

Missouri  
Department of  
Natural Resources

## Appendix C

**Technical Discussion Regarding the  
Unique Middle Scale Monitor Status of the  
Branch Street Monitor  
(AQS Site ID: 29-510-0093)**

## **Introduction**

The Branch Street monitor (AQS Site ID: 29-510-0093) is defined as a unique middle scale monitor and has been given a legacy exemption meaning it is not comparable to the 2012 Annual  $PM_{2.5}$  NAAQS, per EPA's July 2013 Air Quality Design Value Review: <http://www.epa.gov/ttn/analysis/dvreview.htm>. This monitor is not representative of area-wide  $PM_{2.5}$  concentrations as many of the episodes and trends recorded at the Branch Street monitor are unique to this location and not experienced across the St. Louis Region even by the neighborhood scale Blair Street monitor, which is less than 800 m from the Branch Street monitor location. Therefore, while trends and episodes at this monitor are useful and relevant for comparison and analysis of the 24-hour  $PM_{2.5}$  NAAQS, the episodes and design values at this monitor are not suitable for comparison and analysis of the Annual  $PM_{2.5}$  NAAQS.

Ever since the Branch Street Monitor was established it has always been classified in Missouri Annual Monitoring network plans as a unique middle scale monitor that is not comparable to the annual  $PM_{2.5}$  NAAQS. This Appendix provides background information regarding the establishment of the Branch Street Monitor, along with a technical discussion regarding its unique nature that is not representative of area wide trends and episodes across the St. Louis region, which is the reason it is not suitable for comparison to the annual  $PM_{2.5}$  NAAQS.

## **Branch St. Monitoring Site Background and Technical Discussion**

The Branch St. Ambient Air Monitoring site was established October 1, 2006 as a replacement for the former North Market  $PM_{10}$  air monitoring site (AQS Site ID: 29-510-0092) which was subsequently discontinued with EPA approval since it no-longer met siting criteria required in 40 CFR Part 58 Appendix E.  $PM_{2.5}$  monitoring at Branch St. was initiated July 16, 2007.

Although the Branch St.  $PM_{2.5}$  monitor is identified in the 2007 and subsequent Monitoring Network Plans as being a middle-scale monitor not comparable to the annual  $PM_{2.5}$  NAAQS due to its proximity to a group of local sources, no additional rationale for identifying the site as comparable to the Annual  $PM_{2.5}$  NAAQS is required by 40 CFR Part 58.30. However, more details concerning the purpose of the  $PM_{2.5}$  monitoring at Branch St. is available in the departments' 2010 Monitoring Network Assessment (<http://dnr.mo.gov/env/apcp/2010monitoringnetworkassessment.pdf>).

The 2010 Monitoring Network assessment, Sections 8 and 10, describe rationale for establishing the Branch St. site for particulate matter monitoring. In addition to the Network Assessment, internal staff memoranda during this period indicate that the  $PM_{2.5}$  monitoring at Branch St. was also initiated for monitoring of the coarse fraction of  $PM_{10}$  ( $PM_{10-2.5}$ ). This size fraction of  $PM_{10}$  is often referred to as  $PM_{coarse}$ . In anticipation of EPA promulgating its proposed  $PM_{10-2.5}$  standard (71 Federal Register, January 17, 2006, notice of proposed rulemaking), department staff identified the Branch St. site as being one of a small number of locations that would satisfy the proposed monitoring requirement by yielding maximum  $PM_{10-2.5}$  concentrations primarily due to the unique middle scale  $PM_{10}$  concentrations which had been monitored at the former North Market  $PM_{10}$  site.

Despite the fact that the  $PM_{coarse}$  standard was not promulgated by EPA in the October, 17, 2006 monitoring regulation changes (71 Federal Register, October 17, 2006),  $PM_{2.5}$  monitoring had already been established at Branch St. and was approved by EPA Region VII in the 2007 Monitoring Network Plan as a State or Local Air Monitoring Site (SLAMS) for 24-hour  $PM_{2.5}$  NAAQS compliance. The data from the Branch St.  $PM_{2.5}$  monitoring site indicates that no short term (24-hour) violations of the  $PM_{2.5}$  NAAQS have been observed despite the high potential for short term direct  $PM_{2.5}$  emissions from unique local sources. The Branch St. site is located approximately 750 meters (2,460 ft) to the East of the Blair

St. PM<sub>2.5</sub> ambient air monitoring site (AQS Site ID: 29-510-0085) (**Figure 1**). The Blair St. PM<sub>2.5</sub> site is representative of the neighborhood spatial scale of representativeness defined in 40 CFR Part 58 Appendix D and is comparable to both the Annual and 24-hour PM<sub>2.5</sub> NAAQS.

Recent continuous PM<sub>2.5</sub> Federal Equivalent Method (FEM) monitoring initiated at Branch St. indicates a significant diurnal trend in PM<sub>2.5</sub> concentrations that are unique to the Branch St. monitor and appear to be coincident with a single shift operational schedule that has a traditional lunch hour. **Figure 2** compares and contrasts this unique diurnal trend with other area wide ambient air monitoring sites in the St. Louis area. Finally, **Figure 3** depicts the conditional probability plot (pollution rose) of hourly PM<sub>2.5</sub> concentration data plotted by sector of wind rose using on-site 10 meter wind direction meteorological data for both the Branch St. and Blair St. PM<sub>2.5</sub> monitors. If the Branch St. monitor were representative of area wide PM<sub>2.5</sub> concentrations, both the Blair St. and Branch St. PM<sub>2.5</sub> pollution roses would look similar. Clearly the Branch St. monitor observes peak PM<sub>2.5</sub> concentrations on average from the north and south east sectors in magnitudes that are not observed at Blair St.

The previous technical data and current lack of annual PM<sub>2.5</sub> NAAQS violations at the Blair St. site indicates that the annual PM<sub>2.5</sub> concentrations monitored at Branch St. are not area wide and, consistent with 40 CFR Part 58.30, are not comparable to the annual PM<sub>2.5</sub> NAAQS.

Figure 1

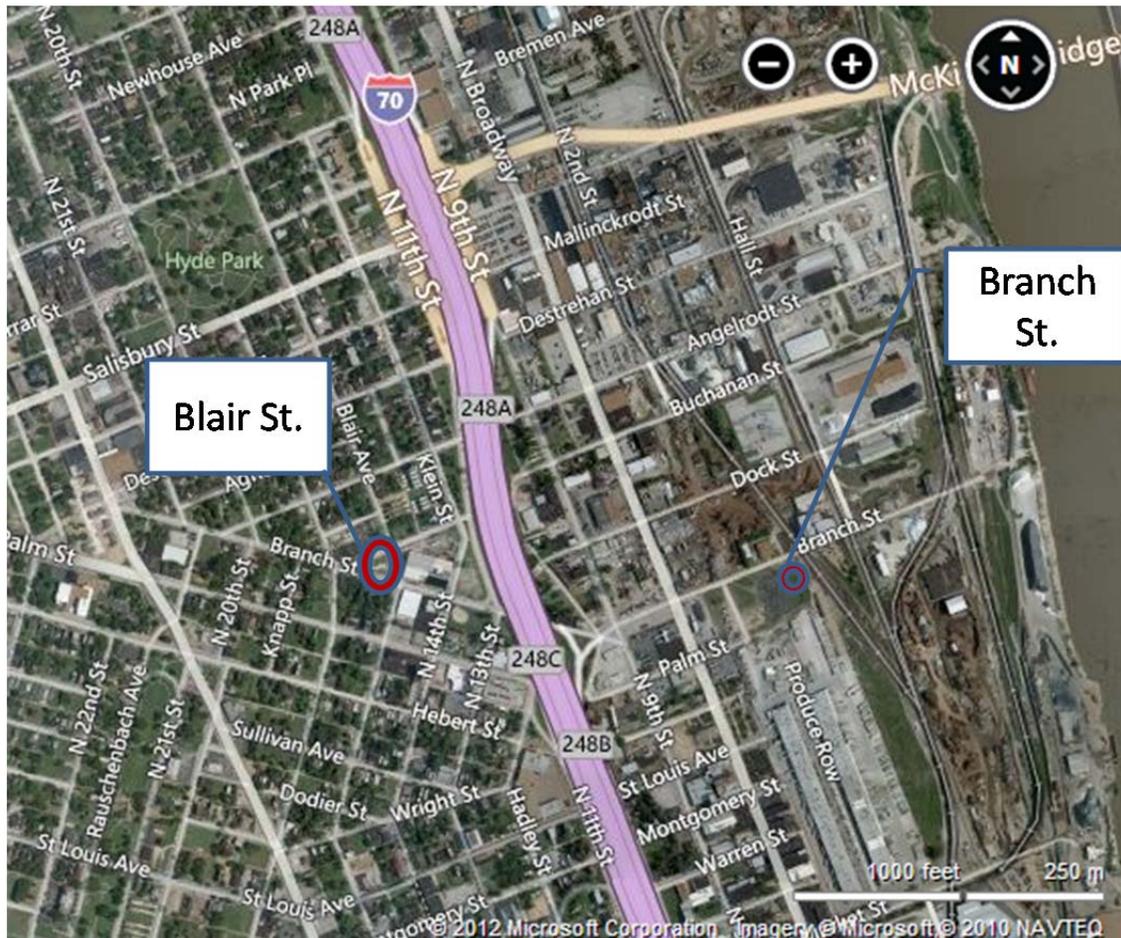


Figure 2

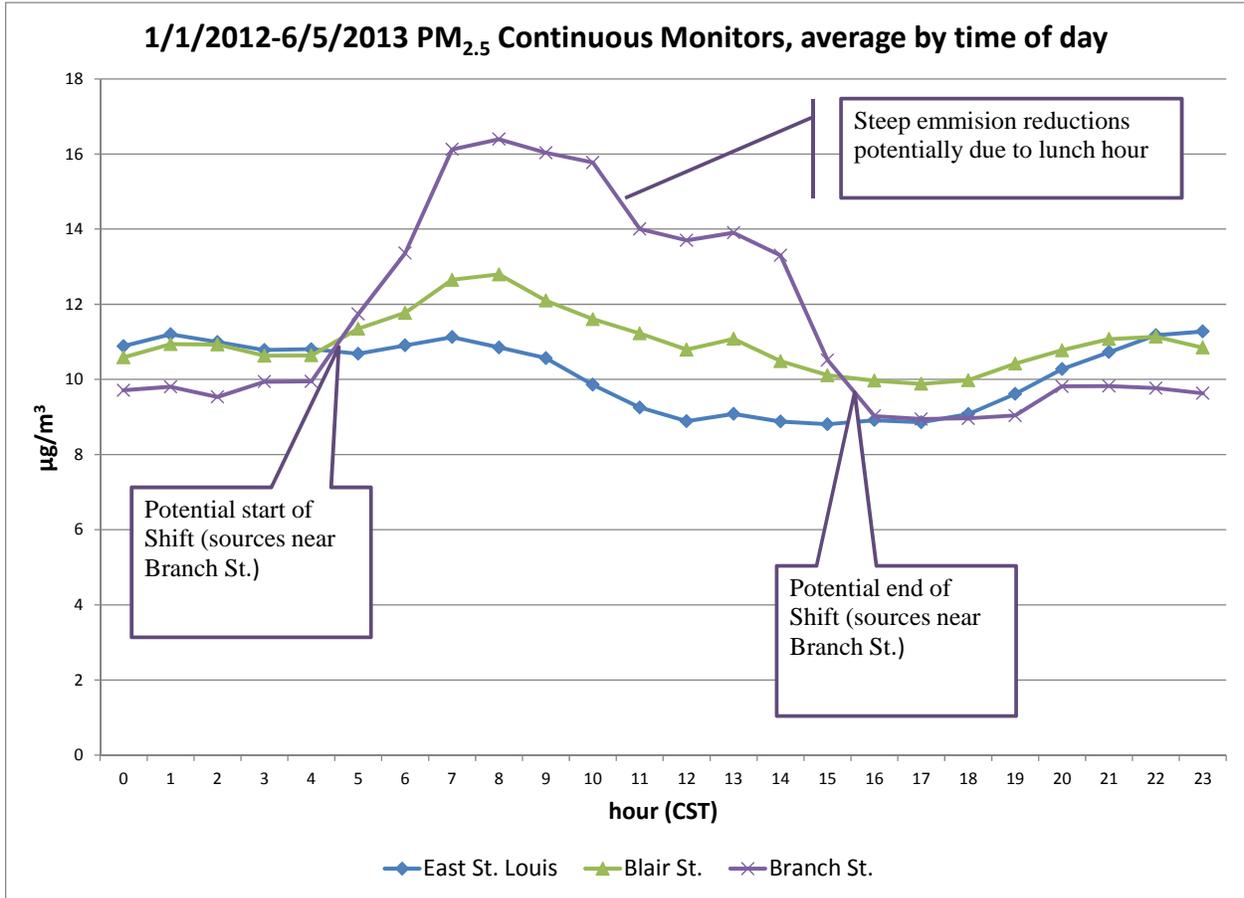
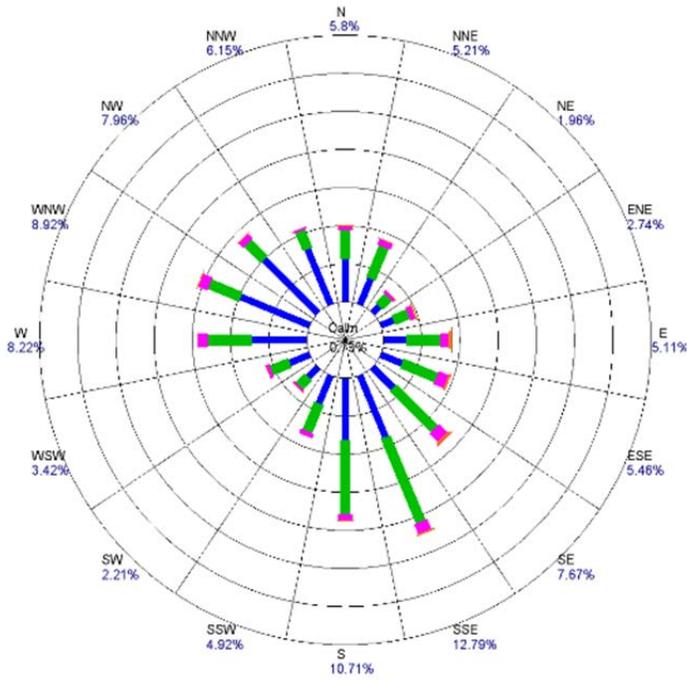
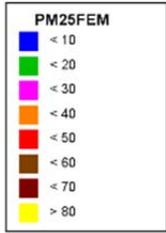


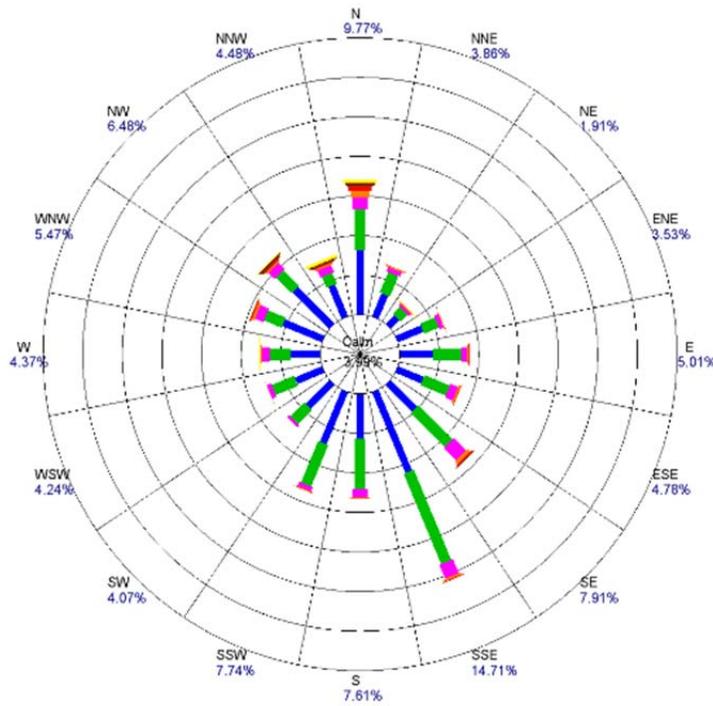
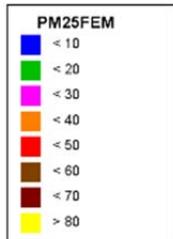
Figure 3

Site: Blair Street  
 Parameter: PM25FEM  
 Units: ug/m3



Period: 1/1/2012-12/31/2012

Site: Branch St.  
 Parameter: PM25FEM  
 Units: ug/m3



Period: 1/1/2012-12/31/2012