



Florida Department of Environmental Protection

Quality Assurance Policy Highlights

April 26, 2017





Overview

- ☐ Rounding Policy
- ☐ Electronic Logbooks and Documentation
- ☐ Gaseous QAPP Highlights





EPA's Rounding Policy

- ❑ Florida adopted EPA's Rounding Policy as of January 1, 2017.
- ❑ EPA's Interpretation:
 - o Standard rounding convention is based on the resolution of the measurement device or instrument and this determines the significant figures used for rounding.
 - o This is crucial for data validation!
 - EPA's acceptance criteria (40 CFR Part 50 Appendices) and guidance documents do not provide physical measurements.

Example: 24-hour sample flow must be within $\pm 5\%$ of 16.67 liters per minute. It is not acceptable to round the $\pm 5\%$ acceptance criterion so that any calculated percent difference up to $\pm 5.4\%$ is acceptable

- Rounding the acceptance criterion increases the error in the measurement.



EPA's Rounding Policy

- ❑ Measurement devices will display their measurements to varying degrees of resolution so the rounding should be based on the same number of significant figures.

Example: If a flow rate device shows measurements to tenths place (3 significant figures) resolution but is audited with a flow device that displays measurements to the hundredths place (4 significant figures) - the rounding will be kept to 3 significant figures.





EPA's Rounding Policy

❑ More details are available in Appendix L of EPA's QA Handbook for Air Pollution Measurement Systems: Volume II (Redbook).

o <https://www3.epa.gov/ttn/amtic/qalist.html>

Table 1: Examples of Quality Control Acceptance Criteria

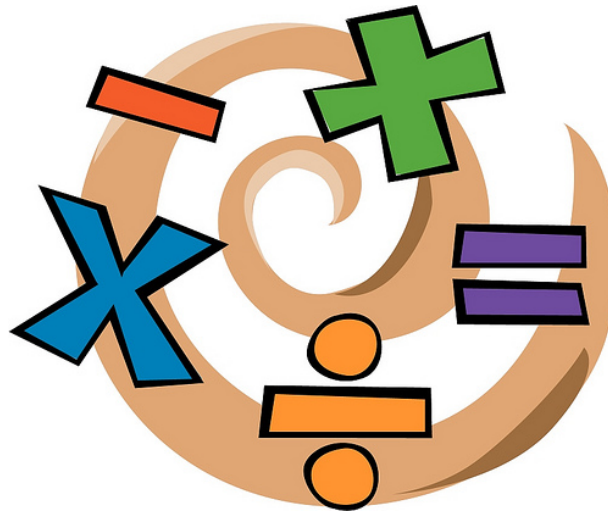
Regulatory Method Requirement	Method Acceptance Criteria	Typical Measurement Resolution	Acceptance Range (Passing Results)			Exceeding QA/QC Check
Shelter Temperature	20 to 30°C or FEM op. range	1 Decimal, 3 SF*	20.0 to 30.0°C or FEM op. range			≤ 19.9°C ≥ 30.1°C
PM2.5 Design Flow (16.67 lpm)	±5%	2 Decimal, 4 SF	15.84 to 17.50 lpm			≤ -5.1% ≥ +5.1%
PM2.5 Transfer Standard Tolerance	±4%	2 Decimal, 4 SF	-4% Audit Std	Sampler Display	+4% Audit Std	≤ -4.1% ≥ +4.1%
				15.84	16.47	
			16.00	16.67	17.34	
			16.80	17.50		
PM2.5 Lab: Mean Temp 24-hr Mean	20 to 23°C	1 Decimal, 3 SF	20.0 to 23.0°C			≤ 19.9°C ≥ 23.1°C
PM2.5 Lab: Temp Control SD over 24-hr	±2°C	1 Decimal, 3 SF	±2.0°C			≤ -2.1°C ≥ +2.1°C
PM2.5 Lab: Mean RH 24-hr Mean	30% to 40%	1 Decimal, 3 SF	30.0% to 40.0%			≤ 29.9% ≥ 40.1%
PM2.5 Lab: RH Control SD over 24-hr	±5%	1 Decimal, 3 SF	±5.0%			≤ -5.1% ≥ +5.1%
PM2.5 Lab: Difference in 24-hr RH Means	±5%	1 Decimal, 3 SF	±5.0%			≤ -5.1% ≥ +5.1%

*SF = Significant Figures



EPA's Rounding Policy Summary

- ☐ Determine the measurement accuracy of the instrument.
- ☐ Implement the rounding policy based on the significant figures.
- ☐ Ensure the appropriate information is documented, especially in borderline situations.
- ☐ When in doubt, verify the best course of action with DEP.





Electronic Logbooks & Documentation

☐ A document is defined as a volume that contains information that describes, defines, specifies, reports, certifies, or provides data or results pertaining to environmental programs.

☐ Federal Records Act of 1950 and the Paperwork Reduction Act of 1995 (44 U.S.C. 3101-3107):

Records are "...books, papers, maps, photographs, machine readable materials, or other documentary materials, regardless of physical form or characteristics, made or received by an agency of the United States Government under Federal Law or in connection with the transaction of public business and preserved or appropriate for preservation by that agency or its legitimate successor as evidence of the organization, functions, policies, decisions, procedures, operations, or other activities of the Government or because of the informational value of data in them....".

☐ Florida's data and record retention requirement per the Florida Statute is 10 years.



Electronic Logbooks & Documentation

- ❑ Each organization should have a documented records management policy
 - o Should be included or referenced in the QMP or QAPP for EPA's approval.
- ❑ The electronic data collection systems for logbook information must ensure that:
 - o Adequate levels of security and administration
 - o Adequate levels of backup.
 - o Unique identifiers for personnel entering or editing information (e.g. e-signatures)
 - o Every logbook entry/edit is date/time stamped and the entry person identified.
 - o Original entries are recorded and archived.
 - Must have an audit trail so initial entries are not erased when revisions are made.



Electronic Logbooks & Documentation

- ❑ At a minimum the e-logbook system should:
 - o Meet National Archives and Records Administration (NARA) requirements that pertain to e-logbooks.
 - o Be able to collect, organize, and categorize records, as well as facilitate the preservation, retrieval, use, and disposition of these records.





Key Features of an Electronic Recordkeeping System

- ☐ **Integrity** - Ensure that the integrity of the records it manages is maintained.
- ☐ **Metadata/Identity** - Identify each record sufficiently to permit the retrieval, protection, and identification of the disposition of the records in the system.
- ☐ **Backup** - Allow for records to be backed up to protect against information loss.
- ☐ **Organization/Delegations** - Documents and identifies the roles and responsibilities of users.
- ☐ **Accessibility** - Document the access and security levels of monitoring personnel.
- ☐ **Retrievability** -The system must retrieve records.
- ☐ **Migration**-The system must allow records to be migrated.



Key Features of an Electronic Recordkeeping System

- ☐ **Auditability**-The system should be tested and reviewed by IT experts and QA auditing personnel.
- ☐ **American with Disability Act (ADA) Compliance** – The e-logbook system should meet ADA standards.
- ☐ **e-Signatures/Legal signatures**- E-signatures should be used as part of the submission process and the legal defensibility of e-logbook information.
- ☐ **Information Security/Locking** – Ensure the official record is secured.
- ☐ **Data entry/data revision/correction**- An entry session may be recalled and revised but should be documented appropriately.
 - o The revision of a records cannot overwrite the original information which must be maintained in the record.
- ☐ **Version Control**- Version control of e-logbook software must be maintained.



Looking Ahead

- ❑ As a PQAO, the recordkeeping procedures needed to be documented.
 - o Florida's QMP will be updated in 2018 to reflect these procedures.
- ❑ Florida Air Monitoring Validation Program (AirMVP)
 - o All local agencies will have the option of using the data management system that will be available with AirMVP.
 - o Florida DEP will house each agency's annual records on the network drives in the interim.





Major Gaseous QAPP Updates

Data and Measurement Quality Objectives and Criteria

☐ Warning Limits

- o The level of allowable imprecision before investigation and corrective action is warranted.
- o Limit is set lower than the control limit to reduce imprecision and bias and enhance data recovery.

Data Quality Warning and Control Limits

Parameter	Control Limit (MQO)	Warning Limit
	Precision Checks (% Difference)	
Ozone (O ₃)	< ± 7.1%	≥ 5%
Carbon Monoxide (CO)	< ± 10.1%	≥ 7%
Sulfur Dioxide (SO ₂)	< ± 10.1%	≥ 7%
Nitrogen Dioxide (NO ₂)	< ± 15.1%	≥ 12%



Major Gaseous QAPP Updates

Performance Audit Action Levels

Parameter	Audit Action Levels	Action Required
Ozone (O ₃)	<±1.5ppb (levels 1&2) or <±5.1%	N/A
	±5.1% - ±6.9%	Investigation and documentation in logbooks required.
	≥7.1%	Corrective action required.
Carbon Monoxide (CO)	<±0.031ppm (levels 1&2) or <±5.1%	N/A
	±5.1% - ±10.4%	Investigation and documentation in logbooks required.
	≥±10.5%	Corrective action required.
Sulfur Dioxide (SO ₂)	<±1.5ppb (levels 1&2) or <±5.1%	N/A
	±5.1% - ±10.4%	Investigation and documentation in logbooks required.
	≥±10.5%	Corrective action required.
Nitrogen Dioxide (NO ₂)	<±1.5ppb (levels 1&2) or <±5.1%	N/A
	±5.1% - ±10.4%	Investigation and documentation in logbooks required.
	≥±10.5%	Corrective action required.



Major Gaseous QAPP Updates

Quality Assurance Policies

☐ Certifications/Calibrations:

- o Volumetric and Mass flow devices must be certified/calibrated **annually** with a certified flow standard and documented.

☐ Auditing:

- o Failed audit are at EPA Audit Levels **3-10 only**.
- o An independent standard should be used to confirm the audit results
- o **All** audits (passing and failing) must be entered into **FAMAS**.
- o **Only passing** audits should be sent to **AQS**.
- o Failures at levels 1 and 2 require an evaluation of the instrument
 - Evaluation procedures are described in Section 3.1.1 of the Corrective Action SOP (DEP 01-4).



Major Gaseous QAPP Updates

❑ Data, Documentation and Records

o Automatic Zero Adjustments:

- An adjustment does not mean a post processing correction on zero.
- Corrective action and data invalidation (if deemed necessary) should occur if the zero drift is greater than the validation template acceptance criteria.
- Data loggers should be programmed to provide flags or warnings of this occurrence.
- See Appendix A, Section E for further details for when an automatic zero adjustment may be considered.

o Zero adjustments should not be done for checks that occur every two weeks and span compensation for automated data output is prohibited.

o Zero compensation through data adjustment was discontinued in the Florida PQAO as of January 1, 2016



Data Validation Template Changes

Requirement	From (2013)	To (2017)	Comment
O₃			
One Point QC	< ± 7% (percent difference)	< ±7.1% (percent difference) or < ±1.5 ppb difference whichever is greater	Added 1.5 ppb difference for low concentration points.
Zero Span	Zero drift < ± 1.5 ppb Span drift < ± 7 %	Zero drift < ± 3.1 ppb (24 hr.) < ± 5.1 ppb (>24hr-14 day) Span drift < ± 7.1 %	Provided more flexibility in zero
Verification/Calibration	All points within ± 2 % of calibration range of best-fit straight line Linearity error <5%	All points < ± 2.1 % or < ±1.5 ppb difference of best-fit straight line whichever is greater and Slope 1 ± .05	Added 1.5 ppb difference for low concentration points and slope as additional guidance
Noise	< 0.005 ppm	< 0.0025 ppm (standard range) < 0.001 ppm (lower range)	Reflects 40 CFR Part 53 change
Lower detectable limit	0.01 ppm	< 0.005 ppm (standard range) < 0.002 ppm (lower range)	Reflects 40 CFR Part 53 change
Requirement	From (2013)	To (2017)	Comment
CO			
Zero/span check	Zero drift < ± 0.03 ppm Span drift < ± 10 %	Zero drift < ± 0.41 ppm (24 hr.) < ± 0.61 ppm (>24hr-14 day) Span drift < ± 10.1 %	
Verification/Calibration	All points within ± 2 % of calibration range of best-fit straight line	All points < ± 2.1 % or < ± 0.03 ppm difference of best-fit straight line. whichever is greater and Slope 1 ± .05	Added 0.03 ppm difference for low concentration points and slope as additional guidance
Zero Air/Zero Air Check	< 0.1 ppm CO	Concentrations below LDL	



Data Validation Template Changes

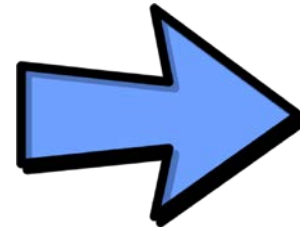
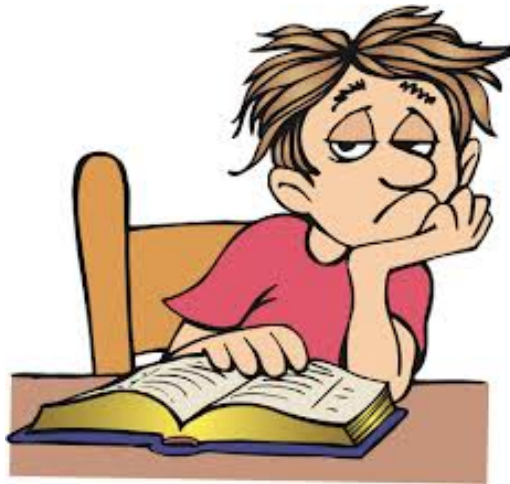
Requirement	From (2013)	To (2017)	Comment
NO₂			
One Point QC	acceptance criteria from $< \pm 15\%$	$< \pm 15.1\%$ (percent difference) or $< \pm 1.5$ ppb difference whichever is greater	Added 1.5 ppb difference for low concentration points
Zero/Span	Zero drift $< \pm 1.5$ ppb Span drift $< \pm 10\%$	Zero drift $< \pm 3.1$ ppb (24 hr.) $< \pm 5.1$ ppb (>24hr-14 day) Span drift $< \pm 10.1\%$	Provided more flexibility in zero
Verification/Calibration	Instrument residence time < 2 min Dynamic parameter > 2.75 ppm-min All points within $\pm 2\%$ of calibration range of best-fit straight line	Instrument residence time < 2 min Dynamic parameter > 2.75 ppm-min All points $< \pm 2.1\%$ or $< \pm 1.5$ ppb difference of best-fit straight line whichever is greater and Slope $1 \pm .05$	Added 1.5 ppb difference for low concentration points and slope as additional guidance
Requirement	From (2013)	To (2017)	Comment
SO₂			
One Point QC	acceptance criteria from $< \pm 10\%$	$< \pm 10.1\%$ (percent difference) or $< \pm 1.5$ ppb difference whichever is greater	Added 1.5 ppb difference for low concentration points
Zero/Span	Zero drift $< \pm 1.5$ ppb Span drift $< \pm 10\%$	Zero drift $< \pm 3.1$ ppb (24 hr.) $< \pm 5.1$ ppb (>24hr-14 day) Span drift $< \pm 10.1\%$	Provided more flexibility in zero
Verification/Calibration	All points within $\pm 2\%$ of calibration range of best-fit straight line	All points $< \pm 2.1\%$ or $< \pm 1.5$ ppb difference of best-fit straight line whichever is greater and Slope $1 \pm .05$	Added 1.5 ppb difference for low concentration points and slope as additional guidance
Requirement	From (2013)	To (2017)	Comment
All Gaseous Pollutants			
Annual Performance Evaluation	Every site 1/year 25% of sites quarterly	Every site every 365 days and 1/ calendar year	Not requiring Annual PEs across all quarters.
Annual PE Primary QA Organization (PQAO) Evaluation	95% of audit percent differences fall within the one point QC check 95% probability intervals at PQAO level of aggregation	None	Removed check from CFR



Summary



To read or have working knowledge of the Quality Assurance documents!





Questions?



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