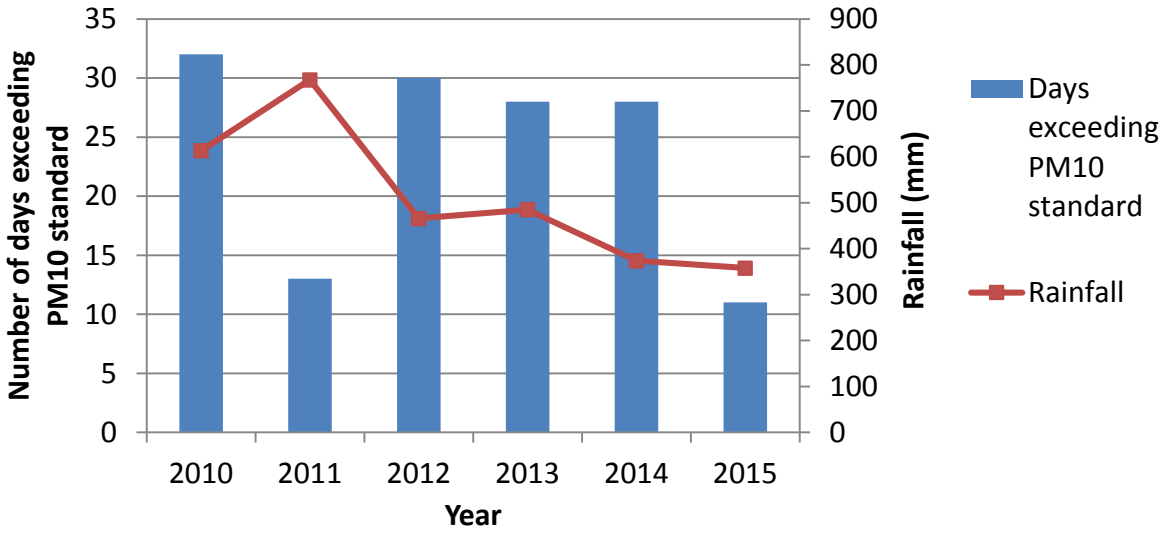

Figure 1. The column graph shows the number of days that have exceeded the PM10 standard in Brooklyn by calendar year since the first full calendar year of monitoring. The line graph shows the annual rainfall.

The improvements in PM10 levels were immediately noticeable from the time the road sealing began. The noticeable initial improvement was likely due to the reduced speed limits imposed on the roads while the works took place. To demonstrate the scale

VICTORIA State Government | Environment Protection Authority Victoria
200 Victoria Street, Carlton VIC 3053
W epa.vic.gov.au | T 1300 372 842 (1300 EPA VIC)

of the change, six days exceeded the PM10 standard in March and April of 2015, but no PM10 exceedences were then recorded until an extremely windy day in October resulted in widespread PM10 exceedences across the monitoring network – not just at Brooklyn. The stretch of days without a PM10 exceedence in Brooklyn reached 176, and there was ultimately 7 months without a PM10 exceedence in 2015, compared with 7 months without a PM10 exceedence for the whole five year period from 2010-2014.

Four days have still exceeded the PM10 standard since the beginning of May 2015, so more work still needs to be done to improve Brooklyn's air quality even further, particularly when you consider that half of the other PM10 stations in Melbourne and Geelong have not recorded a PM10 exceedence since the beginning of May 2015. The positive is that weather conditions have needed to be extremely strong northerlies and very dry for PM10 exceedences to occur in Brooklyn since the road sealing, whereas previously it had only needed to be consistent northerly winds and reasonably dry conditions.

The changing nature of Brooklyn's diurnal air quality profile since the road sealing

For a greater than 50% reduction in the number of PM10 exceedences in Brooklyn during 2015 to have been recorded without any assistance from the weather (e.g. there wasn't any more rain), there didn't necessarily need to be a 50% reduction in average PM10 levels, there just had to be a reduction in PM10 levels during peak times.

Prior to the road sealing the majority of the peak PM10 levels were recorded between 7-10am. Figure 2, below, is a bit complicated but it has been included because it tells an important story. On days when hourly air quality levels reach the 'poor' air quality category, the peak PM10 levels were recorded between 7-10am on the overwhelming majority of days during each financial year until 2015-16. Figure 2 shows that so far during 2015-16 the peak PM10 levels are just as likely to occur between 10am-1pm as they are between 7-10am. This indicates that PM10 levels during the morning traffic peak have experienced a step-change down and we are now beginning to see the effects of the on-site activities more clearly. This has not occurred because the on-site activities are now producing more PM10, but because less PM10 is coming from the roads.

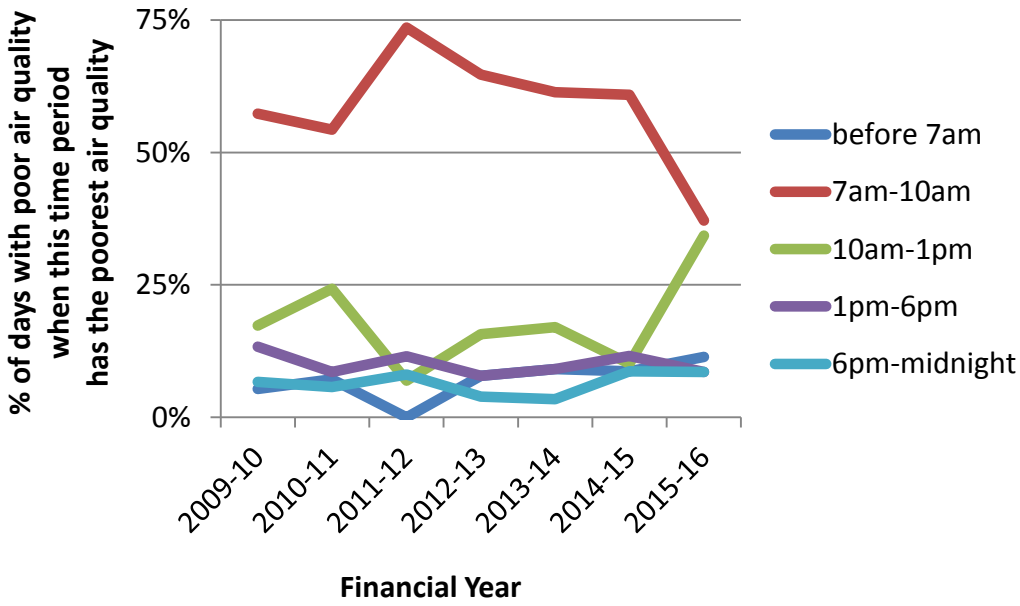

Figure 2. On days when Brooklyn's air quality is poor, what time of day is air quality poorest?

Forecasting poor air quality

The improvements in Brooklyn's air quality during 2015 were reflected in a lower number of alerts issued by EPA for poor air quality in the local Brooklyn region.

EPA first began issuing alerts for poor air quality in Brooklyn back in August 2011. The number of alerts issued each year is displayed in Table 1, below, that clearly shows a drop in the number of alerts during 2015 in line with the reduction in days exceeding the PM10 standard last year.

These alerts are sent to local industries, schools and kindergartens, and released on EPA's website and twitter account.

Brooklyn air quality update – road sealing

Table 1. The number of alerts issued by EPA for poor air quality in Brooklyn.

Year	Number of alerts issued for poor air quality in Brooklyn
2011 (since the beginning of August)	14
2012	33
2013	45
2014	31
2015	21

Further improvements

Even though Brooklyn's air quality improved considerably during 2015, more days still exceeded the PM10 air quality standard in Brooklyn during 2015 than anywhere else monitored by EPA in Victoria. This shows that more actions will be required to further improve Brooklyn's air quality during 2016. EPA is still managing industrial and some minor road based sources in the area through a variety of statutory interventions and collaborative engagement with government partners.

Anecdotal evidence from Environment Protection Officers indicates that detecting off-site dust impacts from business within the BIP is easier since the roads have been sealed.

More information

Bi-monthly summaries of Brooklyn's air quality are published on EPA's website at the following link http://www.epa.vic.gov.au/our-work/current-issues/odour-and-air-quality/brooklyn-industrial-precinct.