



CASTNET SUMMIT

A REGIONAL PERSPECTIVE...

SEPTEMBER 2019



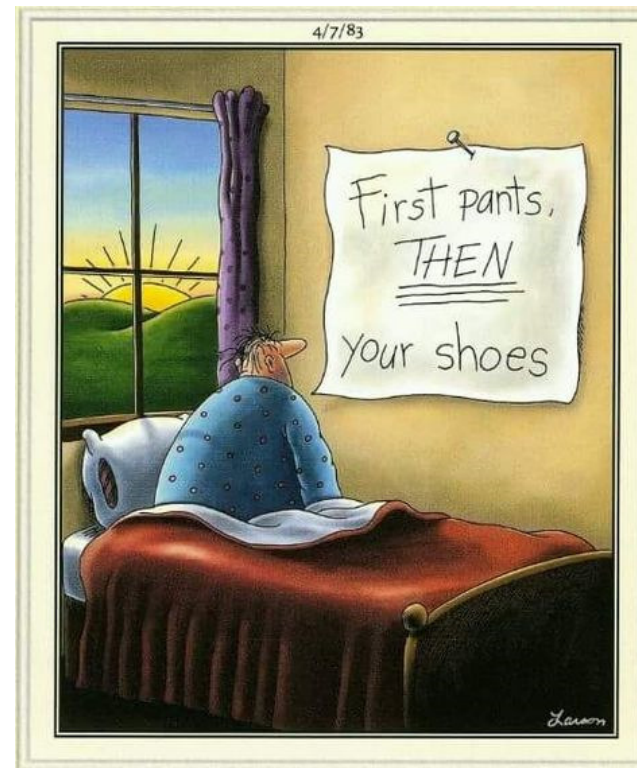
Region 4

Richard Guillot

TSA Auditor
2006 - 2019

Monitoring & Network Review
1994 – 2005

TSA Auditor
1988 - 1993





Region 4

- **Atlanta**

- Air and Radiation Division (ARD)
 - Part 50
 - Part 58, Appendix D - Network Design
 - Grants - 105, 103

- **Athens**

- Laboratory Services and Applied Science Division (LSASD)
 - Part 58, Appendix A, E QA, Siting



Region 4 – Air Monitoring Staff

ATLANTA

- TODD RINCK – RICK GILLAM
- Darren Palmer
- Ryan Brown
- Njeri Carlton-Carew

Daniel Garver
Sara Waterson
Michael Moeller

ATHENS

- LAURA ACKERMAN
- Stephanie McCarthy
- Adam Zachary
- **Mike Crowe** (NPEP)

Keith Harris (SRP)
Tony Bedel
Richard Guillot



Region 4 Air Monitoring Agencies

- 8 States + (17 locals)

- Alabama (2) Florida (7) Georgia Kentucky (1)
- Mississippi North Carolina (3)[1] South Carolina [1] Tennessee (4)

- [2 Tribes] Cherokee Catawba

- =====

- 19 PQAO's + [CAMD & NPS]?



Historical Perspective

Site Meta Data Issues

Site Access Issues

Equipment Concerns

Data Quality Concerns



R4 Annual Air Monitoring Workshop

States, Locals, Tribal Agencies

Vendors

2020 Workshop : March / April , Chattanooga, Tennessee

TOPICS

- **CASTNET, NPS (hint.. hint..)**
- New Regs, Guidance
- Latest Equipment
- Special Studies
- **Grant Commitments**



STATE / LOCAL / TRIBAL PERCEPTIONS

2019 - Region 4 Grant Commitment:

The **agency will collect strip chart data** or its electronic equivalent for quality assurance purposes. Electronic strip chart data must be collected **on a 1-minute timeframe** or less. This data must be retained for a minimum of three (3) complete monitoring years.

Agency Response:

The XXXXXXXX requests that the USEPA meet this same requirement for all USEPA-operated **CASTNET** monitoring sites. The **CASTNET** monitors are considered regulatory monitors by the USEPA and therefore should be held to the same quality assurance standards as the SLAMS monitors.



Regional Perspective

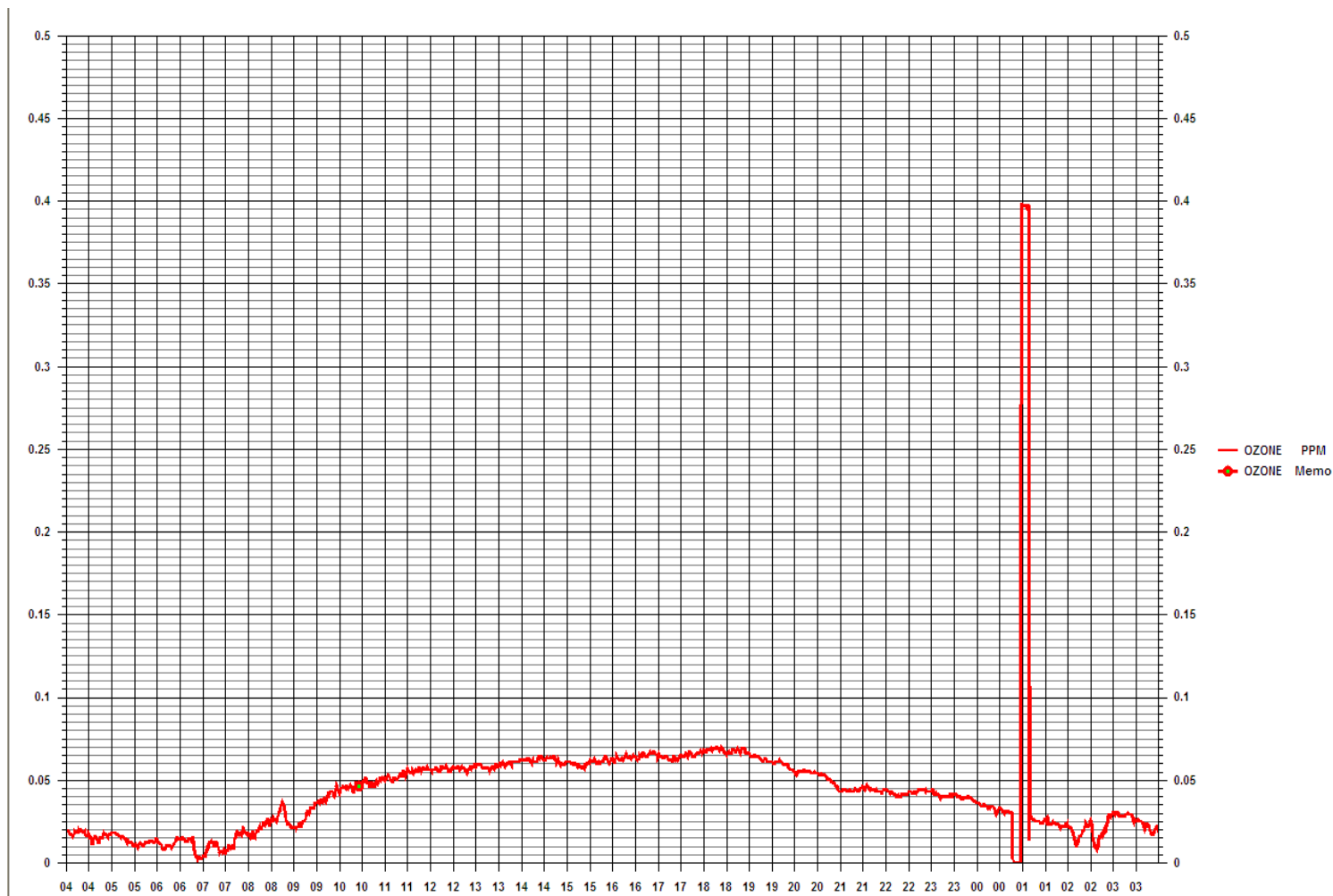
CASTNET / NPS Data Validation

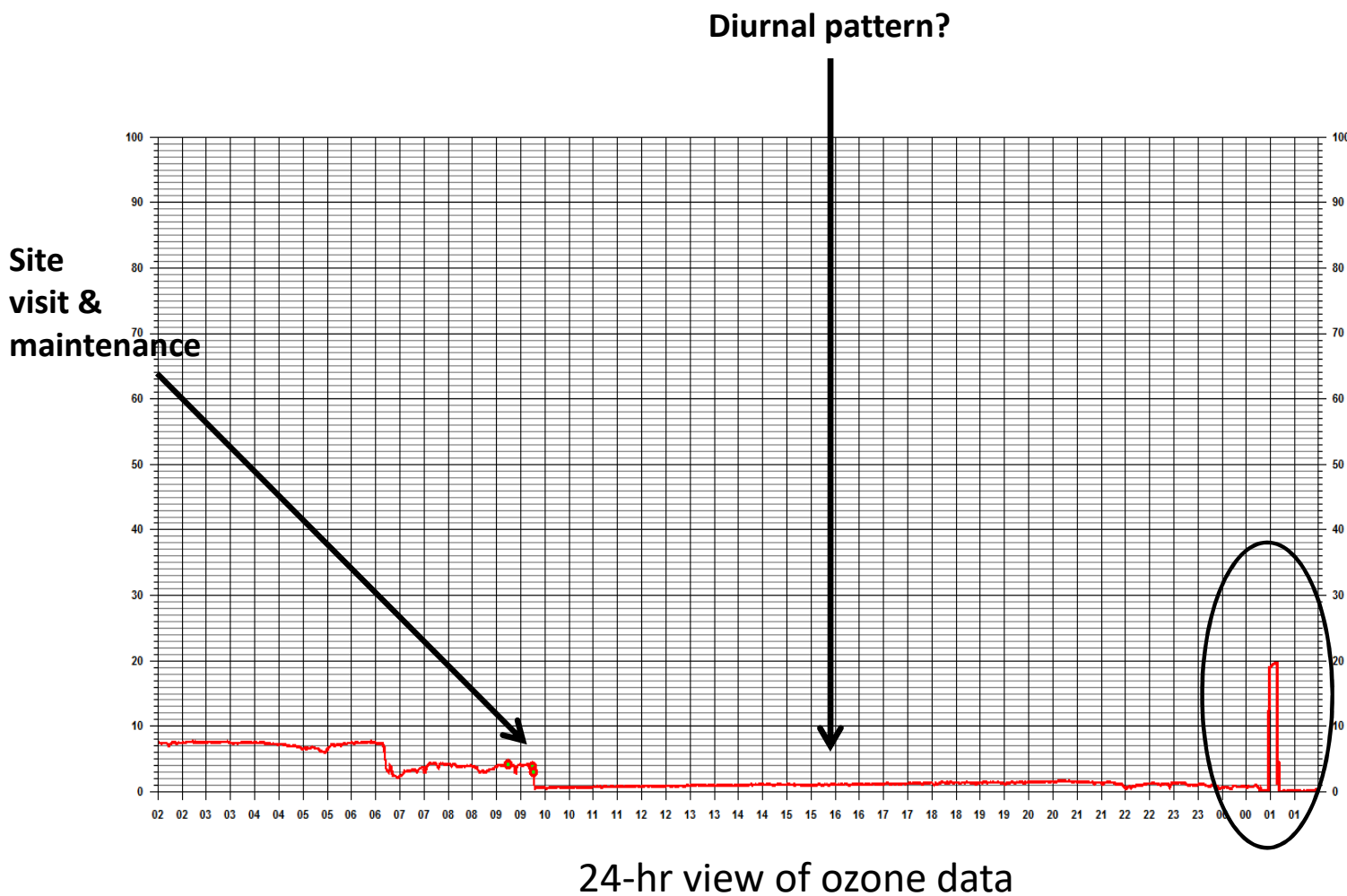
- 1 Minute Electronic Strip Chart Data
- Is it collected?
- How is it used?
- Is it retained?
- For how long?
- Is it available?



Expected Ozone Diurnal Pattern

24-hr view of data

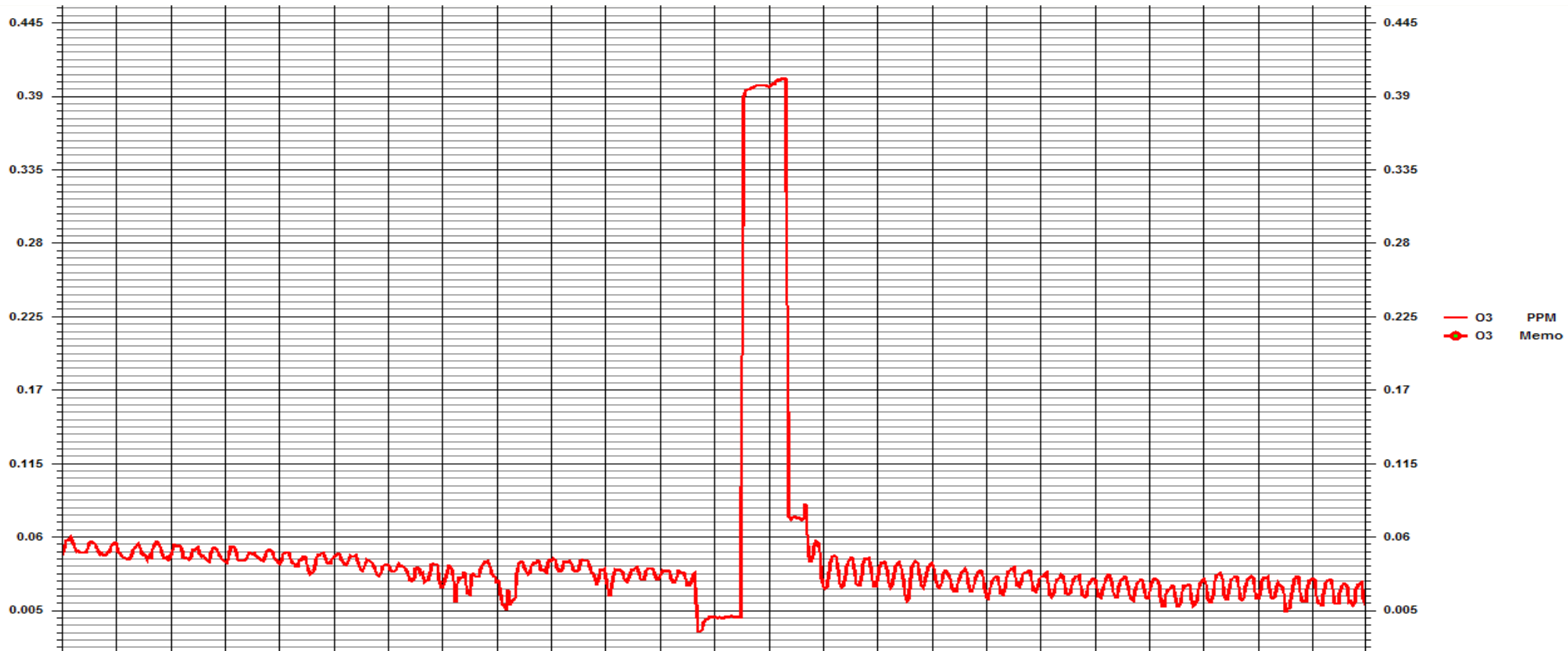




Analyzer leak following internal filter change

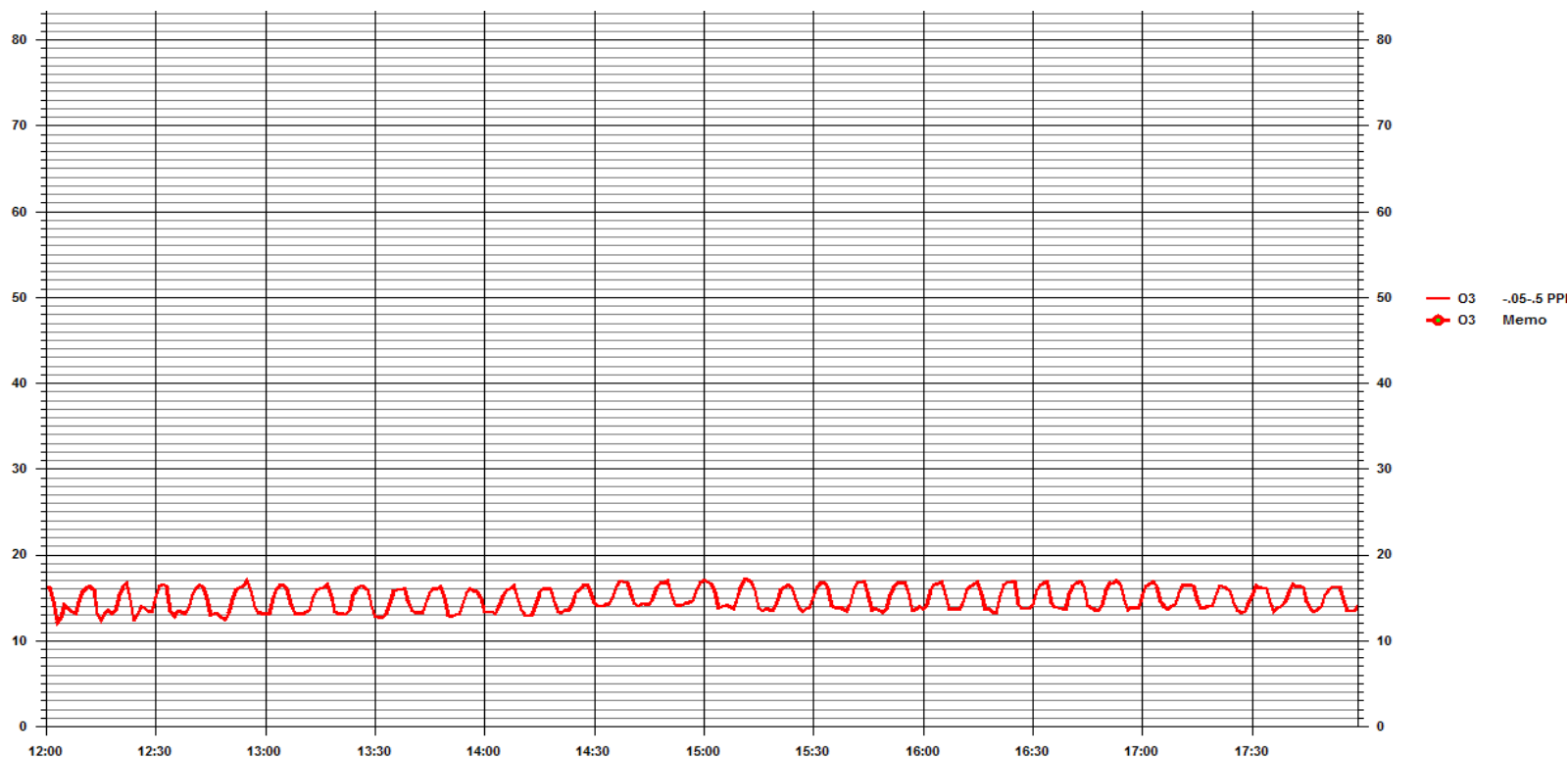
Minute data illustrates lack of diurnal pattern during heat of day

Failed span check follows



Solenoid and/or Detector Malfunction

The QC data for this day looked normal, as did the hourly averages. However, you can see from the graph that there is actually a malfunction occurring.



6-hour view
of ozone data

Water in the Sample Lines

The QC data for this day looked normal, but the operator can see from the graph that there is something wrong.

Parameter:O3 Units:ppb

July 2016

Day/Hour	0:00	1:00	2:00	3:00	4:00	5:00	6:00	7:00	8:00	9:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	Obs	Min	Max	Avg	
Fri	1	35	36	33	37	31	21	28	38	42	42	41	40	45	53	53	53	48	43	40	37	35	34	34	BF	23	21	53	39
Sat	2	36	38	34	31	26	23	36	46	<u>42</u>	<u>43</u>	<u>48</u>	<u>42</u>	<u>46</u>	<u>42</u>	<u>44</u>	<u>45</u>	<u>43</u>	<u>42</u>	<u>35</u>	<u>30</u>	<u>35</u>	<u>32</u>	<u>32</u>	BF	23	23	48	38
Sun	3	<u>40</u>	43	46	46	40	33	40	<u>44</u>	<u>45</u>	<u>44</u>	<u>42</u>	<u>42</u>	49	47	<u>54</u>	<u>51</u>	<u>50</u>	<u>50</u>	<u>58</u>	<u>55</u>	<u>50</u>	<u>50</u>	BF	23	33	61	48	
Mon	4	<u>50</u>	<u>46</u>	<u>42</u>	<u>40</u>	<u>39</u>	<u>35</u>	BF	BF	<u>30</u>	<u>32</u>	<u>30</u>	<u>35</u>	<u>34</u>	<u>38</u>	<u>45</u>	<u>44</u>	<u>45</u>	<u>47</u>	<u>47</u>	<u>50</u>	<u>47</u>	<u>45</u>	<u>39</u>	BF	21	30	50	41
Tue	5	20	<u>20</u>	19	18	16	15	18	BF	23	26	26	27	27	27	28	<u>28</u>	26	27	<u>28</u>	25	25	25	26	BF	22	15	28	24
Wed	6	25	23	21	18	18	19	21	22	26	28	29	25	26	34	26	25	24	20	19	20	18	19	19	BF	23	18	34	23
Thu	7	14	13	9	10	9	6	14	21	23	23	25	26	24	22	22	22	21	22	20	19	15	13	11	BF	23	6	26	18
Fri	8	15	12	10	10	7	5	9	17	20	29	30	28	34	29	27	26	23	21	19	16	14	14	14	BF	23	5	34	19
Sat	9	17	18	17	17	14	14	19	23	26	31	36	43	43	44	42	40	34	28	19	15	19	16	14	BF	23	14	44	26
Sun	10	9	7	5	5	3	5	15	24	35	41	47	40	38	34	34	38	35	38	33	22	15	14	9	BF	23	3	47	24
Mon	11	4	4	5	3	5	6	12	21	23	28	20	22	24	28	29	27	21	18	15	13	11	9	7	BF	23	3	29	15
Tue	12	5	3	5	6	6	9	11	18	22	18	24	26	26	23	22	22	22	30	24	17	19	17	17	BF	23	3	30	17
Wed	13	11	15	15	5	4	5	11	21	27	23	23	30	26	26	22	20	16	16	8	8	9	5	4	BF	23	4	30	15
Thu	14	5	2	1	1	2	2	10	21	30	32	34	44	48	44	35	36	33	26	23	23	16	8	14	BF	23	1	48	21
Fri	15	16	12	8	6	4	6	9	23	34	40	48	50	55	57	53	53	48	39	36	31	27	20	18	BF	23	4	57	30
Sat	16	13	8	8	7	12	14	19	29	35	37	39	40	42	38	37	37	33	29	27	26	22	12	14	BF	23	7	42	25
Sun	17	9	7	9	20	13	13	18	24	34	36	38	34	<u>35</u>	<u>40</u>	<u>50</u>	<u>51</u>	<u>50</u>	<u>49</u>	<u>45</u>	<u>40</u>	<u>35</u>	<u>34</u>	<u>30</u>	BF	23	7	51	31
Mon	18	<u>27</u>	<u>25</u>	13	7	6	-1	AY	<u>35</u>	<u>55</u>	-2	48	BA	35	<u>24</u>	<u>34</u>	<u>26</u>	<u>30</u>	<u>14</u>	<u>15</u>	19	19	19	15	BF	21	-2	37	22
Tue	19	10	<u>7</u>	<u>7</u>	8	9	3	8	<u>12</u>	10	1	3	3	<u>12</u>	<u>19</u>	<u>14</u>	<u>14</u>	<u>15</u>	7	10	7	6	3	2	BF	23	-2	19	8
Wed	20	<u>10</u>	13	12	13	9	5	8	7	2	14	-1	3	2	1	0	2	2	4	8	7	2	5	4	-3	24	-4	13	4
Thu	21	<u>2</u>	1	0	1	1	2	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	-2	9	3
Fri	22	1	1	3	5	7	3	3	2	7	5	3	2	5	7	8	4	10	13	12	1	1	1	-1	-1	24	-1	8	3
Sat	23	1	1	2	3	4	1	5	5	7	5	2	2	1	-1	-1	-1	1	1	1	1	1	1	1	1	24	-2	7	2
Sun	24	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	24	-5	2	-3
Mon	25	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	24	-5	0	-4
Tue	26	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	24	-5	39	15
Wed	27	15	19	22	25	27	25	25	33	40	50	54	55	58	61	60	60	59	58	58	55	53	50	50	45	24	15	61	44
Thu	28	45	35	28	38	43	42	48	45	46	52	55	54	53	52	55	53	59	57	55	56	45	43	39	38	24	28	59	47
Fri	29	35	25	28	26	24	30	34	35	34	35	27	28	34	31	27	26	23	25	17	10	10	6	4	4	24	4	35	24
Sat	30	2	3	10	11	13	10	17	27	34	38	36	38	35	40	46	45	43	39	30	26	24	24	24	20	24	2	46	26
Sun	31	20	19	13	8	5	11	19	31	41	41	43	42	35	44	46	39	36	37	35	34	35	30	25	22	24	5	46	30

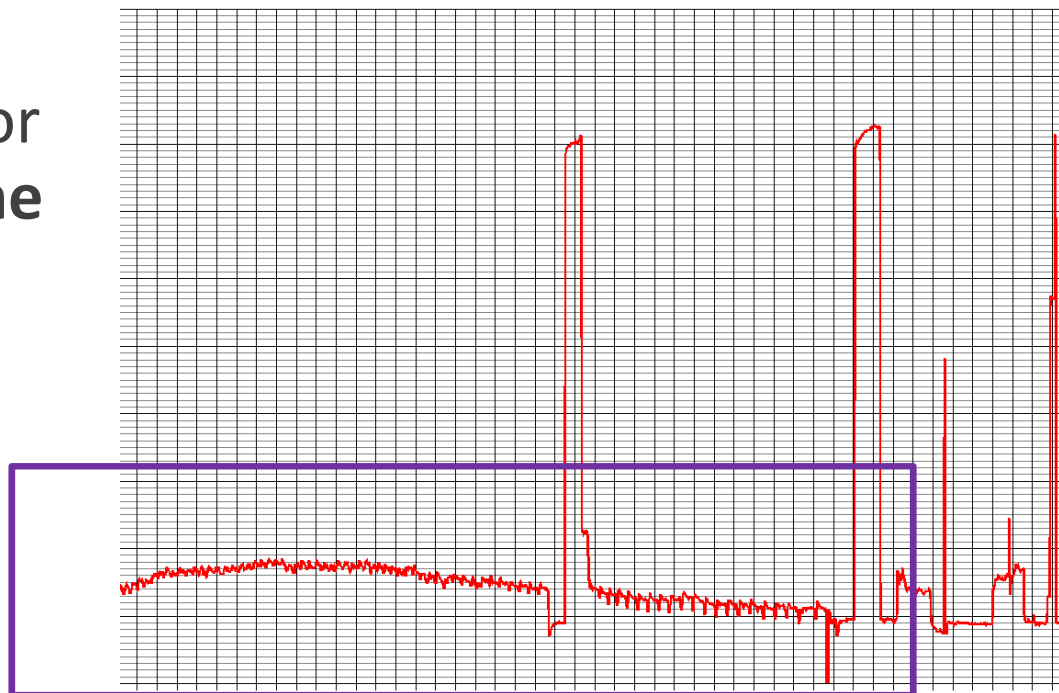


Significantly low concentrations of ozone in July?



Monthly Data Verification Procedures

- Re-review minute data (strip charts) to watch for trends or shifts **over time**
- Review logbook notations for issues not previously observed





REGIONAL PERSPECTIVE

If the data will be used for regulatory decision making:

- IS IT AVAILABLE?
 - To the Region?
 - To the impacted Agency?
- ALL OF IT?
 - ALL LOGS, FORMS, RECORDS, 1 MINUTE DATA, CALIBRATIONS, QA,
- WHAT IS THE PROCEDURE FOR OBTAINING IT?



Technical Systems Audits

Region 4 TSA Reports

Report Sections

- Field Operations, Lab Operations, Records Management, Data Management, Quality Assurance

FINDINGS , CONCERNS , OBSERVATIONS



Regulations and Guidance

Code of Federal Regulations (CFR)

- **MUST vs Should**

QAPP

- Regional Concurrence / Review
 - Conditional Approval

EPA Guidance



Common TSA Finding

Migration of KYNAR (non-equivalent) tube fittings into the probe system.

- **40CFR Part 58, Appendix E, Section 9a**

...Furthermore, the EPA²⁵ has specified **borosilicate glass or FEP Teflon[®] as the only acceptable probe materials** for delivering test atmospheres in the determination of reference or equivalent methods. Therefore, borosilicate glass, FEP Teflon[®] or their equivalent **must** be the only material in the sampling train **(from inlet probe to the back of the analyzer)** that can be in contact with the ambient air sample for existing and new SLAMs.

September 2015, Tad Kleindienst Ph.D.

- Email – KYNAR is not equivalent

PVC (or PVF) hard plastic; poor-fair resistance to strong oxidants (e.g., ozone)
Kynar (PVDF) moderately hard plastic; fair-good resistance to strong oxidants
FEP, PTFE, PFA Teflon; moldable perfluorocarbon; excellent resistance to strong oxidants.

The link below provided by Richard also has a chemical resistance “wheel” for the four different chemicals considered by the website. Without specifying specific chemicals, Kynar was listed as have “good” resistance to strong oxidants. However, I don’t believe this qualitative statement meets the high bar for the use in a monitor for regulatory purposes.

One final technical point, unless a fitting is described as a pass-through, (that is, a tight butt connection can be made between two pieces of Teflon tubing), the analyte gas will most certainly be in contact with the fitting’s barrel.

This said, I do not believe that Kynar meets the standard for Teflon equivalence. Hopefully, this provides some useful information. Let me know if you have any questions on this short writeup.

Tad

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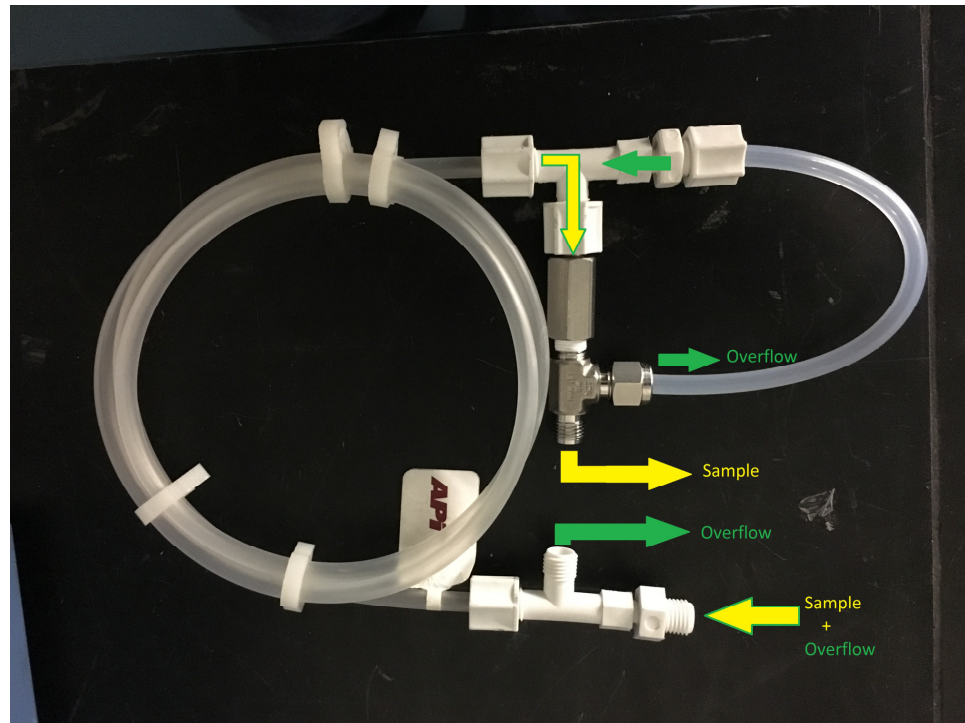
Regional Perspective

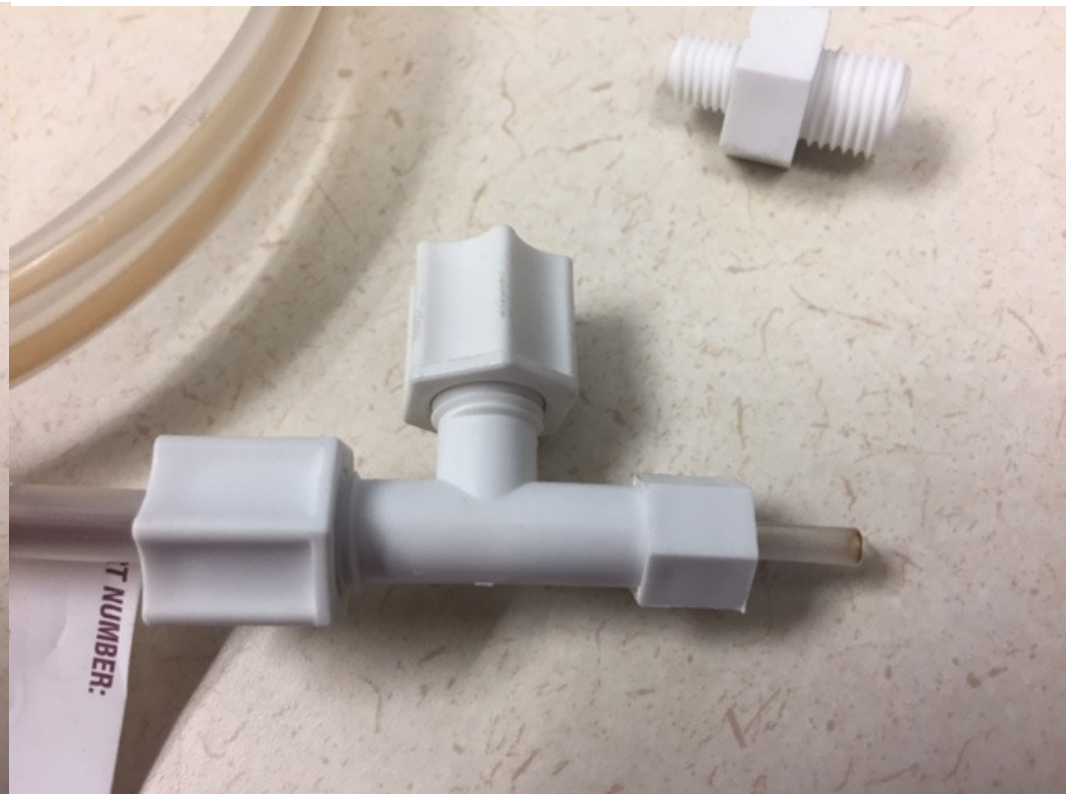
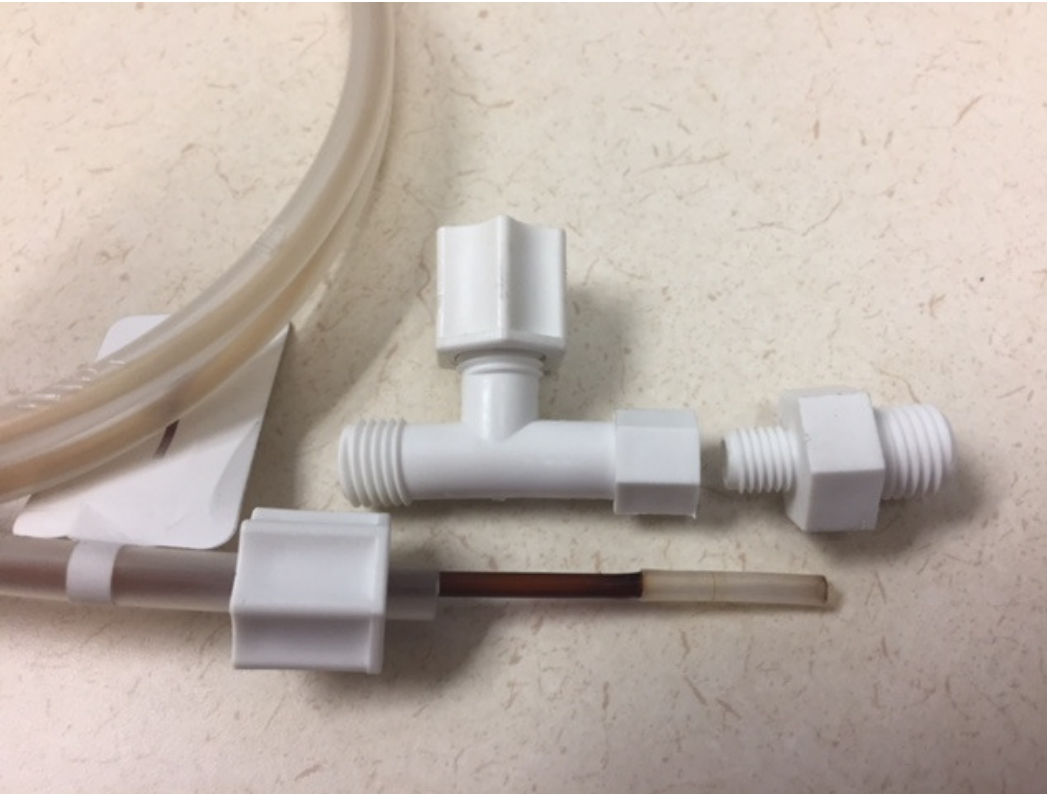
NAFION DRYER

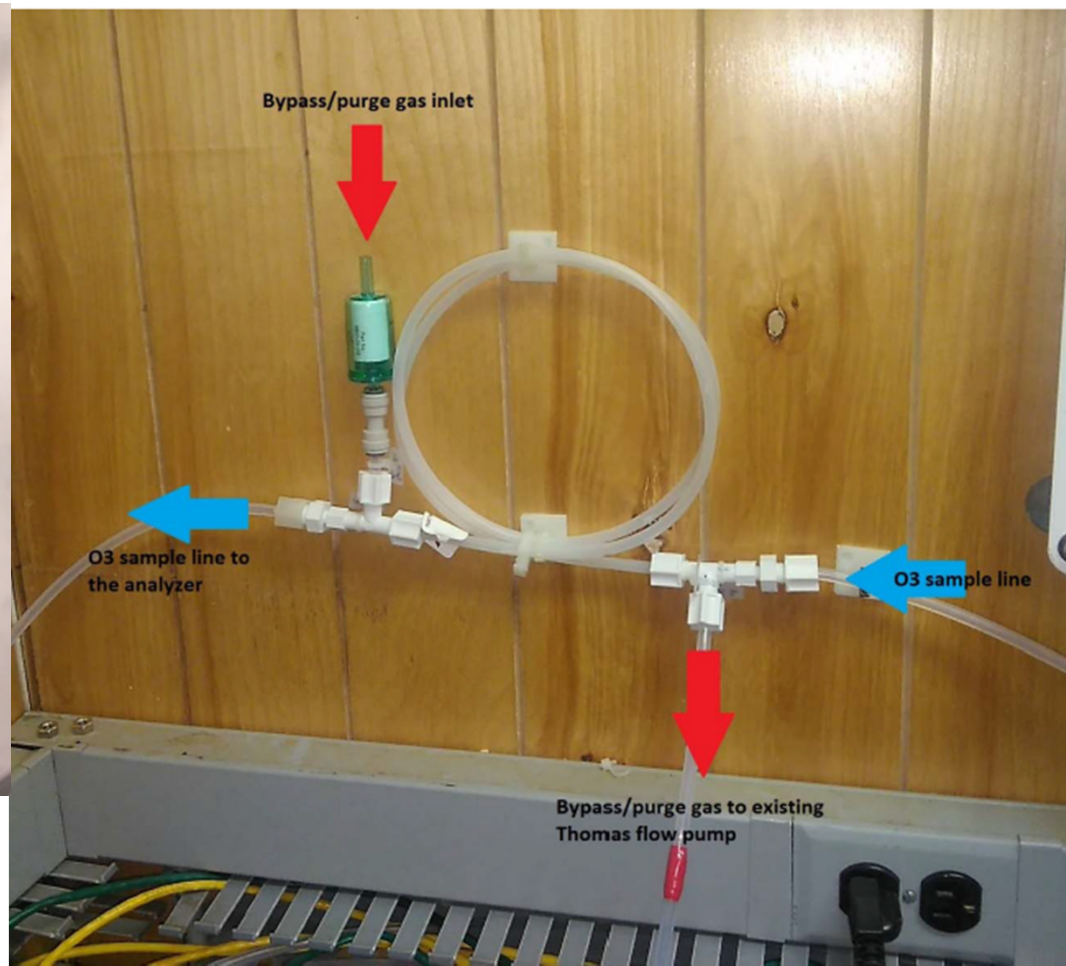
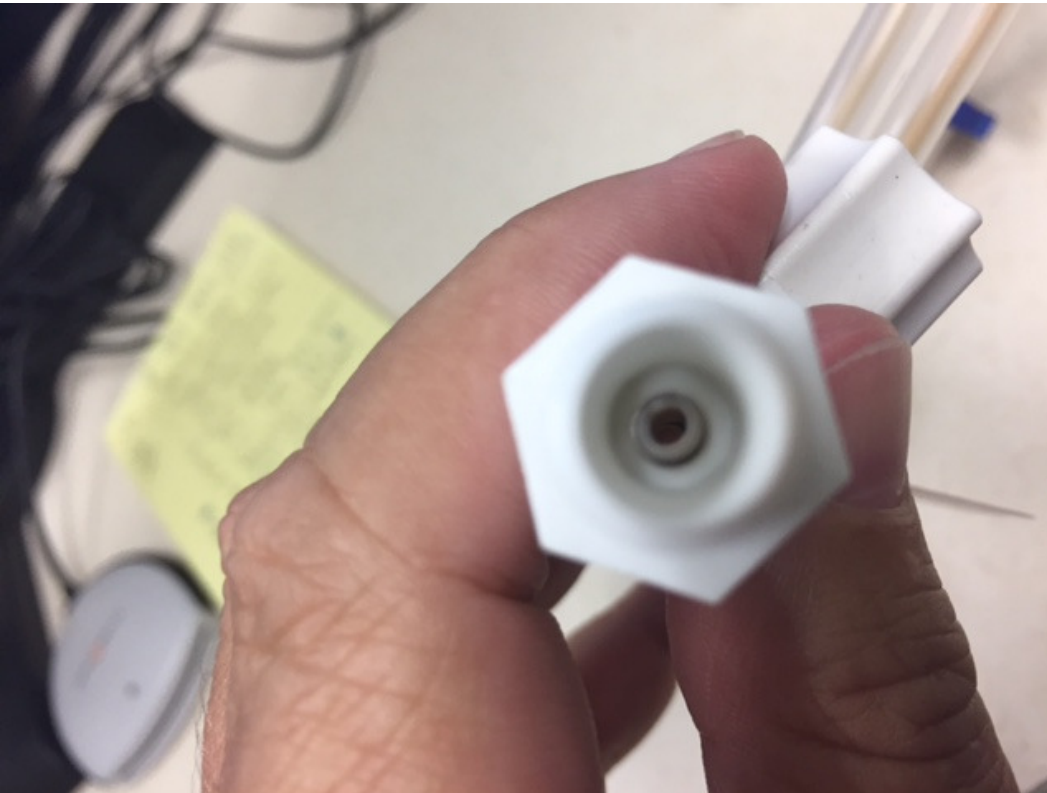
- IN THE PROBE SYSTEM
 - PART 58, APP E , 9.2
 - TEFLON / GLASS

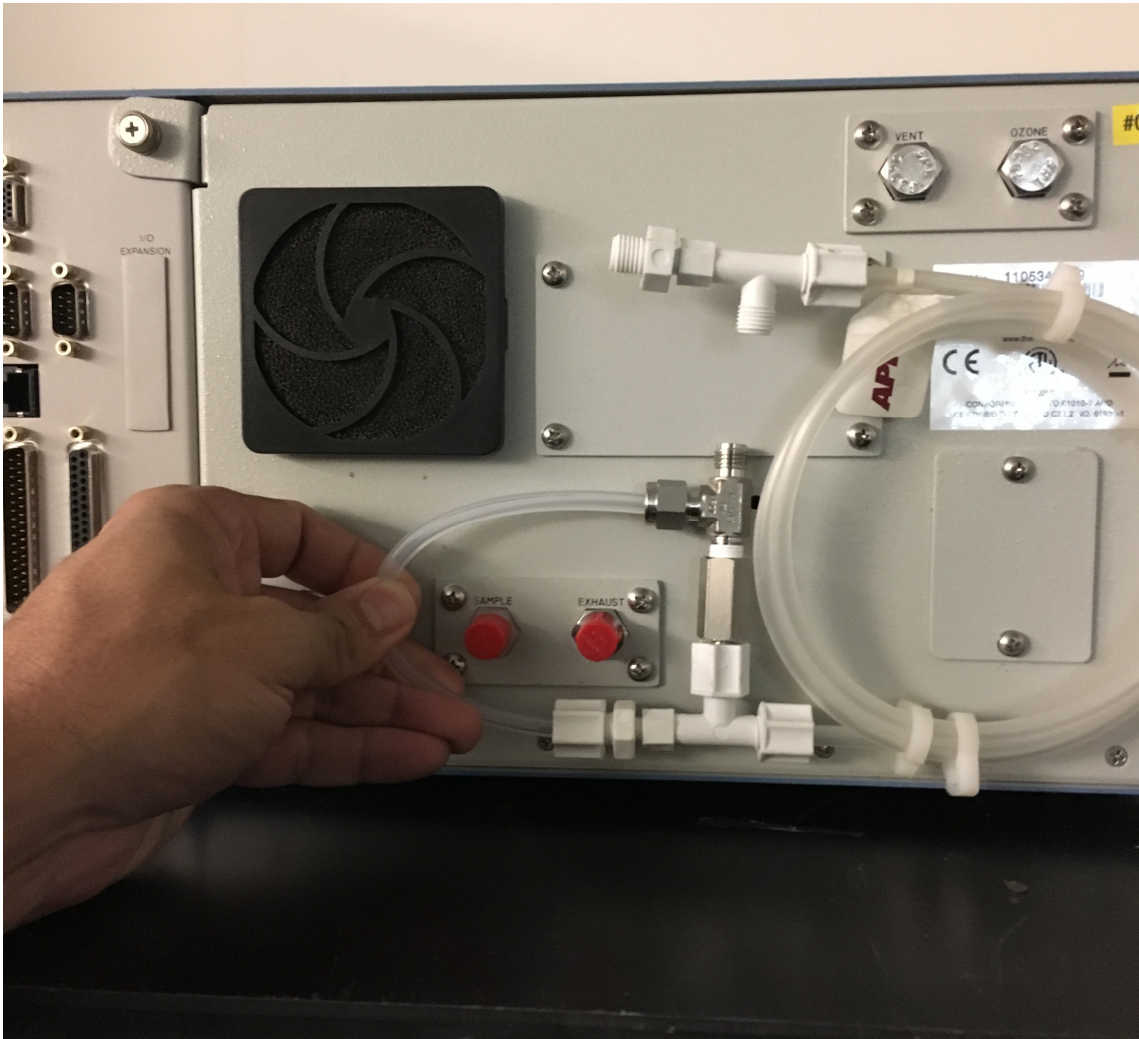
- Polypropylene
- Stainless Steel

Wetted Surfaces?









June 2017
Weinstock Letter to Haeuber

Approving the addition of Nafion dryers is compliant with Part 58 ..

This is the South Eastern U.S. we have moisture issues.

Why am I bringing this up?

Because I AM JEALOUS!!!
Maybe a little

What will my SLTs say?



Regional Perspective

- Siting Issues:
 - Trees, Site Evaluations

- Operations
 - Age of the Shelters ?

- AQS - Data Completeness, Coding



Summary

I do not know enough about : CASTNET NPS
(cant speak for other regions)

Limitations of the contract

- When it comes to data, site access

Who has authority over what?

Who conducts TSAs?

Who evaluates the data before its used for Designations, if anyone?



Summary

STATE, Local, Tribal PERCEPTIONS

- EPA should be the role model for our agencies
- Utilizing the best practices established in CFR and Guidance

Are we holding ourselves to a higher standard in our monitoring efforts?

Questions?





National Park Service (2015 QAPP)

- Mammoth Cave: MACA-HM CASTNET

- Kings Mountain: KIMN-BM

- Look Rock: GRSM-LR CASTNET
- Look Rock: GRSM-LN
- Cades Cove: GRSM-CC
- Cove Mountain: GRSM-CM
- Clingmans Dome: GRSM-CD

- Everglades NP EVER-BC CASTNET



Clean Air Markets Division (2019 QAPP)

Alabama	01-049-9991	SND 152	Sand Mountain
Florida	12-061-9991	IRL141	Indian River Lagoon
Florida	12-077-9991	SUM156	Sumatra
Georgia	13-231-9991	GAS153	Georgia Station
Kentucky	21-221-9991	CDZ171	Cadiz
Kentucky	21-175-9991	CKT136	Crocket
Kentucky	21-229-9991	MCK131	Mackville
Kentucky	21-229-9991-2	MCK231	Mackville-Collocated
Kentucky	21-061-0501	MAC426	Mammoth Cave NP



Clean Air Markets Division (CAMD)

Mississippi	28-161-9991	CVL151	Coffeeville
North Carolina	37-031-9991	BFT142	Beaufort
North Carolina	37-123-9991	CND125	Candor
North Carolina	37-113-9991	COW137	Coweeta
North Carolina	37-011-9991	PNF126	Cranberry
North Carolina	37-xxx-xxxx	DUK008	Orange
Tennessee	47-041-9991	ESP127	Edgar Evins
Tennessee	47-025-9991	SPD111	Speedwell
Tennessee	47-009-0101	GRS420	Great Smoky NP – Look Rock