WestConnex New M5 Ambient air quality monitoring results

November 2015
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1 Introduction: Understanding local air quality

WestConnex is undertaking air quality monitoring within local areas in close proximity to the proposed New M5 motorway. Monitoring stations have been established to measure the existing air quality conditions. The data collected through our monitoring program provides a baseline for the current air quality conditions along the project corridor. The data is being collected as part of the Environmental Assessment process for the New M5.

2 Monitoring air quality

To support the development and assessment of the New M5, seven ambient air quality monitoring stations have been established along the project corridor. Data from these seven stations supplements the multiple long-term monitoring stations operated by NSW Office of Environment and Heritage and Roads and Maritime Services. Air quality specialists have been commissioned to operate and maintain the monitoring network. A map of the monitoring station locations across the New M5 project area is provided below in Figure 1.

Figure 1 New M5 air quality monitoring station locations

3 Monitoring methodology

Air quality monitoring is undertaken in accordance with Australian standards and guidelines. Specific pollutants are monitored and reported against the relevant air quality goals in the National Environment Protection Measure (Ambient Air Quality). Meteorological conditions are also monitored locally to give a
greater understanding of the conditions that may influence air quality outcomes. For more information on the pollutants measured and monitoring methodology visit www.westconnex.com.au

A data verification process is carried out to ensure high quality data capture. The data verification process includes:

- Removal of clearly incorrect data
- Corrections for instrument drift
- Corrections for offsets
- Removal of data acquired during calibration periods
- Removal of data during servicing, maintenance and equipment breakdown periods.

This can cause data gaps, and may be one reason why there is some data missing in the graphs provided.
4 Results

A summary of air quality results from the New M5 monitoring network is provided below. Results of CO, NO$_2$, PM$_{10}$ and PM$_{2.5}$ concentrations are provided and results are also represented graphically. The solid red line in each of the figures corresponds to the respective criteria or advisory reporting standard for that pollutant as stated in the NSW Approved Methods (NSW DEC, 2005).

4.1 St Peters Public School

A summary of the air quality results from the St Peters Public School monitoring station is provided in Table 1 and Figure 2, Figure 3, Figure 4 and Figure 5.

**Table 1 St Peters Public School summary statistics for air pollutants**

<table>
<thead>
<tr>
<th>Statistics</th>
<th>CO (ppm) 8 hour rolling average values</th>
<th>NO$_2$ (ppb) 1 hour average values</th>
<th>PM$_{10}$ (µg/m$^3$) 24 hour average values</th>
<th>PM$_{2.5}$ (µg/m$^3$) 24 hour average values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average value</td>
<td>0.3</td>
<td>9.5</td>
<td>27.6</td>
<td>10.0</td>
</tr>
<tr>
<td>Maximum value</td>
<td>0.6</td>
<td>33.2</td>
<td>50.1</td>
<td>20.7</td>
</tr>
<tr>
<td>Minimum value</td>
<td>0.2</td>
<td>3.0</td>
<td>15.0</td>
<td>4.9</td>
</tr>
</tbody>
</table>
Figure 2 St Peters Public School CO concentrations (eight hour rolling average)*

*Note: The low availability of data was due to a localised power failure causing the station to shut down during the first week of November 2015.

Figure 3 St Peters Public School NO2 concentrations (one hour average)*

*Note: The low availability of data was due to a localised power failure causing the station to shut down during the first week of November 2015.
**Figure 4** St Peters Public School PM$_{10}$ concentrations (24 hour average)*

![Graph showing PM$_{10}$ concentrations](image)

*Note: The low availability of data was due to a localised power failure causing the station to shut down during the first week of November 2015.

**Figure 5** St Peters Public School PM$_{2.5}$ concentrations (24 hour average)*

![Graph showing PM$_{2.5}$ concentrations](image)

*Note: The low availability of data was due to a localised power failure causing the station to shut down during the first week of November 2015.
**Reporting**

Figure 4 shows that there was one occurrence where the reporting standard was exceeded during the November 2015 reporting period. On 26 November 2015, the PM$_{10}$ concentration was 1.1 μg/m$^3$ above the 50 μg/m$^3$ advisory reporting standard.

It is important to note that elevated levels of PM$_{10}$ were recorded at other New M5 monitoring sites and at OEH monitoring stations on this date. This would suggest a regional event led to the elevated levels of PM$_{10}$ rather than a local emissions source.
4.2 Princes Highway, St Peters

A summary of the air quality results from the Princes Highway monitoring station in St Peters is provided in Table 2 and Figure 6, Figure 7, Figure 8 and Figure 9.

Table 2 Princes Highway summary statistics for air pollutants

<table>
<thead>
<tr>
<th>Statistics</th>
<th>CO (ppm) 8 hour rolling average values</th>
<th>NO₂ (ppb) 1 hour average values</th>
<th>PM₁₀ (µg/m³) 24 hour average values</th>
<th>PM₂.₅ (µg/m³) 24 hour average values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average value</td>
<td>0.2</td>
<td>14.0</td>
<td>28.3</td>
<td>13.1</td>
</tr>
<tr>
<td>Maximum value</td>
<td>0.6</td>
<td>60.8</td>
<td>52.3</td>
<td>21.3</td>
</tr>
<tr>
<td>Minimum value</td>
<td>0.0</td>
<td>1.6</td>
<td>15.0</td>
<td>7.0</td>
</tr>
</tbody>
</table>

Figure 6 Princes Highway CO concentrations (eight hour rolling average)
Figure 7 Princes Highway NO\textsubscript{2} concentrations (one hour average)

Figure 8 Princes Highway PM\textsubscript{10} concentrations (24 hour average)
**Figure 9** Princes Highway PM$_{2.5}$ concentrations (24 hour average)

*Note: A data verification process is carried out to ensure high quality data capture. In line with this process, 24-hour data cannot be reported where less than 75% of the hourly data is available.*

**Reporting**

Figure 8 shows that there was one occurrence where the reporting standard was exceeded during the November 2015 reporting period. On 26 November 2015, the PM$_{10}$ concentration was 0.1 μg/m$^3$ above the 50 μg/m$^3$ criterion advisory reporting standard.

It is important to note that elevated levels of PM$_{10}$ were recorded at other New M5 monitoring sites and at OEH monitoring stations on this date. This would suggest a regional event led to the elevated levels of PM$_{10}$ rather than a local emissions source.
4.3 West Botany Street, Arncliffe

A summary of the air quality results from the West Botany Street monitoring station is provided in Table 3 and Figure 10, Figure 11, Figure 12 and Figure 13.

Table 3 West Botany Street summary statistics for air pollutants

<table>
<thead>
<tr>
<th>Statistics</th>
<th>CO (ppm) 8 hour rolling average values</th>
<th>NO₂ (ppb) 1 hour average values</th>
<th>PM₁₀ (µg/m³) 24 hour average values</th>
<th>PM₂.₅ (µg/m³) 24 hour average values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average value</td>
<td>0.2</td>
<td>14.2</td>
<td>22.4</td>
<td>10.2</td>
</tr>
<tr>
<td>Maximum value</td>
<td>0.5</td>
<td>59.4</td>
<td>46.0</td>
<td>19.0</td>
</tr>
<tr>
<td>Minimum value</td>
<td>0.1</td>
<td>1.6</td>
<td>10.2</td>
<td>2.3</td>
</tr>
</tbody>
</table>

Figure 10 West Botany Street CO concentrations (eight hour rolling average)
Figure 11 West Botany Street NO$_2$ concentrations (one hour average)

Figure 12 West Botany Street PM$_{10}$ concentrations (24 hour average)
*Note: Gaps in PM$_{2.5}$ data occurred due to technical difficulties with the instrument recording PM$_{2.5}$. These issues have since been rectified.

**Reporting**

No exceedances of the air quality criteria in the NSW Approved Methods (NSW DEC, 2005) were recorded during the reporting period for the key pollutants outlined above at the West Botany Street monitoring station.
4.4 Bestic Street, Rockdale

A summary of the air quality results from the Bestic Street monitoring station in Rockdale is provided in Table 4 and Figure 14, Figure 15, Figure 16 and Figure 17.

**Table 4 Bestic Street summary statistics for air pollutants**

<table>
<thead>
<tr>
<th>Statistics</th>
<th>CO (ppm) 8 hour rolling average values</th>
<th>NO$_2$ (ppb) 1 hour average values</th>
<th>PM$_{10}$ (µg/m$^3$) 24 hour average values</th>
<th>PM$_{2.5}$ (µg/m$^3$) 24 hour average values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average value</td>
<td>0.2</td>
<td>6.6</td>
<td>24.8</td>
<td>13.1</td>
</tr>
<tr>
<td>Maximum value</td>
<td>0.6</td>
<td>32.3</td>
<td>47.2</td>
<td>20.7</td>
</tr>
<tr>
<td>Minimum value</td>
<td>0.1</td>
<td>0.0</td>
<td>12.0</td>
<td>4.9</td>
</tr>
</tbody>
</table>

**Figure 14 Bestic Street CO concentrations (eight hour rolling average)**
Figure 15 Bestic Street NO₂ concentrations (one hour average)

Figure 16 Bestic Street PM₁₀ concentrations (24 hour average)
Reporting

No exceedances of the air quality criteria in the NSW Approved Methods (NSW DEC, 2005) were recorded during the reporting period for the key pollutants outlined above at the Bestic Street monitoring station.
4.5 Bexley Road, Kingsgrove

A summary of the air quality results from the Bexley Road monitoring station in Kingsgrove is provided in Table 5 and Figure 18, Figure 19, Figure 20 and *Note: Gaps in PM$_{10}$ data occurred due to technical difficulties with the instrument recording PM$_{2.5}$. These issues have since been rectified.

Figure 21.

Table 5 Bexley Road summary statistics for air pollutants

<table>
<thead>
<tr>
<th>Statistics</th>
<th>CO (ppm) 8 hour rolling average values</th>
<th>NO$_2$ (ppb) 1 hour average values</th>
<th>PM$_{10}$ (µg/m$^3$) 24 hour average values</th>
<th>PM$_{2.5}$ (µg/m$^3$) 24 hour average values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average value</td>
<td>0.3</td>
<td>14.6</td>
<td>17.8</td>
<td>9.2</td>
</tr>
<tr>
<td>Maximum value</td>
<td>0.8</td>
<td>59.1</td>
<td>33.2</td>
<td>15.8</td>
</tr>
<tr>
<td>Minimum value</td>
<td>0.1</td>
<td>2.2</td>
<td>10.0</td>
<td>3.9</td>
</tr>
</tbody>
</table>

Figure 18 Bexley Road CO concentrations (eight hour rolling average)
Figure 19  Bexley Road NO₂ concentrations (one hour average)

Figure 20  Bexley Road PM₁₀ concentrations (24 hour average)*

*Note: Gaps in PM₁₀ data occurred due to technical difficulties with the instrument recording PM₂.₅. These issues have since been rectified.
Figure 21 Bexley Road PM$_{2.5}$ concentrations (24 hour average)

*Note: A data verification process is carried out to ensure high quality data capture. In line with this process, 24-hour data cannot be reported where less than 75% of the hourly data is available.

**Reporting**

No exceedances of the air quality criteria in the NSW Approved Methods (NSW DEC, 2005) were recorded during the reporting period for the key pollutants outlined above at the Bexley Road monitoring station.
4.6 Beverly Hills Park, Beverly Hills

A summary of the air quality results from the Beverly Hills Park monitoring station in Beverly Hills is provided in Table 6 and Figure 22, Figure 23, Figure 24 and Figure 25.

Table 6 Beverly Hills Park summary statistics for air pollutants

<table>
<thead>
<tr>
<th>Statistics</th>
<th>CO (ppm) 8 hour rolling average values</th>
<th>NO₂ (ppb) 1 hour average values</th>
<th>PM₁₀ (µg/m³) 24 hour average values</th>
<th>PM₂.₅ (µg/m³) 24 hour average values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average value</td>
<td>0.2</td>
<td>9.2</td>
<td>14.4</td>
<td>6.6</td>
</tr>
<tr>
<td>Maximum value</td>
<td>0.4</td>
<td>48.5</td>
<td>18.1</td>
<td>11.3</td>
</tr>
<tr>
<td>Minimum value</td>
<td>0.0</td>
<td>1.0</td>
<td>10.8</td>
<td>3.0</td>
</tr>
</tbody>
</table>

Figure 22 Beverly Hills Park CO concentrations (eight hour rolling average)
Figure 23 Beverly Hills Park NO₂ concentrations (one hour average)

Figure 24 Beverly Hills Park PM₁₀ concentrations (24 hour average)*

*Note: Gaps in PM₁₀ data occurred due to mechanical difficulties with the PM₁₀ analyser. This issue has since been rectified.
Reporting

No exceedances of the air quality criteria in the NSW Approved Methods (NSW DEC, 2005) were recorded during the reporting period for the key pollutants outlined above at the Beverly Hills Park monitoring station.
4.7 Canal Road, St Peters

A summary of the air quality results from the Canal Road monitoring station in St Peters is provided in Table 7 and Figure 26, Figure 27, Figure 28 and Figure 29.

Table 7 Canal Road summary statistics for air pollutants

<table>
<thead>
<tr>
<th>Statistics</th>
<th>CO (ppm) 8 hour rolling average values</th>
<th>NO₂ (ppb) 1 hour average values</th>
<th>PM₁₀ (µg/m³) 24 hour average values</th>
<th>PM₂.⁵ (µg/m³) 24 hour average values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average value</td>
<td>0.3</td>
<td>11.4</td>
<td>28.6</td>
<td>7.7</td>
</tr>
<tr>
<td>Maximum value</td>
<td>0.6</td>
<td>50.0</td>
<td>44.7</td>
<td>13.2</td>
</tr>
<tr>
<td>Minimum value</td>
<td>0.0</td>
<td>-4.9</td>
<td>15.9</td>
<td>3.9</td>
</tr>
</tbody>
</table>

*Note: The concentration of NO₂ is not measured directly but rather calculated by the difference between NOₓ (NO + NO₂) and NO measured at different times. If the measured concentration of NOₓ is lower than that of NO then estimated NO₂ concentration will be a negative value. When a negative value is recorded for NO₂ it can be interpreted as a concentration of 0.

Figure 26 Canal Road CO concentrations (eight hour rolling average)
*Note: A data verification process is carried out to ensure high quality data capture. In line with this process, 24-hour data cannot be reported where less than 75% of the hourly data is available.
Figure 29 Canal Road PM$_{2.5}$ concentrations (24 hour average)

*Note: A data verification process is carried out to ensure high quality data capture. In line with this process, 24-hour data cannot be reported where less than 75% of the hourly data is available.

**Reporting**

No exceedances of the air quality criteria in the NSW Approved Methods (NSW DEC, 2005) were recorded during the reporting period for the key pollutants outlined above at the Canal Road monitoring station.