



# Your NCore Site Is Approved! Now What?!





## **Disclaimer:**

**Mention of trade names or commercial products during this training session does not constitute endorsement or recommendation for use.**



# Impending Actions

- OAQPS monitoring group has completed review of the NCore portion of many annual monitoring network plans
- Approval (or conditional approval) letters will be forthcoming for many sites in the very near future, from Richard Wayland, Director – Air Quality Assessment Division
  - Addressed to your Air Director and copied to the EPA Region
- Your Air Director may come looking for you soon about this letter

**FROM: Richard Wayland**  
**Director - Air Quality Assessment Division**  
**Office of Air Quality Planning and Standards**  
**U.S. EPA**  
**RTP, NC 27711**

**SUBJECT: EPA Approval of Site Name,**  
**AQS ID XXXXXXXXX as a National Core**  
**(NCore) Network Station**

**TO: Air Director**  
**XXXXX, XX 27711**

***This letter transmits the Environmental Protection Agency's approval of the proposed XXXXXXXX NCore station, XXXXXXXXXX, AQS# XXX-XX-XXXX. This NCore station approval is required according to the Ambient Air Monitoring Regulations<sup>[1]</sup>. Per 40 CFR 58.11(c), the NCore network design and changes are subject to the approval of the Administrator, which has been delegated to the Director of the Air Quality Assessment Division in EPA's Office of Air Quality Planning and Standards (OAQPS).***



# What Comes Next?

- Complete equipment procurement (as needed), acceptance, and deployment
- Gain operational experience and a compile a quality control track-record
  - Trace gases, new PM samplers, meteorology
- Develop/revise SOPs and QAPP for new measurements
- Train station operators and brief QA staff
- Commence data reporting to AQS and AirNowTech when a “comfort level” is achieved



***NCore Deadline  
January 1, 2011***



# Implementation → Operations

## Issue: Implementing Trace Gas Measurements

- What ranges to operate trace-level CO, SO<sub>2</sub>, and NO<sub>y</sub> monitors
  - Regulations don't specify – base decision on analysis of typical ambient concentrations and evaluation of “off-scale” risk
  - Decision affects selection of QC check concentration and ranges for periodic performance audits
  - Consider related decisions on gas mixing capabilities (zero air, calibrators, gas standards)



# Example Calibration and QC Check Concentrations\*

\* For a typical urban NCore station

Item	CO	SO <sub>2</sub>	NO <sub>y</sub>
Full Scale Range	0 to 5000 ppb	0 to 100 ppb	0 to 200 ppb
Cylinder concentration	200 – 300 ppm	10 - 15 ppm	10 – 30 ppm
Calibration ranges			
Zero (action tolerance)	± 40 ppb	± 0.100 ppb	± 0.050 ppb
Level I Span (action tolerance)	4500 ppb ± 10%	90 ppb ± 10%	180 ppb ± 10%
Mid Point Span	2500 ppb	50 ppb	100 ppb
Precision Level	250 - 500 ppb	5 - 10 ppb	20 - 40 ppb
Measurement Uncertainty Goal	15% upper 90 percent confidence limit for CV	10% upper 90 percent confidence limit for CV	10% upper 90 percent confidence limit for CV



# NCore Calibration and QC Checks Requirements and Recommendations

- QC Checks (Precision):
  - Required (40 CFR 58 Appendix A) by:
    - Minimum: Once every two weeks
  - Daily set of points (zero, span, precision) recommended
- Multi-point calibrations:
  - Quarterly (according to TAD) or if drift is an ongoing issue
  - Draft MQO Table - 1 in 6 months, upon instrument startup, repair, or exceeded drift tolerance
- MDL Tests (New recommendation):
  - As part of instrument acceptance, then annually or after major analyzer repair

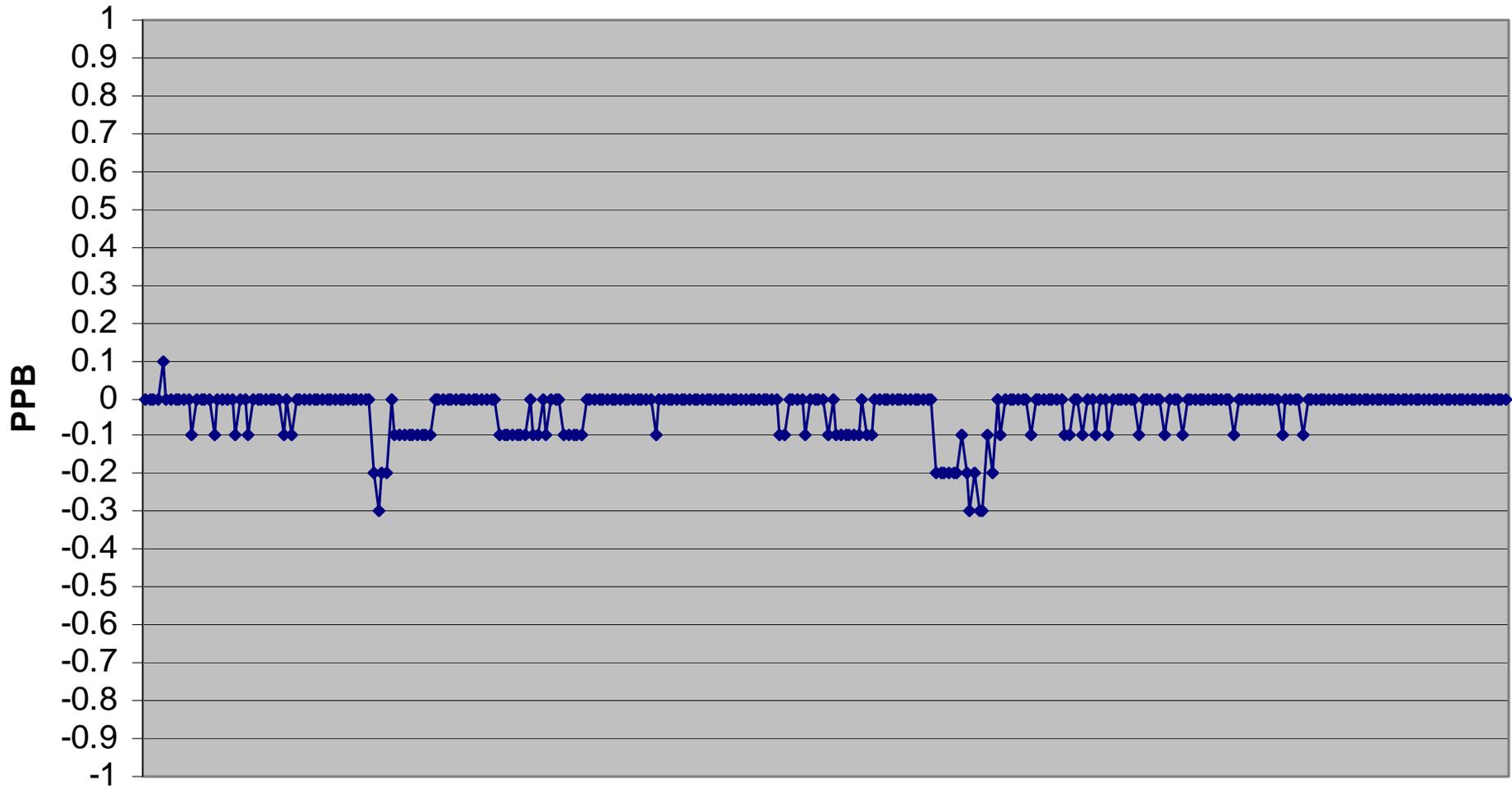


# Assessing QC Performance for Trace Gas Measurements

Using EPA's 2008 data from the Burden's Creek site as an example

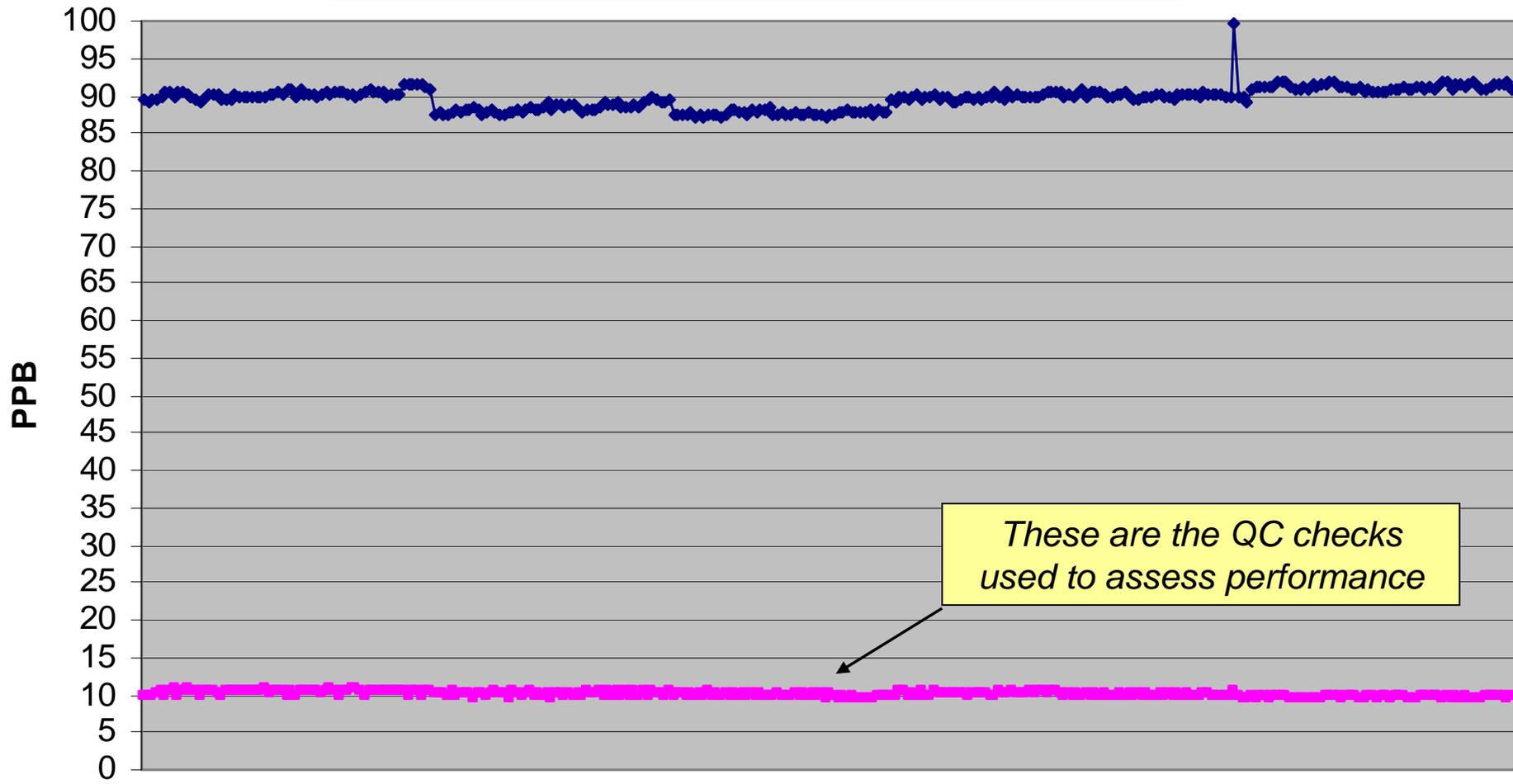


# SO2 Control Chart - Zero Response



# SO2 Control Chart - QC Response

—◆— Burdens Creek Span    —■— Burdens Creek Precision



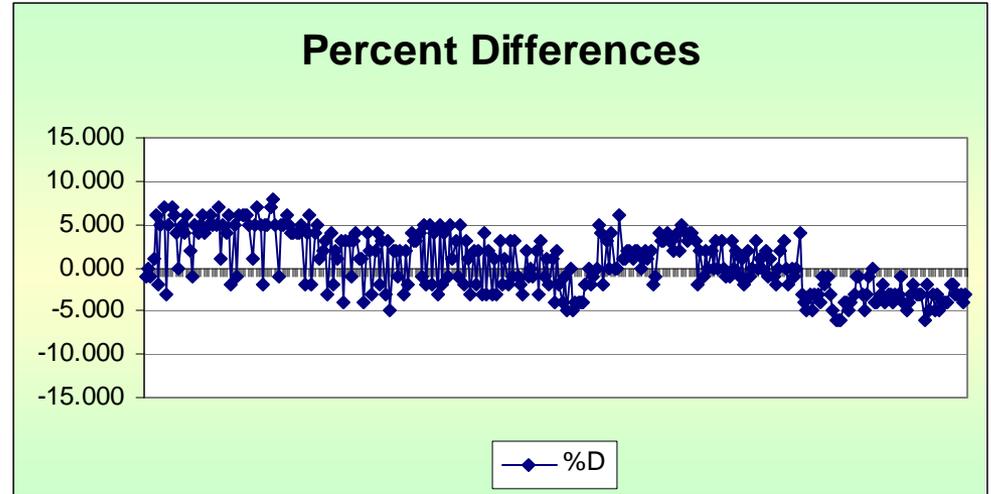


# Assessment Using EPA DASC Tool

<http://www.epa.gov/ttn/amtic/parslist.html>

## DQO Goal for NCore Gases

In order to detect annual trends of 5 percent or greater across the 75 station NCore network, the SO<sub>2</sub> and NO<sub>y</sub> instruments should maintain the coefficient of variance (CV) at **< 10%**, bias at **+/- 10%** and annual data completeness of **> 90%**.



CV <sub>ub</sub> (%)	Bias (%)
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n	S <sub>d</sub>	S <sub>d2</sub>	Σ d	"AB" (Eqn 4)
316	3.353	11.423	919.000	2.908
n-1	Σd	Σd <sup>2</sup>	Σ d  <sup>2</sup>	"AS" (Eqn 5)
315	159.000	3621.000	3621.000	1.735

CV (%) (Eqn 2)  
3.54

Bias (%) (Eqn 3) Both Signs Positive  
3.07 FALSE  
Signed Bias (%) Both Signs Negative  
+/-3.07 FALSE

Upper Probability Limit	Lower Probability Limit
7.07	-6.07

*Measurements met DQO Goal over a full year of QC checks*



# AQS Metadata Actions for NCore

Complete instructions included in attachment B to approval letter

- Local Site Name – Although not required, we are asking you to populate this field with a descriptive name for your NCore station.
- Latitude and Longitude – Ensure the correct “Horizontal Datum” is populated with the coordinates. Monitoring agencies are also encouraged to validate these coordinates with commercially available GPS units and/or by reviewing publically available satellite imagery such as on Google™ Earth.
- Monitor Type – Each monitor operating at an NCore station will typically have at least **two** monitor types associated with it.
  - **EPA-OAQPS** will be responsible for adding “**NCore**” as a monitor type for NCore measurements being reported at each approved NCore station. Note: we will also remove “Proposed NCore”, where applicable. For NCore measurements that come on-line and begin reporting after the initial round of NCore monitor type associations, EPA-OAQPS will periodically review NCore station data in AQS and add a monitor type of NCore for any remaining required NCore measurements being reported, but not already associated with a monitor type of NCore.
- Each monitoring agency **is** responsible for populating a monitor type that provides the “Administrative Classification” of the monitor. For NCore stations this will largely be a monitor type of **SLAMS** since the majority of NCore stations are operated by State and local agencies.



# AQS Metadata Actions for NCore

Complete instructions included in attachment B to approval letter

- Method Code - Each data record includes a 3 digit method code that associates detail on the sampling and analysis method with a piece of data. Of particular note for NCore trace gas measurements of CO, SO<sub>2</sub>, and NO/NO<sub>Y</sub> monitoring agencies should be utilizing the appropriate method code associated with the trace gas measurements that provides a substantially improved detection limit.
  - Default Method Detection Limits (MDL's) are provided for each commonly used trace gas method in the AQS data base. Monitoring agencies can also submit their own MDL, where applicable. Many, but not all of the method codes associated with trace gas instruments have a method code in the range between 500 and 600
  - Use of specific trace level method codes will support ambient data analysis and QA needs to segregate data from “legacy” methods

*Table of Select AQS Metadata associated with NCore*

AQS Metadata Field	Location of Metadata	Are Multiple Options Allowed	Does AQS Require this Field?	Expected Option(s) for NCore	Notes
Local Site Name	Site Level	No	No	We are requesting you identify your site name in AQS.	Please use a descriptive name.
Latitude	Site Level	No	Yes	8 digits, including 6 past the decimal place with a positive sign indicating above the equator (+xx.xxxxxx)	Ensure the correct “Horizontal Datum” is populated with the coordinates
Longitude	Site Level	No	Yes	9 digits, including 6 past the decimal place with a sign (+xxx.xxxxxx)	
Primary Monitor Periods	Site Level	No	Yes, but only for 88101	Always populate for PM <sub>2.5</sub> (parameter code 88101)	
Monitor Type	Monitor Level	Yes	Yes	NCore	EPA-OAQPS will update or add “NCore” as a monitor type for each approved NCore station
				SLAMS, Tribal Monitors, Non-EPA Federal, or CASTNET Other Monitor types such as IMPROVE, PAMS, or Trends Speciation may also apply	Monitors at each station should also identify one of the Monitor Types on the left.
Measurement Scale	Monitor Level	No	No – however, we are requesting you populate this field	Neighborhood Scale 500M to 4KM Urban Scale 4 KM to 50 KM	Expect one of these for monitors at Urban or Suburban Stations
				Regional Scale 50 to hundreds KM	Expected for monitors at Rural stations
Monitoring Objective	Monitor Level	Yes	Yes	Population Exposure Upwind Background, General Background, Regional Transport, or Extreme Downwind	For monitors at all Urban and Suburban NCore Stations Expect one of these for monitors at Rural NCore Stations
				Other Monitoring Objectives may apply for either Urban or Rural NCore stations; however, one of the above should be utilized at a minimum	
Area Represented	Monitor Level	Only one type of area (CBSA or CSA) can be listed per objective	No – however, we are requesting you populate this field	CBSA Represented	Urban Stations should use one of the following
				CSA Represented Rural stations should not populate this field.	
Sample Frequency	Monitor Level	No	Required only for PM	Relevant sample frequencies include: 1 Every Day 3 Every 3 <sup>rd</sup> day	PM monitoring is required at a minimum frequency of one in every third day.



# Trace Level Method Codes

<http://www.epa.gov/ttn/amtic/criteria.html>

Parm Code	Parameter Desc	Standard Units	Meth Code	Duration Code	Sample Analysis Desc	Fed MDL	Summary Scale	Equivalent Method Desc	Reference Method Id
42401	Sulfur Dioxide	007	560	1	PULSED FLUORESCENT	0.00020	4	THERMO ELECTRON 43C-TLE	EQSA-0486-060
42401	Sulfur Dioxide	007	592	1	Ultraviolet Fluorescence	0.00020	4	Ecotech EC9850T	EQSA-0193-092
42401	Sulfur Dioxide	007	600	1	Ultraviolet Fluorescence	0.00020	4	Teledyne API 100 EU	EQSA-0495-100
42101	Carbon Monoxide	007	554	1	Gas Filter Correlation Thermo Electron 48C-TLE	0.02000	3		
42101	Carbon Monoxide	007	588	1	Gas Filter Correlation	0.02000	3	Ecotech EC9830T	RFCA-0992-088
42101	Carbon Monoxide	007	593	1	Gas Filter Correlation Teledyne API 300 EU	0.02000	3	API Model 300 EU	RFCA-1093-093
42600	Reactive Oxides Of Nitrogen	007	574	1	Chemiluminescence Thermo Electron 42C-Y	0.00005	4		
42600	Reactive Oxides Of Nitrogen	007	590	1	Chemiluminescence Ecotech EC9841T	0.00005	4		
42600	Reactive Oxides Of Nitrogen	007	599	1	Chemiluminescence Teledyne API 200 EU/501	0.00005	4		

*Check latest list of designated reference and equivalent methods – updated periodically by EPA/ORD – newer approvals often utilize the identical reference or equivalent method description from the initial FR notice*



# Measurement of PM<sub>10-2.5</sub> Mass

Measurement of PM<sub>10-2.5</sub> mass is **required** and can now be accomplished with one of several recently approved Federal Reference Methods (FRM) or Federal Equivalent Methods (FEM) described in the table below. Monitoring agencies should include one of these methods in their next annual monitoring network plan and have the method operational by January 1, 2011. An annual monitoring network plan submitted to a Regional Office next summer does not need to seek EPA Administrator approval of a newly identified PM<sub>10-2.5</sub> mass FRM or FEM, so long as the NCore station has already been approved.

Manufacturer	Model	Method
BGI, Inc	PQ200 Sampler Pair	Manual Reference Method: RFPS-1208-173
Thermo-Fisher, Inc.	Model 2000 PM10-2.5 Sampler Pair	Manual Reference Method: RFPS-0509-175
Thermo-Fisher, Inc.	Model 2025 PM10-2.5 Sequential Air Sampler Pair	Manual Reference Method: RFPS-0509-177
Thermo-Fisher, Inc.	2000-D Dichotomous Air Sampler	Manual Equivalent Method: EQPS-0509-178
Thermo-Fisher, Inc.	2025-D Dichotomous Air Sampler	Manual Equivalent Method: EQPS-0509-180
Met One, Inc.	BAM-1020 PM10-2.5 Measurement System	Automated Equivalent Method: EQPM-0709-185

*Report PM<sub>10-2.5</sub> data (actual difference) using parameter code 86101 – PM<sub>10-2.5</sub> Local Conditions*



# AIRNOW Actions for NCore

- All of the continuous parameters can be reported to AIRNOWTECH in real-time
- This action is not required but strongly encouraged
- Check with your DAS vendor for specific instructions – attend the Data Acquisition and Reporting session on Wednesday for AIRNOW data transfer updates

The screenshot shows the AIRNOW TECH website interface. At the top, there is a navigation bar with the AIRNOW TECH logo on the left and a menu with items: Home, Agencies, Sites, Navigator, Data, Forecasts, Polling, Notifier, and Resources. To the right of the menu, it says "Welcome, Lewis Weinstock!" with links for "My Account" and "Sign Out". Below the navigation bar, there is a breadcrumb trail: "Agencies > EPA Office of Air Quality Planning and Standards > Sites". A link "Show All Agencies" is also visible. A "Color Legend" box is overlaid on the page, defining the status colors: Green = Current, Yellow = 2 to 6 hrs old, Red = over 6 hrs old, Grey = Unknown status, and Black = Needs Attention. Below the legend is a "Parameter Reference" table with the following columns:

ID	Agency	Active Sites	Ozone	PM <sub>2.5</sub>	CO	NO <sub>2</sub>	PM <sub>10</sub>	SO <sub>2</sub>	NO	NO <sub>x</sub>	NO <sub>y</sub>	NO <sub>2_Y</sub>	NO <sub>2_T</sub>	NO <sub>3</sub>	SO <sub>4</sub>	SO <sub>2_T</sub>	CO <sub>T</sub>	EC	OC	BC	UV-AETH	Temp.	WS	WD	R.Hum.	Bar. Pr.	S. Rad.	Precip.	Dewpt.	Visib.	SO <sub>2_15</sub>
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# Questions

