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TO: PQAO Point of Contacts

SUBJECT: ARB AIR QUALITY MONITORING NETWORK CHANGES

This letter is to inform you of recent changes to the Air Resource Board's (ARB) air quality monitoring network. The purpose of the updates were to stay current with Federal regulations and instrument manufacturer updates. Note that the changes are currently being or will soon be incorporated into the respective standard operating procedure (SOP) for each instrument. Please see the attached table for a detailed list of the following changes:

1. Replace "hockey pucks" with original Teledyne-API filter housings on API 400E's
2. New quality control (QC) limits
3. Ozone calibration changes
4. Replacement of instruments – CO and SO₂
5. Reduction of auto-calibration precision and span QC check levels
6. NO_x Range Change
7. BAM Zero Check
8. Zero Air Accuracy

1. Replace "hockey pucks" with original Teledyne-API particulate filter housing on API 400E's

The use of stainless steel is not consistent with 40 CFR 58 Appendix E, Section 9 "Probe Material and Sample Residence Time" as a suitable material for housing PM filters used on the inlet to the criteria pollutant gas analyzers.

For the purposes of meeting Federal criteria and network uniformity, non-conforming Millipore Corporation filter housings ("hockey pucks") will be removed from service and all TAPI monitors operated by ARB must have their Teledyne-API sample filter housings re-installed or re-connected as appropriate, to return the analyzers to factory assembled condition.

The energy challenge facing California is real. Every Californian needs to take immediate action to reduce energy consumption. For a list of simple ways you can reduce demand and cut your energy costs, see our website: <http://www.arb.ca.gov>.

California Environmental Protection Agency

Instruments without a factory installed in-line PM filter will be outfitted with a suitable replacement for the Millipore assembly. Future analyzer orders will specify an in-line PM filter option when available. Optimally, the retrofit should occur during a scheduled site calibration as maintenance between the as-is and final conditions, to minimize any potential data loss due to leaks or improper assembly. Please see Figure 1 for proper installation of the filter housing.

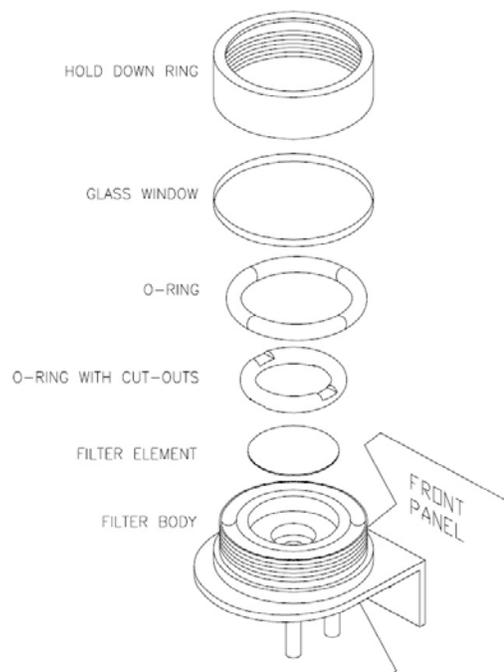


Figure 1: Teledyne-API filter housing
*This figure was reproduced from the TAPI 200 NOx Analyzer Technical Manual.

2. New quality control (QC) limits

ARB has established the following Quality Control (QC) **warning, action, correction** and **invalidation** control limits based on the results of nightly automatic QC checks.

ARB QC limits are evaluated for precision and span QC drift checks. Zero QC limit criteria are based on actual difference, not % difference from true. Acceptable zero QC limits are ± 5 ppb for all gaseous instruments except CO. Zero QC limits for CO are ± 0.04 ppm.

It can be assumed that the instruments are operating properly and no corrective action is required if precision and span instrument QC checks are less than $\pm 5\%$ from true and zero instrument QC checks are less than 5 ppb (O₃, NO₂, SO₂) or less than 0.04 ppm CO.

The “**warning level**” is reached when the nightly QC check response of any gaseous analyzer varies by more than $\pm 5\%$ from the expected value. At this level, instrument performance should be closely observed and/or corrective action taken before the analyzer reaches the action level.

The “**action level**” is reached when the precision/span nightly QC check response for Ozone varies more than $\pm 7\%$, other gaseous parameters vary more than $\pm 10\%$ or zero QC limits are exceeded. If the action level is reached, corrective action **MUST** be initiated. At the action level, calibration staff using certified transfer standards must verify that instrument drift is due to instrument malfunction and not caused by a problem

with the calibration system (i.e. fault O₃ generator or zero air supply). If it is determined that instrument drift problems are analyzer specific, corrective actions must be taken to bring the instrument within acceptable control limits. All corrective actions must be documented on the instrument maintenance sheets and recorded in the station log.

The ambient air monitoring data may be **corrected** if it has been collected by an instrument where instrument drift, as verified by calibration staff, has been greater than +/- 7% for Ozone and +/- 10% for other gases but less than +/-15% from true.

The ambient air monitoring data must be **invalidated** with an appropriate invalid code if it is determined that it has been collected by an instrument where drift has been greater than +/- 15% from true.

3. Ozone Calibration Changes

During semi-annual calibrations, the number of calibration points recorded can be reduced from 10 to 3 readings at each point since newer instruments do not drift as much and the low calibration point must be conducted near 50 ppb due to lower Federal standards. In addition, to meet lower Ozone standards, O₃ precision checks will be conducted at approximately 70 ppb (see paragraph 5).

4. Replacement of instruments – CO and SO₂

ARB is replacing older instruments which are no longer supported by the vendor. Replace the older Dasibi 3008 CO analyzers with new API 300EU (Trace Level) analyzers and change the operating range from 0-50 ppm to 0-5 ppm. Replace the older TECO 43 SO₂ analyzers with new TECO 43i TLE (Trace Level) analyzers and change the operating range to 0-100 ppb.

5. Reduction of auto-calibration precision and span QC check levels

Due to recent 40 CFR changes, 'QC checks should be relative to routine concentrations', the auto-calibration precision and span QC checks need to be reduced. See attached table for appropriate precision and span levels. To facilitate this change, the station calibrator dilution flow rate will be changed from 13 LPM to 10 LPM.

6. NOx Range Change

In order to align the NOx instruments to the Ozone instrument range, reduce the operating range from 1000 ppb to 500 ppb.

7. BAM Zero Check

As required in the new Met-One instrument manual, conduct annual zero filter checks on all BAMs.

8. Zero Air Accuracy

Verify the accuracy of the API 701 zero air generator by performing a zero air check semi-annually during site calibration. A zero air generator zero accuracy check procedure is currently being developed.

Please review the U.S. EPA QA Handbook Volume II, the CARB QA Manual Volume II, and the Air Monitoring Web Manual (<http://www.arb.ca.gov/airwebmanual/index.php>) for further information. If you have any questions regarding these changes please contact Jagjeet Arce at (916) 324-9653 or myself at (916) 322-0960.

Attachment

Sincerely,

/s/

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PQAO Point of Contact

cc: Alberto Ayala, Chief
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Quality Assurance Section

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Parameter / Item	Change Needed	Reason	
Hockey Pucks	Replace with original Teledyne-API Filter Housings	40 CFR 58 Part G, Section 9 - cannot use stainless steel.	
Ozone Only	Change data QC warning level control limit from 10% to 5%	Quality Control Limits for precision and span checks need to be changed due to Lower Federal standards (40 CFR 58) and CARB QA Manual Volume II requirements.	
Ozone Only	Change data QC action level control limit from 15% to 7%		
Ozone Only	Change data correction range from 15% - 25% to 7% - 15 %		
All Gases (except Ozone)	Change data QC warning level from 10% to 5%		
All Gases (except Ozone)	Change data QC action level control limit from 15% to 10%		
All Gases (except Ozone)	Change data correction range from 15% - 25% to 10% - 15%		
All Gases	Change data invalidation range from >25% to >15%		
Ozone	Conduct low calibration point at 50 ppb during semi-annual calibrations		Lower Federal standards.
	Change calibration data recording during semi-annual calibrations from 10 to 3 readings at each point	New instruments are more stable and don't drift like older models.	
Total Oxides of Nitrogen	Reduce operating range from 1000 ppb to 500 ppb.	Align NOx instrument range to O3 instrument range.	
Carbon Monoxide	Replace older Dasibi 3008 analyzers with new API 300EU (Trace Level) analyzers	Need for up to date comm. protocols. Older instruments are no longer supported by vendor.	
	Change operating range from 0-50 ppm to 0-5 ppm		
Sulfur Dioxide	Replace older TECO 43 analyzers with new TECO 43i TLE (Trace Level) analyzers	Need for up to date comm. protocols. Older instruments are no longer supported by vendor.	
	Change operating range to 0-100 ppb		
Station Calibrator	Reduce dilution flow from 13 LPM to 10 LPM.	Most stations only require 3 LPM of dilution air or less. Easier on zero air generators.	
	Ozone	Reduce QC check from 90 ppb to ~70 ppb.	Reduce auto-calibration precision QC check for all gaseous analyzers due to lower Federal Standards (40 CFR 50 App A sec 3.2.1), 'QC checks should be relative to routine concentrations'
	NOx/NO	Reduce QC check from 180 ppb to ~100 ppb.	
	CO	Reduce QC check from 9 ppm to ~1 ppm.	
	SO2	Reduce QC check from 95 ppb to ~15 ppb.	
	NMHC	No Change	Reduce auto-calibration span QC check for all gaseous analyzers due to lower Federal Standards (40 CFR 50 App A sec 3.2.1), 'QC checks should be relative to routine concentrations'
	Ozone	Reduce QC Check from 400 ppb to 320 ppb.	
	NOx/NO	Reduce QC check from 680 ppb to ~400 ppb.	
	CO	Reduce QC check from 40 ppm to ~4 ppm.	
	SO2	Reduce QC check from 400 ppb to ~90 ppb.	
NMHC	No Change		
Zero Calibrator	Verify the accuracy of API 701 by performing a zero air check semi-annually during site calibration	U.S. EPA recommendation	
PM2.5 Continuous	Conduct annual zero filter checks on all BAMs	Required in new Met-One instrument manual. Applies to both old and new BAMs.	