DIVISION OF AIR QUALITY
Ambient Monitoring Section
217 West Jones Street / 1641 Mail Service Center
Raleigh, NC 27699-1641

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MEMORANDUM

TO: Jeff Gobel (PPB), DocuSigned by: Jeff Gobel 98CD1C1D70B34DA... 2/16/2022

Kay Roberts (PPB) DocuSigned by: Kay Roberts BE4009EE242941D... 2/16/2022

Jeremy Pope (PPB) DocuSigned by: Jeremy Pope 6CB642D69CB24F5... 2/16/2022

Mike Lane (PPB) DocuSigned by: Mike Lane 5ED91AA187334B5... 2/16/2022

THROUGH: Joette Steger PPB Supervisor, DocuSigned by: B278F8186CEC4DC... 2/16/2022

FROM: Patrick Butler, Chief Ambient Monitoring Section DocuSigned by: Patrick Butler 4290A7E2D2A0429... 2/16/2022

SUBJECT: **DAQ-17-003 Changes to Data Validation Reporting Procedures for 1-Point Quality Control and Zero/Span Checks for Continuous Gaseous Monitors**

As of 01/21/2022 the United States Environmental Protection Agency (USEPA) has clarified its former guidance on the reporting of 1-point quality control (QC), also known as precision, checks and zero/span checks that fail to meet the "critical criteria" listed in the 2017 Quality Assurance (QA) Handbook and incorporated in the North Carolina Division of Air Quality (DAQ) Quality Assurance Project Plans (QAPPs). The new guidance will not require modification to any existing approved DAQ QAPP or to any QAPP currently undergoing review by USEPA. The new guidance will require modification to DAQ-15-005.5 Data Validation Standard Operating Procedures. The instructions in this memo will be used until the required modifications are incorporated into the relevant sections of DAQ-15-005.5.

This new guidance applies only to those QC checks which fail to meet listed "critical criteria" and is not applicable to QC checks which exceed listed DAQ "action limits" but which still meet "critical criteria" limits. The USEPA critical criteria are listed in Table 1.

Table 1. USEPA Critical Criteria for 1-Point QC Checks

Pollutant	Critical Criteria
ozone	< +7.1% (percent difference) or < +1.5 ppb difference whichever is greater
carbon monoxide	< +10.1% (percent difference)

Table 1. USEPA Critical Criteria for 1-Point QC Checks

Pollutant	Critical Criteria
nitrogen dioxide, nitric oxide, oxides of nitrogen and reactive oxides of nitrogen	< +15.1% (percent difference) or < + 1.5 ppb difference, whichever is greater
sulfur dioxide	< +10.1% (percent difference) or < + 1.5 ppb difference, whichever is greater

Due to the way USEPA's Air Quality System (AQS) is configured as of 4 February 2022, this memo will only apply to the 1-Point or "Precision Point" QC report and upload and will not apply, at present, to the Zero/ Span QC report and upload. For the present, Zero/ Span QC checks will be reported as always.

Going forward, USEPA will only recognize, and AQS will only accept, two "null codes" for any 1-point precision check that "demonstrates an unacceptable lack of agreement between the monitor and the test concentration." **A check which "demonstrates an unacceptable lack of agreement" currently includes instances in which the check failed to run.** This is a departure from previous policy which allowed DAQ to use descriptive null codes to indicate the reason a check failed to run. As an example, in the past DAQ used the null code AV to indicate that the scheduled QC check failed to occur due to a power failure at the site.

Under the new guidance the only acceptable null codes which may be used as place holders in lieu of a QC check are the "1C code" and the new "1F code". It appears that AQS will continue to accept a short narrative explaining the use of the placeholder. **These two codes may only be used to replace QC checks reported in AQS and may not be used to replace invalidated routine ambient data.**

For the present and until further notice, pollutant chemists should proceed with data validation exactly as they have always done except that for the validation of overnight 1-Point QC checks and bi-weekly QC checks the pollutant chemist should:

1.) Review all QC checks prior to upload to AQS and determine if each individual check meets the "critical criteria" requirements listed in the relevant QAPP for that pollutant (see Table 1). "Critical criteria" are distinct from, and less stringent than the "action limits" DAQ imposes in its QAPPs and standard operating procedures (SOPs). A QC check may meet the "critical criteria" requirements while falling outside DAQ's "action limits".

2.) All checks which meet "critical criteria" limits should be reported to AQS exactly as they have always been. No changes are intended for this procedure.

3.) For all checks which **fail to meet "critical criteria"** limits, and at present this includes checks which failed to run, the chemist must next determine if the failed check is valid or not.

A failed check is invalid if some outside issue influences the monitor's ability to measure the test concentration. The outside influence can be a power failure that disrupts the test, a calibrator that for any reason fails to deliver the correct test concentration for the required time period, a failure in any piece of equipment required to successfully complete the QC check (zero air pack, solenoid, etc.), a loss of temperature

control, or any other issue which might reasonably impact the monitor's ability to read the test concentration. **Importantly, starting with the implementation of this quality assurance (QA) bulletin, any QC check which fails to run is considered an invalid check.**

A failed check is valid if all the components in the system perform correctly and the monitor fails to report the test concentration within the limits defined in the critical criteria. To reiterate, a test is only valid when the correct concentration of a test gas is supplied to the monitor for the correct period of time and the monitor reports a concentration value which is outside the critical criteria for the test.

4.) For any check that is invalid for any reason, the chemist should substitute the 1C null QA code for any concentration data and include a comment in the QC report explaining the reason the check is invalid. Except in the case of a check which failed to run, this procedure is unchanged from our current SOP.

5.) For any valid check which fails, the chemist should substitute the new 1F null QA code for any concentration data in the QC report for that specific check. This will indicate to anybody reviewing the data that a valid check ran that failed to meet the critical criteria for the pollutant.

6.) After discovering that a valid check has failed, and **any time the 1F null QA code is used, the chemist must then invalidate all routine ambient data surrounding the failed check**. All data must be invalidated back to the point where it can be proven that the monitor was operating within specifications and forward to the point where it can be proven that the monitor is again operating within the critical criteria specified. In most cases invalidation will be back to the last, passed 1-Point QC check and forward to replacement or recalibration of the monitor. The chemist may also rely on other "compelling evidence" to determine the point at which monitor data is considered to be valid. If the chemist chooses to rely on "compelling evidence" the chemist must exhaustively document all factors used in supporting this conclusion.

Replace and Discard Original	☐
Add Material to Document	☐
Retain this bulleting until further notice	☒
Discard this bulleting after noting contents	☐
This bulleting will be invalid after:	**Click or tap to enter a date.**
This bulletin will be incorporated into DAQ -15-005.5 by	**9/30/2022**