



October 10, 2019

Robert Colby, Director  
Chattanooga-Hamilton County Air Pollution Control  
6215 Preservation Drive  
Chattanooga, TN 37416-3638

Reference: Third Quarter 2019 TDEC /Performance Audits

Dear Mr. Colby:

This report contains the results of performance audits conducted by personnel from Tennessee's Air Quality Assurance Program on September 11<sup>th</sup>, 12<sup>th</sup>, 2019. The audits were performed on various instruments at multiple monitoring locations throughout the Hamilton County monitoring network, including gaseous analyzers for ozone and low volume particle samplers for PM2.5. Sites audited include East Ridge, Eastside Utilities, Siskin Drive and Soddy Daisy.

During the Quality Assurance Performance Audits (QAPAs) on September 11<sup>th</sup> and 12<sup>th</sup>, 26<sup>th</sup> and 27<sup>th</sup> 2019, Tennessee Air Quality Assurance personnel audited the flow rate of each low volume particle sampler against a specified design flow rate and a transfer standard. QA personnel also audited each ozone analyzer with a level three standard (Teledyne 750 multi-gas calibrator) to determine the accuracy of the analyzer against a certified standard. These audits were conducted to ensure that each air monitor within the Hamilton County network was operating within accepted criteria established by federal regulations and guidance documents. Acceptable limits of these performance audits are published in 40 Code of Federal Regulations (CFR) Part 58 and QA Handbook Volume II, which establish federal standards for Quality Assurance and Quality Control practices for ambient air monitoring. These acceptable limits should be considered in conjunction with your Quality Assurance Plan. It is noted that during this audit that the T750U was directly connected to the analyzer during the 11<sup>th</sup> and 12<sup>th</sup>. The audit on the 26<sup>th</sup> and 27<sup>th</sup> was performed as has been done in the past through the sample lines.

Results from the third quarter, 2019 QAPAs, demonstrate that the Hamilton County air monitoring network was operating within acceptable limits of federal regulations and quality assurance guidelines. All QAPA results were noted in the instrument log books and summarized in the following pages of this report. The next TDEC QAPAs will be scheduled with Kathy Jones before November, 2019.

If we can be of any further assistance or should there be questions regarding this audit, please email me at Ben.Hartsfield@tn.gov or call (615) 532-0597.

Sincerely,

A handwritten signature in blue ink that reads "Ben Hartsfield". The signature is written in a cursive style and is positioned above the printed name.

Ben Hartsfield  
Environmental Consultant  
Quality Assurance Section

cc: A, Pratt, APC; M. Oakes, APC; K. Jones, Hamilton County.

*Air Pollution Control Division  
Quality Assurance Performance Audit*

**Site:** Soddy Daisy  
**Audit Quarter:** 3Q 2019  
**AQS #:** 47-065-1011  
**Pollutant:** O3  
**Auditor:** Ben Hartsfield

Instrument Model:	Thermo 49i	O3		<u>Audit Equip:</u>	<u>Serial #</u>
Serial Number:	1435663748			Teledyne 750U	#153
Data Logger Model:	ESC 8872			Teledyne 751H	#183
Data Logger Serial Number:	799			Streamline Pro	#150306
Audit date:	09/11/19	8872		Time	<a href="http://www.time.gov">www.time.gov</a>
<u>Ozone Set Point</u>	<u>Audit Value</u>	<u>Monitor Response</u>	<u>Difference</u>	<u>Acceptable Range</u>	<u>Audit Level</u>
	ppb	ppb			
Zero	0	0	0		Zero
85 ppb	85	86	1.2%	< ± 15.1 %	5
65 ppb	65	66	1.5%	< ± 15.1 %	4
35 ppb	35	35	0.0%	< ± 15.1 %	3
15 ppb	15	15	0.0%	< ± 15.1% or 1.5 ppb	2
Zero	0	0	0		Zero
Data logger time	9:21:00	9:20:59	-00:00:01	* < ± 1 min	
Data logger temperature	25.5	25.2	-0.3	< ± 2.1°C	

**Remarks:**

1. The monitor audited showed satisfactory correlation with our audit standard.
2. All measured parameters were within acceptable limits.
3. The audit results were also noted in the instrument log books.
4. The data logger acceptable time range of < ± one minute is a State recommendation.\*
5. 8816 response - 0, 87, 66, 35, 15, 0. AVT response-0, 87, 66, 35, 15, 0. 49i response- 0, 86, 66, 35, 15, 0.
6. Audit was performed with direct connect from calibrator to sample inlet.

**Recommendations:**

1. None.

Any questions concerning the audits or any comments made in connection with the audits may be addressed to me at (615) 532-0597 or [Ben.Hartsfield@tn.gov](mailto:Ben.Hartsfield@tn.gov)

Sincerely,



Ben Hartsfield  
 Environmental Consultant  
 Quality Assurance Section  
 Report Date: 10/1/19

To: R. Colby, Hamilton Co.  
 cc: K. Jones, Hamilton Co.; A. Pratt, APC; M. Oakes, APC.

*Air Pollution Control Division  
Quality Assurance Performance Audit*

**Site:** Soddy Daisy  
**Audit Quarter:** 3Q 2019  
**AQS #:** 47-065-1011  
**Pollutant:** O3  
**Auditor:** Lance Allen

Instrument Model:	Thermo 49i	O3		<u>Audit Equip:</u>	<u>Serial #</u>
Serial Number:	1435663748			Teledyne 750U	#70
Data Logger Model:	ESC 8872			Teledyne 751H	#182
Data Logger Serial Number:	799			Streamline Pro	#060504
Audit date:	09/26/19	8872		Time	<a href="http://www.time.gov">www.time.gov</a>
<u>Ozone Set Point</u>	<u>Audit Value</u>	<u>Monitor Response</u>	<u>Difference</u>	<u>Acceptable Range</u>	<u>Audit Level</u>
	ppb	ppb			
Zero	0	0	0		Zero
85 ppb	85	86	1.2%	< ± 15.1 %	5
65 ppb	65	66	1.5%	< ± 15.1 %	4
35 ppb	35	35	0.0%	< ± 15.1 %	3
15 ppb	15	15	0.0%	< ± 15.1% or 1.5 ppb	2
Zero	0	0	0		Zero
Data logger time	9:11:03	9:11:00	-00:00:03	*<±1min	
Data logger temperature	26.1	26.1	0.0	< ± 2.1°C	

**Remarks:**

1. The monitor audited showed satisfactory correlation with our audit standard.
2. All measured parameters were within acceptable limits.
3. The audit results were also noted in the instrument log books.
4. The data logger acceptable time range of < ± one minute is a State recommendation.\*
5. 8816 response - 0, 86, 66, 35, 15, 0. AVT response-0, 86, 66, 35, 15, 0. 49i response- 0, 86, 66, 35, 15, 0.

**Recommendations:**

1. None.

Any questions concerning the audits or any comments made in connection with the audits may be addressed to me at (615) 532-0597 or Ben.Hartsfield@tn.gov

Sincerely,



Ben Hartsfield  
 Environmental Consultant  
 Quality Assurance Section  
 Report Date: 10/1/19

To: R. Colby, Hamilton Co.  
 cc: K. Jones, Hamilton Co.; A. Pratt, APC; M. Oakes, APC.

*Air Pollution Control Division  
Quality Assurance Performance Audit*

**Site:** Eastside Utility  
**Audit Quarter:** 3Q 2019  
**AQS #:** 47-065-4003  
**Pollutant:** O3  
**Auditor:** Ben Hartsfield

Instrument Model:	Thermo 49i	O3		<u>Audit Equipment</u>	<u>Serial #</u>
Serial Number:	1435663747			Teledyne 750U	#153
Data Logger Model:	ESC 8872			Teledyne 751H	#183
Data Logger Serial Number:	0642			Streamline Pro	#150306
Audit date:	09/12/19	8872		Time	<a href="http://www.time.gov">www.time.gov</a>
<u>Ozone Set Point</u>	<u>Audit Value</u>	<u>Monitor Response</u>	<u>Difference</u>	<u>Acceptable Range</u>	<u>Audit Level</u>
	ppb	ppb			
Zero	0	0	0		Zero
85 ppb	85	85	0.0%	< ± 15.1 %	5
55 ppb	65	65	0.0%	< ± 15.1 %	4
35 ppb	35	35	0.0%	< ± 15.1 %	3
15 ppb	15	15	0.0%	< ± 15.1% or 1.5 ppb	2
Zero	0	0	0		Zero
Data logger time	9:21:30	9:21:29	-00:00:01	*<±1 min	
Data logger temperature	25.4	25.6	0.2	< ± 2.1°C	

**Remarks:**

1. The monitor audited showed satisfactory correlation with our audit standard.
2. All measured parameters were within acceptable limits.
3. The audit results were noted in the instrument log book and listed above.
4. The data logger acceptable time range of < ± one minute is a State recommendation.\*
5. 8816 response-0, 85, 65, 35, 15, 0. AVT response-0, 85, 65, 35, 15, 0. 49i response- 0, 85, 65, 35, 15, 0.
6. Audit was performed with direct connect from calibrator to sample inlet.

**Recommendations:**

1. None.

Any questions concerning the audits or any comments made in connection with the audits may be addressed to me at (615) 532-0597 or Ben.Hartsfield@tn.gov.

Sincerely,



Ben Hartsfield  
 Environmental Consultant  
 Quality Assurance Section

Report Date: 9/30/19

To: R. Colby, Hamilton Co.  
 cc: K. Jones, Hamilton Co.; A. Pratt, APC; M. Oakes, APC.

*Air Pollution Control Division  
Quality Assurance Performance Audit*

**Site:** Eastside Utility  
**Audit Quarter:** 3Q 2019  
**AQS #:** 47-065-4003  
**Pollutant:** O3  
**Auditor:** Lance Allen

Instrument Model:	Thermo 49i	O3		<u>Audit Equipment</u>	<u>Serial #</u>
Serial Number:	1435663747			Teledyne 750U	#70
Data Logger Model:	ESC 8872			Teledyne 751H	#182
Data Logger Serial Number:	0642			Streamline Pro	#060504
Audit date:	09/27/19	8872		Time	<a href="http://www.time.gov">www.time.gov</a>
<u>Ozone Set Point</u>	<u>Audit Value</u>	<u>Monitor Response</u>	<u>Difference</u>	<u>Acceptable Range</u>	<u>Audit Level</u>
	ppb	ppb			
Zero	0	0	0		Zero
85 ppb	85	85	0.0%	<± 15.1 %	5
55 ppb	65	65	0.0%	<± 15.1 %	4
35 ppb	35	35	0.0%	<± 15.1 %	3
15 ppb	15	15	0.0%	<± 15.1% or 1.5 ppb	2
Zero	0	0	0		Zero
Data logger time	9:48:03	9:48:00	-00:00:03	*<± 1 min	
Data logger temperature	24.7	24.5	-0.2	<± 2.1°C	

Remarks:

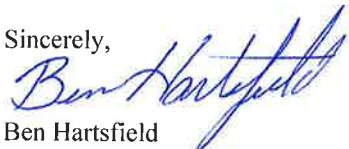
- The monitor audited showed satisfactory correlation with our audit standard.
- All measured parameters were within acceptable limits.
- The audit results were noted in the instrument log book and listed above.
- The data logger acceptable time range of <± one minute is a State recommendation.\*
- 8816 response-0, 85, 65, 35, 15, 0. AVT response-0, 85, 65, 35, 15, 0. 49i response- 0, 85, 65, 35, 15, 0.

Recommendations:

- None.

Any questions concerning the audits or any comments made in connection with the audits may be addressed to me at (615) 532-0597 or Ben.Hartsfield@tn.gov.

Sincerely,



Ben Hartsfield  
 Environmental Consultant  
 Quality Assurance Section

Report Date: 9/30/19

To: R. Colby, Hamilton Co.  
 cc: K. Jones, Hamilton Co.; A. Pratt, APC; M. Oakes, APC.

*Air Pollution Control Division  
Quality Assurance Performance Audit*

**Site:** Siskin  
**Audit Quarter:** 3Q 2019  
**AQS #:** 47-065-4002  
**Pollutant:** PM 2.5  
**Auditor:** Ben Hartsfield

Instrument Model:	Thermo 2025i	<b>PM 2.5</b>	<u>Audit Equipment</u>	<u>Serial #</u>
Serial Number:	21084/ POC #1		Streamline Pro	#150306
Audit Date:	9/11/19		Time	<a href="http://www.time.gov">www.time.gov</a>
<u>Measured Parameter</u>	<u>Audit Value</u>	<u>Monitor Response</u>	<u>Difference</u>	<u>Acceptable Range</u>
Transfer Standard Flow:	16.36	16.68	2.0%	< ± 4.1%
Design Flow:	16.67	16.67	0.0%	< ± 5.1%
Barometric Pressure:	749	749	0.0	< ± 10.1mm
Ambient Temperature:	29.4	29.9	0.5	< ± 2.1°C
Filter Temperature:	32.4	32.2	-0.2	< ± 2.1°C
External Leak Check	AF-6mmHG	AL-6mmHg	Pass	≤ 25 mmHg/min.
Clock Time:	12:30:16	12:30:00	-00:00:16	< ± 00:01:00 minute

Instrument Model:	Thermo 2025i	<b>PM 2.5</b>	<u>Audit Equipment</u>	<u>Serial #</u>
Serial Number:	21131/ POC #2		Streamline Pro	#150306
Audit Date:	06/18/19		Time	<a href="http://www.time.gov">www.time.gov</a>
<u>Measured Parameter</u>	<u>Audit Value</u>	<u>Monitor Response</u>	<u>Difference</u>	<u>Acceptable Range</u>
Transfer Standard Flow:	16.21	16.67	2.8%	< ± 4.1%
Design Flow:	16.67	16.67	0.0%	< ± 5.1%
Barometric Pressure:	748	748	0.0	< ± 10.1mm
Ambient Temperature:	33.0	32.5	-0.5	< ± 2.1°C
Filter Temperature:	32.9	32.7	-0.2	< ± 2.1°C
External Leak Check	AF-7mmHg	AL-7mmHG	Pass	≤ 25 mmHg/min.
Clock Time:	12:41:20	12:41:00	-00:00:20	< ± 00:01:00 minute

<u>Measured Parameter</u>	<u>Audit Value</u>	<u>Monitor Response</u>	<u>Difference</u>	<u>Acceptable Range</u>
Transfer Standard Flow:	5.09	5.03	-1.2%	< ± 5.1%
Design Flow:	5.00	5.00	0.0%	< ± 0.15 LPM
Barometric Pressure:	747	746	-1.0	< ± 5.0%
Ambient Temperature:	29.3	29.4	0.1	< ± 2.1°C
Leak Check		0.0 lpm	Pass	<±0.25LPM
Data logger 8832 #A0994K	12:10:00	12:10:00	00:00:00	*< ± 00:01:00 minute

Remarks:

1. The instruments audited showed satisfactory correlation with our audit standards.
2. The PM 10 inlets and PM 2.5 cyclones were clean.
3. The audit results were noted in the instrument log books.
4. The data logger acceptable time range of < ± one minute is a State recommendation.\*
5. 8832 Data logger time was correct however T640 time was 12:12:30 which was 2:30 minutes off. Time was corrected while on-site.

Recommendations:

1. None.

Any questions concerning the audits or any comments made in connection with the audits may be addressed to me at (615) 532-0597 or Ben.Hartsfield@tn.gov

Sincerely,



Ben Hartsfield  
Environmental Consultant  
Quality Assurance Section

Report Date: 9/30/19

To: R. Colby, Hamilton Co.  
cc: K. Jones, Hamilton Co.; A. Pratt, APC; M. Oakes, APC.

*Air Pollution Control Division  
Quality Assurance Performance Audit*

**Site:** East Ridge  
**AQS #:** 47-065-0031  
**Audit Quarter:** 3Q 2019  
**Pollutant:** PM 2.5  
**Auditor:** Ben Hartsfield

Instrument Model:	Thermo 2025	PM 2.5	<u>Audit Equipment</u>	<u>Serial #</u>
Serial Number:	22109		Streamline Pro	#150306
Audit Date:	9/11/19		Time	<a href="http://www.time.gov">www.time.gov</a>
<u>Measured Parameter</u>	<u>Audit Value</u>	<u>Monitor Response</u>	<u>Difference</u>	<u>Acceptable Range</u>
Transfer Standard Flow:	16.84	16.71	-0.8%	< ± 4.1%
Design Flow:	16.67	16.70	0.2%	< ± 5.1%
Barometric Pressure:	748	748	0.0	< ± 10.1mm
Ambient Temperature:	33.4	32.1	-1.3	< ± 2.1°C
Filter Temperature:	36.2	36.2	0.0	< ± 2.1°C
Compartment Temperature:	34.1	34.1	0.0	< ± 2.1°C
External Leak Check		3 mmHg/min.	Pass	≤ 25 mmHg/min.
Clock Time:	13:11:00	13:10:55	-00:00:05	< ± 00:01:00 minute

**Remarks:**

1. The monitor audited showed satisfactory correlation with our audit standard.
2. PM 10 inlet and PM 2.5 cyclone were clean.
3. The results were noted in the instrument log book.

**Recommendations:**

1. None.

Any questions concerning the audits or any comments made in connection with the audits may be addressed to me at (615) 532-0597 or Ben.Hartsfield@tn.gov.

Sincerely,



Ben Hartsfield  
 Environmental Consultant  
 Quality Assurance Section

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