



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
RESEARCH TRIANGLE PARK, NC 27711

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OFFICE OF  
AIR QUALITY PLANNING  
AND STANDARDS

MEMORANDUM

SUBJECT: Use of Expanded List of Audit Levels for Annual Performance Evaluation for SO<sub>2</sub>, NO<sub>2</sub>, O<sub>3</sub>, and CO as Described in 40 CFR Part 58 Appendix A Section 3.2.2

FROM: Lewis Weinstock, Leader *Lewis Weinstock*  
Ambient Air Monitoring Group (C304-06)

TO: Air Monitoring Program Managers and Staff

Since the promulgation of the October 17, 2006, monitoring rule, EPA has received feedback on the audit levels established for the gaseous pollutant annual performance evaluations in 40 CFR Part 58 Appendix A, Section 3.2.2. The 2006 rule established one additional low level (audit level 1) but also changed the concentration of some of the other levels. These changes were made to provide audit ranges for routine SLAMS sites as well as the NCore precursor gas sites. The rule also stated that the selected audit levels should represent or bracket 80 percent of ambient concentrations measured by the analyzer being evaluated. Monitoring organizations have commented that the levels, as identified in CFR, did not reflect or represent their data very well.

In response to these comments, OAQPS ran an evaluation on 3 years of valid data (2004-2006) for each reporting organization. This analysis confirmed that the audit levels currently in the CFR do not relate very well to the ambient data being measured. Table 1 provides a listing of the current audit levels and the percentage of reporting organizations that have sites with data in the audit level range. Using the 99.9 percentile value as an indicator, SO<sub>2</sub> and CO have a small percentage of reporting organizations with routine data in audit level 4 (~11 percent and 12 percent, respectively). Ozone and NO<sub>2</sub> have no reporting organizations with data in levels 4 or 5.

**Table 1. Current CFR Audit Levels and Percent of Reporting Organizations That Have Routine Concentrations Extending Into the Audit Level**

Audit level	O <sub>3</sub>	% RO with data in audit range	SO <sub>2</sub>	% RO with data in audit range	NO <sub>2</sub>	% RO with data in audit range	CO	% RO with data in audit range
1	0.02-0.05	all	0.0003-0.005	all	0.0002-0.002	all	0.08-0.10	all
2	0.06-0.10	99%	0.006-0.01	97%	0.003-0.005	all	0.50-1.00	all
3	0.11-0.20	4%	0.02-0.10	89%	0.006-0.10	all	1.50-4.00	98%
4	0.21-0.30	0%	0.11-0.40	11%	0.11-0.30	0%	5-15	12%
5	0.31-0.90	0%	0.41-0.90	0%	0.31-0.60	0%	20-50	0%

We also reviewed the spread of data from each reporting organization. Table 2 provides the summary statistics on the smallest, average, and largest spread (minimum value to 99.9<sup>th</sup> percentile value) of the data.

**Table 2. Summary Statistics on Minimum and 99.9 Percent Ambient Concentration by Reporting Organization**

	O <sub>3</sub> (ppm)	SO <sub>2</sub> (ppm)	NO <sub>2</sub> (ppm)	CO (ppm)
Largest Spread	0.005 - 0.128	0.002 - 0.284	0.001- 0.086	0.05 - 15.6
Smallest Spread	0.006 - 0.043	0.002 - 0.004	0.005- 0.021	0.001 - 0.90
Average Spread	0.005 - 0.086	0.002 - 0.071	0.002- 0.054	0.05 - 3.10

Based on this information and effective immediately, we are supporting the expansion of allowable audit ranges to ten levels as shown in Table 3. The area for each pollutant highlighted in green reflects the average spread (lowest routine concentration to 99.9<sup>th</sup> percentile value) of ambient data for the reporting organizations. The expanded table provides at least five levels for each pollutant. With the exception of SO<sub>2</sub>, Table 3 also accommodates three levels for even the smallest spread by a reporting organization identified in the 2004-2006 data in Table 2.

We have also received requests to allow for the selection of non-consecutive audit levels. The current regulation requires three consecutive audit levels to be evaluated as part of an acceptable audit. With the expansion to ten audit levels and the reduction of the concentration span within each audit level, it is appropriate to allow an audit level to be skipped while still auditing a minimum of three levels. Even with this increased flexibility, audit levels should still be chosen to bracket 80 percent of the ambient data. The goal is to choose levels that best reflect the concentrations at your monitoring sites.

**Table 3. Expanded Audit Level**

Audit Level	Concentration Range, ppm			
	O <sub>3</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO
1	0.004-0.0059	0.0003-0.0029	0.0003-0.0029	0.020-0.059
2	0.006-0.019	0.0030-0.0049	0.0030-0.0049	0.060-0.199
3	0.020-0.039	0.0050-0.0079	0.0050-0.0079	0.200-0.899
4	0.040-0.069	0.0080-0.0199	0.0080-0.0199	0.900-2.999
5	0.070-0.089	0.0200-0.0499	0.0200-0.0499	3.000-7.999
6	0.090-0.119	0.0500-0.0999	0.0500-0.0999	8.000-15.999
7	0.120-0.139	0.1000-0.1499	0.1000-0.2999	16.000-30.999
8	0.140-0.169	0.1500-0.2599	0.3000-0.4999	31.000-39.999
9	0.170-0.189	0.2600-0.7999	0.5000-0.7999	40.000-49.999
10	0.190-0.259	0.8000-1.000	0.8000-1.000	50.000-60.000

Yellow highlight related to NAAQS Concentration

These changes have received support by the EPA Regional Monitoring Staff and monitoring organizations that are members of the QA Strategy Workgroup. We recommend that this memo be distributed to your monitoring agencies for incorporation into ongoing quality assurance practices. In a future rulemaking, EPA will consider revising the CFR Appendix A criteria to the levels defined in Table 3 and to provide for the selection of non-consecutive audit levels in a future rulemaking.

These changes will affect how the AMP255 Report evaluates the performance evaluation data. Until that report is revised, it will not correctly evaluate the data. Please make your monitoring organizations aware of this issue. We will also develop some information more specific about the AMP255 Report that will be posted on AMTIC as well as sent to all the AQS contacts.

If you have any additional questions about the issues described in this memo, please email Mike Papp ([papp.michael@epa.gov](mailto:papp.michael@epa.gov)) of my staff.