UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
RESEARCH TRIANGLE PARK, NC 27711

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MEMORANDUM

SUBJECT: Update of Analysis of Proposed Source-oriented Monitoring Emission Threshold

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TO: Lead NAAQS Review Docket (OAR-2006-0735)

This memorandum updates the analysis conducted in developing the proposed range for the emission threshold (Cavender, 2008.)

BACKGROUND

We proposed a requirement for state and local monitoring agencies ("monitoring agencies") to conduct Pb monitoring in areas near sources of Pb that emitted more than an "emission threshold." The emission threshold represents an estimate of the lowest Pb emission rate that under reasonable worst-case conditions (e.g., meteorological and emission release conditions that lead to poor dispersion and high Pb concentrations) could lead to Pb concentrations exceeding the NAAQS.

In the proposal notice, we proposed a range for the emission threshold of 200 to 600 kg/yr. The range of the proposed emission threshold corresponded to the range of the proposed Pb NAAQS, and assumed the NAAQS would be based on monthly averaging. We pointed out that the emission threshold would need to be recalculated based on the final Pb NAAQS level, averaging time, and form.

Decisions on the final Pb NAAQS have been made. The analysis documented here reflects a Pb-TSP NAAQS of 0.15 $\mu g/m^3$ based on a maximum rolling 3-month average ("the final Pb NAAQS").

ANALYSIS

In the initial development of the emission threshold, 3 methods were used to calculate an emission threshold. We use the same methods here, but have revised the methods to update the analysis based on the final Pb NAAQS level, averaging time, and form.

For the first method, we scaled the 5 tons per year (tpy) threshold, which was used to identify candidate sources for monitoring prior to the most recent monitoring requirement revisions based on the existing 1.5 $\mu g/m^3$ Pb NAAQS to the new Pb NAAQS. Based on this approach, a value is calculated as 0.5 tpy (5 tpy *0.15/1.5). We also adjusted the value to account for the difference

in averaging period (calendar quarter vs. rolling 3-month average) using monitoring data (as described below), but the adjustment was so minor it did not affect the result (i.e., the estimated value was still 0.5 tpy after adjustment), and as such, we don't detail the adjustment here.

The second method looked at monitoring data near Pb sources. Source oriented Pb monitors within one mile of a Pb source (identified from the 2002 National Emissions Inventory, NEI) were identified. This group of sites was then narrowed down to sites near facilities emitting one tpy or more, and then to sites which were only impacted by one Pb source. Also, only the highest reading monitor was used for facilities where more than one monitor was identified within one mile. From this analysis, we identified 7 monitor-facility pairs meeting the criteria. Using data in AQS for the years 2002-2005, we developed an estimate of the maximum 3-month average Pb concentration. Next we obtained a ratio of the maximum 3-month average concentration to the facility annual emissions (as identified in the 2002 NEI) to provide an estimate of the impact from the facility in units of $\mu g/m^3$ per tpy (see Table 1). As expected, this value varied greatly by monitor-source pair. Nonetheless, a median impact of 0.2 $\mu g/m^3$ per tpy and a maximum impact of 0.3 $\mu g/m^3$ per tpy were obtained from this list of sites. For a final Pb NAAQS of 0.15 $\mu g/m^3$, these ratios correspond to a value of 0.75 and 0.5 tpy, respectively.

Table 1. Data Used to Estimate Facility Impacts Based on Monitoring Data

AQS Site Id	Maximum 3-Month Average Pb Concentration (µg/m3)	NEI 2002 Facility Emission Rate (tpy)	Ratio (µg/m3-tpy)
171190010	0.33	1.3	0.3
340231003	0.18	1.7	0.1
471870100	0.89	2.6	0.3
480850009	0.75	3.2	0.2
420110717	0.4	4.8	0.1
011090003	1.2	4.5	0.3
290990013	1.29	58.8	0.02
Median			0.2
Maximum			0.3

In the third method, we performed modeling utilizing EPA's SCREEN3 model. SCREEN3 is a single source Gaussian plume model which provides maximum ground-level concentrations for point, area, flare, and volume sources. The initial analysis provided a maximum impact of 0.6 $\mu g/m^3$ per tpy for a maximum monthly averaging time. For this analysis, we used existing monitoring data to develop a scaling factor to convert the maximum monthly impact to a maximum 3-month average impact. Using data in AQS for the years 2002-2005, the maximum monthly concentration and the maximum rolling 3-month average concentration were calculated using the procedures in the final Appendix R for each Pb-TSP monitoring site (see Table 2). Only sites with sufficient data to calculate a maximum 3-month average was used in this analyis, and only data with maximum 3-month average Pb-TSP concentrations greater then 0.01 $\mu g/m^3$.

The ratio of the maximum 3-month average concentration to the maximum monthly concentration was calculated for each site, and the average of these ratios (0.7) was used to correct the maximum monthly impact value (0.6 $\mu g/m^3$ per tpy) to a maximum 3-month average impact of 0.4 $\mu g/m^3$ per tpy (0.6*0.7). This corresponds to a value of 0.375 tons for a final Pb NAAQS of 0.15 $\mu g/m^3$.

CONCLUSION

The updated analysis provides four different values (0.5, 0.5, 0.75, and 0.375 tpy) with an average of 0.5 tpy.

Table 2. Calculation of Average Ratio of Maximum Rolling 3-Month Average to Maximum Monthly Average for the Years 2002-2005.

AQS ID	Maximum Monthly Pb DV ($\mu g/m^3$)	Maximum Rolling 3-Month Average DV ($\mu g/m^3$)	Ratio
011090003	1.76	1.17	0.7
011090006	1.69	0.91	0.5
060371103	0.15	0.06	0.4
060371301	0.04	0.03	0.7
060374002	0.10	0.04	0.4
060658001	0.02	0.02	0.9
060719004	0.14	0.08	0.6
080010005	1.10	0.56	0.5
080310002	0.30	0.18	0.6
080410011	0.14	0.09	0.6
120571066	1.74	1.38	0.8
120571073	0.48	0.34	0.7
170310001	0.04	0.02	0.6
170310022	0.04	0.04	0.9
170310026	0.09	0.06	0.7
170316003	0.05	0.04	0.8
171190010	0.91	0.43	0.5
171193007	0.03	0.02	0.6
171430037	0.03	0.03	0.9
171630010	0.11	0.08	0.8
180350008	0.74	0.51	0.7
180350009	4.56	3.50	0.8
180970063	0.10	0.07	0.7
180970076	0.04	0.03	0.8
181010001	0.04	0.03	0.8

261630015	0.03	0.02	0.7
261630033	0.05	0.04	0.8
290930016	4.19	1.87	0.4
290930021	1.00	0.81	0.8
290930023	0.63	0.36	0.6
290930024	1.60	0.97	0.6
290930025	0.63	0.33	0.5
290930027	1.44	1.05	0.7
290930029	1.47	0.99	0.7
290990004	2.07	1.83	0.9
290990005	0.80	0.69	0.9
290990011	2.21	1.60	0.7
290990013	3.57	1.44	0.4
290990015	3.29	2.26	0.7
390290019	0.03	0.03	1.0
390290022	0.08	0.04	0.5
390350038	0.06	0.03	0.5
390350049	0.45	0.24	0.5
390350050	0.10	0.07	0.7
390350061	0.56	0.36	0.6
390910003	0.27	0.15	0.6
390910005	0.22	0.18	0.8
390910006	0.36	0.27	0.8
390910007	0.26	0.22	0.8
420032001	0.11	0.06	0.5
420111717	0.80	0.43	0.5
420210808	0.09	0.06	0.7
420450002	0.04	0.04	1.0
421290007	0.04	0.04	1.0
471633002	0.15	0.09	0.6
471870100	1.76	0.97	0.6
471870102	0.84	0.71	0.8
480850003	0.80	0.36	0.5
480850009	1.22	0.75	0.6
481410033	0.06	0.06	0.9
Average			0.7

References

Cavender, Kevin, March 3, 2008, Memorandum to the Lead NAAQS Review Docket (OAR-2006-0735), "Lead NAAQS Ambient Air Monitoring Network: Network Design Options Under Consideration."