OFFICE OF AIR QUALITY PLANNING AND STANDARDS

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SPECIAL POINTS OF INTEREST:

- **RA and RP transaction gone, QA transactions now the requirement**
- **Guidance being revised for the QA Handbook, PM2.5 Method 2.12, and developed for TSAs and Electronic Logbooks**

INSIDE THIS ISSUE:

EPA Regions Working Together to Develop Technical Systems Audit Guidance

A Technical Systems Audit (TSA) is an on-site review and inspection of a monitoring organization's ambient air monitoring program to assess its compliance with established regulations governing the collection, analysis, validation, and reporting of ambient air quality data.

During the revision of the QA Handbook Volume II in 2008, the EPA Regions got together and revised the TSA Checklist that can be found in Appendix H. It was not revised in the 2013 Handbook revision. EPA has received some comments from monitoring organizations that the Regions' approaches to conducting TSAs -- what they assess and what they consider findings -- are not consistent. Recent TSA data quality findings have affected NAAQS decisions. In light of this, the Regions have begun sharing their TSA reports, as well as their auditing practices and assessment techniques. This dialogue has led to the Regions and OAQPS working together to develop a TSA guidance document.

The intent of this new document is to provide guidance to assist auditors in understanding the TSA requirements, and to provide guidance and tools to aid in conducting TSAs of ambient air monitoring programs. While the document is geared primarily for federal auditors conducting TSAs of monitoring programs required by the CFR, the principles and tools provided in the document could be a framework for any auditor performing a TSA of any ambient air monitoring network. The guidance document is intended to present "best practices" that, if implemented and followed, would result in the best assessment of a monitoring organization's ambient air monitoring program.

The document will not replace the TSA Checklist, but rather supplement it with other techniques and guidance. The Workgroup formed in March 2015 and has been having calls every three weeks. The goal is to complete the new guidance by winter of 2015.

QA Handbook Vol II and PM2.5 Method 2.12 being Reviewed and Revised

OAQPs is in the process of reviewing and revising both the *QA Handbook for Air Pollution Measurement Systems Vol II* and the *Quality Assurance Guidance Document 2.12-Monitoring PM2.5 in Ambient Air Using Designated Reference or Class I Equivalent Methods.*

QA Handbook

Since the last revision in 2013, OAQPS has been collecting comments for revisions and additions to the Handbook. The QA Handbook Revision Workgroup has had a number of meetings to discuss these comments. Since many monitoring organizations utilize the validation templates, which have a tendency to change more often than the Handbook, we've placed the Validation Templates on AMTIC at http://www.epa.gov/ttnamti1/qalist.html and included a table that tracks changes made to the template. The next version of the Handbook will include validation templates for NCore, NOy and direct NO2 monitoring and newer $PM_{2.5}$ continuous methods.

Method 2.12

The $PM_{2.5}$ method has not been revise since the original version published in 1998.

(Continued on page 3)

Village Green Monitoring Stations Are Popping Up Across the Country

Durham, NC

Kansas City, KS

Through recent near-source air monitoring field studies, such as field campaigns monitoring air pollution adjacent to highways, it is understood that air pollutants can significantly vary with time and space in an urban environment. Current regulatory monitoring stations provide information on regional air pollution levels. However, they are usually insufficient in number to address research questions on local-scale air pollutant trends.

Researchers wanting to evaluate local-scale air quality trends currently balance the desire for spatial information with the desire for temporal information, with cost as a practical limiting factor. A key technology gap are lower cost air pollution monitoring systems that would allow for longer-term sampling at a greater number of locations. Presently, the cost and complexity of implementing multiple traditional-style air monitoring stations leads to researchers often utilizing mobile methods. In addition to the high cost of traditional-style air monitoring stations, siting in public environments is often quite challenging due to the large physical footprint, poor aesthetics, and lack of public engagement in the research.

This research conundrum has led ORD to develop the Village Green air pollution station (henceforth called the "VG station") to address this technology gap. The VG station was designed with a goal of providing real-time pollutant data for several measurements of interest (ozone and fine particles), being self-powered, having a lower/smaller physical footprint, and providing aesthetics and public engagement elements that would expand siting options and augment EPA outreach efforts. In addition, a key goal was an overall lower total cost compared to a traditional monitoring station, by nominally an order of magnitude.

The first VG station was set up June, 2013 outside of a public library in Durham, North Carolina. The system provided good information and was compared against local monitoring stations operating federal reference and equivalent methods.

Monitoring agencies are expressing interest in implementing Village Green monitoring stations to help inform the public on ambient air quality in their community. Village Green provides a solar-powered air monitoring system that will take continuous readings of several air pollutants and weather conditions. The measurements are then streamed to the Village Green and AIRNow websites.

Through an E-Enterprise initiative and joint leadership between OECA, ORD, and OAR, an opportunity was created for state agencies interested in piloting the stations to propose to join as a participant. Twenty-two proposals were received and reviewed by the Village Green Project team, led by Esteban Herrera (OECA). The selected participants were the DC Department of the Environment, City of Philadelphia's Air Management Services, Kansas Department of Health and the Environment, Oklahoma Department of Environmental Quality, and Connecticut Department of Energy and Environmental Protection .

The VGII station is the full integrated system, which is designed to operate only on solar power and utilizes small real-time air monitoring instruments that are expected to require infrequent maintenance. The system also has an on-board microcontroller and cellular modem that provides real-time data streaming to an EPA-hosted AirNow database. To support public engagement, an accompanying website enables the real-time data to be displayed on a website. The station was designed to be integrated with a park bench – this smaller footprint, improved aesthetics, and public outreach associated with this system provide easier siting and an opportunity to engage with community members. The VG physical structure is made out of recycled materials and provides secure and weatherproof storage to the scientific instruments.

Measurements currently taken are ozone, $PM_{2.5}$, wind speed, wind direction, ambient temperature and humidity. In addition, a low cost sensor for nitrogen dioxide is being evaluated at the new stations. Over time additional measurements may be taken at these sites.

At present we are looking at the VGII sites as a research project and are gathering data and comparing it against regulatory monitors in the vicinity of the sensors. A QA project plan was developed for the project but the frequency and acceptance criteria for the checks are minimal compared to regulatory monitors. *(continued on page 3)*

Ozone and PM monitors behind the bench

Village Green Monitors *(Continued from Page 2)*

With this interest there has also been concern expressed by monitoring agencies on the potential use for this data for National Ambient Air Quality Standards (NAAQS) decisions. The Village Green monitors are not intended to be used for any NAAQS related purposes. Although the monitors used in the projects are intended to be as accurate and precise as possible, and there may be monitors that have been approved as federally equivalent methods (FEMs), they will not be sited in manner required for regulatory monitoring nor will they implement the same quality control requirements necessary for use in regulatory decisions making.

Data from these monitors are not required to be reported to AQS and not required to be certified on an annual basis. If monitoring agencies decide to report data to AQS for these monitors EPA will work with AQS programmers to set up a specific Network Affiliation Code and the monitoring organizations will be instructed to use a NAAQS exclusion code on the monitor records. These reporting conditions will ensure data from the Village Green Monitors will be excluded from any regulatory decision making. The Village Green Monitoring system will not be considered a special purpose monitor (SPM) under the 40 CFR Part 58 requirements and therefore will not be required to become a regulatory monitor if operated for longer than two years.

For more information, please visit the Village Green Website at: http://www2.epa.gov/air-research/village-green-project

The station above is located in the children's farm area at the Smithsonian's National Zoological Park. With an average of two million visitors yearly, the Village Green Project at the National Zoo in DC increases visitor's awareness of air quality and local air quality conditions while they explore the zoo

This station is located in Independence National Historical Park near the National Constitution Center. This site was chosen because of its proximity to vehicle and pedestrian traffic. The real-time data generated by the site will be used to educate visitors and residents about street-level pollution exposure.

QA Handbook and PM2.5 Method 2.12 Revision *(Continued from Page 1)*

Since that time there has been a number of changes in the $PM_{2.5}$ method, including the development of the very sharp cut cyclone, by more than one manufacturer. Filter weights have changed due to the award of a different filter manufacturer which means a modification in the check weight guidance is required. In addition, due to recent findings during technical systems audits, there is a need for additional detail and clarification in the pre– and post filter weighing laboratory sections. OAQPS sent a memo out after the August 2014 National Ambient Air Conference asking for comments on this document. Both the EPA Regions and monitoring organization have provided about 10 pages of comments that we are currently wading through. Our goal is to have a draft of Method 2.12 completed in September 2015 and a draft of the QA Handbook in December 2015.

Proposed 1-point QC Revision Causes Push Back…. What's the data say

In the course of considering potential changes to quality assurance requirements as part of the proposed rule - Revisions to Ambient Monitoring Quality Assurance and Other Requirements –79 FR 54356 - OAQPS received a number of comments related to the proposal to lower the concentrations of the one point QC check and to require the selection of the check based on the mean or median concentration of the measurements within the ambient air monitoring network. The comments that were received are currently under consideration. During our review of the comments, EPA performed some additional assessments of monitoring data that was used to provide some rationale for our initial decision to propose the changes in the regulations. These additional details are provided in this article.

BACKGROUND

The EPA proposed to lower the audit concentrations (current section 3.2.1) of the one-point quality control (QC) checks to between 0.005 and 0.08 parts per million (ppm) for SO2, NO2, and O3 (currently 0.01 to 0.1 ppm), and to between 0.5 and 5 ppm for CO monitors (currently 1 and 10 ppm). With the development of more sensitive monitoring instruments with lower detection limits, technical improvements in calibrators, and lower ambient air concentrations in general, the EPA felt this revision would better reflect the precision and bias of the ambient air data being measured at the site.

The majority of the comments (19 of 26 responding to the quality assurance proposal) received on appendix A related to this proposed change. Most of the commenters expressed similar technical concerns which can be categorized below:

The SLAMS network is in place mainly for decisions related to the NAAQS therefore QC checks should be around NAAQS values.

Some of the federal reference methods (FRM) or federal equivalent methods (FEM) that are still in use may operate acceptably at concentrations around the NAAQS but these older methods are not as sensitive at lower concentrations (i.e., mean or median concentrations) so QC checks at these lower levels are beyond the limits of the instrumentation.

The instrumentation necessary to challenge the monitors at the lower concentrations (calibrators with additional mass flow controllers or gas cylinders of lower concentrations) would be required to comply and therefore represent an added expense and burden.

The lower concentrations affect the percent different statistic so there is more chance that the QC check will fail the acceptance requirements and therefore invalidate data that the monitoring organization feels is of acceptable quality.

In order to provide some context to the proposal, EPA extracted routine data and all one-point QC data for the 4 gaseous criteria pollutants for SLAMS sites for calendar year 2013. The following evaluation provides summary information about the routine data and the one-point QC checks reported by states. It must be noted that the one-point QC regulation, prior to the proposal, suggested that " the QC check gas concentration selected should be related to the routine concentrations normally measured at sites within the monitoring network in order to appropriately reflect the precision and bias at these routine concentration ranges". Based on the 2013 data, it is evident that many monitoring organizations did not follow this recommendation and was the reason EPA formally proposed the revision to this requirement.

Nitrogen Dioxide- In Figure 1 (and similar figures for the other gaseous pollutants), the graph on the left represents the mean, 99th percentile and max value for 1-hour routine ambient air data for 43 states and territories (x-axis) reporting NO2 data in 2013. The y-axis is concentration in ppb. The green line (80 ppb) represents the proposed upper range of the one-point QC check while the red line represents the current upper range (100 ppb) for the one-point QC check. Of the 43 states reporting hourly NO2 data, only three states had maximum hourly values (highest value for the year) above the NAAQS (100 ppb) and 99 percent of all the states hourly values were below 60 ppb. The graph on the right is a frequency distribution of the one-point QC checks for 2013. 85 percent of the 1-point QC checks reported for 2013 were above 99 percent of the routine data. *(continued on page 5)*

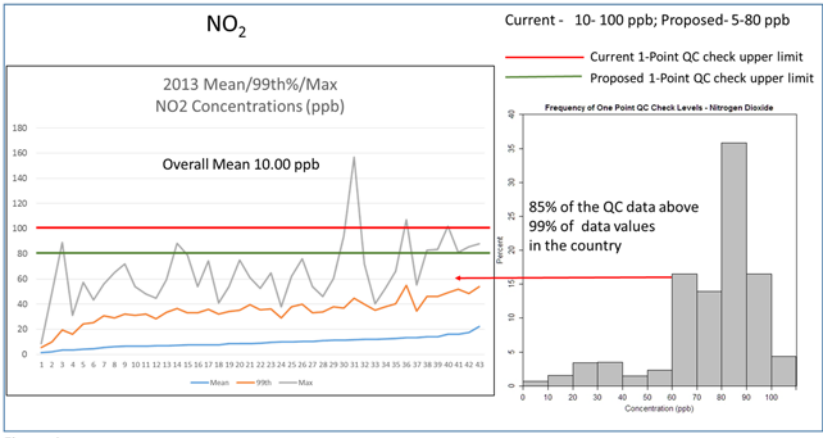


Figure 1

One-Point QC Checks *(continued from Page 4)*

Figure 2 (and similar figures for the other gaseous pollutants), provides an assessment of the one point QC checks using box and whisker plots. In Figure 2, the graph on the left provides the difference between the measured value and the audit standard value; the graph on the right is the same data set but reports the percent difference which is the statistic presently in use for the gaseous pollutants. The one point QC data is segregated into 10 ppb segments (0-10 ppb, 10-20 ppb etc.) in order to evaluate whether the lower QC concentrations have an effect on the precision and bias estimates. The green vertical line on the graph on the right represents the proposed 80 ppb high QC range and the blue shaded area represents where the QC checks would be selected if monitoring organizations selected a QC concentration related to the mean or median routine air concentration. The red lines represents the current percent difference acceptance criteria (±15%). In this case, the NO2 variability, based on the 25th-75th percentile spread, does not appear to be significantly different at lower QC concentrations than the higher QC concentration data.

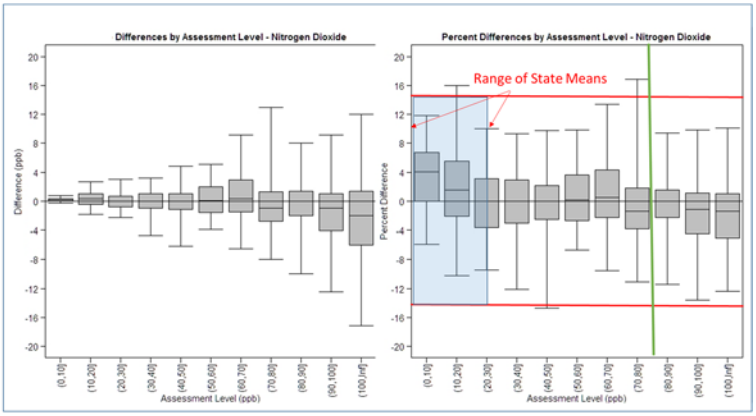


Figure 2

Ozone (Fig.3) - Of the 51 states and territories reporting hourly ozone data, 48 states had maximum values over the NAAQS (75 ppb) but had 99 percent of their hourly values below the NAAQS. In addition, 90 percent of the one-point QC checks were above 99 percent of the routine data.

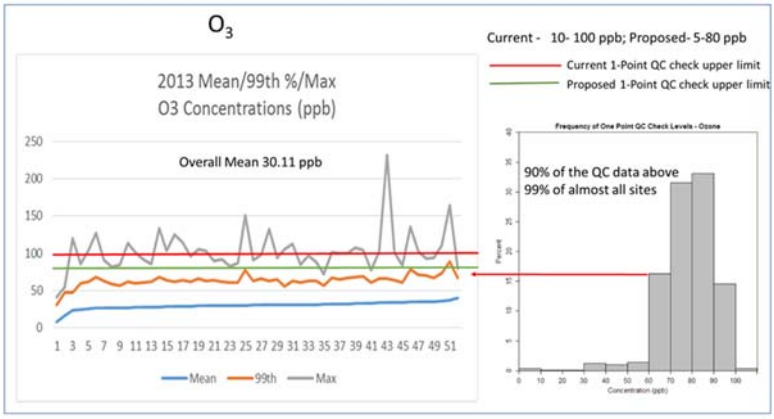


Figure 3

Similar to NO2, figure 4 presents the differences (left graph) and percent differences (right graph) of the one point QC checks segregated into the ten concentration ranges. The ozone acceptance criteria is tighter than NO2 (±7 percent difference) but the variability of the 25th – 75th percentile spread at these lower ranges does not appear to be significantly different from the one-point QC check variability at higher concentration ranges. *(continued on page 6)*

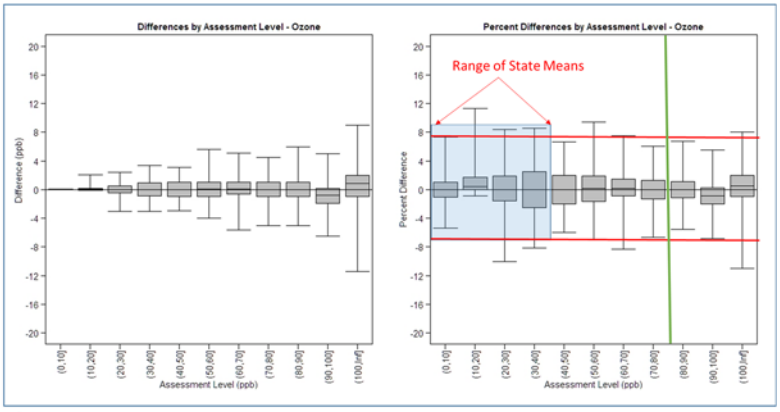


Figure 4

One-point QC Checks *(continued from page 5)*

Sulfur Dioxide (Fig. 5) -In order to provide a readable graph, the left hand graph of Figure 5 does not include maximum values since some states did measure SO2 values that were quite high. Of the 48 states and territories providing hourly sulfur dioxide data, 23 states had maximum values over the NAAQS (75 ppb) and 47 states had 99 percent of their values below 36 ppb. 75 percent of the one -point QC checks were above 99 percent of the routine data.

Figure 6 presents the differences (left graph) and percent differences (right graph) of the one point QC checks segregated into the ten concentration ranges. The SO2 acceptance criteria is ±10% (percent difference). The variability, based on the 25th – 75th percentile spread, at these lower ranges does not appear to be significantly different from the one-point QC checks at higher concentration ranges.

Carbon Monoxide (Fig. 7)- of the 51 states and territories reporting hourly carbon monoxide data, no state was reporting maximum values greater than the one-hour NAAQS (35 ppm) and only three states were reporting hourly maximum values above the eight hour NAAQS (9 ppm). In addition, 99 percent of all states hourly data was below 3.0 ppm. States were providing one-point QC values at lower ranges (graph on right) but about 60 percent of the one-point QC checks were being performed at concentrations greater than 99 percent of the routine ambient air data.

Similar to the other gaseous pollutants, the variability of percent differences, based on the 25th – 75th percentile spread of the box and whisker plots, does not appear to be significantly different between the higher and the lower one point QC concentration values. *(continued on page 7)*

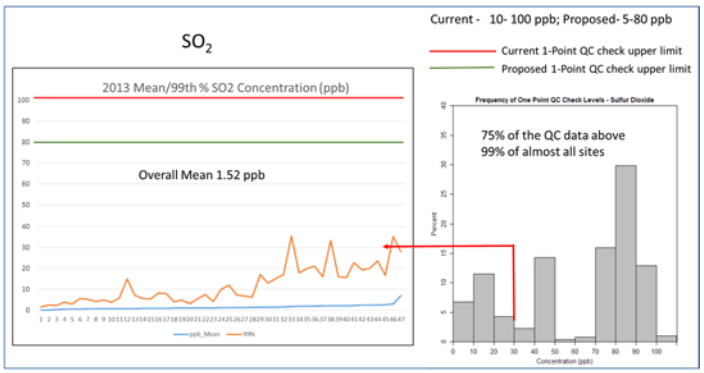


Figure 5

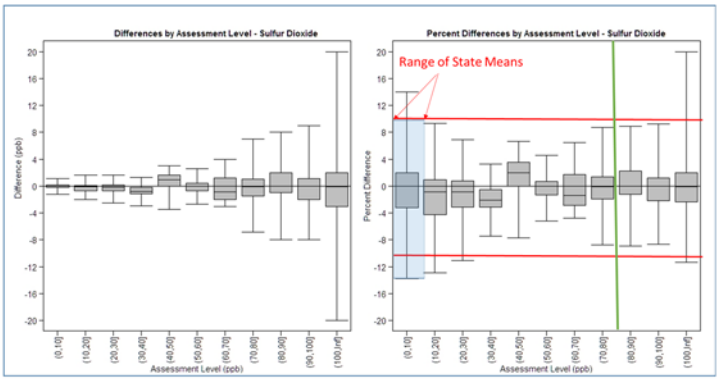


Figure 6

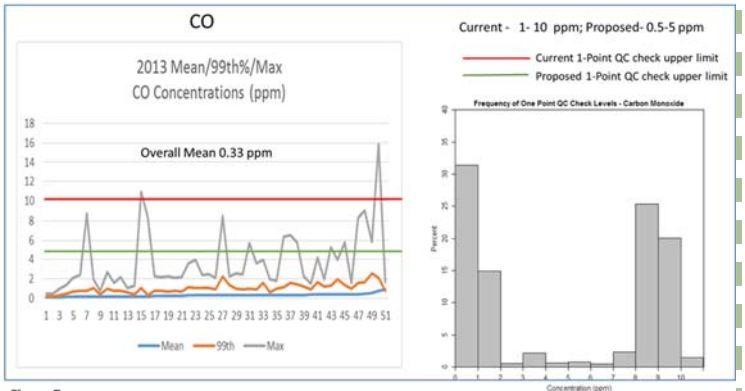


Figure 7

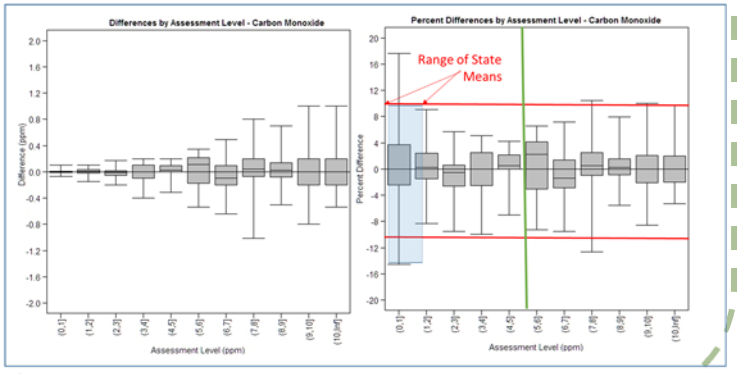


Figure 8

One-point QC Checks *(Continued from Page 6)*

As has been shown, monitoring agencies can test and achieve acceptable precision and bias results at lower concentration levels. Providing data users with estimates of precision and bias where the majority of our ambient air data are measured should be a programmatic goal and monitoring organizations should be working with EPA Regional Offices to develop the budgets necessary for purchasing the updated equipment and revising related procedures. The EPA will continue to endorse this approach to make the QC checks more meaningful and will consider future revisions to Appendix A to either require QC checks at two concentration levels (i.e., one around the mean concentrations and one related to the NAAQS) or require the span check to be reported to AQS. In addition, to alleviate concerns about failing the acceptance criteria at lower QC concentrations, EPA will evaluate suggestions by monitoring organizations to raise acceptance criteria or look at alternative acceptance criteria (e.g. difference instead of percent difference). Since acceptance criteria is included in guidance, EPA will have the opportunity to perform the evaluations without effecting the regulation. In 2011, EPA developed similar guidance for lower concentration levels of the annual performance evaluation audits.

Automated Data Certification Activities Complete Another Year

This is the third year of using the AMP600 report for certification. It appears the process is taking hold since we have received fewer questions about the process this year. The system still has a few issues we need to address.

Evaluation of PEP and NPAP Data Suspended for CY2014 Certification.

OAQPS has had some key retirements in 2014 as well as turnover of data reporting to a new QA contractor. These changes have slowed and in some cases stopped the reporting of NPAP, $PM_{2.5}$ PEP and Pb-PEP data to AQS. Therefore, the AMP600 will report completeness and bias data of any PEP values reported to AQS but will not perform any automated evaluations of that information.

1-point QC Check Completeness.

It was suggested that the evaluation of the 1-point QC check should be more detailed since there were findings during technical systems audits that monitoring organizations were not be performing checks every two weeks but performing checks more frequently at the end of the year to "make up" for missed checks. The CY-13 AMP256 and AMP600 reports simply counted all the 1-point QC checks over the whole year and divided that number by 26. For CY-14 the 1-point QC completeness data were evaluated in the following manner:

- Count the number of checks in each 14 day interval starting with the Jan 1-14 interval. For each 14 day interval, multiple checks will only count as one.
- Divide the total number of checks in #1 by 26

For certification, a green Y is $\geq$ 75%. That means a monitoring organization could miss 6, 14 day intervals (meaning a check past the 14-day interval) and still get a green Y. For a yellow flag, they could miss 9, 14-day intervals and get a warning. Missing 10, 14-day intervals will elicit an N flag which seems very reasonable in light of the CFR requirement. We have received some suggestions to build the intervals around weekends rather than starting on January 1-14. For 2015 data certification, we will review the current procedure to determine the most equitable evaluation of this data.

In previous certification periods there were a number of discrepancies between the AMP256 report and the AMP600. The following fixes have been made so both reports should provide the same information:

Collocation completeness for PM10 - The AMP256 and the AMP 600 will only count sites where a manual sampler is the primary sampler. However there may be times when a site had a manual sampler as primary for a period of time and switched to a continuous monitor. These sites will be included in the manual count if the manual sampler operated as the primary for any time during the year.

Collocation for PM2.5- The appendix A regulation requires that a PQAO collocate 15% of the monitors in each method designation used as a primary monitor. The AMP256 has been revised to assess whether there is 15% collocation for each method designation of only the primary monitors and should therefore match the result in the AMP -600 report. However there may be case where more than one method designation was used at a site as a primary monitor. Any method designation used as a primary at any time during the year will be counted towards the collocation evaluation. So if one ran a method 118 for 6 months and a 143 for 6 months at the same site, the AMP-600 will expect to see collocation for each method designation.

NPAP and PEP Programs get "LEAN"

With a recent change in the OAQPS QA Contract and retirement of key individuals who uploaded NPAP data, OAQPS has had major delays in reporting both NPAP and PEP data to AQS. This has also caused us to delay some of the data flagging and PEP and NPAP data to appear incomplete in the Annual Data Certification Report (AMP600) and Data Quality Indicator Report (AMP256).

Two groups in OAQPS; the Ambient Air Monitoring Group (AAMG) and the National Air Data Group (NADG) have been working together on the data reporting issues but have not been able to make as much progress as either group has wanted. Both Group Leaders and Divison Directors of these groups discussed the reporting issues and agreed that the implementation of the LEAN Six Sigma process might help bring both groups together to discuss a path forward on improving the reporting of the NPAP and PEP program data to AQS.

The LEAN Six Sigma Process

LEAN Six Sigma is a methodology that relies on a collaborative team effort to improve performance by systematically removing eight kinds of waste: defects, overproduction, waiting, non-utilized talent, transportation, inventory, motion, extra-processing.

In January 2015, AAMG and NADG engaged in conversation to submit the NPAP/PEP program as a LEAN Six Sigma project. EPA has a number of trained LEAN Six Sigma facilitators to implement the process. OAQPS submitted a request and was accepted for implementation. In order to start the process, OAQPS and EPA Regions expressed the following concerns about the NPAP/PEP data acquisition process:

- Process for handling field audit data is cumbersome
- Attempts to load audit data into AQS are often rejected
- Reporting of audit data to agency and clients is delayed
- QA assessments based on audits are outdated due to data loading delays

We then expressed a number of goals for a future NPAP/PEP Program:

- Reduce data reporting "lag-time" from the current year -long delay to no more than 90 days.
- Simplify the handling of data
- Remove obstacles to timely AQS reporting of QA data
- Decrease accompanying FTE commitment and contract costs

The LEAN Process Results

Four full days (March 30 to April 2) were set aside for group leaders and key members of both AAMG and NADG to:

- Review current NPAP/PEP implementation processes and identify areas of inefficiencies or where errors might occur
- Identify a future process that was simpler, less error prone, and would reduce report time and save time for all those implementing the process
- Identify products that would be required for the "future" process
- Identify leads from both OAQPS and NADG and participants from the Regions to help move the process along.

Current NPAP

Three areas of inefficiency in the current process were identified where reductions in lead time could be improved.

1. The development of the annual audit list and schedule- It was identified that using network plans or some form of AQS report to identify the universe of sites from which to select the years audits (20% of sites within PQAO) was inefficient.
2. Upon completion of the audits a printout of the audit results was prepared by the auditor and provided to the monitoring organizations site operator. Upon the NPAP auditors return to home base, the audit could be reviewed by the ESAT contracts technical manager as well as the EPA contract officer representative. This review cycle could be quite lengthy and there did not appear to be a time limit on this review.
3. Past procedures required audits to be sent to OAQPS for entry. Entry would be attempted but if it failed they would be sent back to the Regions (who might work with the states) for further review and correction. This process was also very lengthy with no apparent time limit on corrective action. Due to the retirement of two key entry individuals at OAQPS, this process no longer occurs and it is ether up to the EPA Regions or OAQPS to report the data.

NPAP Summary

The improvement in NPAP reporting will depend on NADGs development of an improved reporting feature to help scheduling and the development of a new entry program that will capture the most recent calibration information in a data set that is automatically transfered into a new empty workbook at the site so that block copying of information does not become a source of error.

(continued on Page 9)

NPAP and PEP LEAN Process *(continued from page 8)*

ESAT contractors and federal auditors will then be required to enter the appropriate information at the site and directly confirm this information with the site operator.

In order to reduce review time and error corrections, we will attempt to create a program and acquire technologies that in most cases will allow data to be uploaded to AQS at the site. All indications are that review of successful audits (without upload to AQS) just provides for a possibility that audits will be forgotten to be reported. Therefore, it is proposed that all audits be immediately uploaded to AQS in a pre-production area (so that they are immediately stored in the best location) and provide a minimum amount of time for review (7 days) of successful audits and for a longer period (30 days) for those audits that may have had an exceedance.

Current PEP

Several areas of inefficiency in the current process for $PM_{2.5}$ PEP and Pb-PEP were identified where reductions in lead time could be improved.

1. The development of the annual audit list and schedule- It was identified that using network plans or some form of AQS report to identify the universe of PEP sites from which to determine the years audits was ineffective for all sites.

2. The current weighing lab support database for the $PM_{2.5}$ PEP has become too large for the software platform which is creating problems. Problems resulting from the database size must currently be identified and corrected by the laboratory staff.

3. Field data review of $PM_{2.5}$ PEP data can be lengthy due to the travel schedule of the auditors who are responsible for the review. Field data must be reviewed to ensure the integrity of the hand entered field data into the database.

4. Past procedures required $PM_{2.5}$ and Pb-PEP audit data to be sent to OAQPS for entry. Entry would be attempted but if it failed they would be sent back to the lab manager and the Regions for further review and correction. This process was very lengthy and labor intensive with no apparent time limit on corrective action. Unresolved valid audits may never be successfully uploaded into AQS because of unresolved coding issues.

5. Before $PM_{2.5}$ audit data can be uploaded to AQS, a state valid result must be present in AQS to pair the data. If routine data has not been uploaded to AQS by the SLT, the audit data upload could be delayed or even overlooked during the next upload sequence.

6. The Pb-PEP program requires the auditor to enter audit/run data into a website where the run data and laboratory data can be paired to generate a concentration. Many times this web entry was not completed leaving valid laboratory data unpaired. To resolve this issue, scanned copies of the field data would need to be hand-entered by a third party or the auditor would need to be notified for the input. In both cases, the process is very labor intensive and a calculation of a concentration would be significantly delayed or data would remain unpaired.

7. All Pb-PEP data is required to be "approved" by the regional Pb-PEP contact. A significant amount of time can pass before these audits are approved due to regional priorities, staffing levels, or other problems.

PEP Summary

The improvement in the PEP programs will depend on NADG development of a web based application, similar to that of NPAP, to improve scheduling and the development of a new entry program within this application that will provide the capture of the field data information on site. This new application will also provide a much less labor intensive process for uploading the audit data to AQS.

In order to reduce review time and error corrections, we will attempt to create a program and acquire technologies that in most cases will allow data to be uploaded to AQS upon post-weighing and validation. As with NPAP, all indications are that review of successful audits (without upload to AQS) just provides for a possibility that audits will be forgotten to be reported. Therefore, it is proposed that all audits be immediately uploaded in a pre-production area (so that they are immediately stored in the best location) and provide a minimum amount of time for review of these audits.

Next Steps

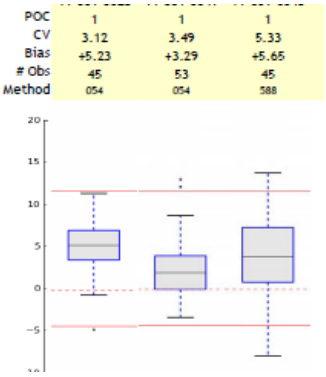
Following the implementation of the new NPAP process, NADG and AAMG program leads will schedule a series of meetings to develop an implementation plan for the new program. AAMG will reach out to few Regions for participation. Using models of the PEP implementation plan, we will identify the key attributes of the new system that will identify the new requirements for the auditor as well as the other key personnel .

In the interim, we will also look at some improvements on the current PEP system that will reduce errors and improve reporting times while the new system is under production.

Author Acknowledgements for this Issue

OAQPS appreciates and acknowledges the folks that helped put this Issue of the QA EYE together: Stephanie McCarthy Region 4) for her contributions to the TSA Guidance Document Article (pg.1), Gayle Hagler (ORD) for assistance on the Village Green article (pg. 2), Greg Noah, Dave Shelow and Nick Mangus (OAQPS) on the NATTS QC article (Pg.11) Robert Coats (NADG) on the PM2.5 QA Collocation (pg 12) and AQS article (pg. 10) and Nealson Watkins on the NOy update (pg 13). We try to get a QA EYE issue out every 4-6months so provide us some feedback or an article you'd like posted to papp.michael@epa.gov

Annual Box and Whisker Plots Coming Out in July



Nick Mangus of the National Air Data Group (NADG) is preparing 2014 data for reporting the annual box and whisker (B&W) plots of the four gaseous pollutants. The report will be posted on AMTIC later in July at http://www.epa.gov/ttnamti1/qareport.html.

Our hope is that this is a last time Nick has to perform this activity. It is expected that QA data will be reported to the DataMart in July and that we and the ambient air monitoring community can start developing automated reports at that site. We'd like one of those reports to be the box and whisker plots. In Nick's review of the data, he has noticed a few things to be aware of.

Assessment values of zero. The assessment value for the one-point QC check is the value of the audit standard. This value should never be zero. Since the audit standards value is in the divisor, and one can't divide by zero, any assessment values of zero are being eliminated from the assessment

Data reported in Assessment Number 2 Field. A monitor had reported a single assessment on a day, but reported it in the assessment #2 field . The data should be reported in the assessment #1 field. The AMP256 does not recognize the data in field #2 (unless there are multiple values) so the B&W statistics may be slightly different than the 256 values. We plan to fix the AMP256 report to cover this in the future.

Electronic Logbook Guidance Being Developed

Monitoring organizations have been suggesting the use of electronic logbooks (e-logbooks) for ambient air monitoring programs for a number of years. OAQPS has organized a Workgroup with the EPA Regions and monitoring organizations to develop a guidance document that provides the minimum requirements for the use of e-logbooks to replace the traditional hardcopy logbooks used in our monitoring networks. Monthly conference calls started in April. During each call, monitoring organization participants have provided presentations of their e-logbook systems and we have also had presentations from Sonoma Technologies and Agilaire.

The purpose of this guidance is to establish minimum requirements for documenting and maintaining e-logbook information for the Ambient Air Monitoring Program. This document is not intended to be inclusive of all electronic records initiatives presently being conducted in the Agency, but rather is seen as a starting point for an e-logbook structure to ensure some consistency across all the monitoring organizations utilizing e-logbooks for ambient air monitoring in accordance with 40 CFR Part 58. In addition, traditional use of hardcopy logbooks is not being discouraged.

The goal of this document will be to ensure that the salient features of good logbook practices are presented so that this data is captured and maintained in a manner that is secure, tamper proof and legally defensible. We hope to have the guidance completed by the end of the year.

Some More AQS Info-QA Transactions and Enhancements

Most QA transactions have a field for "Performing Agency". For most QA transactions, it is recorded by AQS as metadata, but not used; it is explicitly not used for security access – i.e. allowing the user to submit data for a monitor. The exception is the following four "Transactions for Labs" where it is required:

1. Pb Analysis Audit,
2. Lab Proficiency Test,
3. Ozone SRP,
4. AA-PGVP.

Access control:

For all transactions except the four "Transactions for Labs" access is allowed by one of the Agency Roles (e.g. PQAO, Reporting, Analyzing, Audit & etc) assigned to the monitor identified by the transaction.

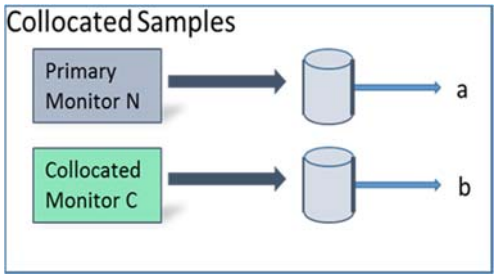
For the four "Transactions for Labs", Only users assigned to the Performing Agency or PQAO on the transaction are allowed to submit the data.

Enhancements:

We are working on an enhancement to allow one agency to be defined as the "child" of another agency. The typical case would be that a local or district agency would be the "child" of a state-level agency. When this enhancement is implemented, if a child has access to a monitor, then its parent would be allowed access also. This should be available by end of July, 2015.

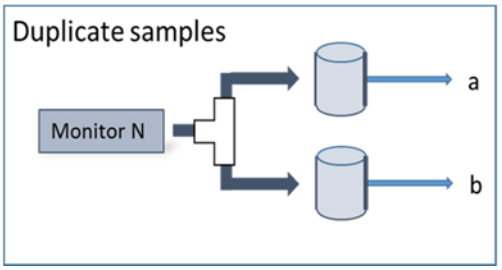
NATTS – Collocated, Duplicates and Replicates QC Data

Duplicate and replicate analyses and collocated data are reported to AQS in the NATTS program. The AQS "RA" and "RP" transactions have been retired and can no longer be used to report data; **all QA data must now be submitted using the new QA transaction format.** Each of these datasets (replicate, duplicate, collocated) now has its own format for uploading to AQS using the new QA transactions as opposed to the more generic and confusing transactions of the past. Below are the definitions of collocated, duplicate and replicate according to the NATTS, and some schematics to clearly illustrate the differences. The new QA transactions will clearly identify the QA data so it can be properly characterized, stored, and used. We are currently developing guidance for preparing and submitting the new QA transactions which should be available in the coming weeks.



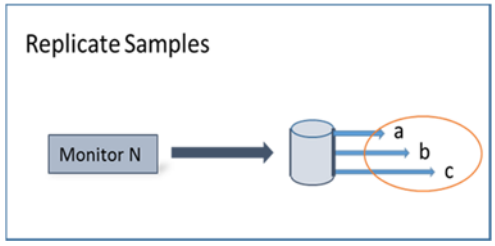
Collocated Samples

Collocated samples are samples collected simultaneously at the same location using two completely separate sampling systems. Assuming neighborhood scale, the recommended horizontal spacing for sampling inlets of collocated samplers is 1 to 4 meters for low volume samplers and 2 to 4 meters for high volume samplers. Recommended vertical spacing is within 1 meter.



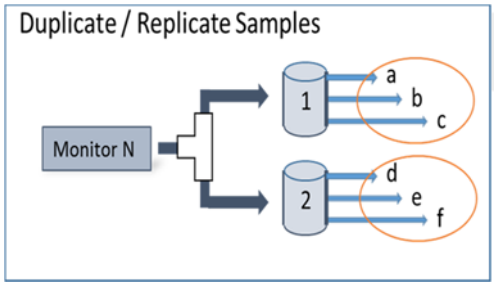
Duplicate Samples

Duplicate samples are samples collected simultaneously using one collection system and the same inlet, and then analyzing the samples and comparing the results obtained.



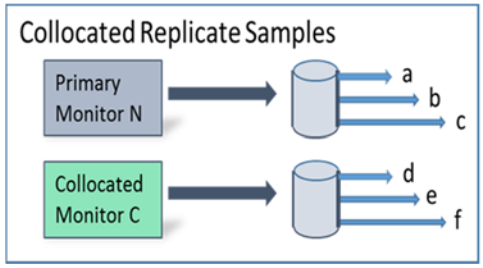
Replicate Analysis

Replicate assessments are the analysis of one discrete sample multiple times to yield multiple measurements from the same sample. These are also known as "split" sample analyses.



Combining Duplicates and Replicates

In some cases, replicates of duplicate samples may be conducted (not required). This is often referred to as a duplicate/replicate sample. In this case (see schematic below), there are two duplicate samples, "1" and "2". Duplicate Sample "1" has three replicates: "a", "b", and "c". Duplicate Sample "2" has three replicates: "d", "e", and "f".



Combining Collocated and Replicate Samples

It is also possible (not required) to make replicate analyses of collocated samples. This is often referred to as collocated replicate samples. Assuming neighborhood scale, the recommended horizontal spacing for sampling inlets of collocated samplers is 1 to 4 meters for low volume samplers and 2 to 4 meters for high volume samplers. Recommended vertical spacing is within 1 meter.

$PM_{2.5}$ QA Collocation Requirements...What's Official... What's not?

When it comes to QA Collocation requirements there is still a lot of confusion out there. Some of the confusion stems from the term "collocation" being used in the generic sense; meaning that sites exists where there is a primary $PM_{2.5}$ monitor and there are other $PM_{2.5}$ monitors "collocated" at the site for purposes other than meeting the "QA Collocation" requirements. In this article "QA collocation" refers to the primary/QA collocated monitors paired to meet the 40 CFR Appendix A QA requirements.

Since 2006 (see QA EYE Issue 2 page 5), EPA has been advocating the submission of the QA collocation data as raw data and eliminating the need for monitoring organization submission of a precision transaction (RP) for this information. This requires the identification of the QA collocated monitor in the QA collocations table on the maintain monitor form in AQS. In 2015, the RP transaction for QA collocated instruments was discontinued.

In addition, after 2012, the collocated monitor must be paired with the NAAQS primary monitor. Prior to 2012, a QA collocated monitor may have been paired with any monitor at a site. AQS has not attempted to identify these sites.

The AMP 256 reports and the AMP600 report will not recognize any collocation where the QA collocated monitor is not paired with the NAAQS primary. It will also not report any monitors where the methods codes are not appropriately paired as required in CFR.

If the site has already been set up you can check the ID of the NAAQS primary as follows:

Go to maintain site form and enter the state/ county / siteID. (Fig 1) and click on "Primary Monitor Periods". The primary monitors are listed on this record (see Fig 2).

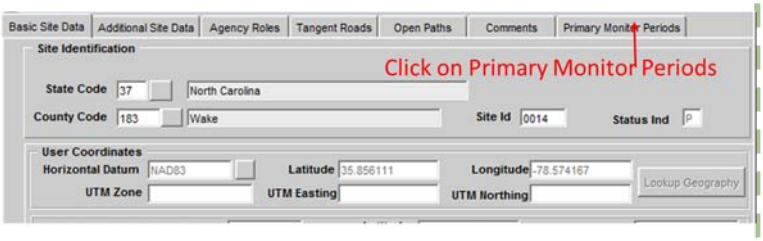


Fig. 1 Partial view of the maintain site form

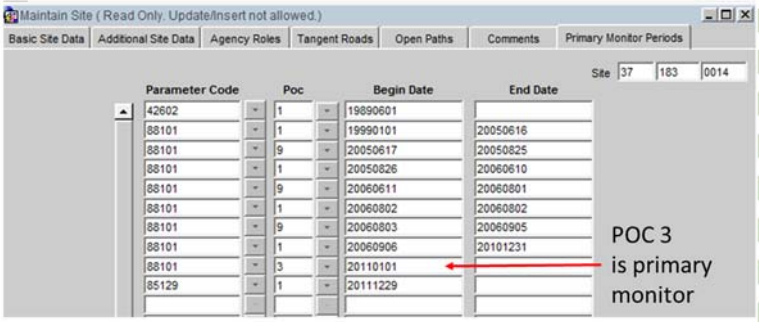


Fig. 2 Primary monitor period record

Now, since all $PM_{2.5}$ sites are not required to have QA collocation, when the PQAO decides to use a site to meet its Appendix A requirements, both the NAAQS primary and QA collocated monitors must be identified in AQS.

1. To identify the NAAQS primary, first retrieve the site in the Maintain Monitor form (Fig. 3), and click on the QA Collocation tab.

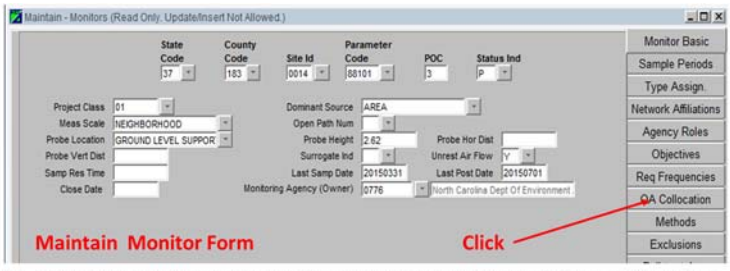


Fig. 3 Partial view of maintain monitor form to enter the NAAQS primary monitor

2. Then, on the QA Collocation form (Fig. 4 Page 13), enter the **begin date for the NAAQS Primary monitor that it will start being used in a collocated pairing**, and enter 'Y' in the "Primary Sampler" column, then click the save icon. The monitor ID does not need to be filled in.

(Continued on page 13)

PM2.5 Collocation Requirements *(continued from Page 12)*

Next , we identify the Collocated QA Monitor:

1. Go to the Maintain Monitor Form *(Fig 3 page 12)* and enter in the state/county/siteID/Parameter Code and POC of the monitor you want to identify as the **QA Collocated Monitor** and click on the QA collocation button. In this case (see Fig. 5) the monitoring organization identified the POC 1 monitor as the QA collocated monitor.
2. Enter the Begin Date for the pairing (which should be the same date used as the begin data for the NAAQS primary monitor), Distance from Primary Sampler" and "N" in the "Primary Sampler?" column to indicate that the QA collocated monitor is not the NAAQS primary sampler. Enter the monitor ID of the primary monitor.

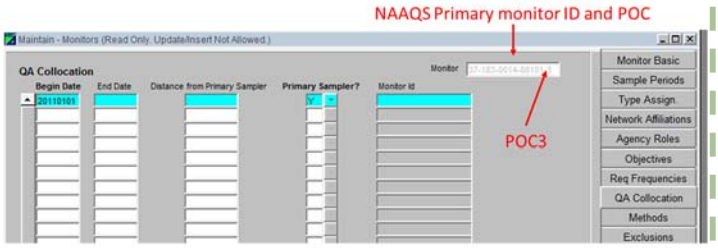


Fig. 4 Partial view of QA collocation record for the **NAAQS primary monitor**

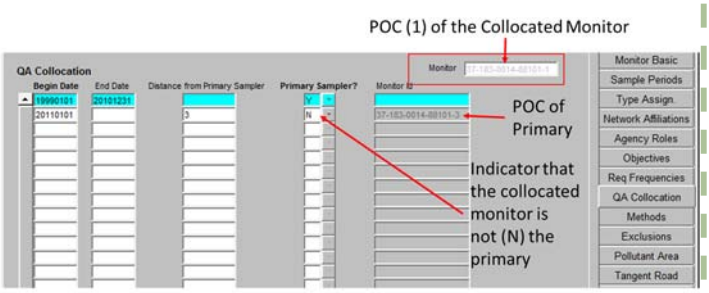


Fig. 5 Partial view of QA collocation record

Some other information about the system

One cannot change a primary unless you change a collocated first (if the site is a QA collocated site). So in the above example:

- one would have to place an end date in the POC 1 QA collocated monitor and add a new POC for the primary (Fig 5)
- Go to the maintain site form click on the primary monitor periods, put an end date for POC 3 (this example figures 1 and 2) and add the new NAAQS primary POC that was revised in the QA collocation table along with a new begin date.

NOy Update

We last discussed NOy issues in Issue 12 (page 8) of the QA Eye. We wanted to take an opportunity in this issue to provide a few reminders and updates on NOy related activities. NOy analyzers provide NO, NOy, and NOy-NO concentration data and are currently required at NCore multi-pollutant monitoring stations. Most models are simply chemiluminescence NOx analyzers that have had their plumbing modified to accommodate an external molybdenum converter. The external converter is necessary to allow sampling intake manifolds at the recommended 10 meter height, which allows for improved ability to measure higher order oxidized nitrogen species, known as NOz, which includes species such as nitric acid and peroxyacetyl nitrate. In many cases, as part of the instrument modification process (at least with older units), the vendors may not have changed the analyzer operating software to reflect the fact that the analyzer had been modified to be a NOy analyzer. As a result, those units may actually display measurement outputs for NOx and/or NO2 instead of the appropriate NOy and NOy-NO metrics. OAQPS is aware of multiple instances where this has caused confusion, and a state thought they had NO2 data coming from a NOy instrument. The key point here is that NOy analyzers do not report NO2 .

In the previous QA Eye article on NOy, we discussed reporting QC data from our NOy analyzers. As an update and correction from the previous QA Eye article we want to emphasize that the focus of 1-point QC checks for NOy analyzers is on the NOy channel. The preferred challenge agent is still NPN or IPN. As a secondary option, if NPN or IPN are not available for QC checks, NO2 is the next best challenge agent for NOy analyzers. NO2 can be generated via GPT or used via certified cylinders of NO2. The tertiary option is to perform the QC checks with NO. This prioritization has been agreed upon at EPA between the Office of Air Quality Planning and Standards and the Office of Research and Development's National Exposure Research Laboratory (NERL). We want to note that currently, EPA-ORD-NERL is beginning to evaluate the merits of using NPN and IPN as a challenge agent for NOy analyzers compared to using NO2 generated from GPT and certified cylinders. When their studies are concluded we will communicate the results and, if warranted, change our preferred QC challenge agent prioritization to reflect any new findings.

Joe Delwiche Remembered

Joe in the Field

When I started my career with OAQPS back in 1995, I did not have that much experience with ambient air monitoring so I did a lot of listening on our monthly EPA calls with the Regions. At that time some dominant players like Norm Beloin (Region 1), Ted Erdman (Region 3) and Mary Kemp (Region 6) provided a lot of sound technical advice. There was one other person who usually spoke towards the end of conversations. He spoke quietly, eloquently and with a knowledge that seemed to make great sense. That was Joe Delwiche.

Joseph (Joe) Delwiche passed away Saturday, May 2, 2015, after a seven-month battle with cancer.

Born December 31, 1950, Joe grew up in Berkeley and Davis, California, the third in a family of six boys. After graduating from Davis High School in 1969, Joe attended San Jose State University for a year then joined the U.S. Coast Guard on June 8, 1970. In the Coast Guard he served aboard the USCG cutter Acushnet on the US Atlantic coast, and on Iceberg Patrol over the north Atlantic aboard C130 aircraft. He was honorably discharged June 7, 1974. He promptly enrolled at Cornell University, in Ithaca, NY, and completed a Bachelor of Science degree in Meteorology in 1977.

After graduation, Joe pursued a career in air quality monitoring. Based initially in Southern California, Joe worked for Rockwell International and its antecedents and traveled extensively with a technician partner and a gas chromatograph sampling for wellhead hydrocarbon emissions throughout the oil patch. He stayed with that activity and took employment in Denver with the US Environmental Protection Agency in 1991, where he became an Air Quality Monitoring Specialist. Joe traveled extensively for EPA monitoring air at designated sites across the western US until he became ill in October of 2014.

Joe's passion for lifelong learning took him and his wife Diane Brunson to museums wherever they went. Before his death Joe completed a certification course in Paleontology, in preparation for working in the fossil lab at the Denver Museum of Nature & Science, a plan for Joe that was sadly not to be. Joe was active in Amateur Radio in the Denver area, and his particular interest was working radio contacts with portable equipment from remote mountain peaks (pictured below) in Colorado in their annual "Fourteener" event.

Joe did a lot of work with the QA community. He worked and contributed on almost every QA regulation and guidance document we have distributed over the last 20 years. Most recently Joe and Chris Hall from Region 10 helped revise the Prevention of Significant Deterioration (PSD) regulation that is currently undergoing review and the PSD Technical Note posted on AMTIC in 2012. His editing skills and mastery of the English language helped to create clarity and readability to many of our guidance documents. In addition, my one-on-one conversations with Joe on QA issues revealed his passion for the work and dedication to the quality of our ambient air data. He objectively expressed the views of the monitoring organizations within Region 8 and helped me see the issues facing the organizations which are not often as clear here in RTP. He represented Region 8 issues with objectivity, grace and tact.

Joe was soft spoken, intelligent, understated, and caring. He was an avid reader with a keen eye for language. As we continue to have our regional conference calls many of us will miss waiting for those final words of wisdom from Joe. Thanks Joe for sharing your wisdom, and friendship.

EPA-OAQPS
C304-02
RTP, NC 27711

E-mail: papp.michael@epa.gov

The Office of Air Quality Planning and Standards is dedicated to developing a quality system to ensure that the Nation's ambient air data is of appropriate quality for informed decision making. We realize that it is only through the efforts of our EPA partners and the monitoring organizations that this data quality goal will be met. This newsletter is intended to provide up-to-date communications on changes or improvements to our quality system. Please pass a copy of this along to your peers and e–mail us with any issues you'd like discussed.

Mike Papp

Key People and Websites

Since 1998, the OAQPS QA Team has been working with the Office of Radiation and Indoor Air in Montgomery and Las Vegas and ORD in order to accomplish it's QA mission. The following personnel are listed by the major programs they implement. Since all are EPA employees, their e-mail address is: last name.first name@epa.gov.

The **EPA Regions** are the primary contacts for the monitoring organizations and should always be informed of QA issues.

Program	Person		Affiliation
STN/IMPROVE Lab Performance Evaluations	Eric	Bozwell	ORIA- Montgomery
Tribal Air Monitoring	Emilio	Braganza	ORIA-LV
Speciation Trends Network QA Lead	Dennis	Crumpler	OAQPS
OAQPS QA Manager	Joe	Elkins	OAQPS
Standard Reference Photometer Lead	Scott	Moore	ORD-APPCD
National Air Toxics Trend Sites QA Lead	Greg	Noah	OAQPS
Criteria Pollutant QA Lead	Mike	Papp	OAQPS
NPAP Lead	Mark	Shanis	OAQPS
PM2.5 PEP Lead	Dennis	Crumpler	OAQPS
Pb PEP Lead	Greg	Noah	OAQPS
Ambient Air Protocol Gas Verification Program	Solomon	Ricks	OAQPS
STN/IMPROVE Lab PE/TSA/Special Studies	Jewell	Smiley	ORIA-Montgomery
STN/IMPROVE Lab PE/TSA/Special Studies	Steve	Taylor	ORIA-Montgomery

Websites

Website	URL	Description
EPA Quality Staff	EPA Quality System	Overall EPA QA policy and guidance
AMTIC	http://www.epa.gov/ttn/amtic/	Ambient air monitoring and QA
AMTIC QA Page	http://www.epa.gov/ttn/amtic/quality.html	Direct access to QA programs