

## Sections 3.1- 3.3

3.1. PQAOs

3.2. Required Agency level Measurement Quality Checks, Objectives and Audits; Overseen and supported at the National level under Section 2.4 NPAP and 2.6 PGV & SRP

3.3. QA for PM methods



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## Section 3.1 PQAO: The Primary Quality Assurance Organization

- Is responsible for a set of stations that monitors the same pollutant and for which data quality assessments can logically be pooled and reported
- Does not have to be the old “Reporting Organization”; in fact, may consolidate two or more



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## Section 3.1 PQAO Characteristics

- (a) Site operation by a common team of field operators according to a common set of procedures;
- (b) Use of a common QAPP or standard operating procedures;
- (c) Common calibration facilities and standards;
- (d) Oversight by a common quality assurance organization; and
- (e) Supported by a common management, laboratory or headquarters.



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# Section 3.2

## Gaseous Pollutants

### 3.2.1 MQOs



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# Performance Evaluation-What and Why

Performance evaluations (PEs) are a type of audit in which the quantitative data generated in a measurement system are **obtained independently** and compared with routinely obtained data to evaluate the proficiency of an analyst, or a laboratory. In a sense, an audit is a “blind” calibration, for which the concentrations are NOT KNOWN to the station operator, who uses the station calibration to say what he/she thinks the concentrations are.

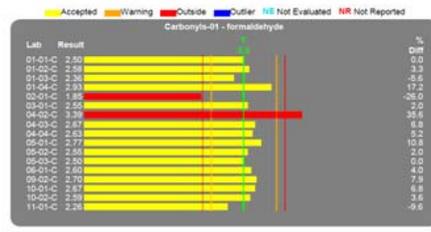
**NPAP-TTP**



**PEP**



**Protocol Gas**



**NATTS PT & ORIA Round Robins**



**SRP**



**PAMS Cylinders**



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# 40 CFR Part 58, App. A – Specifies PE Requirements

- Section 2.4- National Requirements
- Section 3.2-Agency Requirements
- [Relationship- 2.4](#) provides for independent quantitative verification of agency (3.2.2) implementation
- The 2.4 goal for gaseous pollutants is total network checking in 5 years (~20%/yr)
- Now includes SPM sites whose data agencies want used for EPA decisions. Question: Does this mean ALL SPM sites? Answer: NO!



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# NPEP

EPA's National Performance Evaluation Programs (NPEP) Indicate the amount of NIST Traceability (which is ~ National Comparability) by delivery of independently generated and analyzed Proficiency Test samples (PTs), consisting of :

- NPAP: Mailed BOA & TTP; Certification of Calibration Stds vs. NIST (SRP & Protocol Gas)- Mark Shanis
- PEP and Speciation PM Programs- Dennis Crumpler
- (NATTS PT Air Toxics Programs- Dennis Mikel)

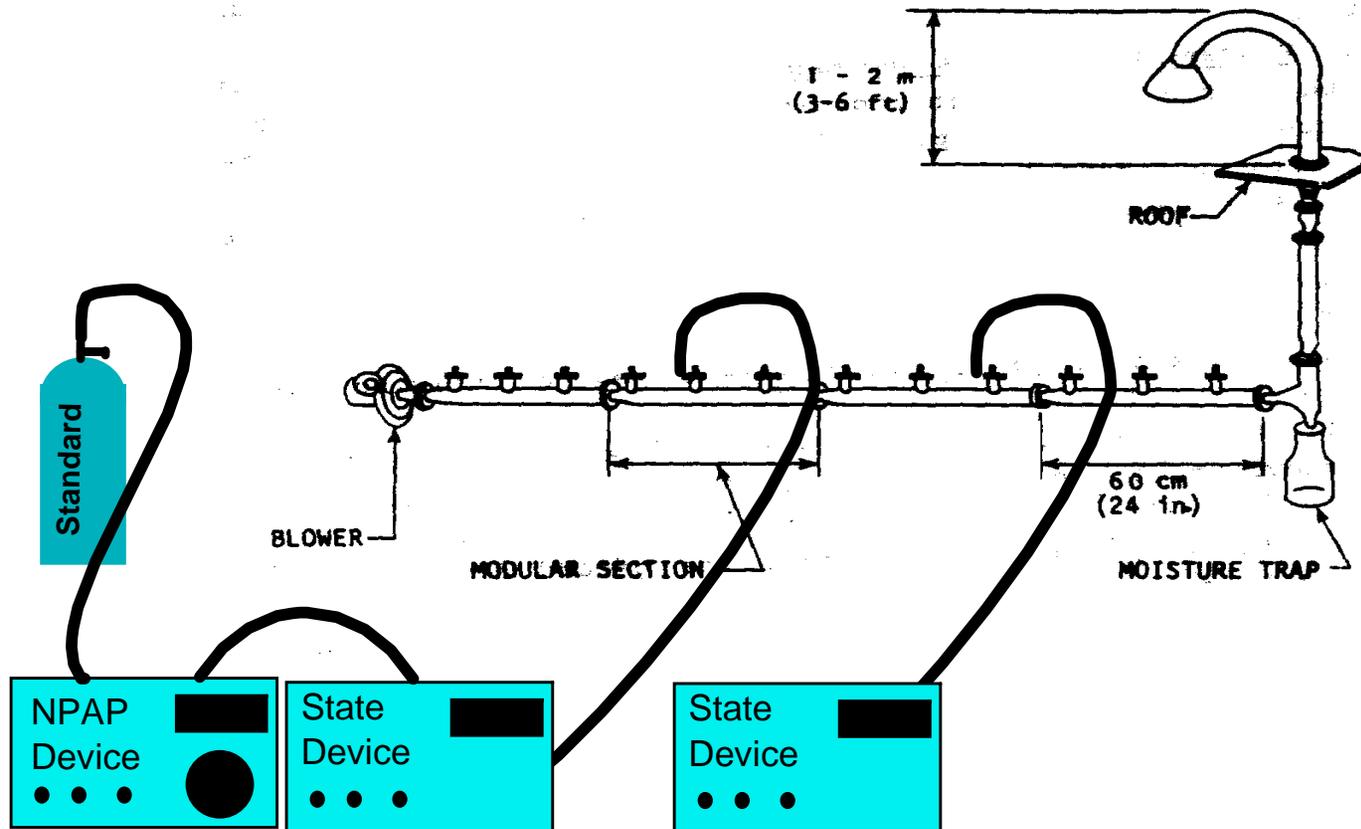


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# NPAP-Mailed, Back of the Analyzer(BOA)



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# NPAP Traceability/Comparability Programs

- NPAP 1980-2005 rugged, simple gas & flow altering devices; Pb Strips, PAMS VOCs&HCOR
  - Checked by central EPA RTP contractor against NIST standards, then shipped (“Mailed NPAP”)
  - Used by SLT agency station operator, Back Of Analyzer
  - SLT Agency results sent to central contractor
  - Contractor’s vs SLT Agency results sent back
  - Time lag could be weeks to a month
  - EPA vs EPA (contractor) Accuracy of 5% vs NIST to ensure EPA ability to measure 10% or > bias of agency calibrations, BOA

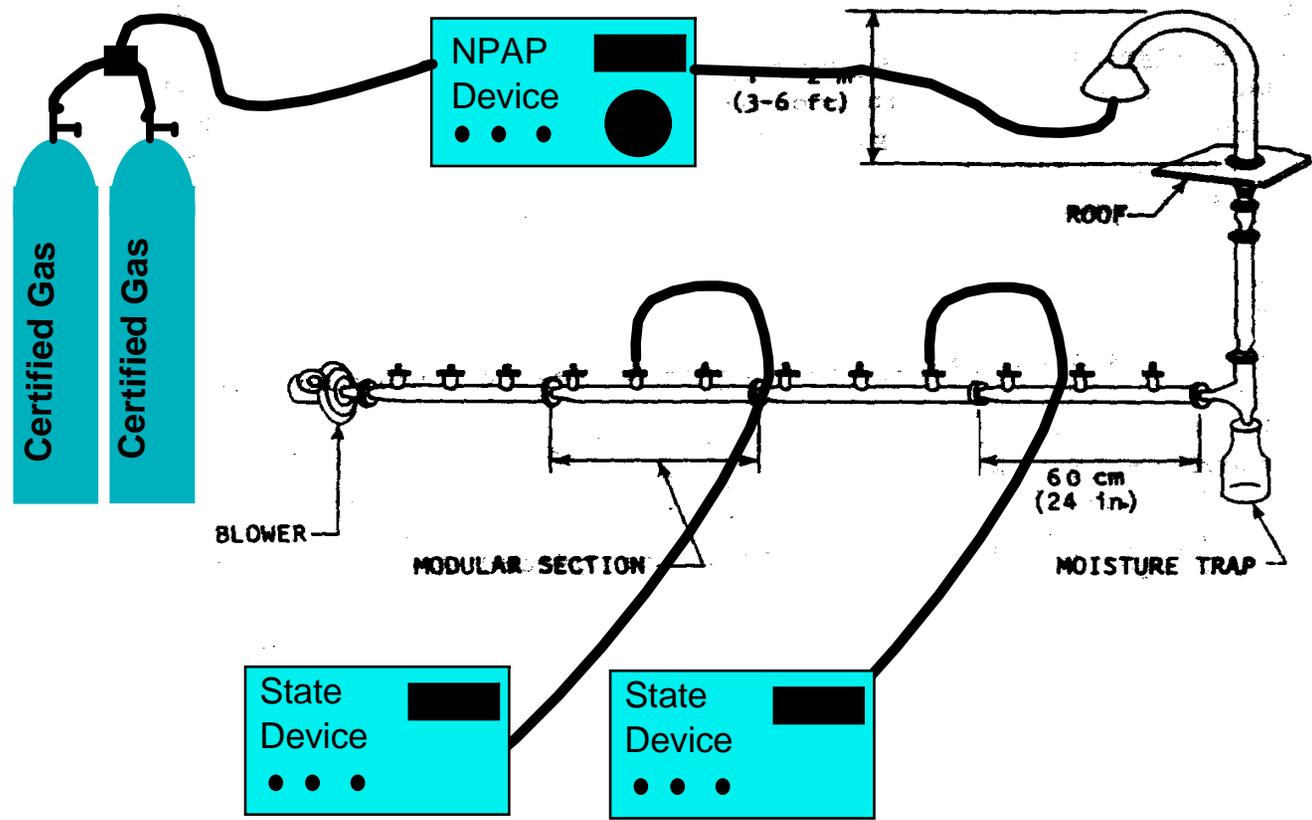


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# NPAP: Through the Sampling Inlet, or Probe (TTP)



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# NPAP TTP

- NPAP TTP Pilot funded, OK'd 2001, purchases in 2002, deliveries in 2003; 3 in field in 2004
- Through the sampling inlet (TTP), not BOA
- Generation, short, direct CO analyzer calibration, and then analysis just prior to audit;
- Independent, EPA trained and managed auditors bring test gases to sampling sites
- Preliminary results to agency operator ON SITE
- EPA TTP vs EPA TTP bias between 2 and 5%
- Inter-Regional sharing, state implementation



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# 3 NPAP TTP Mobile Platform Types



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# NPAP TTP Trailer Platform- Exterior Features



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# NPAP TTP Trailer Platform – Interior Features



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# TTP Connection Set-up:

- The steel hose (Top) is from the audit trailer
- The teflon hose (left) goes to the site monitor
- The white hose (right) serves as a vent (needed due to effects of P on Concentration)



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# Some Station Access & Connections Are Easier



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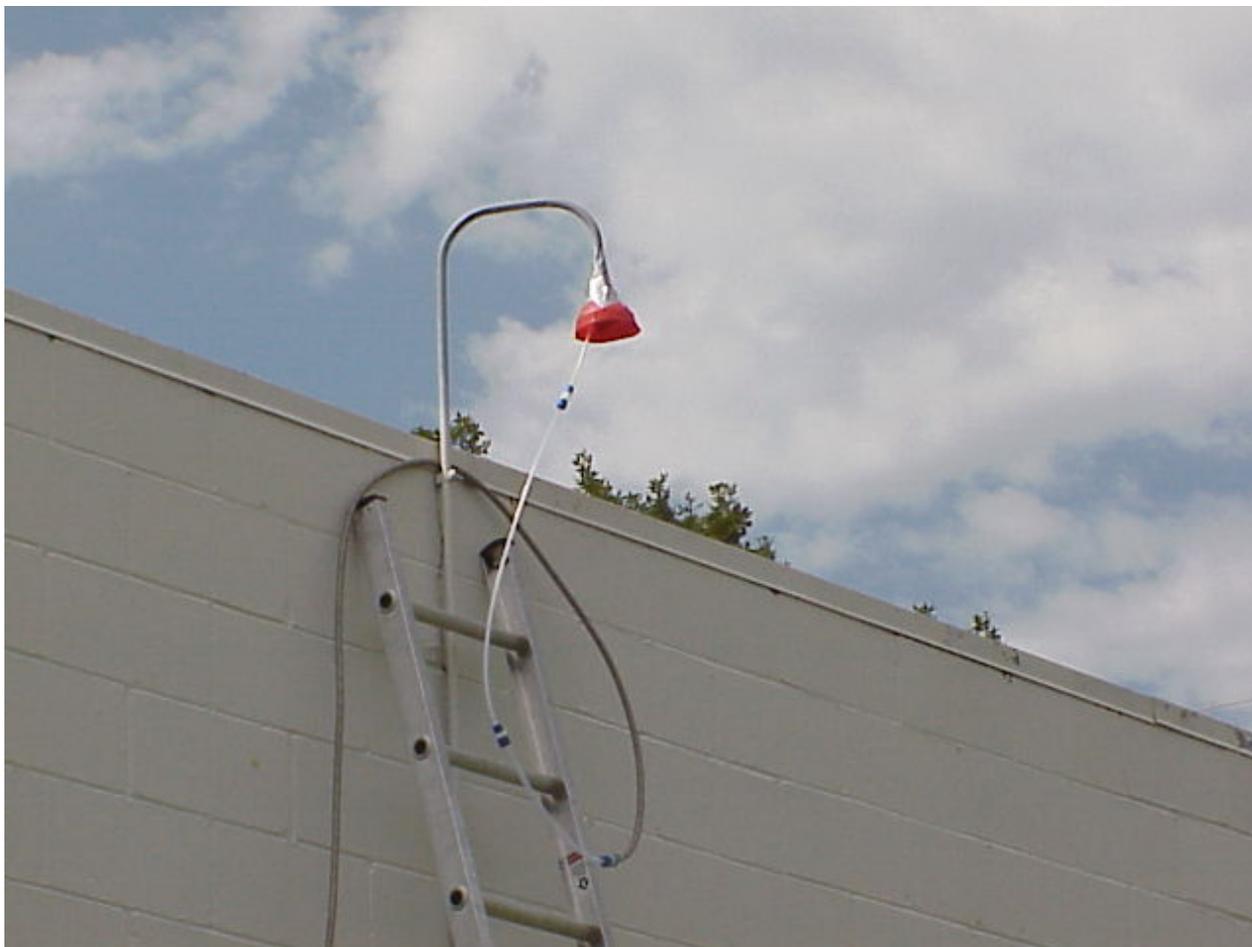




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# PROBLEMS NOTED AT SITES; or, WHY DO TTP?

- There have been several findings that could lead to the reduction in significant problems during future audits.

- dirty manifold
- dirty connectors
- leaky joints
- difficult access
- dirty sample lines
- dirty particulate filter holders



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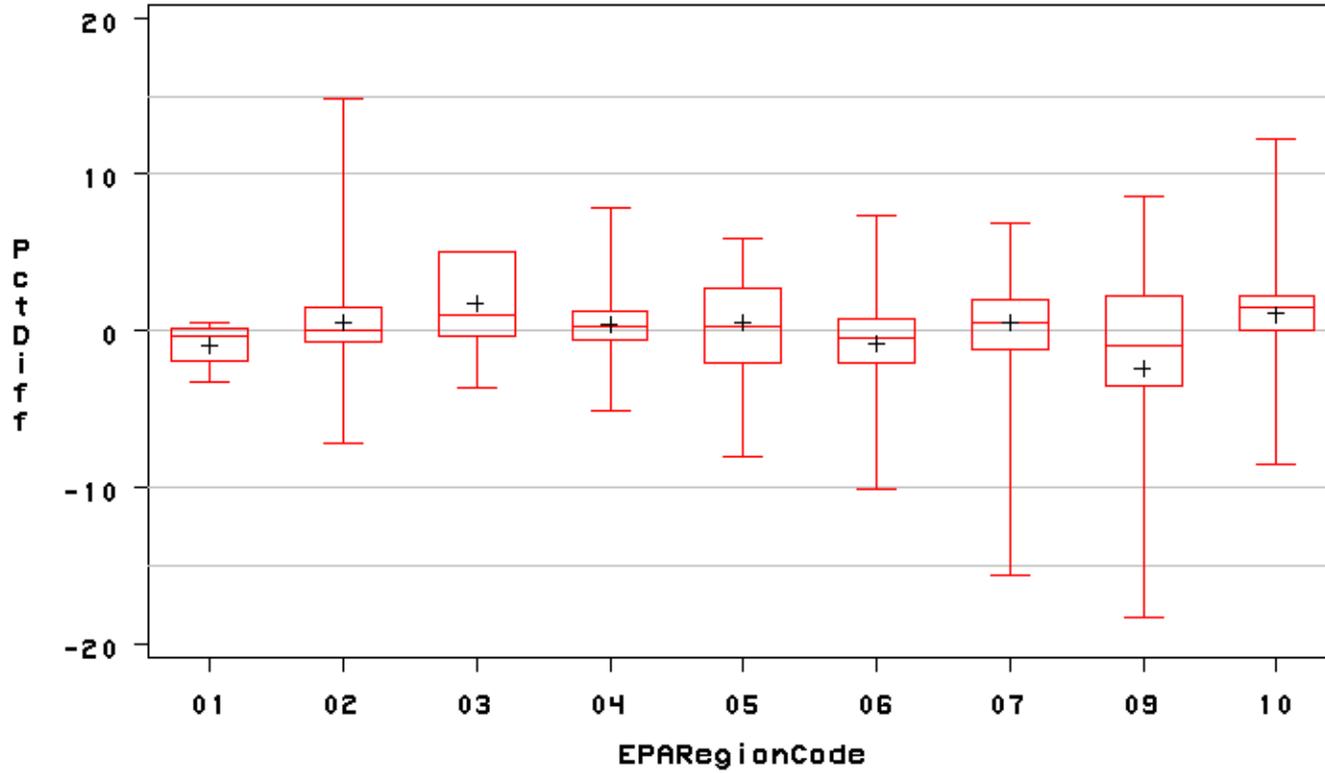
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# NPAP Percent Difference by Audit Level for Ozone

Level 1 Num=3



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# %Completed TTP PE Out of 100% in 5 Yrs: Expect 60% in 3 Yrs; as of 12/07

Region	Total of 05, 06, & 07	Total # Sites	% Completed
1	13	62	21%
2	53	41	129%
3	45	136	33%
4	84	178	47%
5	117	249	47%
6	87	86	101%
7	99	42	235%
8	24	50	48%
9	92	86	106%
10	35	43	81%
<b>Total</b>	<b>649</b>	<b>973</b>	<b>67%</b>



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# NPAP-TTP Summary

- Test gases delivered in mobile labs operated by independent EPA auditors
- Delivery platforms are varied, shared and flexible- trucks, trailers, and case-based
- Tests the whole sampling flow path
- Results verified by analysis ON SITE and provided before leaving the site
- Trouble shooting and follow-up can be same day; help provided coast-to-coast



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# CHANGES-National PEs

- CFR now requires independence and adequacy, in QAPPS, including resources
- Detailed Guidance provided, and Implementation Decision required
- Decision Updated every year
- Certified by Region every year
- Networks Covered by this requirement: SLAMS, PSD; Some SPMs (new); NCORE starting



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# Changes for SLT Agency PEs; in App. A, Sxn. 3.2.2.2

- No Good Deed Goes Unpunished
- Agency choices for Audit ranges were expanded to provide flexibility as typical values go lower
- AQS Reporting requires 3 digits
- Majority of new ranges have 2 digits in their ranges
- Result: gaps between some ranges



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# New Challenges: Changes in Agency PE Requirement Options (10/06): Note GAPS!

AUDIT LEVEL	CONCENTRATION RANGE, ppm			
	O <sub>3</sub>	SO <sub>2</sub>	NO <sub>2</sub>	CO
1.....	0.02 – 0.05	0.0003-0.005	0.0002-0.002	0.08 – 0.10
2.....	0.06 – 0.10	0.006 – 0.01	0.003 – 0.005	0.50 – 1.00
3.....	0.11 – 0.20	0.02 – 0.10	0.006 - 0.10	1.50 – 4.00
4.....	0.21 – 0.30	0.11 – 0.40	0.11 – 0.30	5 – 15
5.....	0.31 – 0.90	0.41 – 0.90	0.31 – 0.60	20 - 50



PARAMETER	LEVEL	LOWER_LIMIT	UPPER_LIMIT
CO	1	0.08000	0.24999
CO	2	0.25000	1.24999
CO	3	1.25000	4.49999
CO	4	4.50000	17.49999
CO	5	17.50000	50.00000
NO2	1	0.00020	0.00299
NO2	2	0.00300	0.00599
NO2	3	0.00600	0.10999
NO2	4	0.11000	0.30999
NO2	5	0.31000	0.60999
O3	1	0.02000	0.05999
O3	2	0.06000	0.10999
O3	3	0.11000	0.20999
O3	4	0.21000	0.30999
O3	5	0.31000	0.99999
SO2	1	0.00030	0.00599
SO2	2	0.00600	0.01999
SO2	3	0.02000	0.10999
SO2	4	0.11000	0.40999
SO2	5	0.41000	0.90999



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# Calibration Gas Standard Certification Programs

Programs for periodically comparing gas calibration standards to NIST – SRP, PGVP-And the Secret Word for today is **TRACEABILITY**



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# TRACEABILITY –TO NIST

- Applies to the comparability of any US monitoring organization's reported value for one of its calibration standards to the equivalent NIST value
- Is about the component and total mean and variability of these values occurring as result of serial intercomparisons between a NIST standard and the organization's standard



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# Standard Reference Photometer (SRP)-Certification Program

- We can't keep ozone in a container, so...
- NIST has made ozone SRPs for the world
- EPA has a US network of 2 in RTP& 9 in the Regions; 1 EPA RTP SRP is used to link the Regions to the NIST SRPs
- 1 of the 2 NIST SRPS links US to the world
- Addressed in 1<sup>st</sup> Ozone Guidance Revision since 1979-see AMTIC, May, 2009



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# Schedule for SRP Verifications and Upgrades-Who, What, Where, When

PRIORITY	DUE DATE	SRP	Region	Location	Name	Bias Upgrade
1	09/12/09	1	RTP	RTP, NC	Scott Moore	<del>09/12/08</del>
2	09/12/09	7	RTP	SRP7 to NIST	Scott Moore	<del>09/12/08</del>
3	03/18/09	4	10	Sacramento, CA	Jerry Freeman	11/15/09
4	03/21/09	36	9	Richmond, CA	Barbara Bates	12/15/09
5	10/14/09	6	5	Chicago, IL	Scott Hamilton	01/15/10
6	10/29/09	8	8	Golden, CO	Michael Copeland	02/15/10
7	04/17/10	10	4	Athens, GA	Mike Crowe	<del>04/15/09</del>
8	05/15/10	3	2	Edison, NJ	Avraham Teitz	05/15/10
9	06/01/10	9	1	N. Chelmsfield, MA	Chris St. Germain	<del>06/01/09</del>
10	07/15/10	13	7	Kansas City, KS	James Regehr	07/15/10
11	09/16/10	5	6	Houston, TX	John Lay	09/16/10



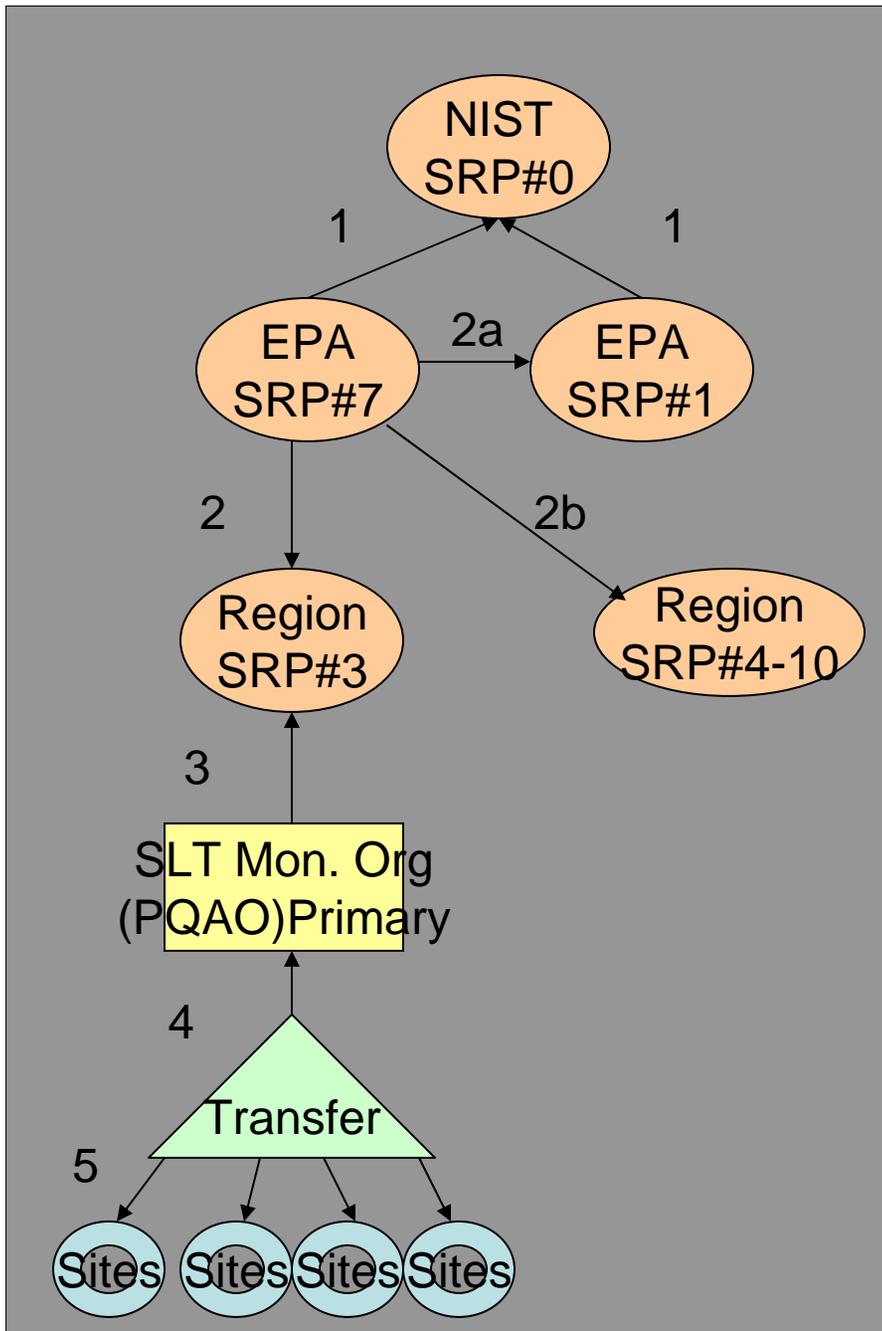
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## O3 Traceability Scenario- Terms from pre-05/09 \*

1. EPA SRP 1 & 7 certified at NIST each year
    - SRP #7 travels to Regions
    - SRP # 1 stays home
  2. SRP # 7 certifies Regional SRPs
    - a- Upon completion of one audit SRP #7 gets verified by SRP #1
    - B- before going to next Region
  3. SLT Mon. Org.(PQAO) brings it's **local primary standard (LPS)** to Region SRP
    - LPS stays at lab
  4. SLT Mon. Org. (PQAO) brings **transfer standard (TS)** in to certify against LPS and then takes TS to site; some also bring TS to Regional SRP
  5. TS certifies site's **working standard**
- \*Note: Review & comment now on 05/09 draft Guidance Revision, while it is still a draft, & not in CFR**



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# Protocol Gas Verification Program

- EPA requires gas calibration standards to be of the EPA Protocol grade
- The Protocol is on an EPA website; has parts G1 and G2; can use as required specifications for purchases-but contains no required % D; gives SLTs flexibility
- Reactive NAAQS gases (and others) should be rechecked using the G1(direct) or G2( by dilution), as appropriate
- EPA did a Verification audit program in the 90's; stopped late 90's; several "one time" blind verification audits have been done since then by a # of national groups;
- EPA is now looking at alternatives; aims to resurrect/ provide options agencies can use in 2010



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# AA-PGVP Expectations

- EPA Covers cost of lab equipment, SRMs and analysis
- Monitoring organizations expected to purchase PG and fund the shipping/transporting of the gaseous standards to analytical verification laboratory.
- EPA will cover the costs of shipping cylinders back to the appropriate monitoring organization.
- **EPA needs to know who is participating**
  - Look for Survey from NAACA or ITEP Representative



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# Protocol Gas Verification Program Timeline

- OAQPS and Regions 7 and 2 have agreed to implement the program.
- A revised Implementation Plan was posted on AMTIC for review and comment in July 2009, at:  
<http://www.epa.gov/ttn/amtic/aapgvp.html>.
- Region 7 and 2 will produce Draft SOPs by Mid December; OAQPS will develop the QAPP..
- A NACAA Representative and a Tribal Representative have volunteered to distribute a survey to ascertain agency participation
- Program start is anticipated end of 1st Quarter (March-April) 2010.



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