Probability Analysis for W 3rd St. Lead and TSP Monitor Exceeding 80 Percent of the Standard

In accordance with 40 CFR Part 50, Appendix R, the lead NAAQS is met at a monitoring site when the identified design value is valid and less than or equal to 0.15 µg/m³. A lead design value that meets the NAAQS (i.e., 0.15 µg/m³ or less), is considered valid if it encompasses 36 consecutive valid 3-month site means (specifically for a 3-year calendar period and the two previous months). For sites that begin monitoring lead after this rule is effective but before January 15, 2010, lead design values that meets the NAAQS will be considered valid if it encompasses at least 34 consecutive valid 3-month means (specifically encompassing only the 3-year calendar period).

Table 1 shows the design value data for the 5-year calendar period of 2014-2018 that were retrieved from the U.S. EPA Air Quality System (AQS).

Table 1 – Monitor Design Values

<table>
<thead>
<tr>
<th>8-Hour and 1-Hour 2-Year Design Values (ppm) at Akron Monitors</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>W 3rd St.</td>
<td>.06</td>
<td>.06</td>
<td>.03</td>
<td>.03</td>
<td>.06</td>
</tr>
</tbody>
</table>

According to US EPA’s Ambient Air Monitoring Network Assessment Guidance¹, it can be shown that the probability that a monitor will exceed 80% of the applicable NAAQS during the next three years is less than 10% if the following equation is satisfied:

\[
\overline{X} + \frac{t * s}{\sqrt{n}} < 0.8 * NAAQS
\]

Where \( \overline{X} \) is the average design value for the last 5 years (or more), \( t \) is the \( t \) value for \( n-1 \) degrees of freedom at the 90% confidence level, \( s \) is the standard deviation of the design values, \( n \) is the number of records (i.e., number of design values), and NAAQS is the standard of interest. For Pb 1-hour, 80% of the standard is .12 ug/m3. Computing the included equation based on the design values from 2014 to 2018 results in a value of .064 ug/m3. This value is much less than 80% of the NAAQS. Therefore, the condition that the probability of exceeding 80% of the NAAQS over the next three years be less than 10% is satisfied.